



LIVERPOOL INDUSTRIAL DEVELOPMENT LANDS STUDY

APP Corporation Pty Limited

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Executive Summary

This report has been prepared by APP Corporation Pty Ltd (APP) to provide Liverpool City Council with an understanding of:

- The changing demands and drivers affecting traditional industrial and employment lands and innovation, research and advanced manufacturing and business park uses; and
- The potential land use implications and planning initiatives required to support long term economic prosperity and job growth in the Liverpool LGA.

It includes a review and analysis of:

- The key domestic and global demands and drivers for change influencing Liverpool's existing industrial precincts;
- Domestic and international case studies which identify and confirm best practice for land use planning; and
- Market and Government initiatives that have incentivised growth and development of industrial development lands.

The report has focused on the following industrial precincts within Liverpool, comprising Chipping Norton, Moorebank, Orange Grove, Priddle/Scrivener Street (Warwick Farm), Sappho Road (Warwick Farm North), Warwick Farm Racecourse (Coopers Paddock), Yarrunga/Prestons, Crossroads (Casula), Hoxton Park Airport (Len Waters Estate) and Austral.

The way in which land and buildings are used and developed in industrial precincts is steadily changing in response to a number of key drivers, both domestically and internationally and include globalisation and impacts of global competition, population growth and increased construction activity. These drivers have led to investment in major infrastructure projects and land releases in Greater Sydney, including Western Sydney Airport. The changing nature of industries, the workplace and working efficiencies have created shifts in global and domestic economic conditions and a changing consumer market, spurring creative thinking and investment in technical and professional service industries.

Liverpool's industrial lands will transform steadily over the coming decades. A growing need for industry to specialise and target niche sectors to retain a competitive edge along with a demand for continued urban services, larger-scale distribution and freight and specialised innovation/creative and advanced technology industries will require the development of a variety of industrial spaces to accommodate the range of demands. Good access to movement corridors, with access to transport, essential services and amenity will be paramount to further development in this sector.

To understand the challenges and opportunities that will influence the changing Liverpool industrial sector, APP has examined the critical success factors of comparable industrial precincts throughout

Australia and overseas and how these learnings could be applied to Liverpool's industrial precincts. This review has focused primarily on their land use planning and development regulation.

A variety of market and government led initiatives can support the retention and growth of local jobs and industries. Value capture is an effective tool to reinvest funds raised from new development projects back into infrastructure upgrades. It is also a means of leveraging growth against significant infrastructure investment, such as the Western Sydney Airport and North-South Rail to drive investment from the private sector and establish important connected corridors of economic strength. Planning and land use incentives can also be used to drive growth, encourage desirable built form outcomes and place making, and protect established industries.

Development standards including building height, floor space ratios (FSRs) and lot size under Liverpool Local Environmental Plan 2008 (LLEP 2008) have been reviewed with a series of recommended improvements included based on the best practice experiences investigated. This report recommends alterations to Liverpool's planning framework to better respond to the changing nature of the industrial precincts. These changes include better definition of the type, scale and nature of industrial and other activities considered suitable in each of the zones as well as clarification of the desired intent of each zone. It is essential that the zones avoid generality by including more specific objectives and remove unnecessary duplication of permissible land uses.

There is a need to reconcile the current zoning of Liverpool's precincts. Specialised urban services are best suited to the IN2 Light Industrial Zone. The IN1 General Industrial Zone should be applied to industrial parks or estates that accommodate mid-sized operators and large, low-impact operations including warehousing, distribution, logistics, processing and manufacturing. The IN3 Heavy Industrial Zone should only be retained in areas where heavy impact industries are considered desirable to be maintained with protected separation distances to surrounding uses.

Finally, this report explores the introduction of a modified B7 Business Park Zone in suitable precincts to allow for a variety of light and innovative industrial, commercial and retail uses. It is recommended that the tailored B7 zoning be applied to the Priddle/Scrivener Street precinct as part of an extension to the Liverpool Health and Education Precinct. This rezoning needs to be supported by initiatives, revised development standards and infrastructure improvements which focus on revitalizing places within the precinct.

1. Introduction

1.1 Purpose of the Study

Liverpool City Council (Council) have commissioned APP Corporation Pty Limited (APP) to undertake a detailed investigation of existing industrial and employment land within the Liverpool Local Government Area (LGA). This report will provide Council with a better understanding of the changing demands and drivers of traditional industrial and employment land and innovation, research and advanced manufacturing and business park uses, the potential land use implications and planning initiatives required to support long term economic growth, prosperity and job creation in Liverpool LGA. This report:

- Investigates the changing demands and drivers of industrial and employment land uses and built form relevant to the Liverpool LGA in the short to medium term.
- Investigates current best practice of land use planning for industrial and employment lands.
- Provides an overview of the objectives, land uses and development standards within existing industrial zones under Liverpool Local Environmental Plan 2008 (Liverpool LEP 2008) and makes recommendations to the planning framework.
- Investigates changing demand and drivers of Innovation/Research/Health/Advanced manufacturing precincts and business parks including B7 Business Park zoned land.
- Investigates current best practice of land use planning for Innovation/Research/Health/Advanced manufacturing precincts and business parks including B7 Business Park zoned land within Australia and in other countries.
- Provides recommendations regarding implementation of Innovation/Research/Health/Advanced manufacturing precincts and business parks within the Liverpool LGA, including zone objectives and permissible uses.
- Provide advice on land use planning initiatives to foster the establishment of Innovation/Research/Health/Advanced manufacturing precincts and business parks in existing precincts.

This study builds on the previous research undertaken by Council and other organisations to understand the constraints, opportunities and changing nature of industries. The study identifies and acknowledges how global competition, advances in technology and collaboration are driving specialisation, clustering and innovation, and how these fundamental shifts need to be understood in the content of Liverpool's employment lands.

1.2 Report Structure

This Study is structured in the following Chapters:

Chapter 1: Introduction – Includes an overview of the purpose of the Study and its structure. This section considers the types of employment precincts examined in the Study, their economic role, typical characteristics and how these relate to Liverpool's industrial context.

Chapter 2: Industrial Employment Lands in Liverpool – This Chapter includes summaries of planning and research documents to provide the strategic context behind the purpose for this Study. It also includes summaries and a Strengths, Weakness, Opportunities and Threats (SWOT) analysis of each of the industrial precincts.

Chapter 3: Key Demands and Drivers – Includes an investigation into the key demands and drivers of employment lands in the context of Liverpool. It also examines how changes globally are re-defining industries as well as the physical form and characteristics of employment lands.

Chapter 4: Best Practice Planning for Industry and Innovation – Investigates international and domestic case studies which have in some capacity demonstrated best practice approaches to planning for industrial and innovation precincts. This chapter considers how approaches to land use planning and development regulation has stimulated economic growth, retained jobs or delivered on a precinct Vision for built form or operational outcomes.

Chapter 5: Market and Government Initiatives – This Chapter investigates a number of international and domestic examples of how the private sector, governments or partnership structures have influenced employment outcomes through initiatives. Some of the initiatives discussed include the utilisation of value capture, investments in infrastructure, governance structures, planning and development incentives and financial abatements.

Chapter 6: Planning Review - Utilising best-practice approaches to land use planning, development regulation and initiatives, a review of Liverpool’s planning framework is undertaken to align zones with the economic roles, SWOTs and characteristics of each precinct. Development standards including building height, floor space ratios (FSRs) and lot size under *Liverpool Local Environmental Plan 2008* (LLEP 2008) have been reviewed with a series of recommended improvements included based on best practice experiences investigated. The purpose of this exercise is to best prepare Liverpool’s employment precincts for the future of evolving industries and to facilitate continued job growth.

Chapter 7: Conclusion – Summarises the key findings from the investigations and planning review to form a series of recommendations and actions for Council’s consideration.

1.3 Defining Industrial and Innovation Precincts

This Study investigates existing employment precincts in Liverpool that are currently zoned IN1 General Industrial, IN2 Light Industrial or IN3 Heavy Industrial. These are currently best defined as industrial precincts. They accommodate a range of built forms, activities and operations that by their nature require some level of physical separation from more sensitive land uses, including residential, due to their environmental impacts and spatial operating requirements.

There has been a myriad of terms used domestically and internationally to define industrial precincts. The Greater Sydney Commission in their Western City District Plan groups Liverpool's industrial precincts into 'urban services' lands and 'sub-regional employment' lands.

Urban services are a collection of industries that support the development, operation and liveability of a city, providing for the needs of local populations. They comprise the likes of local trade and construction services, building support, transport, automotive repairs, manufacturing, storage, postal and hire premises¹. Good examples of urban services precincts in Liverpool include Coopers Paddock at Warwick Farm Racecourse, Chipping Norton (predominantly) and Priddle/Scrivener Street.

Sub-regional precincts by their definition are larger industrial estates typically positioned on, or with good access to arterial motorways and freight rail lines. They typically comprise 'big-box' warehousing, freight and logistics, distribution, postal and processing centres which require larger land parcels to accommodate truck movements and turning, loading and work spaces. They also comprise a series of complementary ancillary uses including commercial offices, neighbourhood retail and recreation which does not compromise the predominant industrial activities². These precincts often require greater physical separation or treatments to surrounding areas and more sensitive land uses because of the nature of the environmental impact arising from their operations. This includes nuisance pollution, noise, odour and unsightliness and risk to human health and safety. They are centres of significant employment numbers but typically lower employment densities owing to their expansive scale. Examples of sub-regional precincts in Liverpool include Moorebank, Yarrunga/Prestons and Hoxton Park Airport (Len Waters Estate).

Whilst the identification of urban services and sub-regional precincts goes some way to delineating and defining industrial precincts, it is worth acknowledging that the nature and characteristics of such precincts, particularly in Liverpool, are much more complex than this. In Moorebank and Chipping Norton, a genuine mix of larger scale transport, warehousing and distribution is inter-mixed with small unit storage and local construction-based activities. Similarly, the Priddle/Scrivener Street precinct, although quite small at 23.2 hectares, includes medium to large floorplate light industrial or freight and logistics uses with a small number of industrial strata units.

There is then the added complexity of innovation and how this ultimately affects the land use definitions and zoning of traditional industrial lands. Innovation precincts are globally recognised as centres of collaboration between firms, researches, investors and entrepreneurs. They can take a variety of forms, from an agglomeration of innovation activity around a research-intensive hospital or university to a single incubator hosting start-ups and innovators. The Brookings Institution defines these precincts as "areas where leading-edge anchor institutions and companies cluster and connect

¹ The future of Greater Sydney's Urban Services, SGS Economics and Planning <https://www.sgsep.com.au/news/latest-news/future-greater-sydneys-urban-services>

² Liverpool Industrial Lands Study, SGS Economics and Planning July 2018

with start-ups, business incubators and accelerators – they are physically compact, transit-accessible and technically wired and offer mixed use housing, office and retail”³.

Globally, traditional industrial areas are undergoing transition due to improving technology, better understanding of good place-making and the impetus to collaborate and specialise. Older inner-city industrial areas, close to transport and innovation anchors, such as research institutions, hospitals and universities are being re-adapted into innovation clusters with a mixture of land uses and built form types⁴. In Liverpool, ageing industrial precincts to the immediate north and east of the CBD have come into the focus of Council and the Greater Sydney Commission in recent years as potential innovation precincts given their scale, declining physical environments and proximity to the Liverpool Collaboration Area, comprising the Health and Education precinct.

Innovation precincts are broad in their employment and land use characteristics. They can be areas of advanced manufacturing, bio-medical and chemical production and warehousing positioned around a scientific research base, through to incubators comprising micro creative spaces, organic markets and live/work settings⁵. The land use zones under LLEP 2008 have not fully comprehended the intricate mixed-use nature of innovation precincts; hence the need for the review and recommendations outlined in this Study.

1.4 Liverpool: Employment Profile

The nature of industrial land is undergoing significant transition, predominantly due to the impacts of innovation in industry and business. These impacts are being felt globally but particularly in Liverpool due to the commitment and delivery of the Western Sydney Airport (WSA) and Aerotropolis under the Western Sydney City Deal. A snapshot of the current and future employment profile of its workers is required to appreciate the changing demands and drivers behind employment lands in Liverpool.

Currently there are 25,600 jobs in employment lands which represents 17% of industrial jobs in the Western City District and 33% of all jobs in Liverpool⁶. Job growth in employment lands has been modest in the LGA over the past decade to 2018, owing mostly to the developed nature of existing operational precincts and the delays in land release for new precincts around the WSA.

A large proportion of employment jobs in Liverpool are in manufacturing (28%) and transport, postal and warehousing (14%). Urban services including construction (12%) and wholesale trade (11%) also account for a large proportion of jobs. Employment in the professional, scientific, research and

³ NSW Innovation Precincts, NSW Innovation and Productivity Council September 2018

⁴ Unlocking enterprise in a changing economy, Victoria State Government September 2018

⁵ *ibid*

⁶ Greater Sydney Region Plan, Greater Sydney Commission 2018

technical services sectors is currently very under-represented in the Liverpool employment precincts⁷. The recent and current employment trends are reflective of:

- the successes of transport, warehousing and distribution centre activities in the sub-regional precincts of Moorebank and Yarrunga/Prestons given their proximity and superior access to the M5 and M7 Motorways and future proposed access to the WSA via the M12 link and Outer Orbital; and
- the decade of growth in the residential development and infrastructure sectors in Western Sydney which has translated to a growing need for local trade and construction business. These in turn have supported the urban renewal and redevelopments in the Liverpool City Centre and new housing estates in the South-West Growth Centres.

According to the *SGS Liverpool Industrial Lands Study - July 2018*, the number of jobs in employment lands in Liverpool are expected to more than double to 59,300 by 2046⁸. Whilst specialised manufacturing jobs will still form part of the industrial sector across the Western City over the next 30 years there is consensus that a steady decline will be experienced as a result of improving technologies in processing and the continued rise of off-shore competition. Freight and logistics, construction and wholesale industries currently have a degree of specialisation which will continue to be in demand, particularly as a result of ongoing land release in the south-west and the construction of the WSA and Aerotropolis.

The highest rates of growth are anticipated in the professional services and transport and logistics sectors. Whilst higher-value knowledge jobs ('smart jobs') will be in demand across the LGA's employment lands, most are anticipated to be based around the WSA and in the Aerotropolis.

1.5 Understanding the Changing Demands and Drivers

Land use and built form in employment lands across the world began to undergo change in the 1990s with increased access to the internet and technological advancements in mechanisation which fundamentally shifted sectors away from the traditional Fordist industries⁹. Further advances in technologies coupled with lifestyle improvements and the rise of global competition and globalization has demanded innovation and specialization to create competitive niche industries¹⁰. These global shifts have impacted on the types of jobs that people have, the way they work and the way they collaborate with others day to day. This has impacted drastically on land use and the physical environments emerging within traditional employment precincts.

For industrial employment lands, this has predominantly resulted in one of the following scenarios:

⁷ Liverpool Industrial Employment Land Study, Knight Frank August 2016

⁸ Liverpool Industrial Lands Study, SGS Economics and Planning July 2018

⁹ Working futures: the changing nature of work and employment relations in Australia, Callus, Ron 2002

¹⁰ Liverpool Industrial Employment Land Study, Knight Frank August 2016

1.5.1 Industrial Parks

The need for space in general industry still remains, notwithstanding the rise of mechanisation and advances and specialization in sectors such as manufacturing. In fact, the success of large-scale industrial cities which are home to a variety of warehousing, distribution, aerospace, port facilities, mining and extractive industries has continued in China, Europe, the Middle East and North America over the past few decades¹¹. Successful Industrial Parks are those that are diverse by the nature of their activities and physical forms but are also well connected and serviced by major transport and digital infrastructure and are well planned in advance of development. Eastern Creek in the Western Sydney Employment Area is a good example of a modern industrial park which has been strategically planned to support general industries.



1.5.2 Specialised Urban Services Precincts

Industrial lands positioned around the edges of cities or in outer-suburban locations have the opportunity to become specialist urban services precincts where the demand for local services and

¹¹ Suzhou Industrial Park celebrates 25 years http://www.chinadaily.com.cn/cndy/201904/12/content_37457505.htm

materials is still high. In Australia, these precincts are either existing or newly planned and developed small-scale industrial estates comprising strata title multi-unit complexes. These precincts accommodate a range of light industrial operations including construction and trade services, storage, advanced manufacturing, plant equipment repair and hire, auto repairs and fabricators¹². Newly developed versions of these precincts are incorporating sustainable methods of construction and operations and their workspaces are decreasing in size and becoming more efficient¹³.



1.5.3 Innovation Precincts

Innovation Precincts are genuine mixed-use precincts that often form around the edge of a catalytic anchor such as a hospital, research centre or university. They typically occur as a result of urban renewal in an inner-city setting which has good access to public transport, walkability, a strong sense

¹² The future of Greater Sydney's Urban Services, SGS Economics and Planning <https://www.sgsep.com.au/news/latest-news/future-greater-sydneys-urban-services>

¹³ Liverpool Industrial Employment Land Study, Knight Frank August 2016

of history and place and excellent amenity for workers¹⁴. Innovation in these precincts is not only drawn from the creative industries that tend to occupy them, but also from the inspiration incited by the urban setting. Land use is both complementary and conflicting in these precincts, owing to the planned and unlikely collaboration and co-existence that can occur to create a truly dynamic place. Residential and retail elements often form core components of these precincts to drive vibrancy and a 24-hour collaboration economy. The Victorian Government's recent establishment of a new Commercial 3 zone typifies the growth and attraction of Innovation Precincts in areas like West Melbourne.

The demands for building and planned space, transport and access, environmental settings and interface treatments are broad and area-specific. Planning for land use, development outcomes and initiatives to encourage job retention and growth therefore need to be consciously grounded in an understanding of economic, environmental, social and technological drivers. These are examined in greater detail in Chapter 2 of this Study.



¹⁴ Reimagining the Liverpool Health, Education, Research and Innovation Precinct, PWC August 2017



1.6 What Is Best Practice?

Council in collaboration with the Greater Sydney Commission (GSC), the Department of Planning and Environment and others have long recognised the need to review and revisit land zoning provisions, objectives and development controls to reflect and accommodate the changing needs of industry. This Study has investigated international and domestic approaches in land use planning and development across Industrial Parks, Specialist Urban Services Precincts and Innovation Precincts to provide insights and ideas for possible changes to Liverpool’s local planning framework. Approaches deemed ‘best practice’ from the case studies have been qualified in the literature on the basis that they have generated significant economic returns, ensured job growth and retention or have delivered on the original precinct vision or objective.

Planning as a broad discipline first needs to consider the question: ***who are we planning for and why?*** In the context of employment lands in Liverpool the changing demographics of the workforce and the continued goal of delivering safe, flexible and attractive places for people to work is understood. Certain precincts have been identified as potentially more suited to a changing economic role given their scale, environmental parameters and proximity to growth in the Liverpool City Centre and Collaboration Area. Other precincts will continue to serve an important economic role as producers and distributors reliant on access to motorways, freight rail and the WSA, however, the changing nature of jobs and spaces in these precincts requires ongoing consideration.

Getting the land use zoning and planning framework right is therefore fundamental to successful growth and transition. In this Study we consider how zoning in places like North America and Europe has been reformed to attract new industries, protect important traditional and heavy industries and encourage change through diversity. Floor area bonuses and height incentives are just some examples of planning approaches applied universally as a means of generating desired land use in new and existing employment precincts. Domestically, the identification of precincts by both State and local governments in land use planning for particular outcomes have laid clear platforms for the successful development of precincts such as the Bentley Technology Park in South Perth.

Land use zoning and planning for built form and environmental outcomes are one part of the equation in delivering successful employment precincts. Economic, social, environmental and political drivers and demands all need to be considered in formulating mechanisms to encourage growth and change. A series of successful initiatives which have been implemented abroad and in Australia have been examined in this Study. These include planning incentives within legislation and local plans, the formation of joint partnerships and transparent governance structures, funding mechanisms, the relocation of catalytic anchors and other financial incentives which have provided cities and regions with continued job growth and excellence in industry.

1.7 Review and Recommendations for Liverpool

The Planning Review undertaken in Chapter 6 includes a series of recommended strategies for Council to consider based on the best-practice case studies examined in Chapters 4 and 5. These consider wholesale changes to the three industrial zones to better align established precincts for the future based on current and future employment trends. Changes to minimum lot size, maximum building height and FSR standards under LLEP 2008 are also discussed.

The review has highlighted that the current zoning framework objectives and land use provisions are too broad, contradictory and unnecessarily duplicative. Differences between the IN1, IN2 and IN3 zones are slight and do not clearly define intended outcomes for different precincts. The result has been a dilution of the character and specific economic roles of Liverpool's employment precincts. In some cases, this will lead to a decline of investment from larger operators who are at risk of relocating around the Aerotropolis¹⁵.

The consistency of numerical standards across the industrial precincts has also fueled homogenous outcomes which erodes specialised built form and land characters. This Study recommends the incorporation of subtle changes to standards and restructuring of industrial zones to better refine the specific character of each precinct.

Council's brief to investigate the function of a B7 Business Park zone has also been pursued. Currently, the B7 zone does not apply in the LGA. Other examples of modified B7 zones across Greater Sydney have been examined in the context of transitioning the Scrivener/Priddle Street precinct into some form of Innovation Precinct. Previously identified by the GSC in their Liverpool Collaboration Area – Place Strategy, the precinct is well positioned to leverage on the growth of the health and education cluster in the eastern edge of the city centre. This Study affirms that opportunities to transition this precinct in connection with the adjoining low-density residential area to the north should be pursued through rezoning, development of a visionary master plan and careful consideration of new controls and incentives.

¹⁵ Liverpool Industrial Employment Land Study, Knight Frank August 2016

2. Industrial, Employment and Innovation in Liverpool

In order to establish the context for this Study the suite of State and Local planning, infrastructure and investment strategies and policy reports are reviewed and summarised. Each of the industrial precincts in the LGA are then reviewed. A SWOT analysis for each precinct has been undertaken to confirm the future threats and opportunities to economic growth, job retention and investment from developers and industrial operators.

2.1 Strategic Planning Context

2.1.1 Greater Sydney Region Plan

The Greater Sydney Region Plan produced by the GSC includes a plan for the Sydney Metropolitan Area. It establishes the core principle of creating and harnessing the value in three 30-minute cities: The Eastern Harbour City, Central River City; and Western Parkland City. Liverpool is identified as a Metropolitan City Cluster in the Western Parkland City whose economy is projected to grow with the development of the WSA. Investigations and commitments for State significant transport infrastructure is also identified including a future mass-transit connection between Bankstown and Liverpool, the M9 Outer Orbital and M12 Motorway, Bringelly Road and The Northern Road upgrades and rapid bus transport services connecting Liverpool to the Aerotropolis and WSA.

The Plan identifies Liverpool as a Collaboration Area. This is a direction by government which identifies the need for collaboration between all agencies and community stakeholders to contribute to better forward place-making for Liverpool. The Collaboration Area is to be well-connected and vibrant with a core focus on leveraging on the growth and development of its health and education precinct and pharmaceutical cluster.

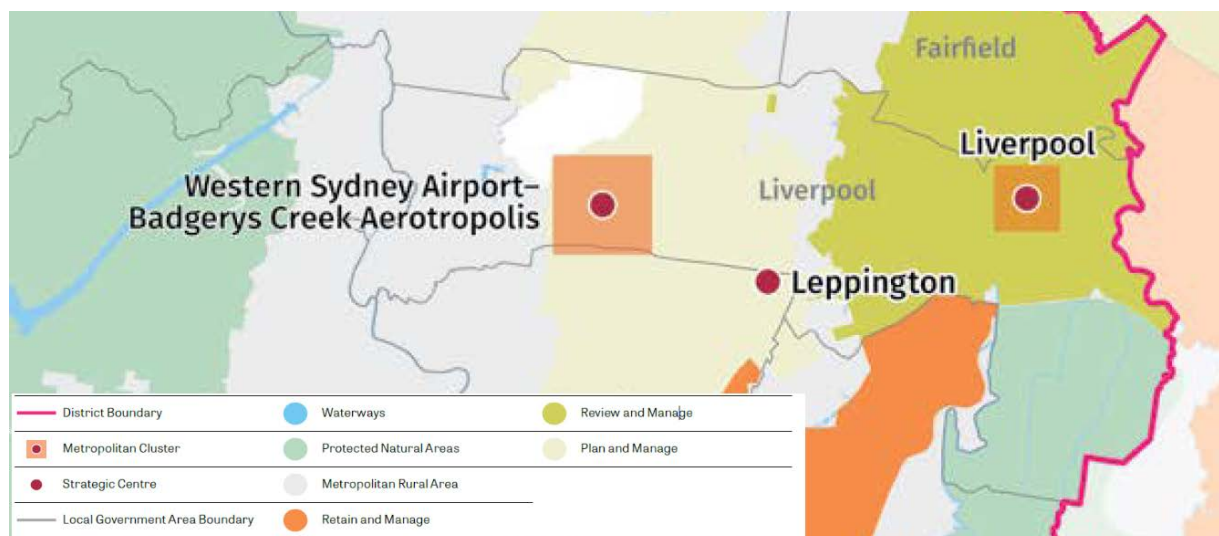


Figure 1 Extract from Western City District Plan – Industrial Lands

Existing industrial zoned lands to the east of the Liverpool City Centre are designated as 'Review and Manage'. This means that these lands require review to confirm whether they should be retained or transition to higher order activities, considering the changing nature of industry and demand. Industrial zoned lands to the west of the city are designated as 'Plan and Manage'. This necessitates that strategic plans are prepared to determine the need for industrial land in release areas in connection with the delivery and timing of infrastructure.

2.1.2 Western City District Plan

The Western City District Plan establishes a series of overarching planning priorities and directions for infrastructure investment, governance, liveability, productivity, sustainability and implementation. It acknowledges the opportunities, strengths, weaknesses and challenges facing Western Sydney from a housing, jobs, place-making and environmental perspective.

Liverpool is the largest Metropolitan City Cluster in the Western Parkland City and is also geographically the closest to the WSA and Aerotropolis. The Plan acknowledges the significance of Liverpool's role as a specialist industry leader in manufacturing, construction, transport and logistics. It also notes the need for the city's employment lands to be adaptive, flexible to change and resilient in the face of globalization and competition.

Importantly, it establishes the following key planning priorities for jobs and skills in the Western City:

- W8: Leveraging industry opportunities from the WSA and Aerotropolis*
- W9: Growing and strengthening the Metropolitan Cluster*
- W10: Maximising freight and logistics opportunities and planning and managing industrial and urban services land*
- W11: Growing investment, business opportunities and jobs in strategic centre.*

Key actions and issues identified in the District Plan for the Liverpool City Centre and Collaboration Area include improving and coordinating transport and other infrastructure to support job growth and developing 'smart jobs' around the health and education precinct, especially in advanced manufacturing, logistics and automation.

2.1.3 Liverpool Collaboration Area – Place Strategy

The Liverpool Collaboration Area identified in both the Greater Sydney Region Plan and the Western City District Plan incorporates the Liverpool City Centre and surrounding precincts including specialist health, education, residential, urban services and industrial areas. The aim of the Collaboration Area is to provide governance to the delivery and improvement of coordinated infrastructure, land use planning initiatives, sustainability outcomes and place making principles.

The Place Strategy identifies the significance of Liverpool as a health and education cluster with opportunities to leverage research, scientific and technical industries around the CBD as part of a pharmaceuticals cluster¹⁶.

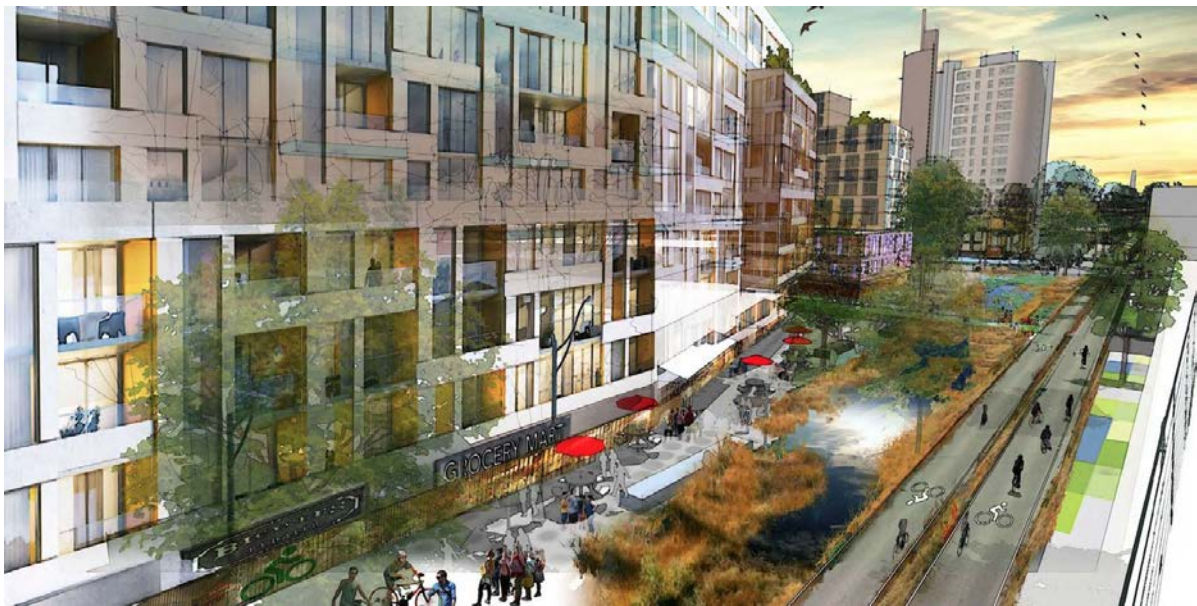


Figure 2 Artistic Impression of the Liverpool Collaboration Health and Education Precinct

The analysis of opportunities and impediments to productivity in the Collaboration Area identifies the following:

- The City Deal ensures that Liverpool will be home to the Western Sydney Investment Attraction Office; will benefit from connections to aerospace, defence and advanced manufacturing industries related to the WSA; and be connected to the airport via rapid bus transport services.
- The health and education precinct offers opportunities for expansion and greater diversity of jobs on the back of \$740 million allocated to the expansion of the Liverpool Public Hospital, ongoing presence of Western Sydney University and emergence of the University of Wollongong and growth in medical technologies.
- Education stakeholders have joined with Council, Ingham Institute for Applied Medical Research and Health Infrastructure to form the Liverpool Innovation Precinct Steering Committee to guide and promote growth of the precinct.
- Warwick Farm's specialised equine activities will continue to attract domestic and international visitation centred around the racecourse.
- Moorebank North industrial precinct is continuing to strengthen, having generated 7,500 jobs in specialised manufacturing, postal, transport and logistics.

¹⁶ Liverpool Collaboration Area Place Study, Greater Sydney Commission September 2018

- The Liverpool Employment Land Study has identified opportunities to re-purpose some sites located close to the City Centre to respond to growth opportunities, particularly those generated by the health care sector.

The Collaboration Area is an important governance tool in the context of this Study. It has already largely identified the productivity, land use and development opportunities and market conditions of Liverpool's industrial zoned lands. The next steps for Council and the State Government through the mechanism of the Collaboration Area is to implement more focused rezoning, infrastructure and development priorities for the employment precincts which are detailed in Section 2.2 of this Study.

2.2 Local Employment Land and Market Studies

Council has previously commissioned Knight Frank and SGS to undertake Industrial Employment Land Studies for the industrial zoned lands and precincts identified in Section 2.2.

2.2.1 Knight Frank Liverpool Industrial Employment Lands Study

The Knight Frank study investigated current market conditions, factors affecting supply and considered the future demand for industrial activities. It establishes that global competition is placing increased pressure on larger industrial operations to specialise and innovate. It also highlights the importance of continuing to protect and encourage growth in smaller-scale urban services industries which support construction, trade, maintenance and repair jobs which are considered the backbone of Liverpool's specialist industrial economy. Manufacturing based employment was found to constitute 46% of blue-collar jobs in Liverpool and the report identifies the future challenge in diversifying this existing skills base, particularly with indicators suggesting a continued decline in this sector¹⁷.

The Knight Frank study also identified the need to release larger tracts of appropriately zoned and serviced employment lands across the western portion of the LGA to leverage on the investment of the WSA and to meet future employment demands. The investments by government outlined in the City Deal in the M9 Outer Orbital, M12 Motorway, future Freight Line and other recent and ongoing upgrades to the arterial motorway network were identified as significant opportunities to grow sub-regional industrial precincts for warehousing, freight and distribution activities.

With respect to the existing eastern industrial precincts the report acknowledged the physical limits and future constraints to their growth but also highlighted the significance from an economic perspective to preserve and diversify urban services jobs. These smaller precincts are predominantly made up of sole-trader and small-business operators who on average employ less than 4 people and typically occupy sites and spaces of 1,500m² or less¹⁸. These precincts however do still contain larger

¹⁷ Liverpool Industrial Employment Land Study, Knight Frank August 2016

¹⁸ *ibid*

freight, logistics, postal, transport and manufacturing operations who have existed for decades and whose businesses are firmly grounded within a local consumer market.

2.2.2 SGS Economics and Planning - Liverpool Industrial Lands Study

The SGS report provided a focused understanding of the role and function of industrial precincts and the future demand that growth will create. It comprehensively detailed the impacts of a growing population on Liverpool's economy and provided a snapshot of market trends and drivers likely to impact the precincts. It also broadly considered opportunities to rezone certain industrial lands and provided recommendations to Council to investigate best-practice land use, planning controls and initiatives to drive growth, ensure job retention and encourage ongoing diversity and resilience in the sectors.

It confirmed that whilst industrial land supply currently exceeds future demand due to the forthcoming industrial corridor stretching along the edge of the WSA and Aerotropolis, not all of the land was zoned appropriately for sub-regional uses. In contrast, there was an identifiable supply issue for urban services industries that rely on close proximity to established centres of population and business, hence the recommendation to protect and manage the eastern industrial precincts¹⁹.

The study called into question the suitability and application of the current zoning framework under LLEP 2008. It acknowledged the broad objectives of each of the three industrial zones and identified unnecessary overlap and inconsistencies between land uses. It also acknowledged a need to revise the current zoning of precincts to better represent the character and importance that each precinct plays in the local economy. A review of development controls and planning initiatives was also highlighted as part of a next steps approach which is discussed in Chapter 6 of this Study.

¹⁹ Liverpool Industrial Lands Study, SGS Economics and Planning July 2018

2.3 The Precincts

This section includes a brief description and Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of each of the industrial zoned precincts in the Liverpool LGA which are shown in Figure 3 below. The information supplied is a collation of information obtained from previously commissioned reports, investigations into land use planning and environmental constraints and discussions with locally based developers and agencies.

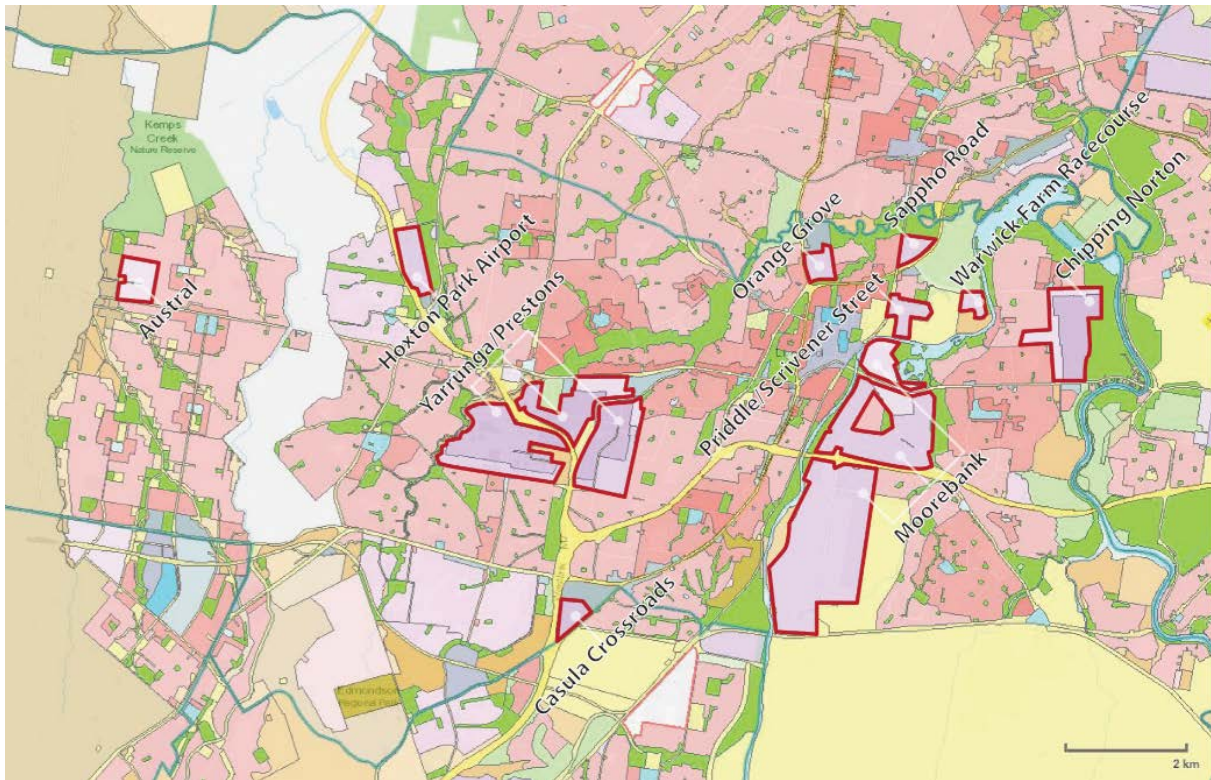


Figure 3 Zoning Map highlighting the location of the Liverpool Industrial Precincts

2.3.1 Chipping Norton



Top: Figure 4 Extract of zoning map showing the Chipping Norton Industrial precinct

Right: Figure 5 Modern unit complex in Chipping Norton

Left Figure 6 Older storage / industrial units in Chipping Norton

<https://www.realcommercial.com.au/property-industrial+warehouse-nsw-chipping+norton-502867642>

Established in the 1970s, the Chipping Norton Industrial Area is one of the largest established industrial areas in South-West Sydney. It benefits from direct access to Governor Macquarie Drive to the north connecting to the Hume Highway and Liverpool CBD as well as the Bankstown Airport via Newbridge Road to the south.

Zoning: IN3 Heavy Industrial and IN2 Light Industrial

Height Limit: 15m – 30m

Lot Size: 2,000m²

FSR: 0.75:1

Built Form and Land Character: Mixture of both older and modern strata title multi-unit complexes with some larger warehousing stock. Lot sizes in the precinct vary from 470m² through to 4.1ha. Building heights are predominantly 1-2 storeys and floor-plates generally occupy between 60-80% of the allotment area.

Industrial Use Character: The precinct accommodates a broad mix of urban service uses including repairs, maintenance, construction, storage, plant hire and equipment, wholesaling, trade suppliers, scrap and metal recycling. Some larger warehousing, transport and logistics operations are also within the precinct.

<p>Strengths</p> <ul style="list-style-type: none"> ▪ Connections to major arterial roads (Newbridge Road and Governor Macquarie Drive), providing direct access to the M5 and Hume Highway ▪ Within 1 kilometer of Bankstown Airport ▪ Established precinct with a strong local economy and defined land use character ▪ Centrally positioned with access to Liverpool CBD and Collaboration Area as well as nearby strategic centres of Bankstown and Campbelltown ▪ Within 5km of the future Moorebank Intermodal Terminal ▪ Genuine Urban Services Precinct with a diversity of businesses serving established residential communities ▪ A mixture of complementary existing business, interacting to create hubs for urban services uses 	<p>Weaknesses</p> <ul style="list-style-type: none"> ▪ Land use conflicts and lack of a defined edge between light industrial and residential precincts to the west and north ▪ Lack of public transport linkages, currently restricted to bus routes along Newbridge Road and Governor Macquarie Drive which connect the industrial areas to Liverpool, Bankstown and smaller suburban centres. ▪ Traffic issues around capacity and safety with conflicts between trucks and residential traffic ▪ Road network is constricted and too narrow to cater for existing truck traffic ▪ Older building stock is in decline, with a mismatch of allotment sizes, building types and access arrangements ▪ The area generally features aging infrastructure and amenity
<p>Opportunities</p> <ul style="list-style-type: none"> ▪ Growth and synergies associated with the Moorebank Intermodal ▪ Opportunities for urban renewal and increased industrial densities ▪ Improved building stock and renewal opportunities good resolved planning controls 	<p>Threats</p> <ul style="list-style-type: none"> ▪ New industrial precincts with modern, purpose-built stock in new industrial parks to the west of Chipping Norton may draw businesses away, leading to vacancies in older stock ▪ Existing infrastructure is not conducive to fast and efficient operational flow when compared to emerging industrial precincts positioned with direct motorway access

- Still some opportunities for smaller-lot subdivision to occur to provide for additional multi-unit complexes
 - Better activate and provide for urban services jobs through a heightened focus on precinct amenity and walkable connections
 - Opportunity exists to investigate linkages, active transportation and connections existing open space
 - To improve physical interface to residential areas
 - Sustained growth in local construction and infrastructure sectors likely to drive demand for urban services
- Traffic and congestion issues continue to lead to a loss of larger, established industrial anchors, creating a flow-on effect of vacancy as the supporting peripheral and complementary industrial businesses follow and vacate
 - Land use conflicts between a range of uses and heavy industrial operators that require greater levels of separation

2.3.2 Moorebank



Top: Figure 7 Extract of zoning map showing the Moorebank Industrial precinct

Right: Figure 8 View of logistics development in Moorebank

Source: <https://www.commercialrealestate.com.au/property/moorebank-logistics-park-moorebank-nsw-2170-12709546>

Left: Figure 9 Artistic impression of Moorebank Logistics Park

Source: <http://qubemlp.com.au/2017/08/23/target-australia-commits-qube-moorebank-logistics-park/>

The Moorebank Industrial Area is positioned to the south of Liverpool CBD and its northern portion sits within the Collaboration Area. It benefits from direct access to the M5 Motorway and is 800m from the Liverpool train station at its north western corner. The southern portion of the precinct will comprise the Moorebank Intermodal Terminal a new transport connection facility for freight containers transported from Port Botany via rail.

Zoning: IN1 General Industrial and IN2 Light Industrial

Height Limit: 15m – 21m

Lot Size: 2,000m²

FSR: 0.75:1 – 1:1

Built Form and Land Character: Diverse – comprising large floor-plate warehousing and distribution centres alongside strata title multi-unit complexes and older factory style buildings. Lot sizes vary from 325m² through to 83 hectares.

Industrial Use Character: Main land use activities include freight, transport, warehousing and wholesale supplies owing to the access to the M5 and M7 Motorways and now the Intermodal. Clusters of urban services including construction services and trades.

Strengths

- Direct access to the adjoining arterial road network, with both the Moorebank Avenue M5 interchange and Heathcote Road Interchange located within the precinct.
- Future road infrastructure will further strengthen this precinct’s accessibility, with the establishment of the M12 providing connections to Western Sydney Airport and surrounding areas.
- The future Intermodal Terminal will provide direct access to Port Botany, strengthening the areas connection with other industrial and commercial areas of Greater Sydney
- Established precinct with a strong local economy and defined land use character
- Centrally positioned with access to Liverpool CBD and Collaboration Area as well as other Metropolitan City Clusters including Penrith, Campbelltown and larger industrial precincts to the north at Eastern Creek, Wetherill Park and Ingelburn to the south-west.
- Within 1km of Liverpool Trains Station, with interconnecting bus services throughout the precinct

Weaknesses

- Established low density residential area positioned in the centre of the precinct, limiting expansion and suite of heavier, more intensive industrial uses
- Traffic issues around capacity and safety with conflicts between trucks and residential traffic
- Shared vehicular access to the southern residential portion of this precinct creates additional conflict between residential and industrial land uses
- Competing interests from light industrial, retail and other operators seeking to establish within the precinct

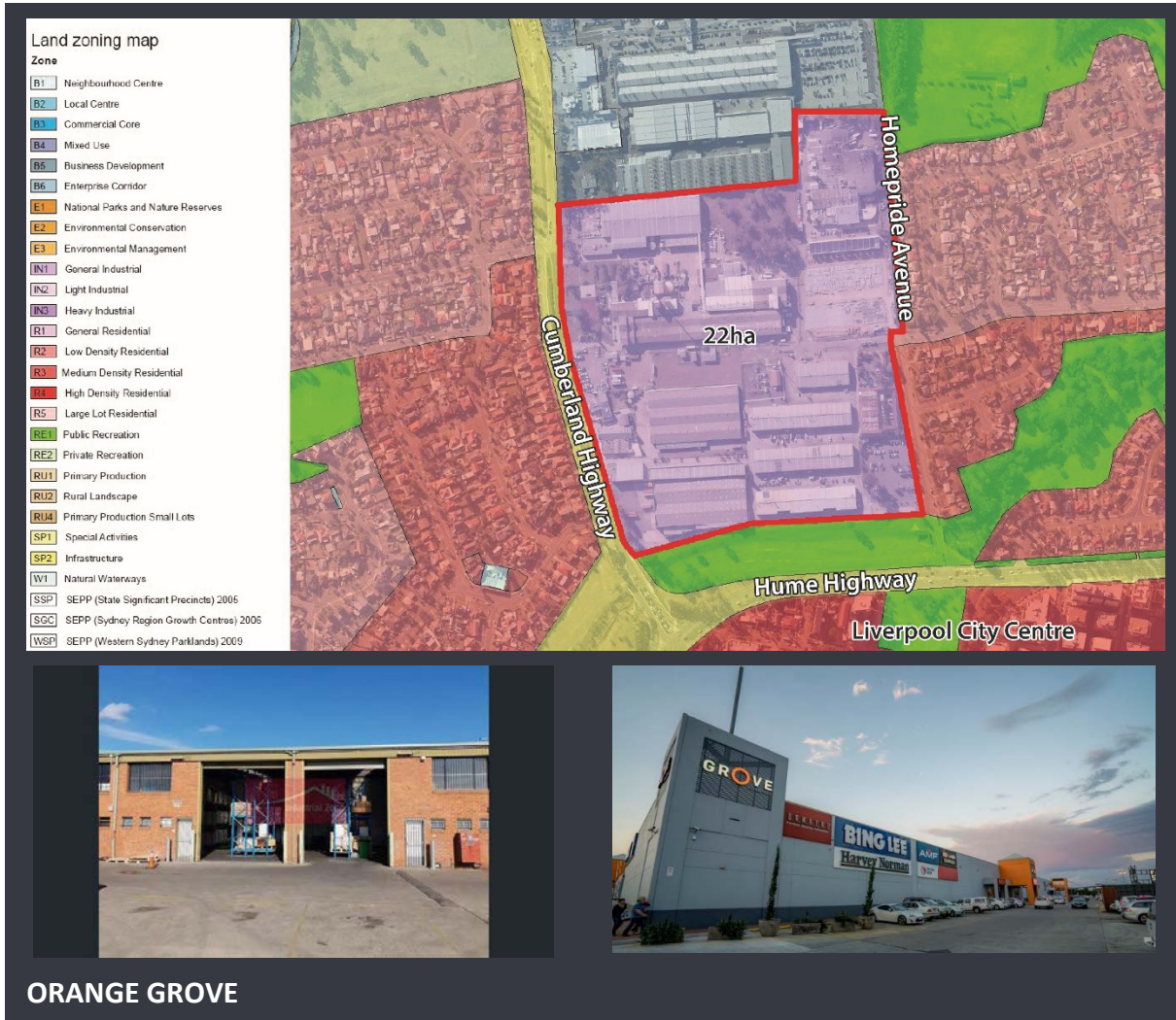
Opportunities

- Growth and synergies associated with the Moorebank Intermodal
- Available land in the southern portion of the precinct still to be developed
- Further opportunities to leverage industrial growth centred around the development and future operations of the Intermodal Terminal
- Future opportunities for further strata-title subdivision of larger building stock as it vacates and relocates to new industrial areas in Greater Western Sydney
- Continued growth in freight, logistics and distribution activities will see demand well-located facilities to serve both e-commerce and traditional goods dispersal throughout Sydney

Threats

- Increasing threat of impacts from creative spaces, incubators, retail and other specialist uses entering the precinct with likely disruption to larger, heavier operators
- Traffic and congestion issues continue to lead to a loss in productivity, prompting businesses requiring larger floorspace and associated transport types to relocate to areas with easier access and room to expand.
- Direct competition from future and emerging logistics and transportation precincts earmarked for the Aerotropolis and Western Sydney Airport

2.3.3 Orange Grove



Top: Figure 10 Extract of zoning map showing the Orange Grove Industrial precinct

Right: Figure 11 View of the Grove Retail Development to the north

Source: <https://www.gazcorp.com/the-grove-homemaker-centre>

Left: Figure 12 Older factory unit stock on Homepride Parade

Source: <https://www.realcommercial.com.au/property-industrial+warehouse-nsw-warwick+farm-502874890>

A small (22ha) pocket of industrial land positioned to the immediate north of the Liverpool City Centre bounded by Orange Grove Road to the west and Hume Highway to the south. The precinct is one of the oldest within Liverpool's Local Government Area, with the northern portion having transitioned to a business and retail focused zone over the past 15 years. Older factory stock is currently unoccupied and ageing, however new strata title unit development is occurring on the eastern edge of the precinct.

Zoning: IN1 General Industrial

Height Limit: 15m

Lot Size: 2,000m²

FSR: 0.75:1

Built Form and Land Character: Typically comprises older-style factories and warehouse buildings that are in a state of decline, situated on large lots (between 1-8ha). Some recent multi-unit stock is currently under construction whilst a larger unit complex constructed in the 1960s occupies the southern part of the precinct.

Industrial Use Character: Characterised as ageing and vacant sites intermixed with new redevelopments in multi-unit stock which is driving urban renewal and re-investment. Predominantly 1-2 storey buildings with large floor-plates. Comprises a range of local urban and trade services with some specialised manufacturing.

<p>Strengths</p> <ul style="list-style-type: none"> ▪ Directly adjacent to Liverpool CBD, within the established Collaboration Area ▪ Well placed to take advantage of urban renewal given the declining state of building stock and emergence of new and redevelopment of sites for specialised urban services and booming new retail precinct to the north at The Grove and Fashion Spree ▪ The precinct is directly connected to both the Cumberland Highway and Hume Highway ▪ Existing public transport linkages connect this precinct with Liverpool CBD and Station, as well as surrounding residential areas and suburban centres 	<p>Weaknesses</p> <ul style="list-style-type: none"> ▪ Much of the existing building stock is currently vacant or in decline, with many of the sites no longer fit for purpose ▪ Traffic issues around capacity with improvements required to the Hume Highway and Orange Grove Road to support new development ▪ Poor pedestrian access to Liverpool Train Station and CBD, with the precinct separated by the Hume Highway ▪ Poor pedestrian and cycle connections throughout the precinct ▪ Bounded by existing residential precincts to the east which limit potential growth ▪ Known contamination issues in this precinct may deter development in this area
<p>Opportunities</p> <ul style="list-style-type: none"> ▪ Urban renewal and adaptive re-use of older building stock could bring about successful incubator and innovative industrial space, creating a strong character and distinctive built for typology which may attract emerging industries and uses ▪ Strong demand for urban services given proximity to surrounding residential areas 	<p>Threats</p> <ul style="list-style-type: none"> ▪ Lack of investment and clarity of a clear direction for this area could see the precinct continue as an industrial wasteland ▪ Traffic and congestion issues continue to lead poor accessibility, prompting businesses and industry requiring ease of vehicular flow to relocate elsewhere

- Large sites which could be subject to further Torrens and strata title subdivision and increased densities
- With the exception of the eastern boundary, this precinct features low-impact interfaces to residential and other surrounding sensitive land uses
- Opportunities to integrate with the successful retail precinct in the north sector of this precinct, which serves a key driver to stimulate activity within the area
- Missed opportunities for government to create real change and drive urban renewal through complicated planning processes
- Without sufficient upgrades to vehicular access, public transport, pedestrian movement, coupled with declining existing public amenity, this precinct may struggle to secure an anchor business or usage cluster to underpin urban renewal across the area
- Poor built form quality of new unit stock being delivered under complying development processes, bypassing Council

2.3.4 Priddle/Scrivener Street (Warwick Farm)



Top: Figure 13 Extract of zoning map showing the Priddle/Scrivener Street Industrial precinct

Right: Figure 14 View of the Direct Freight site and development

Source: <https://www.directfreight.com.au>

Left: Figure 15 Older large-format factory / warehousing on Priddle Street

Source: <https://www.griffinproperty.com.au/8-priddle-street-warwick-farm-194>

A 25ha pocket of industrial zoned land positioned to the immediate east of the Liverpool City Centre. Within the suburb of Warwick Farm and identified in the Liverpool Collaboration Area the precinct is home to a mix of large-scale freight, manufacturing and smaller scale urban services industries. It is bounded by the Sydney Water Recycling Plant to the east, the Liverpool Hospital to the west, the Georges River to the south and an older low-density residential area to the north.

Zoning: IN1 General Industrial

Height Limit: 15m

Lot Size: 2,000m²

FSR: N/A

Built Form and Land Character: Predominantly dated built form stock in the form of a few large warehouses and strata title units, as well as other historic industrial buildings. Typically, the built form occupies the majority of the lot area with lot sizes between 500m² and 4ha.

Industrial Use Character: Paper, pulp and recycling, specialised manufacturing, technology and medical industry with supportive trade, repairs and maintenance operators.

Strengths

- Directly adjacent to Liverpool CBD, within the established Collaboration Area
- Direct access to Liverpool Hospital and broader established health and education precinct
- Strong existing access to public transport, Warwick Farm train station within 500 metres of this precinct
- Close proximity to specialised equine entertainment precinct at Warwick Farm Racecourse
- Nearby links to natural amenity, open space and dedicated recreational precincts along Georges River
- Although this precinct is small, the area and existing commercial and industrial uses provides strong economic output due to location and established uses and businesses

Weaknesses

- Interfaces with non-compatible uses including low density residential to the north, Sydney Water Recycling Plant to the east and equine horse stabling facilities
- Constricted and aging road network provides access to this precinct which is not conducive to large truck movements
- Shared roads and access points to the precinct provide conflicts between industrial and residential traffic, which require rectification in order to deliver a safe and usable vehicular network
- The existing rail infrastructure severs this precinct from Liverpool CBD, with little direct pedestrian and cycle access to the established commercial and health hubs of Liverpool
- Ageing industrial stock is no longer fit for purpose – particularly larger warehouses which are becoming vacant. Precinct cannot compete with sub-regional precincts positioned on arterial motorway network
- Odour impacts and buffer required to the adjoining treatment plant, creating restrictions and complications for further development within this precinct

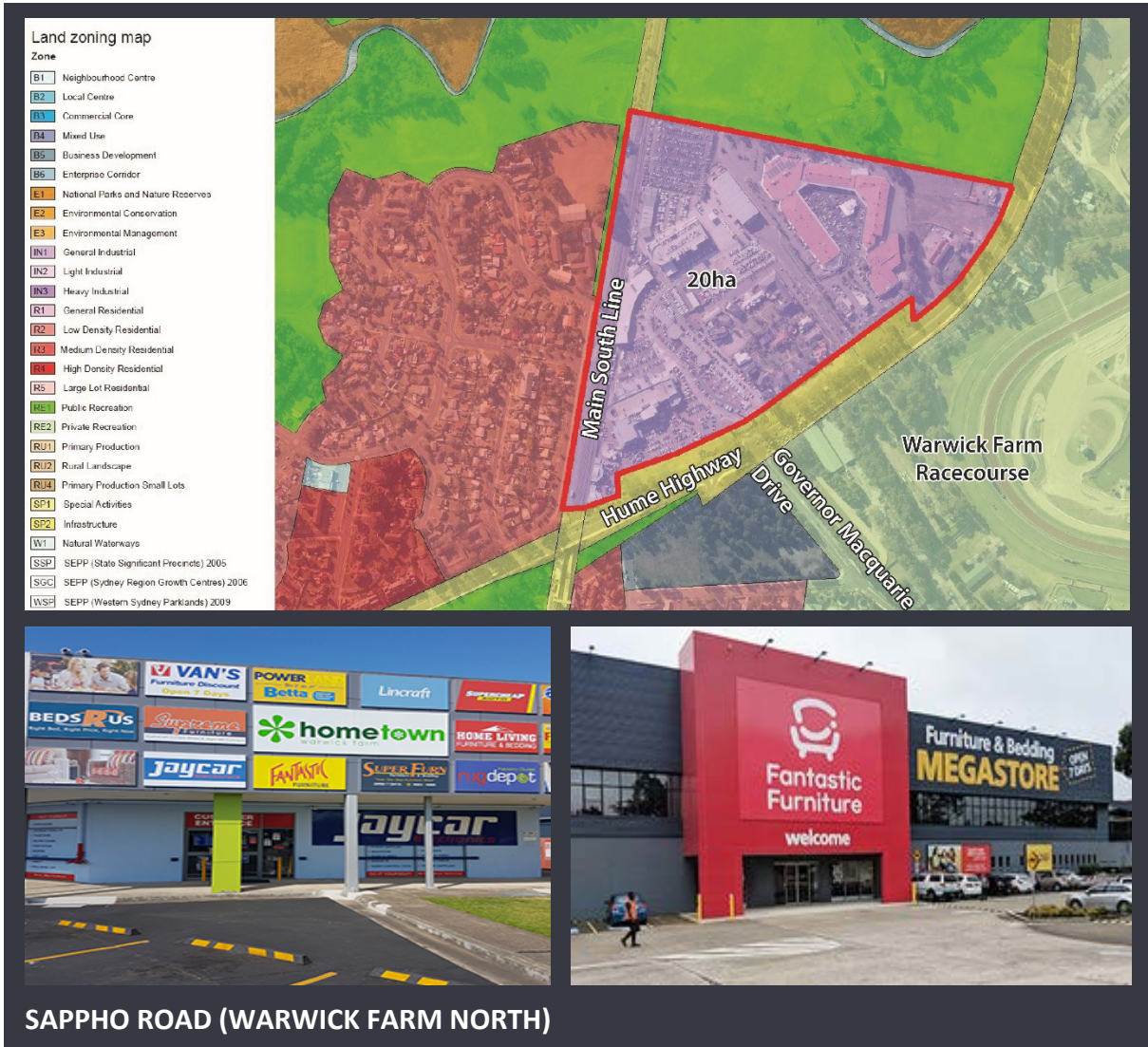
Opportunities

- Opportunities to leverage on proximity to the health and education precinct to create an innovation precinct servicing health, research and science industries
- Improve local amenity to the precinct population through upgraded local road, cycle, pedestrian and open space networks
- The existence of the established entertainment precinct at Warwick Farm Racecourse provides a unique opportunity to leverage this industry and integrate supporting industries and businesses throughout a redeveloped precinct
- The presence of Warwick Farm Racecourse also provides additional entertainment amenity to the precinct, a feature which may encourage redevelopment within the area
- Continued demand and growth in specialised urban services and manufacturing operations close to Liverpool CBD
- Opportunities for redevelopment, strata subdivision and re-purposing of older built stock to attract more creative and professional industries

Threats

- Continued presence of ageing and isolated low-density residential area in the Northern portion of the precinct, which is incongruent to the overall current use and tenancy mix of the precinct
- Advancements in technology may be unable to adequately mitigate the impact of odour present in the precinct, which will stagnate growth and investment potential
- The need to provide good connectivity to the hospital and CBD over or under the railway. If connectivity is not achieved as a priority, development and investment within this precinct will suffer significantly
- Ongoing vacancy of existing operators – transition to new innovative uses needs to be economically viable
- Alterations to current land use and planning may displace successful industries currently operating within the precinct.

2.3.5 Sappho Road (Warwick Farm North)



Top: Figure 16 Extract of zoning map showing the Sappho Road Street Industrial precinct

Right: Figure 17 Fantastic Furniture Megastore

Source: https://www.jaycar.com.au/store/WarwickFarm_JaycarAU?lat=-33.908626&long=150.939695

Left: Figure 18 Retail outlets in Sappho Road

Source: <https://www.fantasticfurniture.com.au/store-finder/store/Warwick%20Farm>

This precinct is a triangular shaped 20ha precinct positioned in the northern part of Warwick Farm to the north of the Hume Highway and east of the train line. It adjoins a open space to the north and a medium density residential area to the west.

Zoning: IN1 General Industrial

Height Limit: 15m

Lot Size: 2,000m²

FSR: N/A

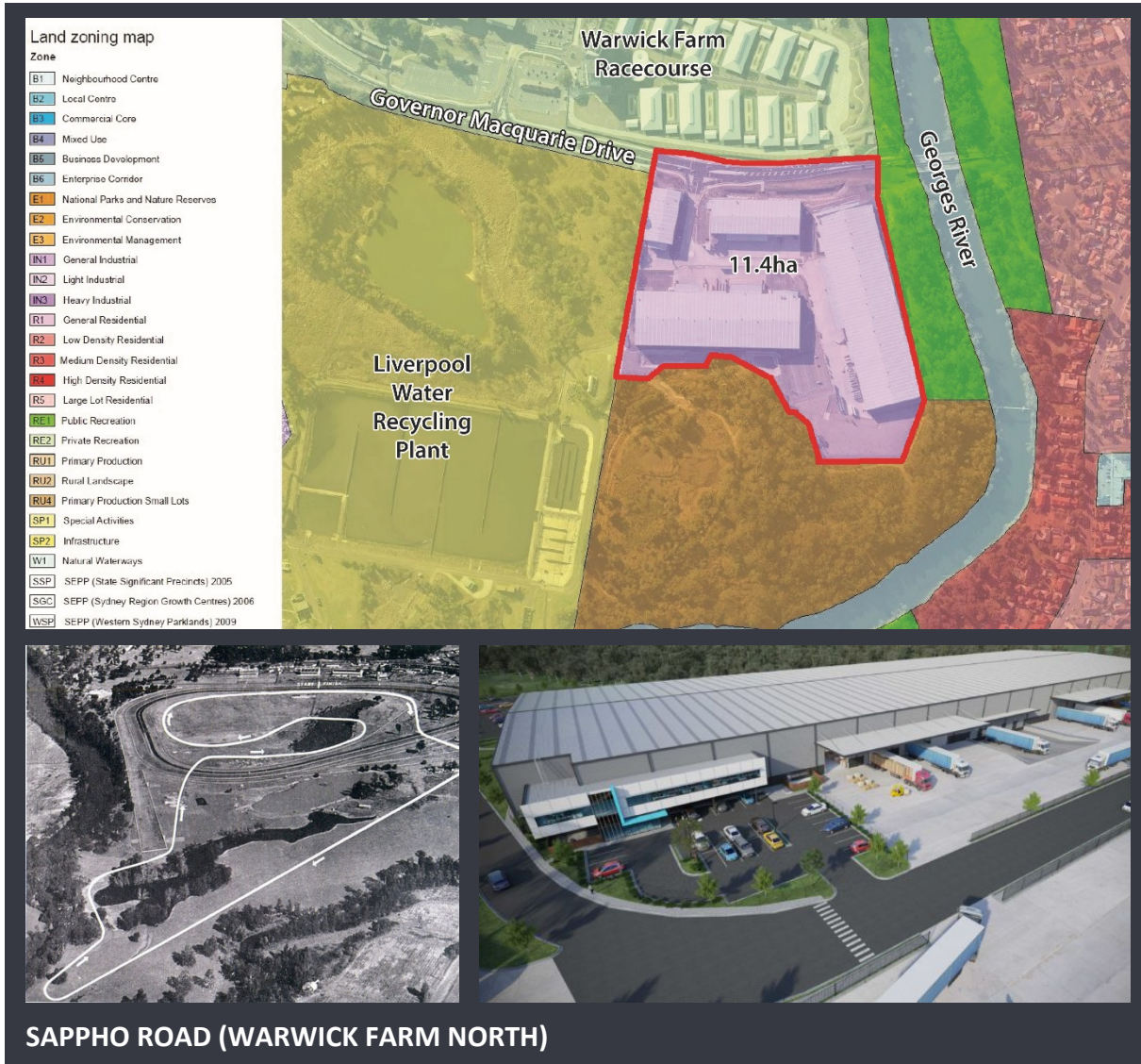
Built Form and Land Character: Highly varied built form character owing to the mixed nature of retail and service uses. Open hard-stand display yards and residential display homes.

Industrial Use Character: Predominantly retail and bulky goods including an existing Motel, car dealership and sales yard and Masterton Homes Display village. This precinct does not currently reflect its industrial zoning.

<p>Strengths</p> <ul style="list-style-type: none"> ▪ This precinct is features direct frontage to the Hume Highway, providing access to Liverpool CBD, Bankstown and greater Sydney ▪ An expansive open space area to the north forms part of this precinct ▪ Warwick Farm Racecourse is easily accessible to the south and east of this precinct, providing am ▪ Strong existing linkages to public transport through access to bus established bus routes and within 500 metres of Warwick Train Station ▪ Existing retail and commercial tenants provide strong economic output. The main commercial anchors are well established and landmark destinations for their serviced sectors, providing an onflow of strong commercial activity in the surround retail and bulky goods businesses. 	<p>Weaknesses</p> <ul style="list-style-type: none"> ▪ Interface to medium density residential along the western boundary will limit intensification ▪ Long established successful retail uses in the precinct conflict with industrial zoning ▪ Despite being closely located to both Warwick Farm station and Liverpool CBD, the Hume Highway disconnects the precinct from the CBD area to the South. Connectivity would need to be improved to full develop this precinct into an extension of Liverpool’s city centre.
<p>Opportunities</p> <ul style="list-style-type: none"> ▪ Rezoning to affirm the existing retail nature of the site to accommodate growth in bulky-goods, display centre and take away food outlets 	<p>Threats</p> <ul style="list-style-type: none"> ▪ Incorporation of new development and interest from new operators could displace existing successful businesses

- Improve connections to Liverpool CBD and Warwick Farm train station through new pedestrian and cycle connections which take advantage of the precinct's location within the greater Liverpool commercial core
- Due to the precinct's proximity to public transport, road infrastructure, Liverpool City Centre and the established health precinct centering on Liverpool Hospital, the precinct is well positioned to adapt over time to support the growing and changing nature of industrial precincts within Liverpool
- Continued disconnection of this precinct will result in ageing stock and possible vacancies into the future
- Competition from competing comparable precincts with improved amenity and access may drive existing tenants and businesses to vacate

2.3.6 Warwick Farm Racecourse (Coopers Paddock)



Top: Figure 19 Extract of zoning map showing the Coopers Paddock Industrial precinct
Right: Figure 20 Artistic impression of the new Stockland Industrial Unit development
Source: <https://www.nettleontribe.com.au/projects/stockland-warwick-farm/>
Left: Figure 21 Aerial view of the adjoining racecourse
Source: <http://www.speedwayandroadracehistory.com/sydney-warwick-farm-raceway.html>

Positioned to the immediate south of the Warwick Farm Racecourse and specialised equine precinct Coopers Paddock is a small (11.4ha) pocket of industrial zoned land which benefits from direct access to Governor Macquarie Drive.

Zoning: IN1 General Industrial

Height Limit: 18m

Lot Size: 2,000m²

FSR: N/A

Built Form and Land Character: Recently constructed warehouse facilities by Stocklands with internal access roads and at-grade car parking.

Industrial Use Character: Small-scale warehousing, logistics and distribution facilities comprising ancillary office areas. Modern industrial complex with contemporary facilities and good on-site amenity for workers.

<p>Strengths</p> <ul style="list-style-type: none"> Well positioned with direct access to Governor Macquarie Drive The recent development of this area into an industrial precinct included a new intersection to control truck and vehicle congestion. Recently completed contemporary industrial warehousing stock which is likely to accommodate local workforce over several decades to come 	<p>Weaknesses</p> <ul style="list-style-type: none"> Size and proximity to the Sydney Water treatment plant which limits an expansion or intensification of use due to issues Increase in industrial density is constrained due to the proximity to residential area, environmentally sensitive lands and the adjacent Liverpool Water Recycling Plant
<p>Opportunities</p> <ul style="list-style-type: none"> Proximity to Liverpool CBD and health district may accommodate more research and health-focused industries into the future. 	<p>Threats</p> <ul style="list-style-type: none"> Locational isolation from other precincts will erode opportunities for innovation and collaboration with other industries As the racecourse precinct expand in the long term, this precinct may be threatened by burgeoning development to the southern side of Governor Macquarie Drive

2.3.7 Yarrunga / Prestons



Top: Figure 22 Extract of zoning map showing the Yarrunga/Prestons Industrial precinct

Left: Figure 23 Large-scale unit and factory development in Prestons

Source: <https://www.colliers.com.au/13340/>

Right: Figure 24 Logistics development in Prestons

Source: <https://www.watchthisspacedesign.com/project-6>

The Yarrunga / Prestons Industrial Precinct is one of the largest and most successful employment districts in Liverpool’s Local Government Area. It is well connected to the arterial motorway network with direct access to the M5 and M7 motorways and the future M9 Outer Orbital. The area will also benefit from committed and ongoing upgrades to Bringelly Road, The Northern Road and M12 Motorway linking the precinct to the WSA.

Zoning: IN1 General Industrial, IN2 Light Industrial and IN3 Heavy Industrial

Height Limit: 15m – 30m

Lot Size: 2,000m²

FSR: 0.75:1

Built Form and Land Character: Land allotments within the area are fragmented in parts, with sizes varying between 1,500m² and 28 ha. Built form comprises a genuine mix of open-style heavier industrial sites with expansive hardstand and storage areas, some factories, large and smaller warehouses and multi-unit complexes. Building heights are predominantly under 16m and stock is varied in age.

Industrial Use Character: The precincts position on the edge of the M5 and M7 motorways has been suited to freight, logistics, warehousing and distribution land uses, and this is likely to continue to be in strong demand into the future. The Aldi Distribution Centre, Inghams, Mainfreight, Biz Holdings and Sydney Water are some of the anchor tenants in the precinct.

Strengths

- Strong existing transport links to M7 and M5 motorways and future road and rail investments, with future road upgrades such as M12 will strengthen these links
- Existing and planned transport infrastructure will provide access to Western Sydney Airport and the Aerotropolis
- Direct access to the future Moorebank Intermodal Terminal and Industrial Precinct
- Established industrial economy as a sub-regional precinct with limited constraints for a mix of heavy and specialised warehouse industrial
- Well positioned to take advantage of growth in logistics, distribution and freight
- Internal road network is well equipped to accommodate heavy industrial vehicles

Weaknesses

- Geographically constrained by hard edges to low density residential areas to the east, west and south
- Current configuration of road network creates traffic conflict between trucks and residential traffic
- A lack of public amenity servicing the current population, in part owing to the age of the precinct and a lack of adequate public transport and both pedestrian and active transport infrastructure
- There is a likely presence of land contamination throughout the precinct, which could inhibit future development with additional capital investment
- Much of the existing building stock may no longer be fit for purpose and is a legacy of past uses within the precinct, relying on significant restricting and redevelopment in order to adequately redevelop the area
- Opportunities for future subdivision are limited with largely developed nature of the precinct

Opportunities

- Well positioned for future growth in innovative industries, freight, logistics and distribution including postal and transport due to both current and planning transport networks and infrastructure
- Can also continue to provide sufficient space for supportive urban services and light industries, leveraging the surrounding established and emerging residential communities
- Opportunities to leverage growth on the Western Sydney Airport and Aerotropolis due to both current and planning transport networks and infrastructure

Threats

- Increased competition from development of release area industrial lands in the Aerotropolis and eastern corridor of Western Sydney Airport, as new and larger industrial areas are developed with ease of access and modern amenity
- Existing stock will require ongoing maintenance, retro-fit and space management to stay competitive with Moorebank and the Aerotropolis
- As Western Sydney Airport and the Aerotropolis mature, land and rents may already be unaffordable for particular existing businesses as it is anticipated this new infrastructure will have a positive overall effect on rents and land value in areas within close proximity

2.3.8 Crossroads, Casula



Top: Figure 25 Extract of zoning map showing the Crossroads Industrial precinct

Right: Figure 26 Views of the new Logistics Centre at Casula

Left: Figure 27 Views of the new Logistics Centre at Casula

Source: <https://www.ampcapitalindustrial.com.au/new-south-wales/nsw-developments/crossroads-logistics-centre-precinct-c>

The Crossroads Industrial Precinct at Casula is a small industrial precinct (21 ha) positioned to the south of the Casula Business and Retail Centre. It adjoins the Hume Highway and Campbelltown Road and benefits from internal road access from Beech Road.

Zoning: IN3 Heavy Industrial

Height Limit: 18m – 30m

Lot Size: 2,000m²

FSR: 0.75:1

Built Form and Land Character: The precinct is part of a new subdivision and will be home to the AMP Crossroads Logistic Centre.

Industrial Use Character: 79,000m² net leasable purpose-built and modern warehouse building housing a range of specialised manufacturing uses and logistics including Cosentino, Electrolux and Westrac.

<p>Strengths</p> <ul style="list-style-type: none"> ▪ Direct access to both the M7 and M5 Motorways interchanges, which provides transportation links to key commercial precincts around Sydney, making this precinct suitable for both logistics and freight ▪ Position and planned infrastructure and will provide direct access to Western Sydney Airport and the Aerotropolis, further enhancing this area as a strategically placed centre for distribution ▪ Recently constructed multi-purpose facilities which will continue to provide niche competitive space for wholesale suppliers and distribution 	<p>Weaknesses</p> <ul style="list-style-type: none"> ▪ Precinct is small in size and constrained to future growth by hard road boundaries and residential lands further to the north ▪ This precinct sits in isolation and lacks proximate connections with comparable industrial areas, removing the opportunity for the creation of co-existent and supporting industrial hubs to emerge.
<p>Opportunities</p> <ul style="list-style-type: none"> ▪ Opportunity exists for future development of new distribution and logistics spaces within this precinct ▪ Well positioned to operate in connection with larger industrial areas which will emerge through the development of both Western Sydney Airport and the Aerotropolis 	<p>Threats</p> <ul style="list-style-type: none"> ▪ Whilst this area will benefit from the establishment of Western Sydney Airport and the Aerotropolis, it is like that competition from larger precincts closer to these key development areas will attract businesses that would otherwise consider this precinct as a viable option for long term occupation

2.3.9 Hoxton Park Airport (Len Waters Estate)



Top: Figure 28 Extract of zoning map showing the Len Waters Estate Industrial precinct

Right: Figure 29 Woolworths Distribution Centre, Hoxton Park

Source: <https://www.tandlnews.com.au/2012/08/14/article/woolworths-opens-hoxton-park-mega-dc/>

Left: Figure 30 Modern unit complex in the Len Waters Estate

Source: <https://www.commercialview.com.au/commercial-real-estate/nsw/for-lease/len-waters-estate-2171>

The Len Waters Estate is another small (21 ha) specialised industrial precinct positioned on the edge of the land occupied by the former Hoxton Park Airport, with direct access to the M7 Motorway.

Zoning: IN1 General Industrial

Height Limit: 15m – 30m

Lot Size: 2,000m²

FSR: N/A

Built Form and Land Character: The area is part of a recent subdivision and subsequent development for industrial warehouses and a distribution centres. The building stock is therefore modern and purpose-built for a number of well-known retail operators.

Industrial Use Character: The precinct is home to the newly developed distribution centres of Big W and Woolworths. Some allotments remain undeveloped or are the subject of recent construction activities for new warehouses.

Strengths

- Direct access to the M7 Motorway Cowpasture Road Interchange which provides access to several commercial hubs across greater Sydney
- The precinct is well connected to planned road and rail infrastructure developments
- On completion, the precinct will have strong transportation links to Western Sydney Airport and the Aerotropolis
- The precinct features recently constructed multi-purpose facilities which will continue to provide niche competitive space for logistics, wholesale suppliers and specialised manufacturing

Weaknesses

- Existing IN3 zoning of the precinct may not be genuinely representative of current uses and operators
- The area is not well serviced by existing public transportation services

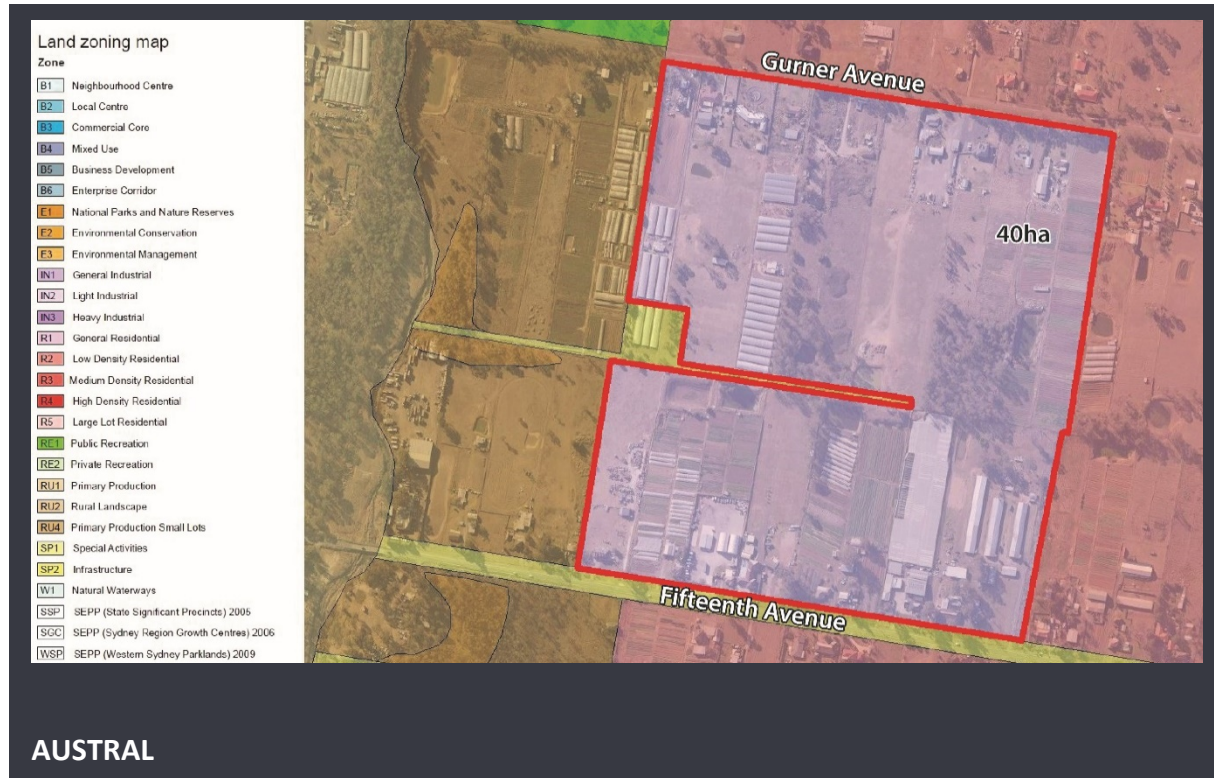
Opportunities

- Future improved integration and connections with the Casula Business and Retail Centre
- To rezone the precinct to a more commensurate industrial zone to allow for supportive urban services, retail or other specialty use

Threats

- Increased competition from development of release area industrial lands in the Aerotropolis and eastern corridor of Western Sydney Airport, as new and larger industrial areas are developed with ease of access and modern amenity

2.2.10 Austral



Top: Figure 31 Extract of zoning map showing the Austral Industrial precinct

This small industrial pocket is positioned on the northern side of Fifteenth Avenue in Austral. It is currently vacant and subject to the provision of future utility infrastructure connections and road improvements.

Zoning: IN2 Light Industrial under Sydney Region Growth Centres SEPP

Height Limit: 13m

Lot Size: N/A

FSR: 1:1

Strengths

- Given limited supply of light industrial land, this area is well positioned to provide smaller sites for multi-unit complexes housing urban services to accommodate local growth and housing
- The precinct is well positioned on a main road in newly established release area,

Weaknesses

- Small and isolated area which cannot leverage growth and activity in larger sub-regional precincts
- Adjoins residential areas to the immediate north, south and east and rural / environmental protection lands to the west which limit the extent of industrial land which is available to develop

<p>providing the foundations of a successful industrial zone</p> <ul style="list-style-type: none"> ▪ The land unaffected by biodiversity or other significant environmental impediments to development, encouraging future unimpeded growth within this area 	
<p>Opportunities</p> <ul style="list-style-type: none"> ▪ Well positioned to provide urban services to support established and emerging local residential communities ▪ Land could accommodate suitable small incubator / creative and specialised industry space for local workforce. ▪ Uniquely positioned to facilitate developments which encourage live/work opportunities 	<p>Threats</p> <ul style="list-style-type: none"> ▪ Increased competition from development of release area industrial lands in the Aerotropolis and eastern corridor of Western Sydney Airport, as new and larger industrial areas are developed with ease of access and modern amenity ▪ Competition from established and emerging industrial precincts which will benefit from both existing and planning road and rail infrastructure, lessening the appeal of this precinct

2.2.11 Planned Industrial Precincts

Tracts of land around the rural areas of Kemps Creek, Rossmore and Bringelly / Badgerys Creek have been identified as future industrial lands under the Stage 1 Land Use and Infrastructure Implementation Plan (LUIIP) for the Aerotropolis. These precincts are an integral part of the broader Aerotropolis precinct and will leverage their future growth on the development of the WSA and other key transport infrastructure committed and under construction.

These precincts are in planning and are likely to undergo more specific land use and master planning to develop the core appreciation of environmental constraints and desirable economic outcomes. The Bringelly / Badgerys Creek Industrial Precinct being the largest planned for Liverpool and closest to the WSA will deliver a global economic corridor of national significance. It is likely to accommodate a range of large-scale distribution, freight and warehouse activity as well as having a focus on innovation which is likely to translate to aerospace industries and scientific research. The opportunities and strengths of these precincts far outweigh the threats and weaknesses; however, all levels of government are appreciating the significance of these precincts and are focusing attentions on excellence in land use and infrastructure planning and implementation as part of the LUIIP.

3. Key Demands and Drivers

The ways in which land and buildings are used and developed in industrial precincts is steadily changing in response to a number of key drivers, both domestically and internationally. Knight Frank (2016) identified the pressures on industries in Australia to innovate and specialise as a result of rising global competition and improvements in digital infrastructure²⁰.

Continued population growth and improved regional planning for land use and infrastructure are influencing change in Liverpool's industrial precincts. Western Sydney Airport and commitments to key road and rail infrastructure around the Aerotropolis will impact growth and transition of sub-regional industrial precincts providing freight, logistics, distribution and transport services to Greater Sydney. These sectors will be further supported in this area through the development of the Moorebank Intermodal Terminal, which will drive increased growth and demand in freight and logistics in the sub-regional precincts around Liverpool. Existing and new building stock will need to adapt to the changing demands of these sectors as industries change the ways in which they conduct their business operations, how they occupy and adapt their space and where they invest.

3.1 Globalisation and the Liverpool Industrial Sectors

Whilst larger-scale industrial operations such as wholesale trade, distribution, logistics and transport are in greater demand in Liverpool's sub-regional industrial precincts, the LGA has an over-representation and reliance on the success of smaller urban services businesses operating in construction and trades, auto repairs and maintenance and other specialised manufacturing. The buoyancy of Liverpool's urban service industries was deemed to be relatively competitive compared with the rest of the Greater Sydney market²¹. However, the identified shortage of vacant and serviceable space to support the growth of this sector is a significant impediment.

Across Australia, the urban service sectors and light industries are transitioning into smaller, more cost-effective spaces as a result of increased global competition. Urban services, tech and creative industries therefore require smaller, flexible spaces which are well serviced by infrastructure. Typically, strata title units and small warehouses on lots of less than 1,500m² are ideal for smaller operations, however these spaces need to be open-plan, adaptable to changing operational needs and contemporary in their design. There is a growing demand for these types of spaces in Liverpool²² which may necessitate further adaptation or redevelopment of larger warehouse spaces in precincts such as Moorebank and Chipping Norton which have good access to the CBD and other strategic centres.

²⁰ Liverpool Industrial Employment Land Study, Knight Frank August 2016

²¹ Liverpool Industrial Lands Study, SGS Economics and Planning July 2018

²² Liverpool Industrial Employment Land Study, Knight Frank August 2016

Urban renewal of industrial parks and replacement of older ‘big-box’ warehousing and factories with smaller multi-unit complexes is occurring across Australia. In Liverpool, recent examples include new unit development within the eastern edge of the Orange Grove Precinct and the recently constructed Stocklands small-warehouses at Coopers Paddock which replaced outdated industrial factory buildings.

Conversely, the growth of the online retail sector has created substantial demand for improved large-scale distribution, storage and postal operations. Consequently, growth has occurred in the logistics, distribution and postal sectors in Australia. There is currently strong demand for services and this is predicted to continue in Liverpool. By 2046, the transport, postal and warehousing sector is anticipated to accommodate an additional 12,556 jobs within the LGA, equivalent to a 348% increase on current employment figures²³.

3.2 Decline of Manufacturing and the Rise of the Service Sector

In Australia, the industrial sector has expanded and contracted since the end of the Second World War in response to technological advancements, global competition, domestic tariff and tax changes and the introduction of free trade in the 1980s. As of 2017, manufacturing accounts for 33% of Australia’s employment sector. Liverpool’s population have a proportionately high level of residents employed in the manufacturing sector, with over 40% of the population employed in industrial workforce. Liverpool’s population is therefore highly exposed to the declining sector. Manufacturing activity in Australia continues to decline, notwithstanding specific sub-sectors attempting to transition and modernise to specialised forms of manufacturing, supported in part by the growth of the services and knowledge sectors, referred to as “smart jobs”.

Smart jobs are technical in nature, generating faster revenues with increased margins and are in higher demand globally. In 2017, the professional and technical services sector represented 8.3% of Australia’s total workforce as of 2017, yet only 2% of Liverpool’s workforce²⁴. This sector is well placed to grow with improvements in skills and investment by government in education and training in connection with significant investments in urban planning, place making and infrastructure including the WSA. The investment by Western Sydney University and the University of Wollongong in Liverpool’s Collaboration Area will be crucial to unlocking growth in this sector.

In Liverpool, demand for specialised manufacturing is forecasted to steadily increase through to 2046, however, will decline overall when compared with the growth of professional and technical, logistics and transport services²⁵. Manufacturing in Liverpool has traditionally required moderate building scales of between 4,000m² and 10,000m² gross floor area as evidenced in the warehouse stock across most of Liverpool’s employment precincts. As the sector has specialised with advancing technologies

²³ Liverpool Industrial Lands Study, SGS Economics and Planning July 2018

²⁴ Liverpool Industrial Lands Study, SGS Economics and Planning July 2018

²⁵ Liverpool Industrial Lands Study, SGS Economics and Planning July 2018

some of these space requirements have reduced and traditional open-working floor areas have been adapted into office areas and mezzanine storage floors. On-site storage areas remain important components of such operations, however the storage space requirements are also declining with the reduction in plant and equipment sizes.

In recent years, the revival of ‘maker-space’, workshops and fabrication labs has prompted the adaptation of historical warehouse, dock and factories into cost-effective and unique working spaces. This has been evidenced internationally in Rotterdam, where former industrial port facilities have been re-adapted into workspaces for specialist engineering, designers, light industries and other creative industries. Similarly, in parts of inner-city Melbourne, the Victorian Government has developed a new Commercial 3 – Innovation Precinct zoning to drive urban renewal and adaptive re-use of now vacant and ageing industrial factories. These initiatives enable collaboration between a series of smaller niche creative industries, encouraging the emergence of innovation precincts. This movement enables urban renewal in a cost-effective way whilst improving productivity output.

3.3 Positive Impacts of Growth

The Greater Sydney Commission was established by the NSW Government in response to the need to sustainability manage growth, with a focus on maintaining and balancing job growth and investment. Their 20-year Greater Sydney Region Plan identifies a population growth projection of 464,450 people in the Western Parkland City, equating to 27% of Greater Sydney’s overall growth²⁶. This population growth will equate to 370,200 new jobs being created in the Western City²⁷.

Liverpool’s competitive urban services industries have been the beneficiaries of population growth within the region. Residential expansion in South-West Sydney and a subsequent housing boom has generated significant growth in the need for locally based construction, materials supplies, building and trade services, which represented 12% of Liverpool’s industrial workforce in 2017²⁸. With continued population growth and ongoing land release across the South West and Greater Macarthur release areas to 2036 and beyond, the construction sector is anticipated to strengthen.

3.4 Investments in Infrastructure

Infrastructure NSW, in collaboration with the Department of Planning and Environment, has developed the State Infrastructure Strategy 2018-2038. In line with Western Sydney’s projected population growth, Liverpool and South-West Sydney stands to benefit from substantial investments in new road, rail and utilities infrastructure. Some of the key policy decisions and priorities relevant to Liverpool include:

- Prioritising intercity road connections to support access from all directions
- Providing a north-south mass transit connection from the T1 Western Rail Line to the WSA

²⁶ Greater Sydney Region Plan – A Metropolis of Three Cities (Greater Sydney Commission, March 2018)

²⁷ Greater Sydney Region Plan – A Metropolis of Three Cities (Greater Sydney Commission, March 2018)

²⁸ Liverpool Industrial Lands Study, SGS Economics and Planning July 2018

- Prioritising sustainable transport connections, particularly walking and cycling infrastructure within the city
- Facilitating high quality digital connectivity infrastructure as part of all development
- Providing social infrastructure, such as schools, social housing and hospitals to support population growth
- Providing additional cultural and recreational infrastructure
- Encouraging Council and private investment in recreational infrastructure
- Facilitating South Creek Catchment to become an enabler of world class water management, urban greening and climate control
- Delivering a freight network to support a growing city, and the next tranche of container imports to Sydney.

Committed infrastructure and projects under construction and investigation likely to influence industrial sectors in Liverpool include:

- Liverpool Rapid Bus Connection to WSA
- Leppington to WSA train link
- North-South Rail Link
- M12 Motorway
- M9 Outer Orbital
- The Southern and Western Sydney Freight Line Corridors

Development of the WSA and supporting infrastructure including the upgrading of Bringelly Road and The Northern Road are projects committed as part of the Western Sydney City Deal. Additionally, the construction of the new Moorebank Intermodal junction to the south of the M5 Motorway is a significant investment by government and the private sector.

The effects of this new transport infrastructure will translate to growth and demand in the logistics, distribution and transport sectors. Precincts such as Moorebank and Yarrunga/Prestons are already well positioned with access to the arterial motorway network, continuing to accommodate the growth in these industries. Savills (2019) have identified the opportunities for job growth in logistics and transport, citing a 50% uptake in large floor-plate space across Western Sydney since 2012²⁹. Western Sydney Airport and its associated future transport infrastructure will continue to boost the logistics, freight and distribution sectors. The nature of these industries is heavily reliant upon movement of goods and materials, hence access to transport and freight corridors is critical.

3.5 Efficient Ways of Working

In emerging specialised industrial sectors, the requirement for abundant floorspace is declining, with a focus on flexibility and efficiency of use. This trend is both cost-driven and a consequence of

²⁹ Quarter Time National Industrial (Q1/2019, Savills)

technological advancements and improvements in mechanisation and processing. As industry becomes increasingly automated, flexibility in operational processes and changes in types of plant and equipment has impacted on the layout and requirements of manufacturing and processing spaces, allowing industrial businesses to operate in locations previously deemed unsuitable for such uses.

Advancements in offline-technologies for specialised manufacturing, technical research and construction services in recent years has enabled more work from home situations. The research identified over 65% of workers in the Warwick Farm industrial precincts lived within a 30-minute commute of their workplace, changing the ways in which workers in a variety of sector are engaging with the workplace³⁰. As a result, the spatial requirements and location of industrial facilities will continue to change, adapting to the requirements of a changing workforce.

3.6 Access to Public Transport and Essential Services

Place-based approaches to planning and urban design demonstrates the significance of attractive places for housing, employment and industry. This has led to growing prevalence of Innovation Precincts where workers have ease of access to public transport, essential daily services and digital infrastructure and improved physical and social amenities.

The current economic output of Liverpool's industrial precincts is strong, despite poor access, undeveloped transport connections and low levels of amenity and access to services across these key employment areas. A strong reliance of private vehicles is evident in these precincts when compared to usage of existing rail and bus connections³¹. In many of these locations, existing public transport services are poorly connected and does not support the day to day needs of workers.

Pedestrian and cycle connections to Liverpool's industrial precincts are also inadequate, largely due to the age of the precincts and the philosophies around urban planning and design at the time they were developed. The best-case examples of Innovation Precincts and Industrial Parks feature internal connections for pedestrians and cyclists between their work space, essential supportive retail and social utilities and other forms of transit. The Priddle/Scrivener Street Precinct is an example of a unique opportunity to provide improved pedestrian and cycle connections between work places and essential services in the adjacent Liverpool City Centre and improved access to regular public transport at Warwick Farm and Liverpool train stations.

Essential services in the form of retail, health care, community facilities and financial institutions have traditionally been positioned away from industrial precincts in local or larger strategic centres. Today, industrial parks and innovation precincts comprise strong essential services offerings built into the fabric of larger warehouses and interspersed within incubators. Access to these services contributes

³⁰ Liverpool Industrial Lands Study, SGS Economics and Planning July 2018

³¹ Liverpool Industrial Lands Study, SGS Economics and Planning July 2018

to enhancing productivity and preserving the health and happiness of workers. Liverpool’s industrial areas require improved and integrated essential services to be developed within existing and emerging precincts. Incentives should be considered to aid investment of essential services.

3.7 Future Industrial Land to be Unlocked

Over the coming decades, the development and unlocking of serviceable lands around Western Sydney Airport and within the Aerotropolis will generate tens of thousands of new jobs. Lands are proposed to be rezoned in Rossmore, Kemps Creek and across the Aerotropolis Core which extends from Bringelly in the south to Badgerys Creek in the north. The NSW Department of Planning and Environment has identified that the 114ha Aerotropolis Core will be a 24-hour, global centre comprising 80% employment land uses, including aerospace and defence industries and other associated uses including logistics and advanced manufacturing³². World-class health and education facilities and additional employment lands to the south east of the WSA are earmarked to provide for campus-style settings which encourage growth of jobs in aerospace, defence and high-technology industries.

These areas earmarked for future rezoning and development will be underpinned by attractive amenity and accessibility features which will attract a mixture of “large-scale and innovative industries” to the Aerotropolis. These new industrial precincts will have excellent access to the arterial motorway network, mass transit rail to be delivered within the next decade and importantly the airport. They are anticipated to be strong drivers for the establishment of new industries as well as existing operators who will look to relocate. The latter is of critical consideration to Liverpool.

With the new lands to be rezoned around the Aerotropolis there is likely to be a midterm surplus in larger sites to support logistics, distribution and transport industries³³. In the short term however, precincts such as Prestons and the Len Waters Estate may lose out with the relocation of large-scale operators to the Aerotropolis who will benefit from access to the WSA, new transport and more efficient, purpose-built modern facilities.

Table 1 Summary of Key Drivers and Demands for Industrial and Innovation Precincts

Key Drivers	Key Demands
Effects of Globalisation and impacts of global competition	Need for industry to specialise and target niche competitive edge
Population Growth and Construction Boom	Demand on continued urban services, larger-scale distribution and freight and specialised

³² NSW State Infrastructure Strategy 2018-2038 (NSW Dept of Planning, 2018)

³³ Liverpool Industrial Lands Study, SGS Economics and Planning July 2018

Key Drivers	Key Demands
	innovation / creative and advanced technology industries
Investment in Major Infrastructure Projects	Variety of industrial spaces to accommodate the range of demands
Changing nature of industries	More efficient work spaces – typically smaller and well-planned with modern facilities
Changing nature of the workplace	Workplaces to be better connected to transport, essential services and provided with improved amenity
Changing attitudes to working efficiencies	Requirements for good access to movement corridors
Access to transport, essential services and amenity	Requirements on access to digital infrastructure
Future land release	Collaboration between specialised industries – rise of the incubator
Western Sydney Airport	Ongoing demand for new large-lot land to be released across Western Sydney
Innovation in Industry	High demand for existing quality small-unit space with good proximity to local consumer / customer market
Rise of the Professional and Technical Services Industry	Improved technologies and storage spaces
Economic conditions and a changing consumer market	Creative thinking and investment in technical and professional service industries – education and training required

4. Best Practice Planning for Industry and Innovation

4.1 What is Best Practice Planning?

This Chapter examines how differing approaches to land use planning and development regulation are utilised internationally and domestically. The investigation into a number of greenfield industrial parks and cities, transformed historic industrial areas and innovation precincts has confirmed that different settings require very different approaches to planning.

All of the case study examples investigated in this Chapter started with a clearly defined Vision. For many, this was rooted in an economic objective and an understanding of the land use activities and industries for which the precincts were targeting to establish, attract and grow. This is fundamentally answering the question of *'who are planning for and why?'*.

Planning approaches should consider whether zoning is segmented or mixed. This is influenced by a number of factors including:

- The specific regulated approach to land use zoning, urban design and development control in a given context and how this is entrenched in legislation;
- Prior examples of successes and failings based on the type of industrial activities, the changing nature of industrial operations and a comprehension of what are good planning outcomes;
- The size of the industrial area and scale of investment and governance;
- The predominant industrial activities that are considered desirable in a particular precinct;
- The environmental setting and crucial aspects of the physical and natural environments which need to be protected and preserved from impact;
- Need for physical separation and isolation due to environmental impact and scale of operations;
- Need for innovation and connection of knowledge-based industries; and
- Investment in infrastructure and the quality of access and utilization of that infrastructure.

Best-practice approaches to land use planning are those that:

- Achieve the objectives and deliver on the Visions originally planned for;
- Stimulate economic activity and draw investment; and
- Protect or help transition workforces to maintain jobs.

This Chapter also considers approaches to development controls, often linked to zoning or land use planning. In any given framework guidelines or controls incorporated in legislation mandate economic, environmental, social and governance outcomes.

Development controls are also used to guide outcomes for the built environment. These can span across the physical design and layout of buildings, operational activities, design of the streetscapes and the public domain, transport, infrastructure, land form and landscape amongst other elements. The combination of such controls contributes to place-making. True reflections of best-practice planning

are evident in the following examples when the components of a place contribute to creating a defined and distinguished character. This in turn generates economic activity, draws investment and contributes to job retention and growth.

4.2 International Case Studies

4.2.1 Keihin Industrial Area, Tokyo Japan



Top: Figure 32 Urban Plan for the Keihin Industrial Area

Source: ("Toward the Integration of Brownfield rehabilitation and planning methodologies: case study of Keihin Industrial Area, Tokyo, Japan", A Murayama, The University of Tokyo, 2006.) <https://www.witpress.com/Secure/elibrary/papers/BF06/BF06014FU1.pdf>

Left: Figure 33 Aerial View of the Keihin Industrial Area

Source: A smart place to work (JTB Photo/UIG via Getty) <https://www.nature.com/articles/d41586-017-08660-0>

Right: Figure 34 View to the industrial foreshore

Source: <http://www.unmissablejapan.com/industry/kojo-yakei>

Markers of Success

Keihin Industrial Area is classified as a “Free Trade Zone” because of its geographical location near a major seaport. Free Trades Zones are an advantage to facilitate foreign trade by removing restrictions to imports and exports.

Keihin Industrial Area, in Kanagawa Prefecture, has over 400 foreign affiliated companies operating within its 4,400ha

High focus on industry-related redevelopment and infrastructure projects to accommodate the established industrial uses within the Keihin Industrial Area, rather than urban redevelopment. Maintaining of existing industrial zoning within the Keihin Industrial Area, and commitment to industrial redevelopment and enhancement and modernisation of infrastructure

At 4,400 hectares, the Keihin Industrial Area is one of the largest industrial areas in Japan. It is located within the Kanagawa prefecture, forming part of the Tokyo Bay Waterfront Area which is the largest concentration of industrial uses in Japan. It has been retained as a predominately industrial and commercial area over its lifetime.

Urban planning in the Keihin Industrial Area has sought to transition the area since 2006 from heavy industries to research and development institutions, light industries, business and commercial facilities.³⁴ This early 2000’s planning response acknowledged that the traditional heavier industries around the ports were down-sizing operations with improved efficiencies in their ways of working, leading to the consolidation of industries, reducing their reliance on and need for expansive lands. Additionally, governments understood the opportunities associated with the rise of new-age industries in the technology and research and development sectors around nanotechnology, biotechnology and information technology.

The following key objectives underpinned the development of the Keihin Waterfront Area Regeneration Master Plan in 2006:

- Maintain and protect the area for industrial land use in zones closest to the waterfront which have excellent port access for shipping and distribution of goods;
- Encourage urban renewal processes including the down-sizing and switching to more efficient ways of working for traditional industries;
- Invest in the creation of an amenable place with new pedestrian and cycle links, greening, better road connections and other local facilities;
- Encourage investment and establishment of new-age industries in technology and research and development within a new Free Trade Zone (FTZ); and

³⁴ Toward the integration of brownfield rehabilitation and planning methodologies: case study of Keihin Industrial Area, Tokyo, Japan (A. Murayama, K. Banno, S. Ishii, T. Kurose & T. Sato, 2006)

- Provide improved transport linkages for workers in the form of metro and bus services throughout the area.

The Master Plan outlines six zones within the Industrial Area which aim to maintain the existing industrial uses while also allowing for new uses to transition into the area. The six zones outlined by the Master Plan have specific policies which aim to achieve the explicit objectives such as employment and population targets, environmental standards and transportation infrastructure³⁵.

The six zones are outlined below:

Zone 1: Inland urban regeneration in cooperation with waterfront regeneration

Zone 2: Promotion of land use transition to create a mixed-use urban area

Zone 3: Advanced manufacturing centre with global competitiveness

Zone 4: Advanced research and development centre related to manufacturing

Zone 5: General distribution centre

Zone 6: Advanced and efficient manufacturing centre

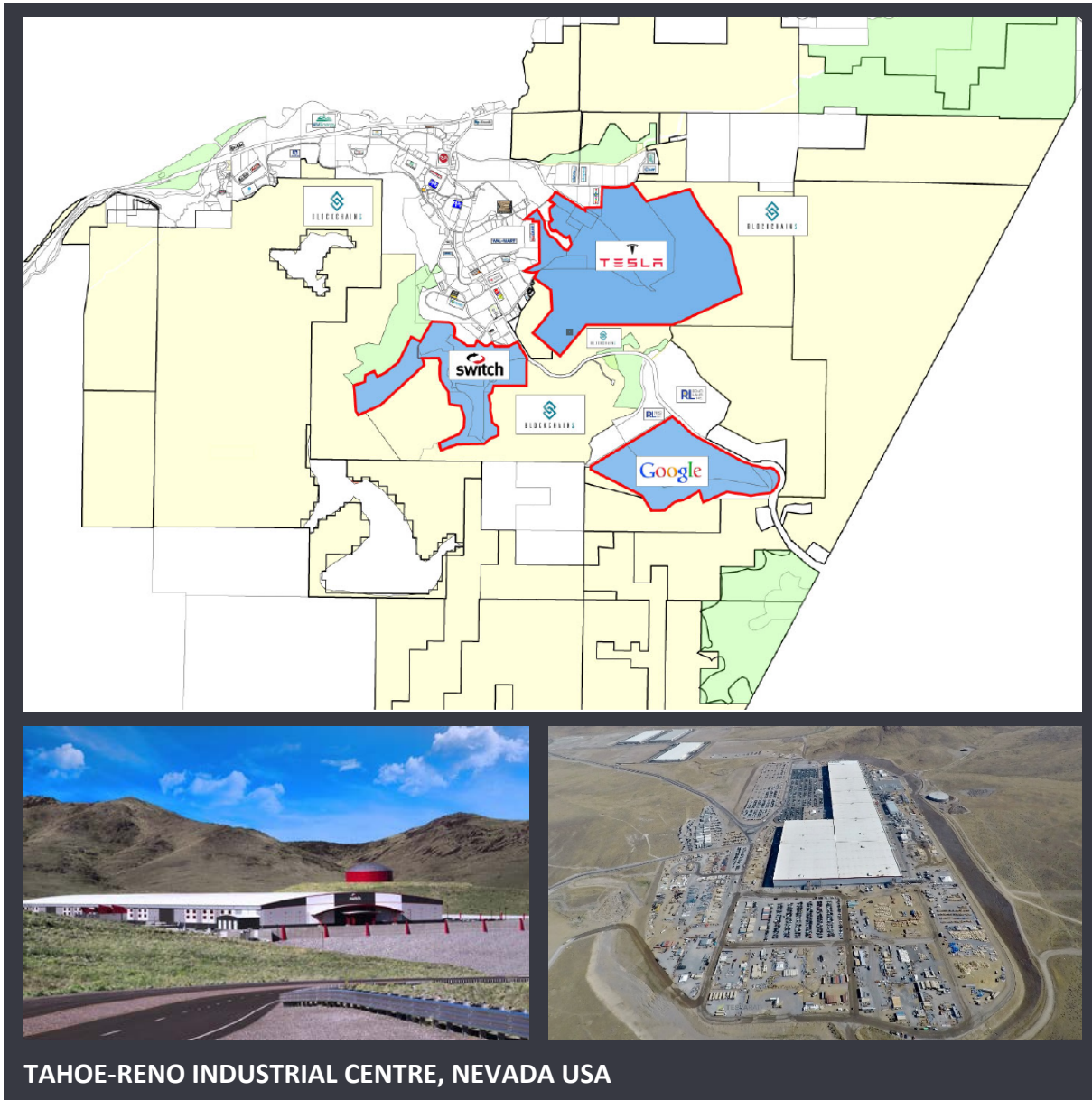
The six zones provide a clear pathway in guiding the planning of the three districts which are interlinked by the existing passenger and freight infrastructure. The Shinurashima and Moriyacho districts act as urban barriers separating the industrial land uses from residential lands further to the north and west. Numerous other examples of how transitional zoning is utilised to buffer impacts of industrial operations to more sensitive uses are identified throughout the remainder of this chapter.

The Daikokucho district was identified as part of the FTZ. Today it remains one of Japan's manufacturing strongholds home to transport machinery, petroleum and coal and chemical companies which heavily rely on the port and surrounding road infrastructure. Changes to urban zoning and the implementation of business-deregulation in the establishment of the FTZ has encouraged significant investment from global operators and driven healthy competition in the area. Some of the operators and industries in the district include the Nissan's Yokohama Plant No. 3, Kagomebuturya Service Shotoken Logistics, Liebherr, Tepco, Nichirikuyokohama Logistics and USS Yokohama.

The Suehirocho district was created to attract advanced small-medium size businesses and research institutions. The Prefecture is one of Japan's leading areas for science and technology centred around the Yokohama City University – Tsurumu Campus. The effective use of the existing port infrastructure, improvements in transport and place making and the ability to leverage the adjoining and existing manufacturing sector and university campus has led to the expansion of scientific and research industries in the district over the past decade. Industries include chemical, recycling and a sewerage treatment plant intermingled with Toshiba's manufacturing plant, Yokohama Bio Research and Supply, JFE Steel Works and Gas Production.

³⁵ Toward the integration of brownfield rehabilitation and planning methodologies: case study of Keihin Industrial Area, Tokyo, Japan (A. Murayama, K. Banno, S. Ishii, T. Kurose & T. Sato, 2006)

4.2.2 Tahoe-Reno Industrial Centre, Nevada USA



Top: Figure 35 Tahoe-Reno Industrial Centre Map

Source: ("Tahoe Reno Industrial Center", Tahoe Reno Website, 2019) <http://tahoereno.com/maps/>

Left: Figure 36 Switch Data Centre

Source: ("Switch Tahoe Reno Now Open: Largest, Most Advanced Data Center Campus in the World", 2017) <https://www.switch.com/switch-tahoe-reno-data-center-now-open/>

Right: Figure 37 Tesla Data Centre

Source: Tesla spurs land grab at Tahoe-Reno Industrial Centre (Alvarez, S. 2018) <https://www.teslarati.com/tesla-gigafactory-land-tahoe-reno-industrial-center-sold-out/>

Markers of Success

Strong demand with 30,000 hectares of land sold for \$175 million with only 250 hectares left remaining in the centre³⁶.

Attraction of strong investment decisions by the likes of Tesla who have established their \$5 billion battery factory in the centre, generating over 6,500 jobs and Switch who have established their \$3 billion headquarters.³⁷

Development in the centre has generated 6,000 jobs in construction.³⁸

The centre draws workers from out of state to Reno with out of state workers representing 20% of the total workforce.

Inclusion of Google's new \$600 million investment over 20 years in its new data centre which will create 50 permanent jobs a year over the next 5 years.³⁹

The Tahoe-Reno Industrial Centre is a privately owned 43,300-hectare industrial park in Storey County, Nevada approximately 16km east of Reno City. The centre is the largest in the United States and accommodates over 130 companies including the Switch Data Centre Campus, Google's Data North American Data Centre and the Tesla Gigafactory. Other industrial activities in the centre include a power plant, logistics and distribution, warehousing, wholesale suppliers, fulfillment centres (packaging plants), technical and extraction-based mining and building product production^{40 41}

The opportunity to establish a mega-industrial centre was born out of the site's location close to a main freight rail line, highways and isolation from nearby communities. Land parcels from 20,000m² - 2,000 hectares affirmed the desired character of the precinct to accommodate only the largest industrial and technological operators⁴². This is evidenced by the acquisition of 1,000-2,000-hectare sites by the likes of Tesla and Google, both of which have established massive data centres that cannot be easily accommodated elsewhere. The parcel sizes are such that each becomes a centre in itself, providing for all of the ancillary supportive services on-site.

The North American approach to development control is similar to Australia's in that it is highly regulated and numerically based in regard to setbacks, on-site car parking, street profiles, building coverage, building areas, heights and loading/service area controls. In Tahoe-Reno, built form design outcomes and layout standards are set out in the Storey County Ordinance. Under the Ordinance, the

³⁶ The Tesla Effect, Hagar R Jan 2018 <https://lasvegassun.com/news/2018/jan/27/the-tesla-effect-tahoe-reno-industrial-center>

³⁷ ibid

³⁸ Nevada: Betting big on high technology and winning, Rogers, J June 20 2018 <https://businessfacilities.com/2018/06/nevada-governors-report>

³⁹ Google planning to building \$600m data centre, Rindels, Michelle Nov 15 2018 <https://thenevadaindependent.com/article/google-planning-to-build-300-million-data-ce>

⁴⁰ ibid

⁴¹ Deep in the Desert, an Experiment of Economic Development, Macaig M Nov 2017 <https://www.governing.com/topics/finance/gov-industrial-parks-reno-tahoe.html>

⁴² Resolution determining similar uses in the I-2 Heavy Industrial Zone, Storey County 2007

Tahoe-Reno Industrial Centre is zoned I2 Heavy Industrial⁴³. Like the NSW IN1 General Industrial zone, the I2 Heavy Industrial Zone permits a broad range of land use activities including mixed use, industrial, office and commercial businesses. Light industrial and commercial zoning is restricted to 10% of the total centre on smaller parcels to ensure larger, more intrusive operators are protected and promoted⁴⁴.

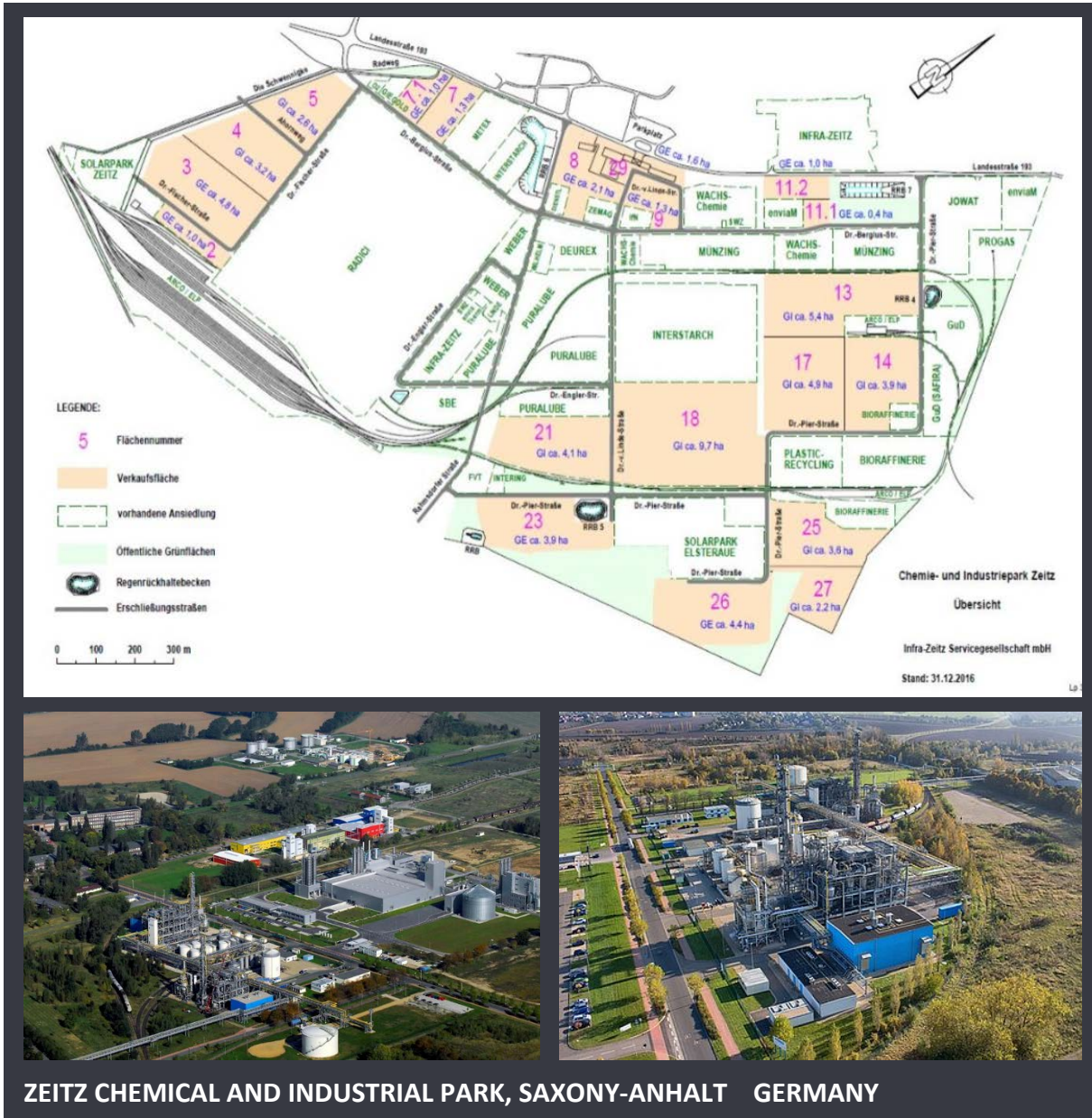
The numerical development controls are applied on a site-by-site basis with uniformity in approaches to overall building construction standards and signage all heavily regulated. The development controls have driven functional layouts of buildings, streets, parking and loading areas across the precinct. Design quality is ensured through architectural review as part of the building permits process in accordance with the Development Handbook and Site Design Guidelines.

The economic success of the centre is a direct result of tax-incentives and limitations on development levies imposed by the State of Nevada as detailed in the next chapter. The approaches to land use planning and development controls set the desired scale and built form outcomes. This was particularly important in providing large and serviced parcels for tech giants and world-leaders in distribution and processing.

⁴³ <https://www.storeycounty.org/309/Zoning-Ordinances>

⁴⁴ Ibid

4.2.3 Zeitz Chemical and Industrial Park, Saxony-Anhalt Germany



Top: Figure 38 Map of Zeitz Industrial Park

Source: (Industrie Park Zeitz Website, 2019) <https://www.industriepark-zeitz.de/en/chemical-park/profile/>

Left: Figure 39 Chemical production operations, Zeitz

Source: ("Five of Eastern Germany's chemical site operators – have jointed to create CeChemNet", 2016)

<https://www.chemietechnik.de/cechemnet-central-european-chemical-network/>

Right: Figure 40 View of Zeitz Industrial Plants

Source: <https://www.invest-in-saxony-anhalt.com/chemical-industry-4-dot-0>

Markers of Success

The former site of Zeitz Hydrogeneration Plant was transformed in the early 2010's to accommodate around 50 different companies, providing for 1,000 jobs within the park⁴⁵.

One of the largest anchor industries in the park Interstarch GmbH are expanding their operations investing \$25 million euros to 2020 in extending production facilities and establishing a new dedicated research department in collaboration with local universities.

Globally recognised as a center of scientific excellence in green energy production and development drawing investment from international organisations from China, Italy, Ukraine and the USA⁴⁶.

\$400 million euros invested by private companies in developments and operations in the park to date. \$600 million euros annual turn-over.⁴⁷

Zeitz is a medium-sized town located 40km south-west of the city of Leipzig. It has an industrial legacy spanning back to the 19th Century linked to lignite mining activities. Following the re-unification of Germany and the de-industrialization which followed, the town fell into economic despair with a number of major industrial enterprises relocating to Eastern Europe. In the 1990's, industries in mechanical engineering, piano manufacturing and sugar cane production, amongst other traditional manufacturing operations, were in a state of steady decline⁴⁸. Heavier chemical production industries continued to operate which began to draw the attention of environmental groups with concerns around pollution outputs⁴⁹.

Multiple shifts in governance and declining demands for production and manufacturing over the years to follow resulted in industrial enterprises in the town decreasing by more than 50% between 1995 and 2001⁵⁰. The impetus for change and a focus on developing a future Vision for the local economy was urban restructuring (Stadtumbauprozess), akin to strategic planning in Australia. It introduced a Special Use zone with an Industrial overlay. The zoning change in itself was not significant, rather it was the two objectives which underpinned a new strategic Vision for Zeitz being:

1. *An importance on re-establishing and building the economy – particularly in industry*
2. *Promoting the historical and cultural assets of the town*⁵¹.

As part of the Vision for Zeitz, the local government collaborated with other district authorities to invest significant capital into renewing the town's civil and cultural attractions whilst upgrading physical and digital infrastructure and streamlining its local land use planning statutes. This included defining the desired types of industrial operations⁵². As a consequence, the interest of Germany's

⁴⁵ <https://www.industriepark-zeitz.de/en/>

⁴⁶ <https://www.invest-in-saxony-anhalt.com/center-of-excellence-chemical-park-zeit>

⁴⁷ https://www.industriepark-zeitz.de/wp-content/uploads/2014/11/Infra_Zeitz_Brosch%C3%BCre_EN.pdf

⁴⁸ <https://acore-project.eu/case-studies/germany-case-study-1-zeitz/>

⁴⁹ <https://acore-project.eu/case-studies/germany-case-study-1-zeitz/>

⁵⁰ <https://acore-project.eu/case-studies/germany-case-study-1-zeitz/>

⁵¹ *ibid*

⁵² <https://acore-project.eu/case-studies/germany-case-study-1-zeitz/>

growing professional, creative and green industries has been drawn to Zeitz. This reflects a movement in recent decades across Europe to develop ‘Eco-Industrial Parks’ which are focused around creating, harnessing and developing green energy and conducting industrial activities in a more environmentally sustainable manner⁵³.

Development of the park is in accordance with the local urban development plan and environmental regulation which mandates efficient grid-like site layouts with physical separation distances to other more sensitive uses. Clear delineation of setbacks is evident along the edges of the precinct. Other key planning control approaches to development in Zeitz has been the establishment of pedestrian / cycle links throughout the precinct and the preservation of heritage industrial buildings. The latter has created a unique post-war edge which has a back-drop of wind-turbines and vast solar farms, delivering a dynamic and attractive place to work and visit.

⁵³ An International framework for Eco-Industrial Parks, United Nations Dec 2017

4.2.4 Suzhou Industrial Park, Jiangsu Province China



Top: Figure 41 Master plan – Suzhou Industrial Park

Source: (“The Building of a Chinese Model New Town: Case Study of the Suzhou Industrial Park”, Zhongjie Lin, 2013)

Left: Figure 42 Views of Suzhou

Source: (“The Building of a Chinese Model New Town: Case Study of the Suzhou Industrial Park”, Zhongjie Lin, 2013)

Right: Figure 43 Views of Suzhou Lake

Source: https://en.wikipedia.org/wiki/Suzhou_Industrial_Park

Markers of Success

Ranked 1st among China’s 219 state-level economic development zones and is a top performer in key benchmarks including technological innovation and foreign trade.

Over the past 25 years the park has contributed 800 billion yuan (\$119.11 billion US) in tax revenue, achieved more than \$1 trillion in foreign trade volume and completed more than 900 billion yuan in investment in fixed assets.

Home to more than 156 projects initiated by Fortune 500 companies.

The Suzhou Industrial Park (SIP) is a modern industrial city covering an area of 288km², located in the Jiangsu Province, approximately 30km to the west of Shanghai. The park is a joint nation venture between Singapore and China which commenced in the early 1990's following the ongoing success of Singapore's industrial global exposure which peaked Chinese interests⁵⁴.

The SIP is a strong example of well-planned land use structured strategically around infrastructure investments by both governments and built form outcomes under a comprehensive master plan developed by the SIP Administrative Committee and China-Singapore SIP Development Corporation⁵⁵. The Vision plan for Suzhou (meaning 'One Body and Two Wings') envisaged two new towns flanking the historic central city, one to its west and the other to the east. It featured a traditional urban fabric known as the "double-cheeseboard" structure defined by two overlapping grids, one consisting of streets and the other canals, hence the city coming to be known as 'the Venice of the East'⁵⁶. Later revisions to the masterplan saw the creation of the freshwater Jinji Lake which formed the centerpiece of a major boulevard and rail connections. Building heights were deliberately transitioned to preserve heritage outlooks to the UNESCO-listed old city whilst also defining the main connectivity routes with strategically positioned skyscrapers⁵⁷.

The plan established a hierarchal organisation of the city. Similar to zoning, the Singaporean approach to land use configuration establishes four levels of public facilities across regions, districts, neighbourhoods and clusters⁵⁸. The SIP districts were designed to accommodate walkable high-density residential neighbourhoods around the lake. These areas were interspersed with retail, commercial and office spaces. The expansive industrial lands comprising manufacturing plants, distribution, freight and production facilities formed the outer periphery of the SIP, making up roughly 50% of the total area (shown in purple in Figure 41).

Transitional approaches to zoning across the SIP ensured appropriate interfaces between land uses and effective separation of activities. For example, heavier industrial operations were positioned on the outer peripheries of the SIP on dedicated larger holdings bounded by the man-made canals and railways. More sensitive residential uses interfaced with commercial zones and heightened access to green parks, recreational areas and the lake. Transitional commercial zones were utilised to buffer industrial operations from the centre of the SIP and were delineated through a set grid road pattern forming regular and expanding block sizes.

Land use planning in the SIP demonstrates the importance of a strong masterplan. In this instance, the masterplan understood the need to physically separate the most sensitive land uses from the heaviest, whilst also promoting transitions where certain forms of mixed use were deemed suitable. It also

⁵⁴ The building of a Chinese model new town: Case study of the Suzhou Industrial Park, Zhongjie, Lin 2016

⁵⁵ The New Economic Partnership between China and Singapore, Bolt, P 1993

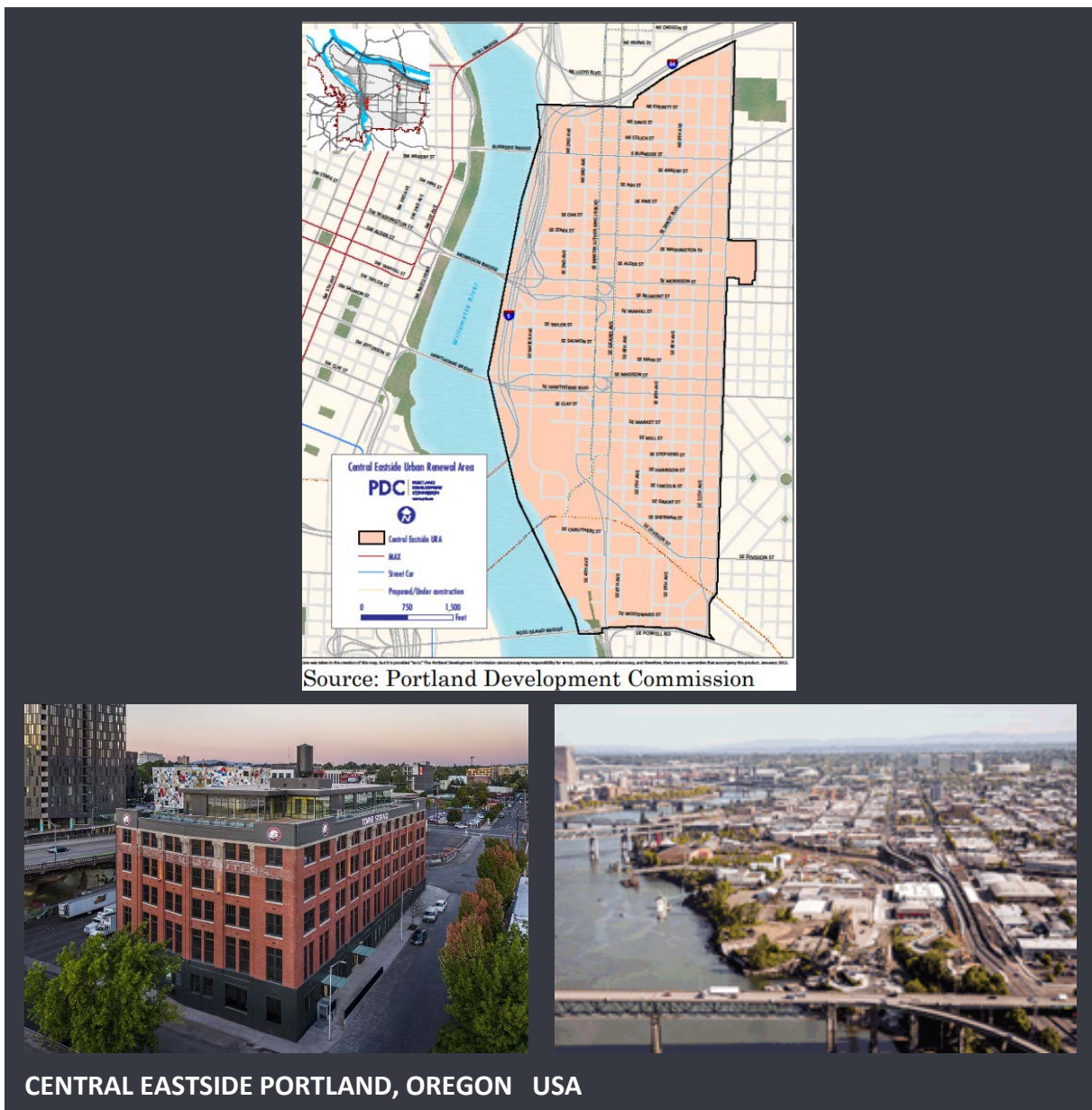
⁵⁶ Building orderly urban spaces: Singapore Suzhou Industrial Park in Jian Zhu Xue Bao 1997

⁵⁷ The building of a Chinese model new town: Case study of the Suzhou Industrial Park, Zhongjie, Lin 2016

⁵⁸ ibid

understood the value of planning for aesthetic outcomes, amenity for residents and workers and delivering infrastructure ahead of development. These factors combined have contributed to the successful development and job growth in the SIP, now into its 25th year of operations.

4.2.5 Central Eastside Portland, Oregon USA



Top: Figure 44 Map of Central Eastside, Portland

Source: ("Central Eastside Urban Renewal Area", Portland Development Commission, 2019) <https://prosperportland.us/portfolio-items/central-eastside/>

Left: Figure 45 Mixed Use corner block and incubator, Eastside

Source: ("Towne Storage in Portland", Journal Staff, 2018) <https://www.djc.com/news/co/12116101.html>

Right: Figure 46 Views of Eastside Industrial Quarter, Portland

Source: <https://www.portlandoregon.gov/bps/article/482062>

Markers of Success

Today, a vibrant and diverse mix of business sectors that employ more than 17,000 people across over 1,100 companies.

Multiple examples of re-investment by businesses into refurbishing historic building stock and contributing to gentrification processes.

19% district business growth since 2008 and 35% of total workforce retained in manufacturing⁵⁹.

The Central Eastside Precinct in Portland was historically an inner-city industrial district which served as a manufacturing and warehousing hub. It is situated on the east bank of the Willamette River, bounded by major highways and collector roads to the west, north and south. Today, it is an excellent example of urban renewal and gentrification which has led to the creation of a leading Innovation Precinct accommodating 17,000 employees within a various range of work-spaces⁶⁰.

The built form within the precinct remains in use by a mix of businesses of varying scales, however, as market demands for non-traditional and knowledge-driven industries increases, so to are the ways in which buildings are being used and adapted. This has given rise to the incubator, a collaborative complex which accommodates smaller-scale specialised manufacturing, design, engineering and other creative industries, all under the one roof⁶¹.

A proactive district authority instituted an 'Employment Opportunity Subarea (EOS)', which is an overlay on the Industrial IG-1 zone⁶². This regulatory approach to zoning provides a more refined level of detail around the desirable types of land use activities in the area to promote continued job growth in incubators and knowledge-sharing neighbourhoods. The approach ensured that existing manufacturing and distribution operations in the zone would not be forced out and protection measures were introduced into the local Ordinance to mandate preservation of industrial operations. These included considerations for the 'predominant' industrial land use and limitations on the EOS which is periodically reviewed in response to changing economic drivers⁶³.

More recently, the Ordinance has been revised again to provide greater flexibility in the 'industrial' land use term to incorporate emerging new-age industries such as professional and financial services, food services and production, software publishing, apparel manufacturing and micro-distilling. The specification of land use activities and definitions works to promote and target particular operators in areas where incubators are more accessible and provide good separation to larger existing industries. The recognition of incubator districts has emerged out of approaches such as the EOS, which from a

⁵⁹ <https://ceic.cc/about/>

⁶⁰ *ibid*

⁶¹ Industrial decline in an industrial sanctuary Portland's Central Eastside Industrial District, Jones, Allison 2014

⁶² Portland's Central Eastside - www.portlandoregon.gov/bps/cc2035/sequadrant

⁶³ Industrial decline in an industrial sanctuary Portland's Central Eastside Industrial District, Jones, Allison 2014

land use perspective in Portland has provided good transitional areas between offices in the Downtown district and the tradition industrial services lands⁶⁴.

Planning controls between the EOS and industrial lands are also interesting. The protectionist approach to heavier industries on the edge of the city has seen the complete removal of key development controls including no maximum Floor Area Ratio (FAR), building heights, site coverage or requirements for landscaping⁶⁵. By contrast, the EOS areas are subject to more fine-grain building standards around site coverage, height and FAR, but the build-to boundaries and no landscaping requirements have retained the inner-city industrial character⁶⁶. The local control plan promotes urban renewal in order to preserve historic building stock on the east side and provides more specific standards for the development of incubators, although flexibility in adaptation of industries to space is encouraged.

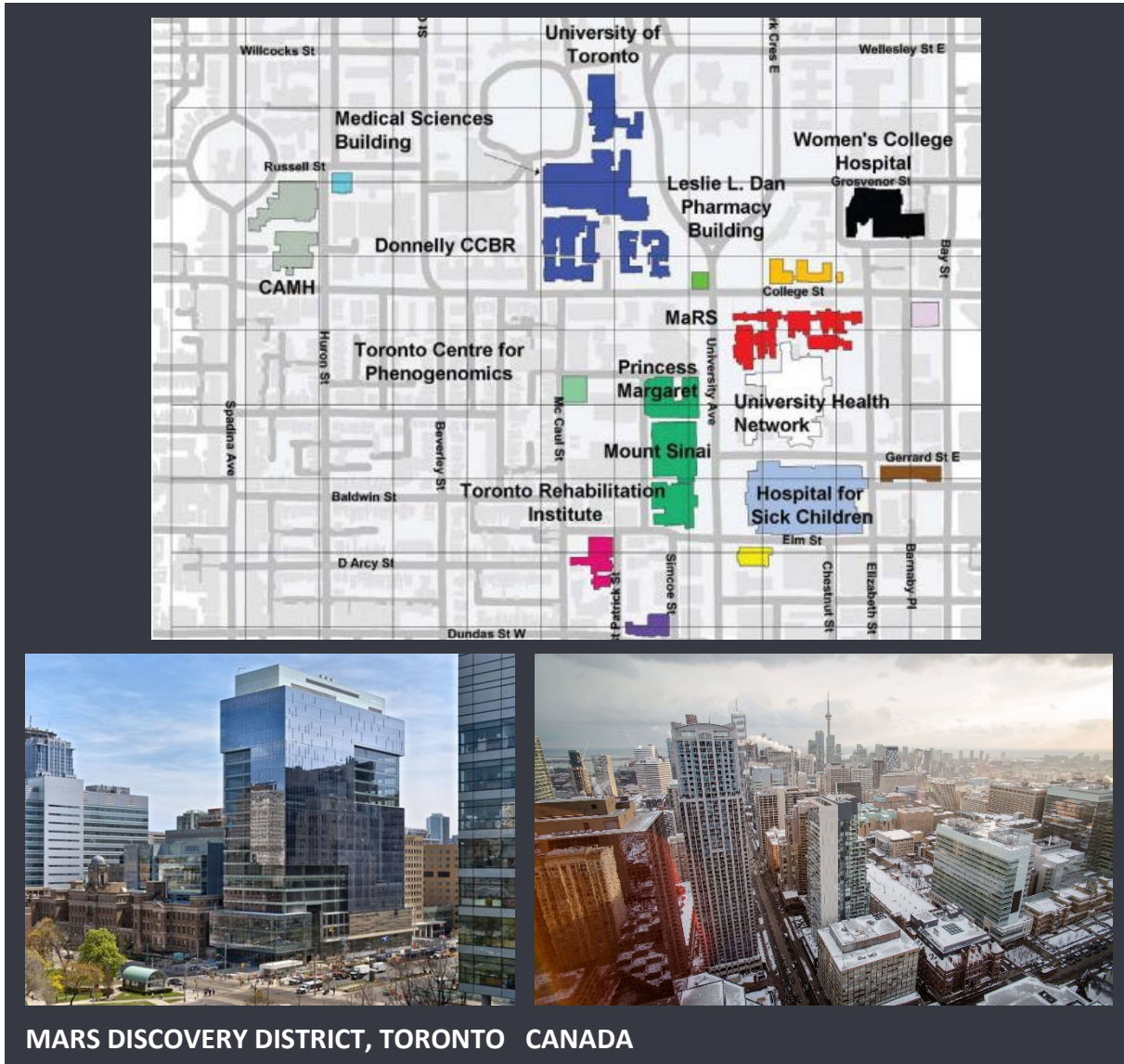
These approaches to land use planning have been successful in supporting the establishment of new and emerging innovation industries in the area. Controls have preserved the heritage fabric of the area and contributed to vibrancy and a dynamic and attractive urban setting. Recent changes to incentivise protection of traditional industries through uplift standards are now being tested by other economic drivers.

⁶⁴ *ibid*

⁶⁵ The Central Eastside Industrial District: Contested visions of revitalization. Minner, Jennifer 2000

⁶⁶ Portland's Central Eastside - www.portlandoregon.gov/bps/cc2035/sequadrant

4.2.6 MaRS Discovery District, Toronto Canada



Top: Figure 47 Locational Map – MaRS Discovery District, Toronto

Source: <http://torontodiscoverydistrict.ca/district-map/>

Left: Figure 48 MaRS Discovery District

Source: ("MaRS Discovery District – Phase 2", 2019) <https://www.pcl.com/projects-that-inspire/pages/mars-discovery-district-phase-2.aspx>

Right: Figure 49 Broader views of Discovery District, Toronto

Source: <http://placematters.marsdd.com/>

Markers of Success

MaRS play a key role in increasing the commercialization potential of Toronto's science and technology ventures. At 1.5 million square feet, the centre is one of the world's largest urban innovation hubs attracting major global innovation brands.

MaRS supports over 1,000 young companies with expert advice, market intelligence and access to capital and talent⁶⁷.

Between 2012-14 startups in the centre generated \$640 million in revenues with over 60% coming from exports.

In 2017, MaRS added 28,900 new technology jobs to Toronto across 1,300 ventures. 6,000 people work in the established MaRS centre.

Since 2008 MaRS has generated \$3.1b into the regional economy, with \$1.4b generated from startups in 2017 alone⁶⁸.

The MaRS Discovery District was founded in 2000 as a non-profit corporation to incubate innovative new medical and technological companies by bringing together Toronto's academic, hospital, government and business sectors such that research could be commercialized. The first stage of the project saw small innovative businesses and start-up companies occupy a converted historic building on the edge of the Children's Hospital, Queen's Park and the Metro Station. The District has since expanded to occupy surrounding blocks and other historic industrial buildings. To date it provides working spaces for over 4,000 workers in high technology, research, medical science, pharmaceutical production, information and communications technology, engineering and social innovation⁶⁹. Some of the organisations that occupy the District include the City of Toronto and Government Offices of Ontario and Canada, the University of Toronto, Ryerson University, St Michael's Hospital, the Toronto Rehabilitation Institute, NPS Pharmaceuticals, MDS Inc, CIBC, Cancer Care Ontario and many more⁷⁰.

The City of Ontario in the 1990's rezoned vacant industrial zoned lands to 'regeneration areas' to permit a range of mixed-use activities with employment overlays that drove innovation projects such as MaRS. Since, Toronto has been at the forefront of the Jane Jacobs 'flexible zoning and land-use approach' which advocates for greater mixed use in driving vibrancy, creativity and investment (also termed spur economics)⁷¹. Recently the City's Official Plan and Provincial Policy Statements have been readapted again to ensure local planning for land use and controls responds to local market drivers, creative thinking and resilience over time.

The result has been projects such as MaRS which offer small-scale work spaces positioned close to purpose-built research labs with cafes, shopping centres and residential apartments all assorted across

⁶⁷ <https://www.toronto.ca/legdocs/mmis/2016/ed/bgrd/backgroundfile-92791.pdf>

⁶⁸ <https://aicd.companydirectors.com.au/membership/company-director-magazine/2019-back-editions/april/mars-innovation>

⁶⁹ <https://www.marsdd.com/about/>

⁷⁰ <https://aicd.companydirectors.com.au/membership/company-director-magazine/2019-back-editions/april/mars-innovation>

⁷¹ Some Great Idea, Keenan, Edward 2013

a range of different, yet inter-connected building types. Adding further to this complexity of mixed use are the drivers for operators to re-adapt heritage buildings where possible and preserve key historic land markers and streetscape qualities⁷².

The Official Plan outlines a series of objectives and tests for the City's inner and special economic zoned areas, including MaRs. These tests are used to balance and reconcile a range of diverse objectives affecting land use planning including economic outputs, social and environmentally sustainable indicators. These indicators sit over the top of built form, density and often specific land use outcomes regulated under the Official Plan. For example, a proposal which sought to establish 500 new jobs in research and develop collaborative work spaces would represent desired planning outcomes and as such, variations to height controls could be considered more favorably.

There is little question that Toronto's approach to flexible land use zoning in areas like the MaRs Discovery District have drawn significant investment and have resulted in vibrant, active and attractive places to live and work which have molded to the changing nature of workplaces and lifestyles⁷³. The City are continuously revising their approaches to land use planning and development controls, particularly in respect of protecting residential amenity and recognizing the importance of maintaining successful creative industry spaces which could be pushed out with increasing rental values.

4.2.7 Key findings from International Examples

- Land use planning approaches for modern industrial parks are underpinned by protectionist and separation policies to protect the amenity of surrounding sensitive uses, but also to preserve sufficiently sized lands for larger operators.
- In contrast, land use planning for successful Innovation Precincts has been suitably flexible, incorporates a genuine mix of uses including some strategic residential and creative spaces.
- Setting the scale for larger industrial parks from the outset is important for not only preserving expansion of industrial parks but also driving economic growth and attracting global leaders in industry.
- Both Industrial Parks and Innovation Precincts need to be supported by transport, digital and utilities infrastructure.
- Land use planning for Innovation Precincts should focus more on design outcomes and place-based approaches rather than stringent regulation around zoning.
- Generally, competitive industries around the world are becoming more environmentally conscious of sustainable and efficient operations. In Europe, environmental regulation around industrial uses often outranks land use and building design outcomes.

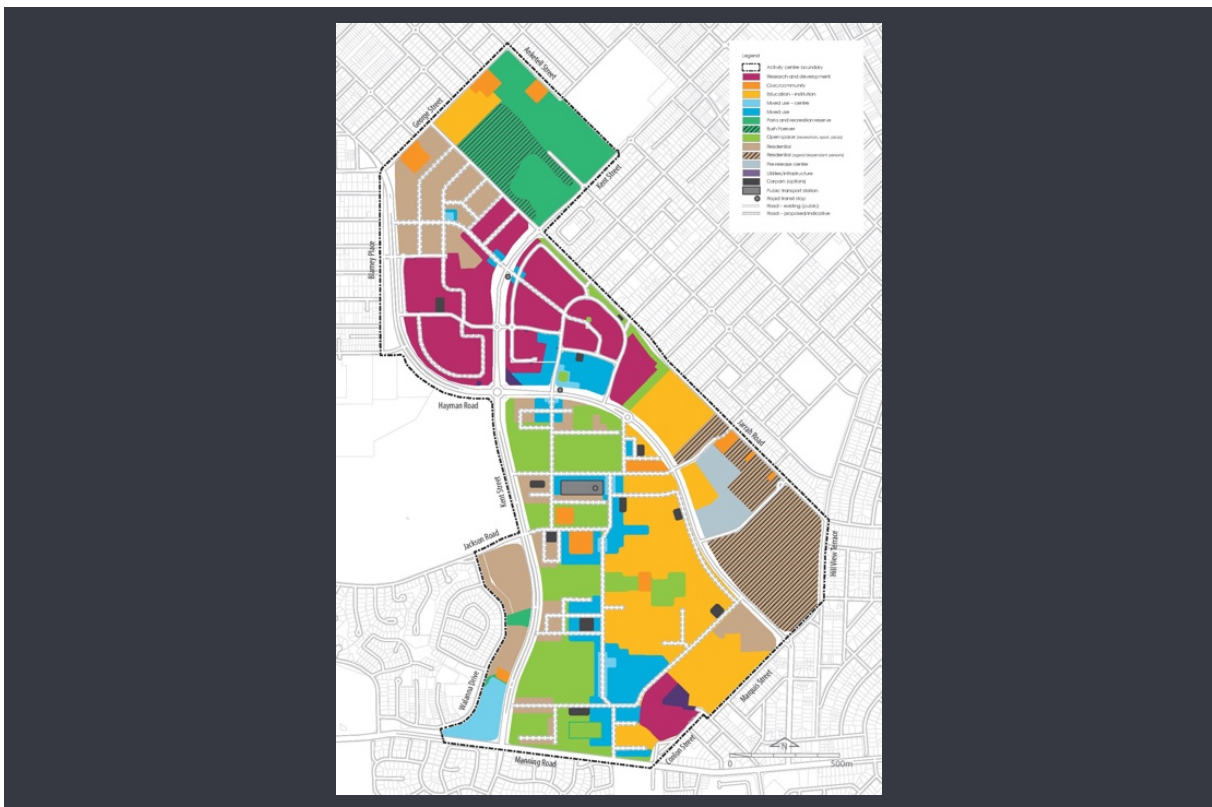
⁷² Zoning for a better Toronto, Martin Prosperity Institute 2010

⁷³ *ibid*

- For both Industrial Parks and Innovation Precincts, comprehensive master planning has proved critical to successful delivery. The more adaptable the plan, the more resilient the urban fabric of a place is to changing demands and drivers.
- Clearly specifying desired land use outcomes in zoning establishes a clear message for investors and the community as to what a precinct will be like. Zoning needs to clearly define the types of industries and businesses and consider aspects such as scale, level of environmental impact and economic functions.
- A genuine understanding of space requirements for different industrial usage types should inform regulations and development controls. These need to transform as requirements change over time.

4.3 Planning for Domestic Precincts

4.3.1 Bentley Technology Park, Perth





BENTLEY TECHNOLOGY PARK, PERTH
 Top: Figure 50 Zoning Plan – Bentley Tech Park
 Source: <https://techparkwa.com.au>
 Left: Figure 51 Curtin University, Bentley
 Source: (“Bentley – Technology Park”, Mingor Website, 2019) <http://www.mingor.net/localities/bentley.html>
 Right: Figure 52 View of Bentley Tech Park Function Centre
 Source: <https://techparkwa.com.au>

Markers of Success

- Acknowledged by Western Australia State Government as an important catalyst for science and technology development.
- Home to more than 100 organisations including technology-based industry, research and development, academia and support organisations. Anchor tenant is CSIRO.
- 8,600 jobs currently in the precinct, 5,000 of which are knowledge / professional jobs – anticipated to grow to over 20,000 by 2031⁷⁴.

The Bentley Technology Park in Perth was opened in 1985. The Western Australian State Government as an initiative to accommodate a new base for CSIRO and others in proximity to Curtin University introduced the Technology and Industry Development Act, 1983. The purpose of the Act was to establish a corporate body to oversee the development, management and operation of technology parks across the state and to zone land appropriately for such uses. The governments’ Vision for the Bentley Technology Park was to create a planned city where scientific and technological industries could thrive, and research resources could be shared and expanded around Curtin University⁷⁵.

Zoning frameworks applying to the park fall across two local government areas. A Technology Park zoning applies in the South Perth Council area whilst a Special Use zone applies in Victoria Park. Land use terms that are permitted without any form of consent in the zones include: *Café / restaurant, child*

⁷⁴ <https://techparkwa.com.au/features/>
⁷⁵ Growing WA through innovation, Legislative Assembly Report No. 7 June 2016

care centres, civic uses, consulting rooms, industry – service, office, public utility, research and development and take-away food outlet.

The land use activities that currently operate within the park would broadly be captured under the *research and development* land use terms and include pharmaceutical, energy, educational institutions, IT research, government research agencies (CSIRO), geoscience and engineering, software development, vocational training, scientific research and technology development. *Research and development* is defined under the Local Planning Scheme as “*scientific and industrial research and the development, production and assembly of products associated with such research undertaken on any land or within a building designed and equipped for such activities*”. The land use term clearly defines the nature and types of activities considered desirable in the zone and reflects those that have occupied the park.

Land parcels within the precinct remain vacant to this day and this is likely the result of a number of factors:

1. The strict and limited application of land uses permitted in the park. Whilst this has preserved lands for the specific purposes sought by government in the early 1980’s other commensurate land uses have been prohibited from entering the park.
2. Development controls for new buildings in the park are highly restrictive and largely outdated (as discussed below).
3. There may be a lack of demand for such knowledge-intensive uses to invest in the park given its poor access to public transport and other essential services.
4. The corporate body managing the park has been overly restrictive in the application of their powers under the Act.

Development controls under both Local Planning Schemes are highly restrictive. Maximum 7 and 7.5m height limits and plot ratios of 0.5:1 severely limit new built forms, particularly on smaller sites, which would produce spaces which are unlikely to attract major R&D. Setback and landscape controls may also be unnecessarily restrictive to new developments which require flexibility in the establishment and use of new spaces.

Whilst the initial stages of development in the park were largely successful in attracting major R&D and delivering suitable built form for such users at the time, it seems that growth of the park has stagnated. This is largely due to the restrictions around complementary land uses and the prohibitive nature of the existing development controls. The State Government in collaboration with the Councils are currently reviewing land use and development controls in the park with the aim of introducing more vibrant activities including small-scale retail and investigating drivers for the establishment of incubator spaces⁷⁶.

⁷⁶ <https://www.jtsi.wa.gov.au/what-we-do/industry-development/industry-participation/technology-parks>

4.3.2 Smeaton Grange, Sydney



Top: Figure 53 Map – Smeaton Grange and surrounds

Source: <https://www.camden.nsw.gov.au/community/community-information/suburb-maps/>

Left: Figure 54 Avid Industrial Development – Ironbark Estate, Smeaton Grange

Source: <https://www.avid.com.au/project-landing-pages/iron-bark-industrial-estate-smeaton-grange-nsw>

Right: Figure 55 Artistic impression of new industrial development within the Ironbark Estate

<https://www.avid.com.au/project-landing-pages/iron-bark-industrial-estate-smeaton-grange-nsw/>

Markers of Success

Camden Council's largest employment centre providing for over 4,300 jobs across the precinct which represents 24.1% of all jobs in the LGA.

Well-planned physical interfaces to established and future residential precincts to control environmental nuisance impacts of industry.

Smeaton Grange is one of the most active precincts in South-West Sydney with median property prices on average increasing over 35% in the past 4 years.

Continues to attract investment from international operators including Amazon who have recently purchased 2ha for \$7 million to establish their fulfillment centre (warehouses).

Smeaton Grange is an industrial park in South-West Sydney situated within the Camden LGA. The precinct is situated on the junction of Narellan Road and the upgraded Camden Valley Way between the centres of Camden and Narellan. The land is zoned IN1 General Industrial with some pockets of IN2 Light Industrial positioned at the edges of the precinct where it interfaces with more sensitive residential land uses in Currans Hill and Gregory Hills.

The predominant built form observed in the precinct is warehouses and distribution centres of varying sizes. Multi-unit complexes housing construction and trade services are also scattered throughout the precinct. The broad nature of land uses permitted in the IN1 zone has resulted in a genuine mix of operators from industrial-retailers through to childcare, recreation centres, storage and warehousing, vehicle repairs, scrap metal recyclers and some limited manufacturing activities.

Smeaton Grange was developed in accordance with a comprehensive masterplan under Camden's DCP which has helped to deliver a clearly defined street hierarchy and some examples of good landscape outcomes and edge buffer treatments.

Development standards under the Camden LEP 2010 as they apply to Smeaton Grange are as follows:

Minimum Lot Size:	2,000m ²
Maximum FSR:	1:1
Maximum Height:	11m

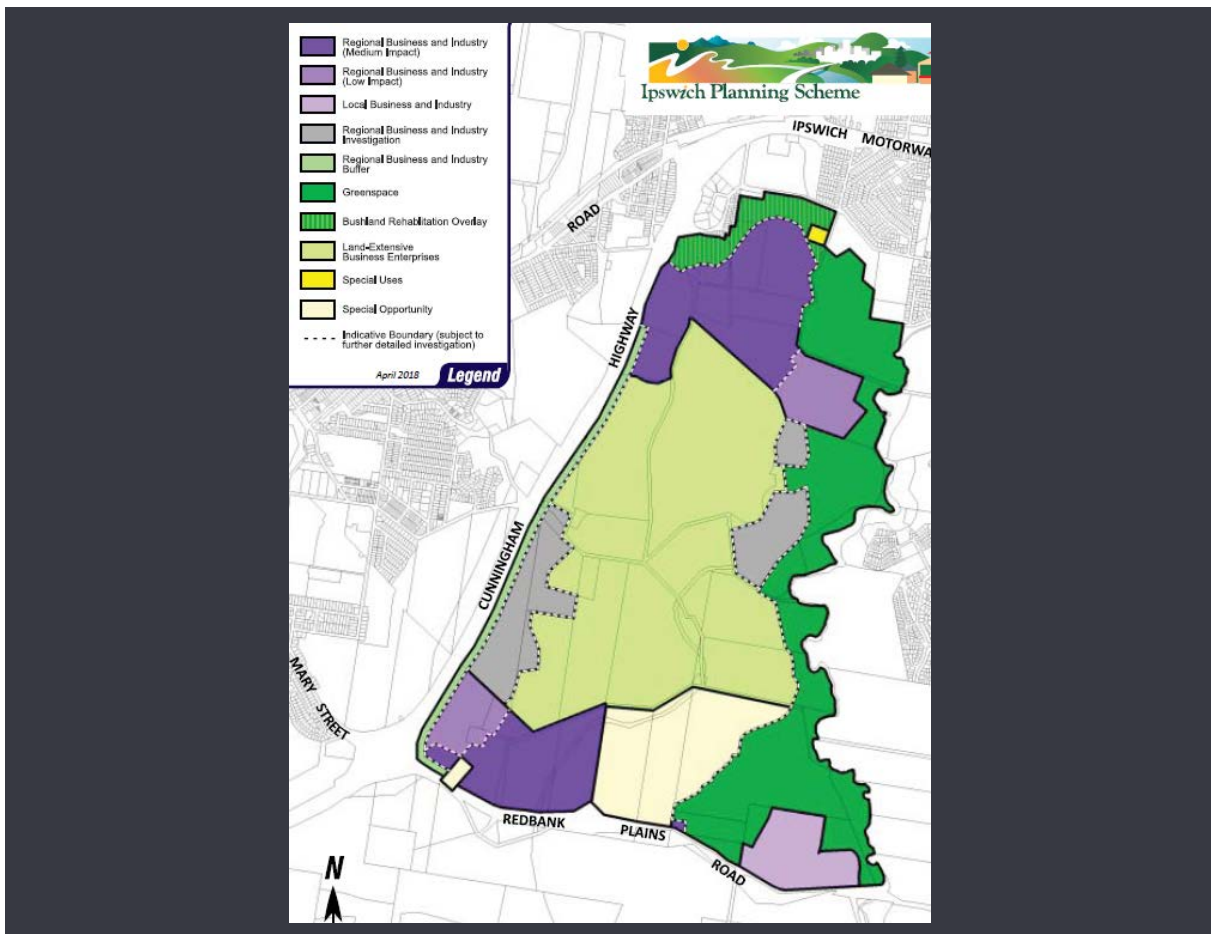
What is interesting to note is the range of lot sizes, building types and scales that have eventuated in the precinct, even with such stringent controls. The masterplan identified specific areas around the edges of the precinct which would be more suited to larger distribution and warehousing operations. Older building stock in the precinct (developed in the 1990's and early 2000's) comprised 2,000m² sites with single buildings or small-scale unit complexes whilst more recent stock has seen a mix of larger floorplates with smaller strata title units as evidenced in the Ironbark Estate developed by AVID⁷⁷. This

⁷⁷ <https://www.avid.com.au/project-landing-pages/iron-bark-industrial-estate-smeaton-grange-nsw/>

reflects a change in the demands for smaller storage and warehousing space to suit urban services and other light industries.

The masterplan included controls around separation and landscape buffer treatments to the adjoining residential areas to the north and east. Extensive landscape treatments to the Camden Valley Way interface were also originally established to provide visual amenity and screening. To the east landscape corridors were doubled by the preservation of major overhead power line easements which still exist, providing 50m buffer zones between industrial buildings and the closest residential properties. To the north the separation distances have been reduced along Turner Road, however the implementation of an IN2 Light Industrial zone has resulted in more passive uses interfacing to a now major local road⁷⁸. The masterplan approach together with well-considered DCP controls has achieved good amenity and interface outcomes to surrounding residential properties.

4.3.3 New Chum Enterprise Area, Ipswich



⁷⁸ <https://www.camden.nsw.gov.au/assets/pdfs/Planning/Development-Control-Plan/DCP-Part-D.pdf>



NEW CHUM ENTERPRISE AREA, IPSWICH

Top: Figure 56 New Chum Zoning Map
 Source: ("Ipswich Planning Scheme 2", City of Ipswich, 2019) <https://www.ipswichplanning.com.au/>
 Left: Figure 57 Views of established industrial area adjoining New Chum Estate
 Source: <https://www.rhcommercial.com.au/properties/2-chum-street-new-chum-4303-queensland>
 Right: Figure 58 New Chum and surrounds
 Source: <https://www.realcommercial.com.au/property-land+development-qld-new+chum-500722659>

Markers of Success

- Strong example of transitional land use zoning implemented to control impacts to surrounding residential amenity. State Government initiated Temporary Local Planning Instrument in place to mandate separation distances between new industries and residences.
- Successful means of utilising rezoning and investment by industry to remediate and repair open-cut mine site and manage existing environmental issues.

The New Chum Enterprise Area is a newly rezoned and proposed industrial precinct in the Ipswich LGA, positioned in the outer south western area of Brisbane. In 2018 Ipswich Council introduced the New Chum Implementation Guide into their Planning Scheme to provide directions around the configuration of proposed land use and separation treatments for new development. The area has long been flagged as having strong enterprise potential by both the State Government and Council being positioned close to the existing heavy industrial areas of Swanbank to the south and having direct motorway access to Brisbane⁷⁹.

The area covers some 8km² and includes lands heavily disturbed by previous extractive mining which has left the land unstable, flood prone and impacted by spontaneous combustion of coal and carbonaceous shale. The land was identified as suitable for conversion to a mixture of industrial land uses where built forms could suitably adapt and be responsive to constraints⁸⁰. Adding to the constraints is the existing low-density residential areas positioned to the north and west of the site.

⁷⁹ Implementation Guideline No. 25: Ipswich Planning Scheme
⁸⁰ Synopsis of findings of the Ipswich-Western Corridor industrial land analysis, December 2008

Council's approach to land use implementation is based on separating heavier industrial operators from nearby residential through land use buffering and transitioning uses based on precinct classifications. The outer peripheries of the area are classified for light industries, business and larger-scale recreational activities whilst heavier industrial operations (known as land-extensive enterprises) are arranged in the centre of the precinct. The strategy is for new development to act as a catalyst for rehabilitating degraded lands in the area whilst also encouraging the implementation of compatible outdoor / adventure sports and off-road vehicle pursuits⁸¹.

Approaches to zoning and master planning of the precinct also nominates edge biodiversity areas which are to be preserved and regenerated as part of larger development sites. These edge treatments together with development controls around high-quality façade treatments to buildings fronting residential edges work to ensure a high standard of visual amenity is achieved along the Cunningham Highway corridor.

Interestingly, land use classifications are based on the level of environmental impact and the land sizes required to support certain industries. Land uses are allocated according to their regional or local significance which are defined by size, character and dependence on access to the outer arterial motorway network. Land extensive industries and enterprises are those operations requiring larger sites such as distribution, freight and chemical production industries. These are positioned in the centre of the site where the need for more expansive buffers to surrounding sensitive uses and environmental areas of significance are recognised.

Whilst not yet developed the approach to land use planning for New Chum is considered reflective of best practice on the basis that:

- Land use configuration has been mindful of land area requirements and the need for separation and isolation of larger, more intensive industrial operators;
- Planning has recognised the significance of incorporating and promoting recreational green edges to provide amenity for workers as well as doubling as extensive vegetated buffers to residential properties;
- It has recognised the importance of high-quality built form in connection with landscape treatments for visual aesthetic; and
- It introduces a comprehensive street network supported by pedestrian and cycle connections for workers to access local business precincts offering essential services, food and drink and retail.

⁸¹ Implementation Guideline No. 25: Ipswich Planning Scheme

4.3.4 Sydney Science Park, Penrith



Top Figure 59 Locational map – Sydney Science Park

Source: <https://www.celestino.net.au/sydneysciencepark/residential>

Right: Figure 60 Artistic impression – Sydney Science Park

Source: ("Sydney Science Park – APP", APP Website, 2019) <https://www.app.com.au/our-work/sydney-science-park>

Left: Figure 61 Artistic impression aerial of Sydney Science Park Masterplan

Source: <https://www.celestino.net.au/sydneysciencepark/residential>

Markers of Success

Earmarked to cater for some 12,000 new knowledge-based jobs, with opportunities of longer-term injecting tens of millions of dollars in revenues into the broader Western Sydney economy.

The \$5 billion project has drawn collective investments from leading industry partners including CSIRO, the Parramatta Catholic Education Diocese, ANSTO and the Westmead Health Precinct's seven health, education and research organisations⁸².

Sydney Science Park occupies 280ha of newly zoned business enterprise lands in Luddenhum. It is the creation of Celestino (the developer) in a joint venture with the Commonwealth Government, Catholic Education Diocese and a number of International Scientific Research Institutions including the Birling National Avian Laboratories Centre. It is a project which is aimed at delivering a fully integrated community that will create more than 12,000 knowledge-based jobs in food technology and development, research and scientific industries together with educational facilities for over 10,000 students and homes for 10,000 residents. It is an innovation precinct which has excellent access to Western Sydney's arterial motorway networks and the WSA. Currently under construction, the park will be home to CSIRO's first dedicated Innovation Zone and Urban Living Lab which provides housing and services for scientific research professionals⁸³.

Planning for the park was undertaken in 2014/15 which saw the land rezoned from rural to a mixture of B7 Business Park, B4 Mixed Use and RE1 Public Recreation to facilitate:

- A new specialised centre accommodating R&D, employment, education and supporting retail and residential use;
- 440,000m² of employment and education floor space;
- 3,000 dwellings integrated within the town centre and within the employment and education land; and
- A diverse worker, resident and student community that is demographically balanced, responds to changing lifestyles and work requirements over time.

The rezoning approach to the park allowed for an immense level of flexibility which was required given the need to incentivise investment and attract major scientific, research and educational institutes into a greenfield site. The mixed use centre and modified B7 zone allowed for certain types of worker and student housing to be integrated throughout the park for promotion of better live-work arrangements, higher pedestrian and cycle outcomes and transit-orientated development principles with the future north-west rail link. The percentage of recreational and landscaped open space across the park was also key to unlocking the rezoning in promoting a high level of amenity for workers, students and residents.

⁸² <https://www.celestino.net.au>

⁸³ <https://theurbandevolver.com/articles/aerotropolis-sydney-science-park-one-step-closer>

Development standards under Penrith LEP 2014 stipulate maximum building heights of 18m and 24m across the education, research and town centre areas to accommodate mixed use built form and minimum lot sizes down to 225m² and 125m² for integrated small lot housing, consistent with the growth centre controls.

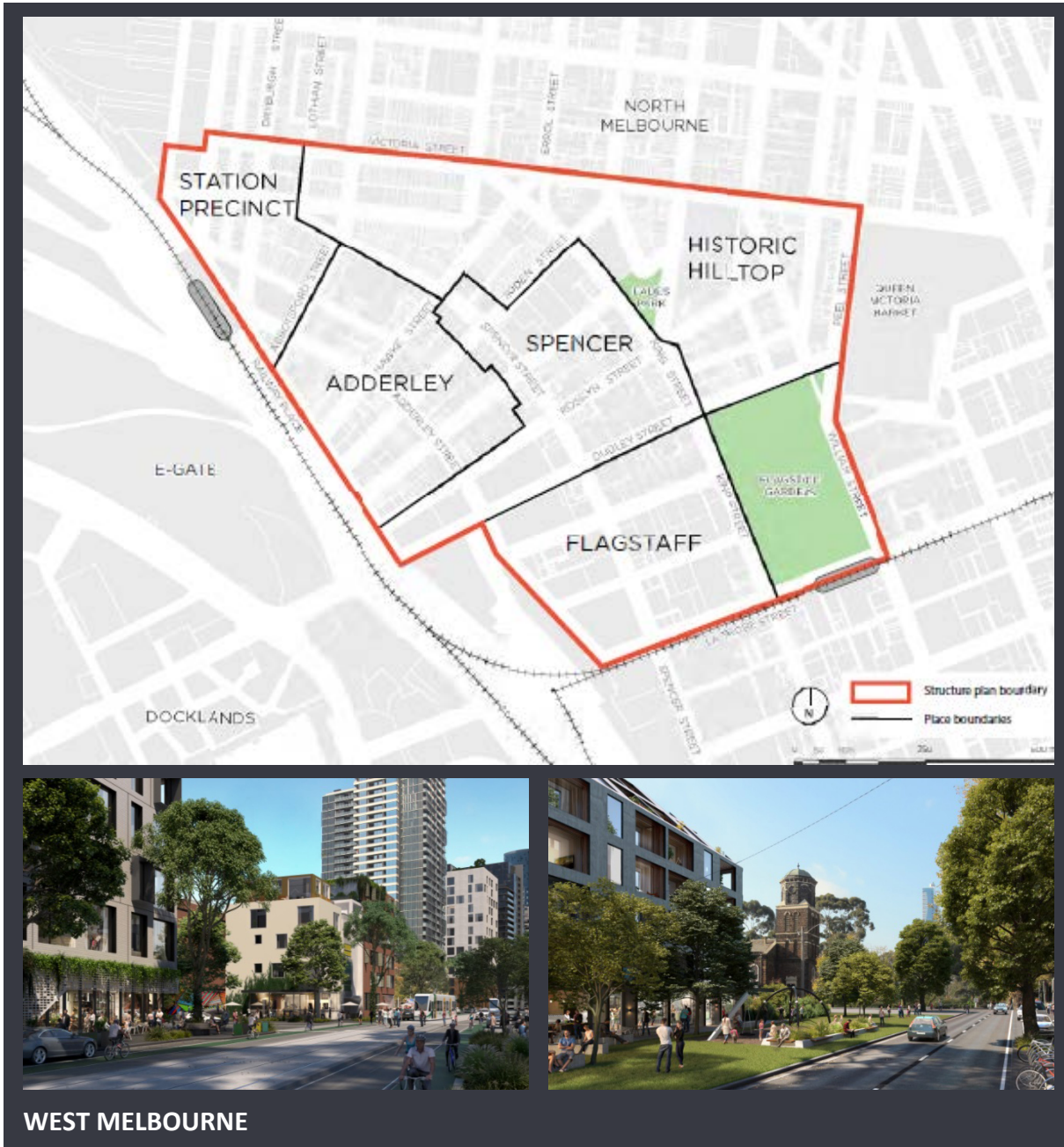
Development controls are included in a site-specific chapter in Penrith DCP 2014. Extensive place-based controls guide the design of public streets, pedestrian and cycle connections, landscape and biodiversity corridors, public art and creation of a public domain within the town centre. More specific design requirements for the town centre is mandated through precinct plans which must be prepared and approved by Council prior to construction to establish fine-grain urban design outcomes⁸⁴.

A variety of building heights, coverage and setback controls are included to produce a variety of built forms for different areas and usage types. Typically, larger building forms with greater heights and floor areas are required to provide increased setbacks and landscaping, whilst smaller forms are encouraged to abut streets at a reduced or nil setback. Active street frontages are promoted along major pedestrianised thoroughfares and internal building amenity controls are extensive to mandate good solar penetration and sustainability outcomes⁸⁵.

⁸⁴ https://www.penrithcity.nsw.gov.au/images/documents/building-development/planning-zoning/planning-controls/Penrith_DCP_2014_Part_E16_Sydney_Science_Park.pdf

⁸⁵ https://www.penrithcity.nsw.gov.au/images/documents/building-development/planning-zoning/planning-controls/Penrith_DCP_2014_Part_E16_Sydney_Science_Park.pdf

4.3.5 Innovation Precincts in Victoria



Top: Figure 62 West Melbourne Structure Plan boundaries

Source: ("West Melbourne Structural Plan, City of Melbourne", 2018) <https://participate.melbourne.vic.gov.au/westmelbourne>

Left: Figure 63 Artistic impressions of future mixed innovation precinct – West Melbourne

Source: ("West Melbourne Structural Plan, City of Melbourne", 2018) <https://participate.melbourne.vic.gov.au/westmelbourne>

Right: Figure 64 Artistic impressions of future mixed innovation precinct – West Melbourne

Source: ("West Melbourne Structural Plan, City of Melbourne", 2018) <https://participate.melbourne.vic.gov.au/westmelbourne>

Land use zoning in Australia has traditionally been utilised to separate activities, often grounded in the idea that residential, commercial and manufacturing activities are inherently incompatible. On the basis of successful Innovation Precincts overseas the NSW and Victorian Governments are beginning to investigate efforts into the development of these precincts in response to rapidly changing trends in industry jobs, lifestyles and approaches to urban planning.

The Victorian Government, particularly in areas around inner-city Melbourne are leading this charge with the establishment of a new zone – the Commercial 3 zone. This has been established in 2018 as a mixed-use employment zone under the Enterprise Precincts policy. It is intended to facilitate the establishment and growth of creative industries, small manufacturers and startup businesses. The zone prioritises particular uses that form part of the emerging economy, including new models of industrial, commercial, office and other employment generating uses, whilst still permitting some forms of retailing and residential⁸⁶.

Uses permitted in the Commercial 3 zone include arts and craft centres, education centres, home-based businesses, certain types of industry, manufacturing sales, markets and research centres. Complementary uses including accommodation, small-scale retailing and warehouses are also permissible with consent, however scale parameters under development controls apply to such uses to best manage their role and scale. For example, shops up to 200m² and warehouses of up to 500m² are permitted with consent. Dwellings are also permitted within a mixed-use development where the residential floor area does not exceed 35% of the combined GFA⁸⁷.

In precincts like West Melbourne, recent attempts at new approaches to land use zoning to encourage urban renewal and retained employment may seek to implement the Commercial 3 zone within a few sub-precincts. Planning in West Melbourne has acknowledged the importance of residential and commercial developments in driving renewal and gentrification processes, however, in recent years the mixed-use zoning of the area has led to an over-abundance of residential units which has forced out traditional industry⁸⁸. The 2018 Structure Plan now seeks to introduce a Special Use zone with incentives provisions to allow for residential apartment buildings only where a certain percentage of the GFA is dedicated to employment generating uses; similar to Central East Side in Portland.

Cremorne, an inner-city area in Melbourne's south east has also been earmarked recently for incorporation of the Commercial 3 zone around the bustling and growing technology precinct, anchored around the cluster of software companies like MYOB⁸⁹. In Cremorne, the City of Melbourne has understood the key draw cards behind the establishment of clusters of creative, technology and innovation startups who are drawn by the presence of like-minded entrepreneurs, heritage buildings,

⁸⁶ Unlocking enterprise in a changing economy, Victorian Government, September 2018

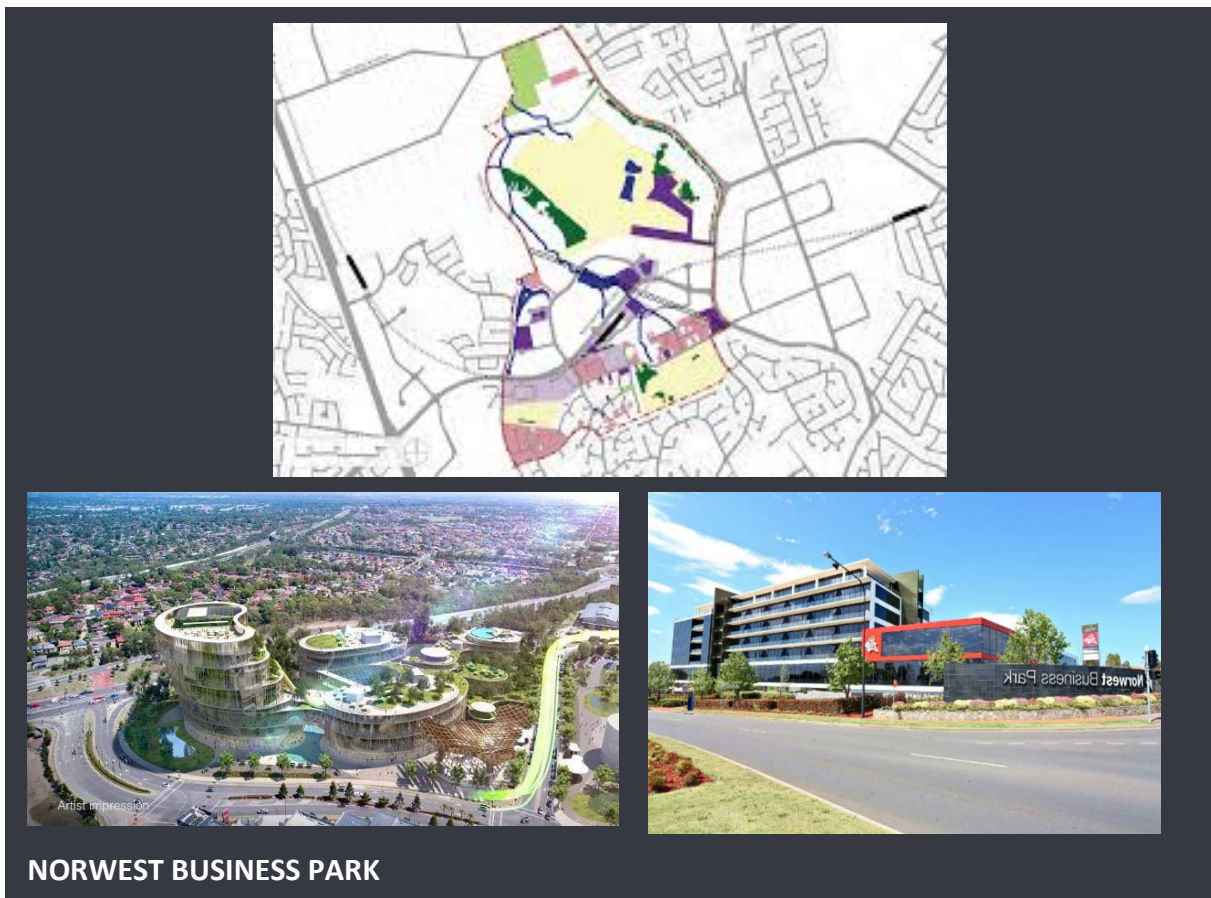
⁸⁷ Applying the Commercial 3 zone – Planning Practice Note 85, September 2018

⁸⁸ West Melbourne Structure Plan 2018, City of Melbourne

⁸⁹ <https://www.premier.vic.gov.au/boosting-innovative-technology-jobs-in-melbourne/>

co-working spaces, a mix of large and small land parcels left by departing industries, and good public transport. Other emerging precincts likely to be investigated for the Commercial 3 zone include parts of Collingwood, South Melbourne and Brunswick that share these key attractor traits⁹⁰.

Norwest Business Park



Top: Figure 65 Norwest Station Structure Plan

Source: https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&ved=2ahUKEwj2yueYz5jjAhUWVH0KHU2wDxOQjhx6BAGBEAI&url=https%3A%2F%2Fwww.planning.nsw.gov.au%2F-%2Fmedia%2FFiles%2FDPE%2FReports%2Fnorth-west-rail-link-norwest-station-structure-plan-a-vision-for-norwest-station-surrounds-2013-09.pdf%3Ffile%3Den&psig=AOvVaw0bH_ANCZFpktXJI3AFQ-nA&ust=1562238801956655

Left: Figure 66 Artistic impressions of future Mulpha development, Norwest Smart City

Source: https://www.dailytelegraph.com.au/subscribe/news/1/?sourceCode=DTWEB_WRE170_a_GGL&dest=https%3A%2F%2Fwww.dailytelegraph.com.au%2Fnewslocal%2Fhills-shire-times%2Fnorwest-smart-city-mulphas-futuristic-vision-for-a-nation-leading-business-park-has-been-revealed%2Fnews-story%2Faa8e950e01440b6ed8b9d5f0326a8405&memtype=anonymous&mode=premium

Right: Figure 67 View of entrance to Norwest Business Park from Windsor Road

Source: <https://jagonal.com.au/office/building/NSW/Sydney/Sydney-North-West/Norwest/Norwest-Business-Park>

⁹⁰ <https://www.premier.vic.gov.au/boosting-innovative-technology-jobs-in-melbourne/>

Markers of Success

Planning for the business park has been responsive and adaptive to growth and the changing nature of industries

The partial B7 zoning of the park has produced a larger occupation of commercial uses than industrial or research-intensive industries, however it includes specialist innovative clusters around medical uses

The Norwest Business Park located off Windsor Road in The Hills LGA is a largely developed precinct which is second only to Macquarie Park in terms of overall land size at 377 hectares. It comprises approximately 272,500m² of commercial office floorspace and a further 60,000m² of industrial and retail floorspace which is forecasted to provide for 35,000 jobs once capacity is achieved⁹¹.

The park is home to over 350 companies, comprising a diversity of information technologies, pharmaceuticals, manufacturing, construction and financial services⁹². As of 2016 The Hills Shire Council's civic and administrative offices were relocated into the precinct, reflective of its now regional economic significance which continues to grow. The partial B7 zoning of the park has produced a larger occupation of commercial uses than industrial or research-intensive industries, however it includes specialist innovative clusters around the Norwest Private Hospital including advanced health and medical organisations including Sigma Pharmaceuticals, ResMed and Rhone Polenc. The B7 zone has proven successful in the rate of land take up and development of accommodative facilities. This successful growth was supported by the executive housing development provided in the adjacent R2 and R3 residential zones incorporating the estates of Bella Vista and Bella Vista Waters⁹³. Early investments in regionally significant retail and transport infrastructure also aided in the attraction of large investments by international and domestic organisations⁹⁴.

As growth began to constrain the precinct focuses from The Hills Shire Council and the NSW State Government saw further commitments to improving regional transport infrastructure including new stations on the North West Metro, upgrades and widening to Norwest Boulevard and improved connections to the M7 Motorway⁹⁵. In more recent years lands around the major retail centre were rezoned to accommodate mixed use and residential flat building developments built around the principles of transit-orientated development (TODs). These approaches to land use planning and development controls over time have seemingly encouraged renewed economic development and investments in park.

⁹¹ Research park case study analysis, Hill PDA, February 2013

⁹² <http://norwestbusinesspark.com.au>

⁹³ <http://realcommercial.com.au/property-offices-nsw-baulkham+hills-5794934>

⁹⁴ Research park case study analysis, Hill PDA, February 2013

⁹⁵ <https://www.pwc.com.au/agendas/cities/citypulse-sydney-building-three-cities-for-the-future-web.pdf>

The Norwest Master Scheme has underpinned the ongoing development of the park. From the outset it advocated for the establishment of good pedestrian and cycle links between the retail centre and throughout the park. With the provision of the Metro line, the scheme has again been revised to focus improved pedestrian and cycle connections from places of work, residences and retail to the stations. Road widening, and improved connections are currently being undertaken by the Council in connection with new high-rise developments.

Amenity for workers and residents was always considered a crucial element of the scheme. The Norwest Lake and lake-front dining precinct was developed to encourage high quality break-out and interactive places for people to meet and collaborate⁹⁶. Similar to Suzhou's central lake, the Norwest Lake provides a central recreational anchor and helps orientate land use configuration in the precinct.

Importantly, approaches to planning for the business park has been responsive and adaptive to growth and the changing nature of industries. Zoning has been re-examined over time to ensure land use definitions help aid investment and economic returns. These planning processes have been collaborative in working with major institutions to understand their work-space needs and drivers. Being confronted with expansive residential projects in the Norwest town centre Council are mindful of avoiding a dilution of this precincts' key role as an economic hub, seeking to continuously protect businesses through the continued application of the B7 zone which prohibits residential development.

4.3.6 Key Findings from Australian Examples

- Industrial zoning frameworks across Australia recognise the core differences of industries based on the extent of environmental impact, requirements for land size and separation. Other industries, including urban services, light industries and innovative industries typically fall into broad industrial, commercial, employment or business zonings which more often than not results in fragmented and mixed-use precincts.
- Best-practice approaches to land use planning for industrial parks establish the differing characteristics of uses and include clearly defined land uses. Different types of industrial operations are then segmented into sub-precincts to create clusters of commonality and shared knowledge and resources.
- The economic success of industrial precincts depends on access to other supportive land use activities. Planning needs to consider what supportive uses are appropriate and their quantification needs to be controlled via development regulations incorporated into zoning to avoid diluting the predominant employment uses.
- Innovation precincts in Australia have developed organically in inner-city areas with good access to amenity, transport and built form character, including predominantly vacated industrial factories and buildings of heritage value. Moves to recognise the characteristics of Innovation

⁹⁶ <http://www.norwestassociation.com.au/master-scheme/>

Precincts, such as the Commercial 3 zoning in Victoria will provide some direction to the market around investment decisions and will continue to encourage the growth of creative industries.

- As evidenced overseas, for Innovation Precincts to thrive planning needs to be flexible, adaptive to fast moving drivers of change and incentivizing to draw in startups and users that require cheap rents and cost-effective spaces to operate.
- Collaboration is linked to mixed use areas. Incorporating some limited residential use into precincts to create live-work spaces can support vitality and vibrance, however, careful planning decisions need to be made so as to not compete with employment outcomes.
- Industrial parks should utilise transitional zoning to buffer adjoining sensitive uses. The incorporation of physical separations and vegetated buffers has also proven successful in protecting surrounding amenity. Utilising major roads, rail and infrastructure corridors as well as native forests and other natural features should be investigated in master planning ahead of development commencing.
- Attractive physical features such as man-made lakes, recreational areas or eat streets are pivotal to the successful development of precincts. These help to orientate designers in place-making, configure land use zoning and attract investment from business.
- Planning for industry needs to be both flexible and prescriptive, depending on the needs to control or drive innovation in outcomes. Well-planned precincts such as Bella Vista and Sydney Science Park are also successful because key infrastructure decisions and assets were locked in ahead of development.
- Different industries require very different spaces, levels of access to infrastructure and facilities. Accordingly, some businesses will tend to occupy certain locations over others. Consultation with the private sector ahead, and throughout the course of planning is vital to successful precincts.

5. Market and Government Initiatives

Having considered the key drivers and demands of industry and innovation and the best practice approaches to land use planning, this Chapter considers examples of market and government led initiatives that have supported retention and growth of local jobs and industries. As industries change over time as a result of geo-political factors, technological advancements and global competition there is often a need for governments and the private sector to intervene through planning, financial and governance mechanisms to protect jobs and facilitate transition. The ongoing decline of the traditional manufacturing sector in western nations has seen gradual transitions to service and knowledge industries as well as the promotion of the professional, technical and advanced manufacturing sectors through numerous interventions and incentives. Whilst markets tend to adapt and transition organically over time there is often need for leaders to intervene and be proactive to ensure economic downturns and the effects of urban decay are avoided.

5.1 Utilising Value Capture

Value capture is a mechanism of utilising funds raised from taxes or levies on new private-sector development projects and rate-payer revenues to improve infrastructure. Government authorities around the world enact value capture to drive urban renewal or the development of new precincts and often use incentives to drive initial investment by the market.

Werksviertel is a repurposed former industrial district in Munich which has been transitioned into a thriving Innovation Precinct following ongoing collaboration and intervention by government, the land owners and the community. The city government has deployed instruments to enable land intensification and has reinvested profits from new developments back into social and cultural infrastructure to promote a destination employment centre for business investment⁹⁷. The district's growth and success are the result of multiple government-led initiatives in city planning, including:

- The promotion of residential developments to drive economic returns through a value-capture model;
- Preservation of historic buildings and assets to preserve cultural drawcards and contribute to a sense of tradition and place;
- Incorporation of mixed use and a variety of building forms to add vibrancy and visual intrigue which has drawn investment from both smaller and larger companies;
- The setting of high environmental performance standards; and
- Creating a dynamic combination of recreational, artistic and retail spaces to add vibrancy and life to the precinct.

⁹⁷ Building the innovation economy – Case Study: Munich, Clark, G, Moonen, T & Couturier, J, October 2016

The NSW Government has used value capture to reinvest into infrastructure improvements to support its largest business parks at Macquarie Park and Norwest, within Sydney's Global Economic corridor. In Macquarie Park levies on new high-rise residential developments under a State Infrastructure Contributions (SIC) have helped to fund local and regional road improvements and investments in upgrades to recreational infrastructure. In Norwest, development contributions paid in accordance with The Hills Contribution Plan has delivered road widening improvements along Norwest Boulevard and upgrading of the public domain around the entrance to the new Metro stations, new and improved pedestrian and cycle connections and stormwater drainage infrastructure⁹⁸.

5.2 Decentralisation and Anchors

Decentralisation, relocation and investments in major research and education institutions have also proven successful in driving economic growth and job protection. These mechanisms have been pursued by both the free market and government in several major cities around the world.

Paris-Saclay is a research-intensive business cluster which is undergoing growth and expansion. It is a strong economic hub which accommodates 40% of the Paris regions public research institutions and 40% of the city's industrial high-tech research and development sector. The city's governments committed over \$1.5 billion euros in relocating and re-establishing the Paris University's real estate projects and \$1 billion euros towards the establishment of state-owned laboratories and research institutes within a central cluster⁹⁹. This education and research clustering together with significant investment in the expansion of the Paris Metro has attracted global energy, IT, automotive, aerospace and health research companies to the district, contributing to a super-innovation precinct.

The establishment of the CSIRO's first living laboratory in the Sydney Science Park is a domestic example of government investment acting as an impetus for future economic growth in the research and development sector. Other examples such as the Bentley Technology Park in the 1990's saw CSIRO's establishment of a research base draw investment from other major institutions who collaboratively work and leverage on the knowledge and professional services on offer.

In Rochester, Minnesota the establishment of the Mayo Clinic within the heart of the city became an anchor to the growth and development of Discovery Square. The precinct is a highly connected urban life sciences hub which has seen growth of the clinic resulting from ongoing investments from the private sector in new laboratories and private health care facilities¹⁰⁰. Today it is the largest public-private partnership in the state which has created a destination medical and research centre of international importance that directly employs over 55,000 specialist workers¹⁰¹.

⁹⁸ https://www.lindsaytaylorlawyers.com.au/in_focus/value-capture-through-voluntary-planning-agreements-part-2-key-issues-examples-of-some-local-council-practices/

⁹⁹ https://www.epaps.fr/wp-content/uploads/2017/08/170629_BI-anglais_bd.pdf

¹⁰⁰ <https://obamawhitehouse.archives.gov/the-press-office/2016/09/26/fact-sheet-announcing-over-80-million-new-federal-investment-and>

¹⁰¹ https://www.nawic.com.au/nawic/documents/20141215_NAWIC_WalkTalkWork.pdf

5.3 Investments in Infrastructure

The best practice approaches to land use planning discussed in Chapter 4 included a common theme of needing to plan for crucial infrastructure to configure land use activities and establish a basis for development regulation. Employment centres rely on infrastructure to transport workers, goods and services. For heavier industries, more intensive utility infrastructure services in the form of power generation, water management and sewerage treatment are vital to operations. For Innovation Precincts to succeed, investments in cultural and social infrastructure in addition to transport is important in creating a sense of identity in place and can attract new investment into renewal areas.

There are multiple examples of where the private sector and/or governments have contributed to well-planned infrastructure ahead of development and gentrification. The Brooklyn Tech Triangle is an excellent example of where infrastructure planning in conjunction with a strategic plan for urban renewal helped establish one of the world's largest technology innovation hubs. The Triangle is home to more than 1,350 companies and employs 17,300 people. It incorporates office headquarters in Downtown Brooklyn, the virtual design and advertising sectors in DUMBO and both factories and distribution yards at the Navy Yard. Urban place-based planning coincided with the development of an infrastructure implementation plan to ensure proper connectivity throughout the triangle¹⁰². The city invested heavily in an integrated public transport network which was dedicated solely to supporting economic growth and development in the triangle. It included:

- Increasing regular bus services and their connections to ferry stops
- Improvements to the public domain around stops and more regular ferry services
- New and improved bicycle and pedestrian connections as priority-ways throughout the precinct linking to bus and ferry stops¹⁰³

The Government of China are often cited for their infrastructure-led approach to development of their cities. In the Suzhou Industrial Precinct (SIP), billions of dollars were invested by the government in transport and utility services infrastructure to deliver sub-precincts and neighbourhood plots ahead of the development of buildings. This included key investments in passenger and freight rail lines that operated around the perimeter and through the central grids of the city, commencement of transit bus services on completion of all major road construction, utility services including water, power and sewer and local parks, as well as the man-made lake system¹⁰⁴.

Similarly, investment in infrastructure by US state and city authorities in precincts such as Tahoe-Reno, Nevada and the Park 8Ninety Estate in Missouri City, Texas, ahead of individual site development went to establish precinct floor plates to attract investment. In both examples, the establishment of industrial parks through zoning and planning incentives alone was not enough to draw major

¹⁰² <http://brooklyntechtriangle.com/about/>

¹⁰³ brooklyntechtriangle.com/assets/Brooklyn-Tech-Triangle-Strategic-Plan.pdf

¹⁰⁴ <http://www.bbc.com/travel/bespoke/specials/suzhou-city-of-classical-charms/modern-city.html>

investment from leading industries due to competition with other more established precincts across the country. Governments in both cases encouraged investment by constructing major roads and highways, new rail connections and utility service and digital infrastructure. The land was also subdivided in Tahoe-Reno at the expense of the city into large land holdings to encourage investment from Google and Tesla, which eventuated.

The Western Sydney Aerospace and Defence Industries precincts in the Aerotropolis are following the trends of examples like SIP and Tahoe-Reno. The Western Sydney City Deal is a strong example of commitments by multi-tiered government ventures to deliver key infrastructure to support and incentivise economic investment and growth ahead of development. The obvious examples of this include the commitments to the WSA and all of its facilities, the M12 motorway, the North-South Rail Link and other road and utility upgrades.

5.4 Planning and Development Incentives

Planning and development regulatory systems can be structured to incentivise economic growth, desired land use outcomes and protection industries and jobs.

The Bayswater Industrial precinct in Victoria is one of the state's largest existing mixed industrial business areas. It includes a variety of different types of warehousing, distribution and heavier activities including chemical production, waste recycling and processing plants. Both State and local governments have acknowledged the need for transition of industries in the area for long term employment security with the nature of industries advancing and changing in their needs for space. The over-exposure of the precinct to traditional manufacturing was also seeing large warehousing spaces falling vacant¹⁰⁵. To drive renewal and encourage investment by emerging industries, the local government have taken a lead on developing a series of planning incentive controls for new development and modifications in the precinct. Selected Industrial 1 zoned areas were first rezoned to a Commercial 2 zone to create a more vibrant activity core comprising a new retail centre and commercial office spaces as one catalyst for transition. Building heights and plot ratios are also proposed to be increased across the traditional industrial lands to provide both existing and new companies with opportunities to redevelop their sites¹⁰⁶.

The LOGIS eco-industrial park in Dandenong is the first of its kind in Victoria. It is a 74-hectare innovation park which is home to Kraft Foods, Cadbury, Ascent Pharmaceuticals, Mercury Marine and Terex Australia. The strategic vision for the park, driven by private sector developers in conjunction with Council, was to create an environmentally sustainable industrial innovation park which built from the learnings of European cities¹⁰⁷. Development regulations mandate sustainable operational outcomes and the use of green building methods including water reuse, the installation of solar PV

¹⁰⁵ Bayswater Industrial Precinct Review, AEC Group, October 2014

¹⁰⁶ <https://www.communitynews.com.au/eastern-reporter/news/city-of-bayswater-to-advertise-draft-local-planning-strategy/>

¹⁰⁷ <http://www.premiersdesignawards.com.au/entry/dandenong-logis-eco-industrial-business-park/>

and battery technologies for energy supply and mandates on lowering emissions. This approach has been well received by industry and has attracted investment into the park¹⁰⁸.

In the Central East Side precinct in Portland, Oregon, the growth of the Innovation Precinct and application of mixed-use zoning tools threatened existing manufacturers with being forced out due to development opportunities and spikes in leasing costs. At the same time, the County wanted to encourage transition of decaying industries on the city's edge to more innovative industries in advanced manufacturing and professional service jobs. A means of incentivised planning was introduced in an attempt to protect existing businesses and influence the retention of manufacturing and light industries in the precinct. Floor Area Ratios (FARs) and Floor Area Uplift (FAU) controls allocated a ground floor industrial bonus to incentivise the retention or provision of manufacturing floor space in new and redevelopment projects¹⁰⁹. In return, developers were permitted to build increased residential and mixed-use floors above. Additional amenity protection provisions were included into the city's Ordinance to give priority to the operations of existing manufacturing industries over new sensitive land uses. The approach has been successful in retaining industrial operations whilst also encouraging the establishment and growth of emerging creative industries¹¹⁰.

5.5 Development Authorities

Industrial precincts developed by a government or joint-venture led authority have proven successful in many cities. Development authorities or corporations are typically established to drive growth, change or set standards for innovation. Many governments intervene in the industrial and innovation sectors to drive change but also to build economic structures to suit the state or areas geo-political drivers and to give rise to competitive markets.

Governments in Asia have invested in the model of development corporations to enable new projects in industrial parks. The Singaporean and Chinese Governments in partnership established the SIP Development Corporation to build the infrastructure and provide all regulatory oversight and management of the SIP. Singapore's industrial hubs in the 1980s and 90s experienced significant growth around investments by the Ports Authority Development Corporation who developed dock-side freight and manufacturing spaces, which cemented the city as one of the world's most important trade ports.

In Europe, the experience has been similar. Government-led development authorities have driven visionary change in the development of eco-industrial parks and innovation precincts. Through promotion of innovation within emerging industrial sectors, countries such as Germany, The Netherlands and Denmark have become world leaders in the development of clean and efficient industries.

¹⁰⁸ https://www.savills.com.au/_news/article/109969/158808-0/3/2018/major-corporations-flock-to-dandenong-south

¹⁰⁹ <https://www.portlandoregon.gov/bps/article/79307>

¹¹⁰ Industrial decline in an industrial sanctuary Portland's Central Eastside Industrial District, Jones, Allison 2014

In Rotterdam, the concept planning and initial stages of development of the RDM Precinct were led by the City Ports Development Authority. The authority was responsible for all strategic land use planning, infrastructure and investment decisions under legislature that eventuated in the RDM Master Plan. The authority undertook the first stages of the precinct's development in the construction and establishment of incubator space and a communal trade hall which spurred immediate local and international investment from startups and research institutions. The authority was also responsible for the establishment and construction of the public educational institutions which were strategically positioned with good access to the incubator and research facilities¹¹¹. Today the authority still oversees the management and planning development approvals for all land use activity and construction operations in the precinct.

In Western Australia, the Corporate Body established under the Technology and Industry Development Act, 1983 actively continues to manage and oversee development and investment decisions affecting the Bentley Technology Park. Their powers are extensive and function in accordance with detailed statutory provisions which see them having the ultimate oversight over planning approvals in the park. There is an argument to suggest that the overly regulated body has actually stagnated growth of industry in the park, however, it has been successful in maintaining the original land use vision and upholding the highest standards of specialised technical research firms.

The Western City and Aerotropolis Authority established under the City Deals and Western City and Aerotropolis Authority Bill 2018 is a similar example. It is a body instituted to oversee development and regulation in the Aerotropolis. Its powers extend to decision making around key investments, infrastructure, strategic planning and other economic priorities. City-shaping projects such as the Bentley Technology Park and WSA demand strong leadership where important investment, planning and infrastructure decisions can be directed by a corporate body governed under legislative powers.

5.6 Joint Venture Partnerships

Joint venture partnerships between government and the private sector represent the strongest, most comprehensive mechanism to drive economic growth and job retention. Governance structures which reflect the interests of both the public and private sectors in collaboration can deliver real change and stability and multiple successful examples of employment areas have eventuated from such partnerships.

The Randwick Health and Education Precinct has been identified by the Commonwealth and NSW State Governments as a centre of strategic importance in education, research and innovation. It is an active precinct in Sydney's south orientated around 4 major hospitals, 9 medical research institutions, internationally recognised research centres and more than 100 student startups¹¹². An intriguing joint-

¹¹¹ The impact of urban planning and governance reform on the historic built environment and intangible cultural heritage, Azadeh, AK, Nadin, V, June 2017

¹¹² <https://sciencemeetsbusiness.com.au/tag/china-torch-program/>

venture partnership between the Commonwealth and State Governments, Chinese Industry and UNSW was formed to birth the Chinese Torch Innovation Network. This \$3 billion project will create the Torch Innovation Precinct at UNSW which will see planned developments in R&D delivered by stakeholders over the next decade¹¹³. The precinct will comprise advanced R&D and prototype manufacturing as well as a new UNSW Solar Industrial Research Facility. By 2022, the base will be home to between 5-10 major Chinese innovation companies and 100 Chinese and Australian startup technology companies. The project is expected to inject hundreds of millions of dollars into the local economy and provide for thousands of new knowledge-based jobs with additional space for student startups to grow¹¹⁴.

The Oslo Cancer Cluster was initiated in 2006 as a cluster member organisation to accelerate ongoing collaborations and knowledge-sharing of oncology research, treatment and pharmaceutical production. It is an oncology research and industry cluster that is a national non-profit member organisation with 90 members including national and international research institutions, technology companies, financial institutions, university hospitals and other organisations¹¹⁵. This makes it one of the largest R&D joint venture clusters in the world which contributes the most highly specialised oncology R&D centre. The Oslo Cancer Cluster Innovation Park and Incubator opened at Montebello in 2015, adjoining the Radium Hospital and the Institute of Cancer Research. It is continually cited by the Norwegian Government as vital to preserving and maintaining jobs in the fields of medical research and specialised health care¹¹⁶.

The MaRs Innovation Precinct is an example of a successful joint venture funding and governance model between the City of Ontario and private sector industries, however, ongoing funding commitments by government over recent years have drawn controversy and concern from the general public¹¹⁷. The initial concept for MaRs was to utilise existing and improved public research, education and health institutions to anchor the development and organic growth of innovation industries. Ongoing financial commitments from the city as well as private sector investors has seen the continued expansion and growth of the precinct which now supplies over 7,000 jobs and has resulted in over \$1 billion in capital investments¹¹⁸. The lessons from the MaRs governance model is the need for strong transparency and stringent regulation around development control and monitoring.

¹¹³ <https://www.innovationaus.com/2017/07/UNSW-carries-a-new-China-torch/>

¹¹⁴ https://www.theaustralian.com.au/subscribe/news/1/?sourceCode=TAWEB_WRE170_a_GGL&dest=https%3A%2F%2Fwww.theaustralian.com.au%2Fnation%2Finquirer%2Ftorch-precinct-lights-the-way-for-unsw-innovators%2Fnews-story%2Fdb120b7fe66e23895d0e01598a99fe70&memtype=anonymous&mode=premium

¹¹⁵ <http://oslocancercluster.no>

¹¹⁶ <https://nordiclifescience.org/oslo-cancer-cluster-gets-new-innovation-park/>

¹¹⁷ <https://betakit.com/mars-may-see-layoffs-as-province-continues-with-tech-funding-cutbacks/>

¹¹⁸ <http://www.digitaljournal.com/tech-and-science/technology/mars-discovery-district-proof-toronto-s-tech-sector-is-growing/article/526756>

5.7 Tax Breaks and Rebates

Financial incentives for growth and investment can also be regulated successfully by authorities to drive economic outcomes. In North America, the tax and regulatory systems are often adjusted to accommodate free market economics at macro and micro scales. In Europe, a trending focus on environmental outcomes has led to rebate regulations and financial incentives to reduce emissions.

In Australia, new development in employment areas has not been often been financially incentivised. Mechanisms such as S7.11 Contributions and SIC credits are often applied only for precinct-wide developments and are not available to stand alone projects. Furthermore, whilst tax concessions and credits are available to businesses, particularly small-businesses and sole traders, they are not readily promoted to encourage reinvestment into built form assets or new development projects.

The Tahoe-Reno Industrial Park is an excellent example of how financial de-regulation and tax abatement incentives encouraged significant return on investments into the region by some of the world's leading companies. In establishing the regulatory framework around the development of the park the State of Nevada imposed restrictions on development fees and extractions that the County could impose on developers. This saw the removal of a range of standard taxes on companies investing in the park including no corporate income tax, personal income tax, inventory tax, unitary tax, estate and/or gift taxes, franchise tax, inheritance tax and no special intangible tax¹¹⁹.

New market tax credits in the US have been utilised to incentivise revitalisation of low-income and disadvantaged communities to provide lines of credit against federal income taxes for qualified investments in community infrastructure. These tax incentives were taken up by developers and industries to renovate and repurpose buildings in the Cortex Technology District in St Louis which was founded in 2002 as an innovation hub of bioscience and technology research¹²⁰.

In Europe market-based instruments such as environmental taxes, tradable permit systems and targeted subsidies have been implemented to deliver sustainable building and operational outcomes. These have been successfully implemented throughout German and Danish eco-industrial parks where financial incentives are targeted at continual improvements in sustainable operations¹²¹. This too applies to the heaviest industries in areas like Zeitz that have transitioned to sustainable energy production from intensive-based manufacturing.

¹¹⁹ Deep in the dessert, an experiment in economic development, Maciag, M, November 2017

¹²⁰ <https://www.stlouis-mo.gov/government/.../news/2018-nmtc-sldc-awarded-35m.cfm>

¹²¹ An international framework for Eco-Industrial Parks, UN Industrial Development Organisation, December 2017

5.8 Summary

- Value capture is a successful tool used to reinvest funds raised from new development projects back into infrastructure upgrades. Leveraging on existing public assets to support the growth of business and to draw investments can be successful in reducing costs, particularly for innovative industries and startups who require greater financial support in the establishment phases.
- The targeted decentralisation, relocation and clustering of public research and knowledge-based institutions can provide strong anchors for investment and growth of innovation precincts. These are centres of activity that generate employment, create vibrancy within an urban setting and release economic value streams which are valuable, particularly for precincts undergoing or in need of renewal.
- Significant infrastructure investment by authorities is critical to driving investment from the private sector. Infrastructure projects, such as the WSA and North-South Rail are vital to good placemaking, establishing important connected corridors of economic strength and drawing in anchor industries.
- Infrastructure projects can be pursued through a multitude of financial streams and governance structures including Development Authorities or Corporations, Government / Public-Sector and Private Sector Partnerships and multi joint ventures. Such arrangements can also reposition or develop impetus projects to incentivise investment and job growth. These have proven to be successful models both internationally and in Australia.
- The planning regulatory systems and land use incentives can be successfully implemented to drive growth, encourage desirable built form outcomes and place making, and also to protect established industries. Examples include bonus building height and floor space provisions in return for commitments to employment floor areas; zoning to encourage particular land use outcomes and leveraging funds raised from new incentive-based developments to provide public domain improvements.
- Financial incentives including tax abatements and development levy credits can also be used to protect and retain jobs.
- Other means of generating continued economic resilience and job retention include:
 - Ongoing investments into best-practice research, opinion polling and surveying of workers and industry leaders;
 - Targeted marketing and promotion by government and the private sector of investment and focus in new or existing precincts;
 - Ongoing investment into understanding key drivers and changing demands of industry; and
 - Focusing on the creation of great places with a developed understanding of the end users firmly in mind.

6. Planning Review

6.1 Intent and Purpose

The previous employment land studies prepared by Knight Frank and SGS identified concerns around the adequacy of the three industrial zones that apply in the Liverpool LGA. These reports and the analysis provided in Chapter 2 of this Study broadly characterised the industrial precincts into two categories: Industrial Parks and Specialised Urban Services Precincts. The investigations have then affirmed that certain precincts are well positioned to be transitioned under another zoning classification. This opinion has been shared in the work of the Greater Sydney Commission in the Liverpool Collaboration Area – *Place Study* which establishes a Vision of three very distinct land use outcomes for the existing industrial zoned precincts:

- The Scrivener/Priddle Street Precinct being transformed for Innovation / Research / Health / Advanced Manufacturing (i.e. a B7 zoning)
- The Orange Grove and Sapho Road precincts transformed to Business Development (i.e. a B5 or B6 zoning)
- The Georges River South (North Moorebank) precinct to be retained as Industrial

In this Chapter a review of the current industrial zoning objectives and provisions has been undertaken to determine:

- What improvements can be made to better align existing zoning with the changing demands and drivers of industry and employment in the context of Liverpool;
- If the objectives listed in each of the three zones are appropriate and whether or not these should be revised; and
- How land use terms can be best positioned within each zone to best reflect the objectives and characterisation of employment types.

Development standards for minimum lot size, maximum building height and floor space ratios under Clauses 4.1, 4.3 and 4.4 of LLEP 2008 will be reviewed as they currently apply to the precincts. This review will identify whether or not the current standards are appropriate and require change to reflect the changing demands and drivers of industry. The final component of this Chapter will consider the B7 Technology Park zoning in reviewing its current objectives and land use provisions to determine its relevance to the precincts.

6.2 Review of Liverpool Industrial Zones

The three industrial land use zones under LLEP 2008 are the IN1 General Industrial, IN2 Light Industrial and IN3 Heavy Industrial zones. Each of the zones comprise a broad mixture of permitted uses to enable industrial, business and retail activities. Residential accommodation is prohibited in all of the industrial zones.

The three zones are differentiated mainly by the terms 'light', 'general' and 'heavy' which in themselves should deliver very different land use outcomes. However, in Liverpool's industrial precincts this is often not the case. The objectives in connection with the permissible land use activities across the three zones have resulted in broad outcomes with a mixture of industrial and other uses evident across the precincts.

The following sections review the current objectives and permitted land uses in each of the zones.

6.3 Review of Zone Objectives

The objectives of the three zones are reproduced below with a short analysis on each provided:

IN1 General Industrial

- *To provide a wide range of industrial and warehouse land uses.*
- *To encourage employment opportunities.*
- *To minimise any adverse effect of industry on other land uses.*
- *To support and protect industrial land for industrial uses.*
- *To particularly encourage research and development industries by prohibiting land uses that are typically unsightly or unpleasant.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area.*

Analysis

The IN1 General Industrial zone objectives are very broad and non-specific, allowing for a range of industrial and warehouse uses to encourage employment opportunities. The generality of the land use objectives provides for a genuine mix of activities which in turn restricts larger and more intrusive operations such as waste management and processing, extractive industries and offensive and hazardous industries.

IN2 Light Industrial

- *To provide a wide range of light industrial, warehouse and related land uses.*
- *To encourage employment opportunities and to support the viability of centres.*
- *To minimise any adverse effect of industry on other land uses.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area.*
- *To support and protect industrial land for industrial uses.*
- *To allow other land uses that are compatible with industry and that can buffer heavy industrial zones while not detracting from centres of activity.*

Analysis

The IN2 Light Industrial zone objectives provide for urban service-type industries which are smaller in their land take and operational scale, less intrusive, positioned closer to and on the edge of centres and provide for a mix of land uses. In this sense, the objectives of the IN2 zone are very clear in terms of the locational parameters, however the types of land use operations sought in this zone could be improved. Warehousing for example can require large-tracts of land and be reliant on B-double trucks which may not be suitable for urban services precincts close to centres and more sensitive areas (i.e. residential neighbourhoods). Therefore, the scale and types of warehousing needs to be more clearly typified to provide better guidance to planners.

IN3 Heavy Industrial

- *To provide suitable areas for those industries that need to be separated from other land uses.*
- *To encourage employment opportunities.*
- *To minimise any adverse effect of heavy industry on other land uses.*
- *To support and protect industrial land for industrial uses.*
- *To preserve opportunities for a wide range of industries and similar land uses by prohibiting land uses that detract from or undermine such opportunities.*

Analysis

The objectives of the IN3 Heavy Industrial zone are very similar to the IN1 zone. They encourage a wide range of industries which goes against the success of isolated larger users which require separation from other activities due to the more intrusive nature of their operations and larger land take requirements. The objectives do call on the need to preserve lands which require separation from other land uses, however the types of industrial uses are again not clearly defined. The generality of the objectives translates to flexibility in the application of land use types which can impact on the success of heavy industries.

Summary

The objectives of the three industrial zones are currently too generalised. The general and heavy industrial zone objectives are very similar with the only key difference being that the IN3 objectives note the need for separation to provide isolated larger sites for more intrusive operations.

All zones call for a mix of different industrial land use types and 'other' activities. This can be considered appropriate for urban services / light industrial precincts, but not always conducive for other industrial precincts which require separation from more sensitive uses.

In Liverpool, the range of industrial uses evident in the IN1 and IN3 zones in precincts such as Yarrunga/Prestons, Moorebank, Casula and Chipping Norton reflects the generalised zone objectives. As an example, the IN3 zone in Chipping Norton comprises predominantly urban service type industries which could be considered suitable in an IN1 or IN2 zone based on the scale and less-intrusive nature of these existing operations.

The IN2 Light Industrial zone objectives position such precincts close to centres, such as the Liverpool City Centre, and are often utilised to buffer heavier industrial activities. The nature of urban services industries under the zone is not clear and is confused by the reference to ‘warehouse’ uses which can vary significantly in scale.

The objectives of each zone should be revisited to:

- Better define the type, scale and nature of industrial and other activities considered suitable in each of the zones;
- Clarify the desired intent of each zone (i.e. the intent of the IN2 Light Industrial zone to provide for small-scale urban service industries that are compatible with surrounding and adjoining land uses);
- Avoid generality by including more specific desired outcomes; and
- Avoid the application of objectives which can be conflicting.

Recommended objectives for each of the three zones is provided later in this Chapter.

6.4 Review of Land Use Provisions

Table 2 identifies the land use terms permitted with development consent in each of the three industrial zones:

Table 2 Permissible Land Uses across the Industrial Zones

	IN1 General Industrial	IN2 Light Industrial	IN3 Heavy Industrial
Animal boarding or training establishments		✓	
Boat building and repair facilities		✓	✓
Boat Sheds	✓	✓	✓
Cemeteries	✓	✓	✓
Centre-based child care facilities	✓	✓	
Community facilities	✓	✓	
Crematoria	✓		✓
Depots	✓	✓	✓
Educational establishments		✓	
Environmental facilities	✓	✓	✓

	IN1 General Industrial	IN2 Light Industrial	IN3 Heavy Industrial
Freight transport facilities	✓		✓
Garden Centres	✓	✓	
General Industries	✓		✓
Hardware and Building Supplies	✓	✓	
Hazardous storage establishments			✓
Heavy industrial storage establishments			✓
Heavy Industries			✓
Heliports	✓	✓	
Horticulture			✓
Hotel or Motel Accommodation	✓	✓	
Industrial training facilities	✓	✓	
Industrial retail outlets	✓		
Information and education facilities	✓	✓	
Kiosks	✓	✓	✓
Light Industries	✓	✓	✓
Liquid fuel depots	✓	✓	
Mortuaries	✓		✓
Neighbourhood shops	✓	✓	
Offensive storage establishments			✓
Oyster aquaculture	✓	✓	✓
Passenger transport facilities	✓	✓	✓
Places of public worship	✓	✓	
Public administration buildings	✓		
Pubs		✓	
Recreation areas	✓	✓	✓
Recreation facilities (major)		✓	

	IN1 General Industrial	IN2 Light Industrial	IN3 Heavy Industrial
Recreation facilities (indoor)	✓	✓	
Recreation facilities (outdoor)	✓	✓	✓
Registered Clubs		✓	
Resource recovery facilities			✓
Respite day care centres	✓	✓	
Restaurants or cafes	✓	✓	
Rural industries			✓
Service stations		✓	
Sex services premises	✓	✓	✓
Storage premises	✓	✓	✓
Take away food and drink premises	✓	✓	
Tank-based aquaculture	✓	✓	✓
Timber yards		✓	
Transport depots	✓	✓	✓
Truck depots		✓	✓
Vehicle body repair workshops	✓	✓	✓
Vehicle repair stations	✓	✓	✓
Vehicle sales or hire premises		✓	
Veterinary Hospitals		✓	
Warehouse or distribution centres	✓	✓	✓
Water recreation structures		✓	

Table 2 above demonstrates that a number of industrial and non-industrial land uses are permitted across multiple industrial zones under LLEP 2008. In fact, 33% (19 out of 57) are permissible with consent in all three of the zones, these include: *boat sheds; cemeteries; depots; environmental facilities; kiosks; light industries; oyster aquaculture; passenger transport facilities; recreation areas; recreation facilities (outdoor); sex services premises; storage premises; tank-based aquaculture; transport depots; vehicle body repair workshops; vehicle repair stations; and warehouse or distribution centres.* 37% (21 out of 57) of other land uses listed in Table 2 are permissible with consent in at least

two of the industrial zones, with at least one of those zones being IN1 General Industrial, owing to the general, mixed use character of this zoning. Only 30% (17 out of 57) are unique to a single zoning.

Given the broad objectives and breadth of similar land uses permitted across all three zones the resultant industrial precincts in Liverpool lack defined character of uses. The research presents that successful approaches to land use zoning for industrial parks, specialised urban services precincts and innovation precincts have been built on defined Visions and a segmentation of land uses of different scales, operations and levels of impact. The industrial zoned precincts in Liverpool comprise a range of different industries which is representative of most historical examples of industrial precincts across Sydney. The reason for this is two-fold:

1. Industrial activities and the needs for space have changed over time, however, the release of new industrial lands has not kept pace with changing demand and so competing industries of varying scale and operations tend to occupy available precincts wherever they can; and
2. The generalised objectives and broad range of permissible industrial land uses across different industrial zones results in a mixed-use outcome.

The organic mixing of certain industrial activities of varying scales can result in positive outcomes according to the research. Particularly in specialised inner-city areas comprising of light industrial / urban services and emerging innovation precincts, smaller-scale operators can leverage on a few larger anchor tenants. As an example, a Bunnings Warehouse or Home Hardware would typically occupy a larger site within an urban services precinct where specialist construction and trade operators seek out sites nearby within the precinct.

The weight of the research however does indicate that larger operations encompassing wholesaling, warehousing, distribution, logistics and aerospace, more intensive forms of manufacturing, processing, recycling and the like require separation from smaller operators and demand larger site areas. The success of such operators is dependent on separation, access to transport corridors and larger sites. In Liverpool, such sites are currently scarce because of the encroaching of smaller occupiers which dilutes the character and disrupts the function of industrial parks. Industrial parks do require some smaller and ancillary land uses including essential services like food and drink premises, retail, community services and office space, but these need to be adequately controlled.

Interestingly too, the IN3 zone appears to be more prevalent in the Liverpool LGA than most other LGAs in Western Sydney. The IN3 zone is typically reserved for the highest-impacting land uses such as offensive and hazardous industries which require expansive separation distances and good amenity controls and buffers to adjoining lands. In Liverpool, the IN3 zone is used widely and permits *light industries* which again go towards generalising the zone, taking away from its intended character to serve heavy industries.

6.5 Industrial Land Use Terms

The research presented in this Study discusses different types of industrial land use activities that are broadly captured under the group terms of *Industry, General Industry, Light Industry, Heavy Industry, Commercial Premises* and *Warehouse or distribution centres*. One of the problems with the current approach to land use terms under the Standard Instrument LEP is that the inclusion of Group Terms for industrial land uses results in the broader application of outcomes in the zones. This approach then relies heavily on non-statutory DCP provisions to help define the character of certain industrial areas, which they often do quite comprehensively. Nonetheless, the approach is evident in Liverpool's precincts where a mismatch of mixed industrial activities fight to occupy the available lands, often resulting in operational conflicts.

Whilst this report has considered the difficulties in amending land use terms under the Standard Instrument LEP, it is considered that more specific land use definitions would provide greater clarity to Council, investors, industries and the general public around the types of operations considered desirable or otherwise in each zone. Examples of industrial land use operations and activities discussed earlier in this Study, but not separately defined under a specific land use definition include:

- Manufacturing
- Mineral Processing
- Logistics and Transport
- Aerospace
- Data Centre
- Professional and Knowledge Industries
- Private Research Institutions
- Medical Research Industries
- Postal processing and distribution
- Scientific Research
- Robotics and Mechanisation Development
- Food Science
- Sustainable Energy Producers and Distributors

The inclusion of additional specific and targeted industrial land use activities as opposed to the widescale application of general Group Terms would help to better define precinct outcomes in order to better plan and manage for areas. This in turn improves opportunities to plan properly for streetscapes that accommodate certain vehicle types, deliver the right capacities for infrastructure and contribute to better place making which connects similar and compatible land use activities.

6.6 Aligning the Zones

Based on the types of industrial precincts identified in this Study, there is a need to reconcile the current zoning of Liverpool's precincts. A number of precincts positioned in close proximity to the Liverpool City Centre have been earmarked as potential innovation precincts or future business

development zones. These precincts may be more suited to a Business zoning which will be discussed later in this Chapter.

The following discussion considers aligning the current industrial zones with the types of industrial precincts identified in the research.

6.7 Specialised or Other Urban Services Precinct = IN2 Light Industrial Zone

The IN2 Light Industrial Zone is representative of an Urban Services Precinct. These provide smaller-scale industrial and essential services close to centres and residential neighbourhoods where services can be quickly distributed and dispatched to suit the needs of the consumer/customer base. They require smaller spaces, largely for storage of equipment and low-impact operations.

Such precincts do allow for a broader mix of land use activities. This is because the services offered do not necessarily conflict with other commensurate land uses such as recreation facilities, dance studios, gymnasiums and shops which also require less land-take and separation from sensitive uses.

Larger industries should be discouraged from occupying in these zones unless there is a strong nexus between the operations. Whilst the existence of some larger operators within these areas is acknowledged, it is expected that over time that larger, more intensive industries will relocate with expansion and new purpose-released lands to the west in the Aerotropolis. In areas like Chipping Norton, Scrivener and Priddle Street, these existing larger operators include paper production and recycling plants, logistics, waste recovery and recycling centres, all of which are becoming less and less compatible with their surrounding contexts.

Desirable activities in the IN2 Light Industrial Zone include:

- Light Industries (including specialised manufacturing and creative industries)
- Small-scale depots
- Storage and small-scale warehousing facilities
- Construction and Trade Services including showrooms, packaging and small-scale distribution operations
- Industrial training facilities
- Industrial retail outlets
- Vehicle body repair and workshops where environmental impacts can be suitably managed
- Sales and hire premises
- Service stations
- Garden Centres
- Hardware and Building Supplies
- Plant Nurseries
- Specialised food manufacture/sales
- Breweries/Cellar doors
- Education and training
- Health Services

6.8 Industrial Park or Estate = IN1 General Industrial Zone

The issue with the current IN1 zone as it applies to Liverpool is its generalised objectives and broad range of permissible land uses which result in a lack of definition and a confused economic role. This is best reflected in the precincts of Moorebank, Hoxton Park, parts of Yarrunga/Prestons and even in IN3 zoned precincts including Chipping Norton and Casula. These precincts comprise a mix of smaller, mid-tier and larger operations with varying lot sizes and street-types and differing geographic contexts. They are all existing precincts constrained by surrounding sensitive land use zones; predominantly low-scale residential and mixed business zones.

The research indicates that successful industrial precincts can comprise a mix of operators of differing scales and levels of impact. However, these need to be properly separated through the application of development controls around land and building size, separation distances and other amenity treatments. In Moorebank, this physical separation of operators has been market-led with the development of the orbital and staged release of the precinct. In the north, given the interface with low density residential properties, industrial lands have been occupied by less-intrusive smaller urban services whilst in the south large-scale distribution, logistics and transport industries have occupied larger properties in close proximity to the terminals.

The IN1 zone should therefore be applied to preserve mid-sized operators and large, low-impact operations including warehousing, processing and manufacturing. Distribution, logistics, transport and postal operators should also be permitted in the precincts where they have good and direct access onto motorways or freight rail such as in Yarrunga/Prestons, Hoxton Park and Moorebank South.

More intrusive operators such as waste recycling, extractive industries, chemical production and refining and other hazardous and offensive industries should be encouraged to occupy within the IN3 zone. The number of such operators in Liverpool is diminishing, however, where they exist in place they should be permitted to remain either in the IN1 or IN3 zone subject to revised development controls for expanded activities or where redevelopment is proposed.

IN1 zones should in many instances replace the IN3 zoned lands in Liverpool's precincts. In conjunction, the IN3 zone requires further refinement to provide only for more intrusive hazardous and offensive industries as opposed to general and light industries. Consideration should also be given to buffering IN1 zones with IN2 zones as is the case in a number of precincts already. Land use zoning buffers allows for an effective transition of activities to more sensitive land uses surrounding industrial precincts.

Desirable activities in the IN1 General Industrial Zone include:

- Some light industries
- Depots, transport depots and passenger transport facilities
- Manufacturing and processing
- Distribution centres

- Freight and Logistics
- Warehousing
- Wholesale trade supplies
- Storage (both small and heavy industrial / large-scale)
- Service stations and Highway centres
- Limited retail, recreation and commercial office space where it does not detract from the primary industrial activity
- Repairs and maintenance centres
- Vehicle repair and service premises
- Vehicle and scrap storage yards
- Mid-tier and larger construction services
- Technology and Research Centres
- Some waste processing and recycling facilities
- Aerospace Industries
- Pharmaceutical production
- Chemical production and laboratories
- Mortuaries and crematoria

6.9 Industrial Park = IN3 Heavy Industrial Zone

The broad application of the IN3 zone in Liverpool is not reflected in the character of its land use activities. In most other LGAs across NSW the IN3 zone is preserved for areas of large-scale heavy industries which are more intensive polluters and require greater separation and isolation. The IN3 zones in Chipping Norton, Yarrunga/Prestons and Casula are viewed as inapplicable and should be replaced in the main by the IN1 zone.

Heavy industrial operations around the world are transitioning with improvements in technology and with renewed focusses on sustainable and safe operations. This being said, there is, and will likely continue to be demand for more offensive and hazardous industries including smelters, liquid gas and chemical refineries, extractive industries and waste processing plants. These uses emit noise, dust, waste and pollution regardless of the treatments and controls applied in the operational processes. They also have a higher risk profile in the event that the control processes fail and therefore require greater separation from other activities, and even complete isolation depending on the intensity of the use.

Whilst a handful of such heavy industrial are located within the existing IN3 zoned lands it is unlikely that any of the precincts are truly accommodative of such uses and therefore the zone should be considered for removal from the precincts reviewed in this report. IN3 zonings may be suitable to newly released tracts of land around the Aerotropolis where they are properly planned for and well separated from surrounding uses, particularly residential properties. Council may, in the short term

look to preserve pockets of IN3 land in the southern parts of the Yarrunga/Prestons precinct and within the north-eastern corner of the Chipping Norton Precinct.

Additionally, rural industries such as horticulture should be removed from the IN3 zone. Whilst such large-scale operations can be commensurate to heavy industrial activities they are better placed within an RU1 or RU2 zone.

Desirable activities in the IN3 Heavy Industrial Zone include:

- Offensive and hazardous industries
- Offensive storage establishments
- Hazardous storage establishments
- Extractive industries
- Chemical processing
- Liquid Gas and Petroleum Refineries
- Energy production activities
- Waste recycling and processing

6.10 Avoiding Duplication

Table 3 below reconfigures existing permissible land uses to reflect the desirable activities in each of the industrial zones as a means of resolving unnecessary duplication and better aligning land uses to each of the zones as discussed.

Notable recommended changes to permissible land uses include:

- Boat building and repair facilities removed from IN3 zone to avoid duplication.
- Boat sheds removed from IN3 zone to avoid duplication.
- Cemeteries removed from all industrial zoned – recommend SP1 or SP2 zoning for any existing cemeteries. Cemeteries are considered an incompatible use with industrial lands.
- Place a restriction on the size of centre-based child care facilities in the IN1 and IN2 zones.
- Place a restriction on the size of depots based on the type of industrial zone and remove from the IN3 zone.
- Freight transport facilities removed from the IN3 zone to avoid duplication.
- Garden centres removed from the IN1 zone to avoid duplication.
- General industries removed from the IN3 zone to avoid duplication.
- Horticulture removed from the IN3 zone. Recommend this land use type be permissible only in the rural zones.
- Industrial retail outlets made permissible in the IN2 zone in addition to the IN1 zone to encourage on-site sales from creative and light industries to the public.
- Information and education facilities removed from the IN1 zone to promote these specific uses in the IN2 zone only.
- Light industries removed from IN1 and IN3 zones to avoid duplication.

- Liquid fuel depots removed from IN2 zone and made permissible in the IN3 zone in addition to IN1.
- Oyster aquaculture removed from IN2 and IN3 zone to avoid duplication.
- Passenger transport facilities removed from IN3 as inappropriate use in the zone.
- Recreation facilities (major) removed from IN2 zone. Recommend these types of uses be appropriately zoned as RE1, RE2 or SP1 / SP2.
- Recreation facilities (indoor) removed from IN1 zone but retained in IN2 zone.
- Recreation facilities (outdoor) removed from IN3 to avoid duplication.
- Respite day care centres removed from IN1 and IN2 zones. Considered more appropriate in residential zones.
- Rural industries removed from IN3 zone.
- Service stations made permissible in IN1 zone in addition to IN2 zone.
- Sex service premises removed from IN3 zone to avoid duplication.
- Storage premises removed from IN3 zone – offensive storage preserved in IN3 zone.
- Tank-based aquaculture removed from IN2 and IN3 zones, retained in IN1.
- Transport depots removed from IN3 zone.
- Place a restriction on the size of transport depot operations dependent on zone.
- Truck depots removed from IN2 and IN3 zones and made permissible in IN1.
- Vehicle body repair workshops and vehicle repair stations removed from IN3 zone.
- Utilise size restrictions under Cl. 5.4 based on zone for warehouse and distribution centres to control scale of operations.

Table 3 Recommended reconfiguration of land uses under the industrial zones

	IN1 General Industrial	IN2 Light Industrial	IN3 Heavy Industrial
Animal boarding or training establishments		✓	
Boat building and repair facilities		✓	
Boat Sheds	✓	✓	
Cemeteries			
Centre-based child care facilities (recommend size restrictions under Cl. 5.4)	✓	✓	
Community facilities	✓	✓	
Crematoria	✓		✓
Depots (recommend size restrictions under Cl. 5.4 to control size in the IN2 zone)	✓	✓	
Educational establishments		✓	

	IN1 General Industrial	IN2 Light Industrial	IN3 Heavy Industrial
Environmental facilities	✓	✓	✓
Freight transport facilities	✓		
Garden Centres		✓	
General Industries	✓		
Hardware and Building Supplies	✓	✓	
Hazardous storage establishments			✓
Heavy industrial storage establishments			✓
Heavy Industries			✓
Heliports	✓	✓	
Horticulture			
Hotel or Motel Accommodation	✓	✓	
Industrial training facilities	✓	✓	
Industrial retail outlets	✓	✓	
Information and education facilities		✓	
Kiosks	✓	✓	✓
Light Industries		✓	
Liquid fuel depots	✓		✓
Mortuaries	✓		✓
Neighbourhood shops	✓	✓	
Offensive storage establishments			✓
Oyster aquaculture	✓		
Passenger transport facilities	✓	✓	
Places of public worship	✓	✓	
Public administration buildings	✓		
Pubs		✓	
Recreation areas	✓	✓	✓

	IN1 General Industrial	IN2 Light Industrial	IN3 Heavy Industrial
Recreation facilities (major)			
Recreation facilities (indoor)		✓	
Recreation facilities (outdoor)	✓	✓	
Registered Clubs		✓	
Resource recovery facilities			✓
Respite day care centres			
Restaurants or cafes	✓	✓	
Rural industries			
Service stations	✓	✓	
Sex services premises	✓	✓	
Storage premises	✓	✓	
Take away food and drink premises	✓	✓	
Tank-based aquaculture	✓		
Timber yards		✓	
Transport depots (recommend size restrictions under Cl. 5.4 to control size in the IN2 zone)	✓	✓	
Truck depots	✓		
Vehicle body repair workshops	✓	✓	
Vehicle repair stations	✓	✓	
Vehicle sales or hire premises		✓	
Veterinary Hospitals		✓	
Warehouse or distribution centres (recommend size restrictions under Cl. 5.4 to control size in the IN2 zone)	✓	✓	✓
Water recreation structures		✓	

To ensure the scale of certain uses are suitably controlled to reflect the desirable characteristics of each zone, it is recommended that the following size restrictions be incorporated into Clause 5.4 of LLEP 2008:

<i>Centre-based child care centres:</i>	<i>If development for the purpose of centre-based child care centres is permitted under this Plan, the centre is not to exceed a total gross floor area of 100m² in the IN2 Light Industrial Zone or 200m² in the IN1 General Industrial zone.</i>
<i>Depots:</i>	<i>If development for the purpose of depots is permitted under this Plan, they are not to exceed a total site area of 2,000m² in the IN2 Light Industrial Zone</i>
<i>Transport Depots:</i>	<i>If development for the purpose of transport depots is permitted under this Plan, they are not to exceed a total site area of 2,000m² in the IN2 Light Industrial Zone</i>
<i>Warehouse or distribution centres:</i>	<i>If development for the purpose of warehouse or distribution centres is permitted under this Plan, they are not to exceed a total gross floor area of 2,000m² per development in the IN2 Light Industrial Zone</i>

6.11 Revised Industrial Zones

The following recommended changes to the industrial land use zones under LLEP 2008 have been formulated based on the discussions in this Chapter and the research findings.

IN2 Light Industrial

The IN2 Light Industrial Zone should be revised as follows:

1. Objectives

- To provide land for urban and essential services, light industries and creative industries as opposed to general industries and heavy industry
- To encourage employment opportunities and to support the viability of centres
- To support collaboration in business and development
- To preserve lands for employment nearby to consumers and customers
- To permit industrial and non-industrial activities that minimise impacts to other lands
- To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area.
- To promote high quality built forms, landscaping and contribute to excellent place-based outcomes.
- To support, protect and buffer industrial land in the IN1 zone

2. Permitted Without Consent

Nil

3. Permitted With Consent

Animal boarding or training establishments; Boat building and repair facilities; Boat sheds; Building identification signs; Business identification signs; Car parks; Centre-based child care facilities; Community facilities; Depots; Educational establishments; Emergency services facilities; Entertainment facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Garden centres; Hardware and building supplies; Helipads; Heliports; Hotel or motel accommodation; Industrial retail outlets; Industrial training facilities; Information and education facilities; Kiosks; Light industries; Neighbourhood shops; Passenger transport facilities; Places of public worship; Pubs; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Registered clubs; Restaurants or cafes; Roads; Service stations; Sex services premises; Storage premises; Take away food and drink premises; Timber yards; Transport depots; Vehicle body repair workshops; Vehicle repair stations; Vehicle sales or hire premises; Veterinary hospitals; Warehouse or distribution centres; Water recreation structures

4. Prohibited

Pond-based aquaculture and any development not specified in item 2 or 3.

IN1 General Industrial

The IN1 General Industrial Zone should be revised as follows:

1. Objectives

- To provide a wide range of industrial land uses.
- To encourage employment opportunities.
- To minimise any adverse effect of industry on other land uses.
- To support and protect industrial land for industrial uses including warehouse, distribution centres, processing and manufacturing and research and development industries.
- To promote high quality built forms, landscaping and contribute to excellent place-based outcomes.
- To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area, but only where they do not detract from predominant industrial uses.

2. Permitted Without Consent

Nil

3. Permitted With Consent

Boat sheds; Building identification signs; Business identification signs; Car parks; Centre-based child care facilities; Community facilities; Crematoria; Depots; Environmental facilities; Environmental protection works; Flood mitigation works; Freight transport facilities; General industries; Hardware

and building supplies; Helipads; Heliports; Hotel or motel accommodation; Industrial training facilities; Industrial retail outlets; Kiosks; Liquid fuel depots; Mortuaries; Neighbourhood shops; Oyster aquaculture; Passenger transport facilities; Places of public worship; Public administration buildings; Recreation areas; Recreation facilities (outdoor); Restaurants or cafes; Roads; Sex services premises; Storage premises; Take away food and drink premises; Tank-based aquaculture; Transport depots; Vehicle body repair workshops; Vehicle repair stations; Warehouse or distribution centres

4. Prohibited

Pond-based aquaculture and any development not specified in item 2 or 3

IN3 Heavy Industrial

The IN3 Heavy Industrial Zone should be revised as follows:

1. Objectives

- To provide suitably planned areas for heavy industries that require separation from other land uses.
- To encourage employment opportunities.
- To minimise adverse effect of industry on other land uses.
- To support and protect heavy industries.
- To promote well connected places with good direct access to motorways and freight rail infrastructure.
- To enable other land uses that provide supportive services to meet the day to day needs of workers in the area, but only where they do not detract or restrict the operations of the predominant heavy industrial land uses.

2. Permitted Without Consent

Nil

3. Permitted With Consent

Building identification signs; Business identification signs; Crematoria; Depots; Environmental facilities; Environmental protection works; Flood mitigation works; Hazardous storage establishments; Heavy industrial storage establishments; Heavy industries; Helipads; Kiosks; Mortuaries; Offensive storage establishments; Recreation areas; Resource recovery facilities; Roads; Warehouse or distribution centres

4. Prohibited

Pond-based aquaculture and any development not specified in item 2 or 3

6.12 Review of Lot Size, Height and FSR Standards

This Study has detailed the changing demands for lands and building forms across different industrial contexts and how these are of relevance to the Liverpool precincts. For urban services, light and creative industries, operators are in demand of flexible spaces in order to adapt to change and varied ways of operating. Spaces are becoming smaller and land parcels of 1,500m² or less are in high demand. By contrast, distribution, warehousing, logistics, transport and postal industries are requiring larger, purpose-built spaces on a range of lot sizes. In Liverpool, there is demand for warehousing lots of between 2,000 -4,000m² but there is likely to be increased demand for sites of more than 10,000m² with the development of new motorways, rail and the WSA. The research undertaken has indicated that heavy industries typically require a vast range of built forms and land areas, so the more flexibility built into development standards for these types of uses, the better.

Industries across all sectors are becoming more attune to their operational needs. No operations are the same; the built form requirements can therefore be very different. In Liverpool, the current models for industry comprise multi-unit strata titled complexes, stand-alone warehouses of varying sizes, larger distribution and logistics centres and a mix of 'other' types.

A review of the current minimum lot size, building height and floor space ratio development standards as they apply to the precincts has indicated the following:

- A minimum 2,000m² lot size applies across all of the precincts, regardless of zoning, operational characteristics or built form.
- Maximum building height limits across the precincts range from 13m up to 30m in Yarrunga/Prestons and Chipping Norton.
- FSRs range from 0.75:1 – 1:1, with some precincts not having allocated FSR maximums.

Table 4 Summary of current development standards

	Lot Size	Height	FSR
Yarrunga/Prestons	2,000m ²	15m – 30m	Nil - 0.75:1
Moorebank	2,000m ²	15m – 21m	0.75:1 - 1:1
Chipping Norton	2,000m ²	15m – 30m	0.75:1 – 1:1
Casula	2,000m ²	18m – 30m	Nil – 0.75:1
Hoxton Park Airport	2,000m ²	15m – 30m	N/A
Coopers Paddock	2,000m ²	18m	N/A
Priddle/Scrivener Street	2,000m ²	15m	N/A
Sappho Road	2,000m ²	15m	N/A

	Lot Size	Height	FSR
Orange Grove	2,000m ²	15m	Nil – 0.75:1
Austral	N/A	13m	N/A

Currently building height standards are considered flexible. These currently permit upwards of 4-5 storey industrial building forms comprising a typical floor-ceiling height of 5-6m per floor. Taller buildings and structural forms appear to be promoted in those heavier industrial precincts whilst 15m represents a standard height standard across most of the precincts. Most of the current built form exhibited in the precincts would measure less than 13m, comprising often of no more than 1-2 storeys. The demand for increased heights is strongest in multi-unit complexes typically occupying light industrial areas. Larger warehousing operations are also often utilising additional height to store vertically with improved robotics and mechanisation of activities.

Floor space ratio standards may currently be too low, evidenced by the fact that the maximum building height standards are often not reached. The FSR standards across the precincts are typically between 0.75:1 and 1:1. Due to DCP controls mandating extensive front setbacks in the order of 15-20m to main collector roads and 5-10m for local streets, site coverage for most existing sites would sit between 50-75%. These types of site coverage outcomes are typical of most industrial sites below 40,000m². The current controls therefore would only permit the establishment of 1-2 storey forms in precincts including Moorebank, Yarrunga/Prestons, Chipping Norton and Casula where very few examples of new or redevelopment projects have been cited. The research indicates that:

- All types of industries require flexibility in the application of space and functional designs;
- Most industries are willing to utilise height in building forms as a result of innovation and improved technologies as opposed to flat-pack big-box designs with mezzanine level offices;
- Globally, increasing density controls have led to a resurgence of investment in redeveloping sites and establishing new businesses within existing precincts, particularly those close to public transport;
- lifting density controls to promote renewal of existing industrial areas has attracted some initial interest and investment in Victoria.

The use of incentive FSR uplifts has also proven successful in a number of settings. In NSW in recent years the application of incentive bonus FSRs have been utilised in the residential development sector in order for governments to deliver place-making improvements to streetscapes, open space and infrastructure and also to mandate design excellence. A similar approach to incentivise investment in Liverpool’s industrial precincts would draw redevelopment activity and provide Council with opportunities to improve the public domain, open space provisions and deliver improved infrastructure through increased contributions or site-specific Voluntary Planning Agreements (VPAs). In IN2 zoned areas to avoid dilution of industrial activities, FSR bonuses should be linked to a requirement to preserve a certain ratio of total floor area for exclusive use by specialised

manufacturing, processing or other light industrial uses. These would be considered at the DA stage and imposed as a requirement (positive covenant) on the title of the land and imposed by conditions of development consent.

Minimum lot sizes across the precincts are considered very flexible for the IN1 and IN3 zones, but not flexible enough for IN2 areas. Demand for smaller industrial sites is evident for light and creative industrial activities with the Knight Frank 2016 report citing a demand for sites of 1,500m² and less across Liverpool's urban services sectors. Whilst strata subdivision of multi-unit complexes is currently a mechanism used to deliver these types of products, a reduction in the minimum lot size area to 1,000m² in the IN2 zone is not a radical change. This approach will assist in providing attractive land parcels that are in demand. In the IN1 zone, which is recommended to replace the majority of the existing IN3 zoned areas, a range of lot sizes are required, including larger parcels of 4,000m², 8,000m² and 10,000m²+. In existing precincts, increasing the minimum lot size is recommended to ensure larger land parcels are retained to provide sufficient space for larger operators, however, this decision is unlikely to be supported by land owners. Indeed it may be too late to go about increasing minimum lot size standards for the established precincts, however, newly proposed industrial lands across the western part of the LGA in the Aerotropolis should seek to establish well-planned estates for larger operators with minimum 10,000m² lot size standards to support international logistics and distribution operations.

Incentivising land amalgamation through development standards as part of new development in the established precincts could prove to be a successful mechanism to deliver master-planned industrial precincts with improved landscape, built form and streetscape interfaces. Similar to the ideology of consolidating multiple smaller residential properties to accommodate residential flat buildings or mixed-use development in the city centre, Council could encourage consolidation through development standards, site-specific DCPs or through planning proposals supported by VPAs. The intent of such an approach would be to create larger parcels for both larger stand-alone operators and improved multi-unit sites for mid-sized operations in the IN1 zone. This preserves more flexible land areas in the long-term to support the ongoing viability and economic strength of sectors. Opportunities to proceed with such an approach should be investigated in the larger precincts of Moorebank South and Yarrunga/Prestons.

6.13 Recommended Changes to Development Standards

The following recommended approaches are provided for consideration:

- Generally, look to retain existing building height standards as they apply across the precincts. Give consideration to increasing maximum building heights to 30m or higher for earmarked innovation precincts (discussed further in 6.3).
- Increase all base FSR standards to 1:1 across all industrial precincts and seek to update DCP controls to deliver improved landscape, street interface treatments, building design and sustainability outcomes.

- Apply incentive bonus FSR provisions for IN2 zones to permit additional 1:1 FSR in lieu of allocating a minimum 50% of total floor area in a development to light or creative industries including specialised manufacturing, warehousing, construction, trade, etc.
- Apply incentive bonus FSR provisions for IN1 zones to permit additional 1:1 FSR where a new or substantially redeveloped building exhibits architectural design excellence, achieves a high standard of environmental sustainability in its construction and operation, and contributes to improvements within the public domain.
- Reduce minimum lot size standards for Torrens title subdivisions in the IN2 zone from 2,000m² to 1,000m².
- Continue to permit industrial strata-title subdivisions across all zones with no minimum lot size control.
- Consider increasing the minimum lot size standard from 2,000m² to 4,000m² or larger in parts of Yarrunga/Prestons and Moorebank South to effectively preserve big sites for larger distribution and logistics operators.
- Apply an incentive standard to encourage consolidation of existing industrial sites to deliver minimum 8,000m² lots in Yarrunga/Prestons, Moorebank and Chipping Norton to encourage redevelopment and the creation of larger master-planned sites. Incentives for industrial developers could include a minimum 3:1 FSR and 30m height limit which also mandates that new development achieves a high standard of building design and flexibility; contributes to improvements within the public domain and achieves environmental sustainability outcomes in its construction and operations.

6.14 Review of B7 Technology Park Zone

The B7 Business Technology Park zone does not currently apply under LLEP 2008. The application of this zoning in places like Norwest Business Park, Macquarie Park, Marsden Park and now Sydney Science Park have drawn investment and attention from large-scale industrial, commercial, health, educational and scientific research sectors. In the context of Greater Sydney, these precincts, along with the emerging inner-city locations of Waterloo, Alexandria and parts of Botany are the closest examples to the Innovation Precincts examined in this Study.

In Western Sydney, the existing Innovation Precincts like Norwest and Marsden Park are typically home to large-scale operators who occupy sites over 4,000m² in area. These are predominated by light industries and commercial office developments that are expansive, well-constructed and have attracted internationally renowned and owned businesses. They are representative of the traditional US model of suburban business parks with supporting retail centres and executive housing estates. Traditionally, these areas have been heavily dependent on cars, but still provide good access for pedestrians and cyclists. The inclusion of the North West Metro has helped to re-activate areas within Norwest and Bella Vista. These parks are not currently accommodating smaller-scale creative and specialised industries who would tend to occupy inner-city areas around South Sydney's Waterloo or Alexandria. In this sense, there exist two very different types of Innovation Precincts which has been

considered in the literature. The latter version should objectively be the aim for Liverpool's Scrivener/Priddle Street Precinct and potentially also the Orange Grove Precinct given their established character and good proximity to the city centre.

The B7 zone allows for a variety of industrial uses but encourages the development of business parks which incorporate a genuine mix of light industrial and commercial offices. Under the Standard Instrument LEP the objectives of the B7 zone are as follows:

- To provide a range of office and light industrial uses
- To encourage employment opportunities
- To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area

Permissible land use activities under the B7 zoning in the Standard Instrument are limited to the following:

- Centre-based child care facilities
- Garden centres
- Hardware and building supplies
- Light industries
- Neighbourhood shops
- Office premises
- Oyster aquaculture
- Passenger transport facilities
- Respite day care centres
- Tank-based aquaculture
- Warehouse or distribution centres

Modified versions of the B7 zone have been adopted by a number of Greater Sydney Councils including The Hills in Norwest Business Park, Blacktown City Council in Marsden Park and Penrith City Council in Sydney Science Park. All have very different objectives and varying permissible land uses which reflects the characteristics of key anchor tenants in the precincts. For example, in Penrith's Sydney Science Park one of the key objectives is to *"provide a range of higher order job opportunities including health, cultural and high technology industries"*. This objective reflects the Vision of the Sydney Science Park developer Celestino in partnering with the major research institution CSIRO to develop living laboratories, high technology industries and educational establishments. The B7 zone objectives under The Hills LEP 2012 seeks to *"make provision for high technology industries that use and develop advanced technologies, products and processes"*. The objectives here focus less on education, health and research, and more on supporting established and advanced internationally recognised industries which has resulted over the past two decades.

Emerging Innovation Precincts around Waterloo, Alexandria and Botany are being spurred on by the City of Sydney's recent efforts to rezone older industrial lands to a mixture of B6 Enterprise Corridor and B7 Business Park. The key difference here is that the B6 zone permits forms of residential accommodation whilst the B7 zone does not. Both zones are 'open zonings' in that a majority of land use activities are permissible with consent, as opposed to Liverpool's industrial zonings which are designed as 'closed zonings' where all land use activities are prohibited unless stipulated otherwise. The B7 zone in Sydney operates in a similar way to the typical IN2 Light Industrial zone in that one of its objectives is to support the viability of nearby centres. A range of light industrial, business and retail activities are permissible with consent in the B7 zone.

6.15 Defining Liverpool's Innovation Precincts

Scrivener/Priddle Street Precinct

The Greater Sydney Commission in their Liverpool Collaboration Area – Place Strategy have identified the Scrivener/Priddle Street Precinct as a future Innovation Precinct given its geographical position on the eastern edge of the city centre and hospitals precinct. This precinct has significant opportunities to leverage on the growth and future investment in the public and private hospitals as well as the growth of involvement and interests from multiple research institutions and educational partners including the Western Sydney and Wollongong Universities. The constraints of this precinct have been well documented, but simple investments in connectivity infrastructure and a focus on planning for good interfaces to adjoining land uses will unlock this precinct's potential. The existing building stock in the precinct is ageing, however the combination of discounted rents, vacant big-box sites and urban-scale streets could attract interest from the right occupiers with well-considered planning approaches and investments.

The precinct is too small to replicate the likes of a Norwest or Marsden Park. It's constraints and ageing built forms could aid its characterisation as a new inner-city creative precinct which accommodates renewable energy technologies, a range of smart-office jobs and specialised small-scale industries. Medical research and advanced technologies including pharmaceutical production has been identified as a potential target land use outcome for this precinct, however, these industries given their scale would require larger, new, purpose-built facilities which would necessitate redevelopment of the precincts' sites and streets.

The precinct is well suited to transition under a modified B7 zoning with new development standards which incentivise either urban renewal through revitalisation of existing building stock or through new master-planned redevelopments. Rezoning should also seek to consider approaches to transition the adjoining low-density residential zone to a mixed use (possibly B6 Enterprise Corridor zone) and overcome constraints tied to odour impacts from the Sydney Water treatment plant.

Orange Grove Precinct

The Orange Grove Precinct has not yet been identified as a possible Innovation Precinct. Instead, the precinct has been earmarked for future transition to a Business Development zoning under the Collaboration Area. Council has long fought to preserve this precinct as an industrial area to protect employment opportunities on the northern edge of the city centre. The adjoining B5 Business Development lands to the north form part of the precinct and have been successfully developed as an integrated retail precinct comprising wholesale trade, bulky goods and warehouse clothing and food outlets. The development, known as The Grove, in its most recent stages has renewed older industrial building stock and reinterpreted the industrial heritage of the site to create an interesting and attractive retail centre.

The IN1 zoned lands to the south are wedged between the new retail precinct, residential areas to the east and west and the city centre further to the south. New industrial storage units are currently under construction in the eastern corner of the site, however the remainder of the building forms in the precinct exist in a state of dilapidation. These sites no longer suit general or heavy industry but may continue to support light and creative industries within newly developed sites under an IN2 zone with incentives provisions to encourage redevelopment. Application of a B7 zone could also deliver significant employment outcomes similar to that of an IN2 zone as proposed to be revised earlier in this Chapter. The key difference between the two zonings would be the incorporation of more mixed-use outcomes under a B7 zone compared to the IN2 zone where retail and other business premises would be limited.

6.16 Recommendations for Adopting a B7 Zone

The formulation and adoption of a B7 Business Park zone for the Scrivener/Priddle Street Precinct needs to be developed on the back of a strong Vision. The objectives for the zone must adopt some of the core provisions under the zoning in the Standard Instrument, but additional objectives can be utilised to define desired land use, built form and economic outcomes. On the basis that the precinct is renewed or redeveloped as an Innovation Precinct (as in the MaRS Precinct in Toronto or Central East Side in Portland, Oregon), zoning for the Scrivener/Priddle Street Precinct needs to consider the success factors:

- **Collaboration** – The future development of the precinct needs to be mindful of encouraging collaboration and incentivising the creation of shared and integrated work spaces.
- **Quality of Place** – Place-making and high quality architectural and urban design principles need to underpin the creation of a great place to attract industries, employers, start-ups and investors.
- **Diversity and Inclusion** – Space needs to be designed for a range of users, with flexibility built into new developments and incentives provided to attract a range of different land use activities and scales of operations.

- **Affordability** – New development in the precinct needs to be attractive and affordable for large- and small-scale operators, including locally-based operations which require discounted rents and flexible operating areas.
- **Critical Mass** – Getting the density right is crucial to the success of the precinct. The area is restricted in size but innovative approaches to space and the configuration of tenancies can attract a number of operations and in turn a large number of new jobs.
- **Vibrant Living** – Is the precinct suitable for some supportive residential components with live-work spaces, or is the adjoining low-density residential area more suited to development of a mixed use B6 zone?
- **Competitive Advantage** – What is the competitive advantage or specialised niche market created in this precinct? There is a focus on attracting advanced and technical industries, pharmaceutical production and scientific research.
- **Anchor Institutions** – The existing private and public hospitals, a range of supporting medical and research institutions and tertiary educational institutions anchor the precinct to the city centres eastern specialised health and education edge.
- **Infrastructure** – Improvements to road, utility infrastructure service capacities, open space and digital infrastructure in this precinct is considered a must.
- **Accessibility** – A vital part to unlocking the success of this precinct is improving accessibility for pedestrians, cyclists, commuters and workers to the Liverpool city centre across the railway line and from Warwick Farm and Liverpool stations.

The following modified B7 zoning provisions for the Scrivener/Priddle Street Precinct are provided for Council's further consideration:

B7 Business Park

1. Objectives of Zone

- To provide a range of office, light and creative industrial uses.
- To encourage specialised and targeted employment opportunities in advanced and specialised manufacturing, technology, research and development and professional industries.
- To enable a wide range of land uses to meet the day to day needs of workers in the area.
- To improve connectivity and ensure uses support the viability of the nearby centres.
- To contribute towards the creation of a resilient, integrated and collaborative health and education precinct.

2. Permitted Without Consent

Nil

3. Permitted With Consent

Business premises; Car parks; Centre-based child care facilities; Community facilities; Educational establishments; Environmental protection works; Flood mitigation works; Food and drink premises; Function centres; Garden centres; Hardware and building supplies; Health services facilities; Hotel or motel accommodation; Industrial retail outlets; Industrial training facilities; Information and education facilities; Kiosks; Light industries; Markets; Neighbourhood shops; Office premises; Passenger transport facilities; Recreation areas; Roads; Signage; Warehouse or distribution centres

4. Permitted Without Consent

Any other use not identified in item 2 or 3.

To strengthen the characterisation of this zone it is strongly recommended that land use definitions be further investigated to specifically include *research and development, advanced and technology, scientific and research and specialised industry*.

6.17 Recommendations for Development Standards

Examples of best practice approaches to development regulation for Innovation Precincts has demonstrated the need for flexibility and density incentives to drive urban renewal and investment. In precincts such as Central East Side, Portland incentive zoning provisions were implemented to protect base line manufacturing whilst allowing denser development outcomes with increased building heights and floor area ratios.

In places such as Rotterdam, Discovery Square in Rochester and MaRs in Toronto development standards around building heights and floor areas were completely relaxed in certain parts to encourage investment by the private sector with merit-based development proposals. In these examples, place-based planning and urban design underpinned the desired future character of the area and sites were developed in accordance with aspirational provisions in the respective master plans.

In Victoria, governments have observed the successes of overseas examples and are now building flexibility into new approaches for planning controls to harness the creation of Innovation Precincts in inner-city locations.

For Scrivener/Priddle Street and Orange Grove building height controls currently sit at 15m on average. These should be revised up or completely removed to encourage increased building heights. Increasing or relaxing controls around building heights, as a similar approach to high density residential precincts, can provide improved ground-plane opportunities for landscaping, streetscape and the public domain. Relaxing height controls ensures that maximum FSRs can be commercially achieved which is a key component for unlocking redevelopment in these precincts.

Equally, existing FSR controls of 0.75:1 – 1:1 in these precincts will not encourage redevelopment of sites. Most of the developed building forms in these precincts are built to the maximum site coverages

and density controls which have been in place for well over a decade. The necessary redevelopment of sites will only come about as a result of increasing FSRs which can be incentivised as discussed previously in this chapter. It is recommended that FSRs in the Scrivener/Priddle Street precinct be increased to a base line of 1.5:1 with incentives allowing for up to 2.5:1.

The Vision for a renewed Scrivener/Priddle Street precinct should be formulated in a specific masterplan which could form part of a new DCP chapter. The masterplan should be entrenched in best practice urban design and place-making principles to bring about change in streets and connectivity, open space, built forms, interface treatments and improved amenity for workers.

7. Conclusion

This report provides Council with an understanding of the changing demands and drivers of traditional industrial and employment lands and innovation, research and advanced manufacturing and business park uses. It considers the potential land use implications and planning initiatives required to support long term economic growth, prosperity and job creation in the Liverpool industrial precincts.

The ways in which land and buildings are used and developed in industrial precincts is steadily changing in response to a number of key drivers, both domestically and internationally, including:

- The effects of globalisation and impacts of global competition;
- Population growth and increased construction activity;
- Investment in major infrastructure projects in Greater Sydney, including Western Sydney Airport;
- Changing nature of industries, the workplace and working efficiencies;
- Future land release in Greater Sydney;
- Innovation in industry and the rise of the professional and technical services industry;
- Economic conditions and a changing consumer market; and
- Creative thinking and investment in technical and professional service industries.

As a result of these drivers and influences, the demands on Liverpool's industrial lands will transform steadily over the coming decades. Key sector demands include:

- A growing need for industry to specialise and target niche sectors to retain a competitive edge;
- Demand on continued urban services, larger-scale distribution and freight and specialised innovation/creative and advanced technology industries;
- A requirement for a variety of industrial spaces to accommodate the range of demands;
- Smaller and more efficient workplaces;
- Requirements for good access to movement corridors, with access to transport, essential services and amenity;
- Collaboration between specialised industries;
- Requirements on access to digital infrastructure;
- Ongoing demand for new large-holdings to be released across Western Sydney to accommodate logistics, distribution and more expansive warehousing operations linked to the WSA; and
- High demand for existing quality small-unit space with good proximity to local consumer/customer markets.

In order to understand the challenges and opportunities that will influence the changing Liverpool industrial sector, it is important to distill the learnings from both domestic and international examples of comparable industrial development lands. These comparable precincts show differing approaches to land use planning and development regulation which have underpinned successful growth in jobs and industries. Some of the key lessons from these best practice examples include:

- Land use planning approaches for modern industrial parks underpinned by protectionist and separation policies which work to preserve the amenity of surrounding sensitive uses, but also provide sufficiently sized lands for larger operators.
- Land use planning for successful Innovation Precincts has been suitably flexible, incorporates a genuine mix of uses including some strategic residential and creative spaces.
- Setting the scale for larger industrial parks from the outset is important for not only preserving expansion of industrial parks but also driving economic growth and attracting global leaders in industry.
- Both Industrial Parks and Innovation Precincts need to be supported by transport, digital and utilities infrastructure.
- Land use planning for Innovation Precincts should focus more on design outcomes and place-based approaches rather than stringent regulation around zoning.
- Comprehensive master planning from the outset has proved critical to the successful delivery of industrial parks and innovation precincts. The more adaptable the plan, the more resilient the urban fabric of a place is to changing demands and drivers.
- Clearly specifying desired land use outcomes in zoning establishes a clear message for investors and the community as to what a precinct will be like. Zoning needs to clearly define the types of industries and businesses and consider aspects such as scale, level of environmental impact and economic functions.
- An understanding of space requirements for different industrial usage types should inform regulations and development controls. These need to be revised and re-adapted as requirements change over time.
- Best-practice approaches to land use planning for industrial parks establish the differing characteristics of uses and include clearly defined boundaries. Different types of industrial operations are then segmented into sub-precincts to create clusters of commonality and shared knowledge and resources.
- Planning needs to consider what supportive uses are appropriate and their quantification needs to be controlled through development regulations incorporated into zoning. This avoids a diluting of the predominant employment land uses.
- Innovation precincts thrive where planning is flexible, adaptive to fast moving drivers of change and incentivizing to draw in start-ups and users that require inexpensive rent and cost-effective spaces to operate.
- Incorporating residential use into innovation precincts to create live-work spaces can support vitality and vibrance, however, careful planning decisions need to be made so as to not compete with employment outcomes.
- Industrial parks should utilise transitional zoning to buffer adjoining sensitive uses in order to protect surrounding amenity.

To facilitate the transition and adaptation of Liverpool's industrial development lands, it is essential that incentives are explored. A variety of market and government led initiatives can support the retention and growth of local jobs and industries, including:

- The use of value capture as a tool to reinvest funds raised from new development projects back into infrastructure upgrades.
- The targeted decentralisation, relocation and clustering of public research and knowledge-based institutions to provide strong anchors for investment and growth of innovation precincts.
- Leverage growth against significant infrastructure investment, such as the Western Sydney Airport and North-South Rail, to drive investment from the private sector and establish important connected corridors of economic strength.
- Pursuing infrastructure projects through alternative governance structures including Development Authorities or Corporations, Government/Public-Sector and Private Sector Partnerships and multi joint ventures.
- Planning and land use incentives can drive growth, encourage desirable built form outcomes and place making, and also protect established industries. Examples include bonus building height and floor space provisions in return for commitments to employment floor areas; zoning to encourage particular land use outcomes and leveraging funds raised from new incentive-based developments to provide public domain improvements.
- Financial incentives including tax abatements and development levy credits to protect and retain certain industry sectors and jobs.
- Ongoing investments into best-practice research, ongoing investment into understanding key drivers and changing demands of industry.
- Focusing on the creation of great places with a developed understanding of the end users firmly in mind.

A review of Liverpool's planning framework has been undertaken to align zones with the economic roles, SWOTs and characteristics of each industrial precinct. Development standards including building heights, floor space ratios (FSRs) and lot sizes under Liverpool Local Environmental Plan 2008 (LLEP 2008) have been reviewed. A series of recommended improvements (outlined below) have been included based on the best practice examples investigated.

The objectives of each industrial zone should be revisited to:

- Better define the type, scale and nature of industrial uses and other activities considered suitable in each of the precincts;
- Clarify the desired intent of each zone (i.e. the intent of the IN2 Light Industrial zone to provide for small-scale urban service industries that are compatible with surrounding and adjoining land uses);
- Avoid generality by including more specific desired outcomes; and
- Avoid the application of objectives which can be conflicting across zones.

This report has identified a need to reconcile the current zoning of Liverpool's industrial precincts in accordance with the following overarching characteristics and economic roles:

Specialised or Other Urban Services Precinct = IN2 Light Industrial Zone

- Larger industries should be discouraged from occupying in these zones unless there is a strong nexus between operations.

Industrial Park or Estate = IN1 General Industrial Zone

- Current IN1 zone has generalised objectives and a broad range of permissible land uses which result in a lack of definition and a confused economic role.
- The IN1 zone should therefore be applied to preserve mid-sized operators and large, low-impact operations including warehousing, processing and manufacturing.
- More intrusive operators such as waste recycling, extractive industries, chemical production and refining and other hazardous and offensive industries should be encouraged to occupy lands within the IN3 zone.
- IN1 zones should in many instances replace the IN3 zoned lands in Liverpool.

Industrial Park = IN3 Heavy Industrial Zone

- IN3 zonings may be suitable for newly released tracts of land around the Aerotropolis where they are properly planned for and well separated from surrounding land uses, particularly residential properties.

Modified versions of the B7 zone have been adopted by a number of Greater Sydney Councils including The Hills in Norwest Business Park, Blacktown City Council in Marsden Park and Penrith City Council in Sydney Science Park with varying degrees of success. The introduction of a B7 Technology Park Zone in certain precincts, including Priddle/Scrivener Street and Orange Grove are likely to encourage development of business parks which incorporate a genuine mix of light industrial, creative industries and commercial uses which is consistent with the overarching objectives of these precincts within the Liverpool Collaboration Area.



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LIVERPOOL INDUSTRIAL LANDS STUDY



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1. INTRODUCTION

1.1 Background

Over the next 30 years, Liverpool will undergo a significant transformation. Population growth, a policy pivot towards the Central and Western Cities and infrastructure delivery will fundamentally alter the LGA and surrounds. Liverpool sits at an important juncture. To its east is a maturing economy, to its west an emerging one. Ensuring that Liverpool meets the demands of this growth through intelligent planning of industrial lands is vital.

1.2 Purpose of the study

Liverpool City Council have commissioned SGS Economics and Planning to undertake an industrial lands study (industrial lands are also referred to as employment lands). This report provides Liverpool City Council with a better understanding of the role and function of employment lands and the future demand that industrial growth will create. This report:

- Projects likely demand for employment lands over the short, medium and long-term with the consideration of regional influences such as Western Sydney Airport.
- Provides an analysis of broad market trends that will shape the size and nature of industrial lands in the LGA.
- Identifies barriers to rezoning and servicing of future industrial lands.
- Profiles the industrial landscape of Liverpool and the employment precincts.
- Provides economic development and planning recommendations to preserve and increase industrial land.

1.3 Document structure

The structure of this report is as follows:

- **Chapter 2: Strategic context.** Outlines the strategic planning context and drivers for industrial lands at the state, regional and local level, with key implications for Liverpool identified
- **Chapter 3: Western City District industrial profile.** Establishes the strategic context of employment lands across Greater Sydney and profiles employment lands in the Western City District
- **Chapter 4: Liverpool's industrial profile.** Establishes the employment profile and current supply of employment lands in Liverpool LGA
- **Chapter 5: Precinct profiling.** Establishes the precinct context and employment profile of the employment lands in Liverpool LGA
- **Chapter 6: Future supply of industrial land.** Assesses the future supply and demand of industrial land in the Liverpool LGA and identifies suitable areas for future industrial land.
- **Chapter 7: Insights.** Provides an overarching narrative that brings together the key findings of the report.
- **Chapter 8: Recommendations.** Outlines Strategies and actions for Council, to ensure sufficient provision of industrial land I the right locations.
- **Appendix**

2. STRATEGIC CONTEXT

This chapter outlines the strategic planning context and drivers for industrial lands at the state, regional and local level, with key implications for Liverpool identified.

2.1 Metropolitan planning context

Greater Sydney Region Plan (2018)

Purpose of the document

The Greater Sydney Region Plan (2018) was developed by the Greater Sydney Commission (GSC) and is the NSW Government's metropolitan planning strategy for the Greater Sydney Region. The policy directions in the plan are intended to inform district and local level land-use planning and infrastructure prioritisation across Greater Sydney.

The Plan sets up a 40-year vision (to 2056) to align land use, transport and infrastructure planning and delivery across Greater Sydney. The vision is structured around a metropolis of three cities: The Western Parkland City, Central River City and Eastern Harbour City. Western Sydney Airport (WSA) will be a catalyst for growth in the Western Parkland City, which includes Liverpool Council.

Liverpool is identified in the plan as part of the Metropolitan City Cluster of the Western Parkland City. It is intended to provide a focus for the commercial activities and population services in the Western Parkland City, which will grow as the population increases in South-West Sydney. The Western Parkland City will be structured on a poly-centric city model, in which economic growth will be underpinned by the existing centres of Liverpool, Campbelltown-Macarthur, Greater Penrith and the future Western Sydney Airport-Badgerys Creek Aeropolis.

Liverpool is also identified as a Collaboration Area in the Plan. These are areas in which a place-based collaborative process will be led by the GSC, bringing together different levels of government and key stakeholders to coordinate planning solutions to complex problems. A key focus for the Liverpool Collaboration Area is for it to be a well-connected and vibrant centre, with a focus on health, education, research and innovation driven by the presence of health and educational institutions.

Relevance to industrial and urban services land

The Plan discusses the importance of industrial and urban services land to the Greater Sydney economy. It specifies that management of industrial and urban services land across Greater Sydney will need to reflect local contexts and provide for a wide range of businesses which are vital to Sydney's overall productivity. The Plan identifies three approaches which planning authorities should take when managing industrial land:

- **Retain and Manage** – all existing land is safeguarded from competing pressures, retaining land for economic and employment purposes, with management to evolve as business practices change.
- **Review and Manage** – land is reviewed to confirm whether it should be retained or transitioned to higher order activities, considering the changing nature of industry and demand for land.
- **Plan and Manage** – Strategic plans are prepared to determine the need for industrial land in land release areas, accompanied by timely infrastructure sequencing and servicing.

The plan and manage approach is designated for land in the eastern half of the Liverpool LGA, while the plan and manage approach is designated for the western half which has not yet been developed for urban purposes.

Western City District Plan (2018)

Purpose of the document

The Western City District Plan provides a link between metropolitan strategy and local planning, and articulates how the objectives of the Greater Sydney Region Plan are to be achieved through a series of objectives and actions under four themes: infrastructure, liveability, productivity and sustainability.

The LGAs that make up the Western City District are the Blue Mountains, Camden, Campbelltown, Fairfield, Hawkesbury, Liverpool, Penrith and Wollondilly. The size of the district has been driven by the proposed Western Sydney Airport and the future Badgerys Creek Aerotropolis.

The District Plan aims to address housing, employment and other issues of metropolitan and district level relevance, while considering issues which are unique to the local region. The District Plan nominates lead and partner agencies responsible for addressing specific priorities.

Relevance to industrial and urban services land

Elaborating on the Greater Sydney Region Plan, the Western City District Plan highlights the importance of strategically managing industrial land and ensuring appropriate supply. This is noted to be a key issue for the Western City District, particularly in areas such as Liverpool where there are pressures for land to be rezoned for residential use. The plan outlines the need to accommodate jobs and services near both new and existing communities, as well as to provide larger precincts to absorb demand for industrially zoned land.

The Plan identifies that the Western City has a higher level of industrial and urban services land than the benchmark across Greater Sydney, however this amount is expected to be reduced by 2036. With significant longer-term population growth expected, additional land will be needed for industrial uses and urban services.

Key actions and issues identified in the District Plan for the Liverpool City Centre as part of its planning as a Collaboration Area include to:

- Improve and coordinate transport and other infrastructure to support jobs growth,
- Develop smart jobs around the health and education precinct, especially in advanced manufacturing, logistics and automation, and
- Capitalise on the WSA and Western Sydney City Deal.

Liverpool Collaboration Area

The Greater Sydney Region Plan identifies the Liverpool City Centre, Health and Education Precinct and the surrounding areas as a Collaboration Area. The Plan provides the following definition of Collaboration Areas:

“Collaboration Areas are a place-based process led by the Greater Sydney Commission to address complex issues that require cross-stakeholder solutions. This may involve the alignment of the activities of councils and agencies at the NSW and/or Australian Government level, and a range of public and private stakeholders such as hospitals, universities and research institutions to deliver significant regional and district liveability, productivity and sustainability outcomes.” (GSC 2018, p42)

The designated area extends east across the Georges River from the Liverpool City Centre, encompassing all of the Moorebank industrial precinct. This includes larger and smaller

industrial sites as well as several large sites along the Georges River, where a consideration outlined in the Plan is strong developer interest in rezoning land for additional housing.

The Collaboration Area Place Strategy aims to realise a step-change in the role and function of Liverpool. The focus on the Liverpool health and education precinct and growth of Liverpool as a vibrant, mixed-use centre have several implications for the planning of the LGA's industrial lands:

- The expansion of the CBD across the river and potential development of a mixed-use precinct on the banks of the Georges River would see a loss of up to 50 hectares of IN2-zoned land North of Newbridge Road
- The growth of the health and education precinct, supported by the NSW Government's recent commitment to \$740m in funding for Liverpool Hospital's upgrade, will enhance the precinct's role as a health and education cluster of metropolitan significance. This is likely to extend to the attraction of research, translation and advanced manufacturing uses aligned with this role. The Adjacent Warwick Farm and Scrivener Street precinct (currently zoned IN1) is likely to transition towards advanced manufacturing and med-tech uses. This will potentially displace the incumbent uses
- Increased residential development in and around Liverpool City Centre (above the previously forecast levels) will require additional population-serving industries to cater for the growing population.

Collectively, these factors will impact on both the supply of and demand for industrial lands in the LGA, particularly close to the Liverpool City Centre.

2.2 Local strategic context

Liverpool Business Centres and Corridors Strategy

The *Liverpool Business Centres and Corridors Strategy (2007)* and *Liverpool Retail Centres Hierarchy Review (2012)* identify that significant population growth in the LGA, as well as key transport infrastructure projects, will mean growth in demand for retail floorspace in the future. This will include demand for bulky goods floorspace, as well as supermarket and general retail. The documents recognise that the key strengths of the Liverpool City Centre remain in retail trade. The Strategy notes that for Liverpool's economy to be sustainable, there is a need to improve the quality of building stock and the public domain, and to attract investment to higher growth sectors, including business services, health, cultural industries and communications.

The Strategy and Review outline goals to grow the LGA's specialised centres for bulky goods retailing, including at Warwick Farm and Casula. It was estimated that there would be a need for additional space for this type of retailing on top of what was currently available in the LGA, although additional floorspace has since been delivered. The Strategy and Review note that land to house this type of use needs certain characteristics, including space for generous floorplates and parking, good highway and regional road accessibility, proximity to population growth centres, and separation from surrounding sensitive land uses.

The Strategy recommends that core commercial areas in the LGA be preserved for future business, office and growth, and that office premises should be limited to business zones.

Knight Frank Liverpool Industrial Employment Lands Study

Purpose of the document

In June 2016, Knight Frank undertook an analysis of industrial employment lands on behalf of Liverpool City Council. The report considers current market conditions, factors affecting supply, and highlights the nature and extent of future demand for the LGA's industrial lands.

Relevance to industrial and urban services land in Liverpool

The report notes that Liverpool LGA is expected to experience significant employment growth over the next 20 years. Of the industries predominately located in industrial land use zones in the LGA, transport, postal and warehousing are expected to experience the greatest job growth, increasing by 76% from 5,206 (2016) to 9,190 in 2031. Knight Frank highlight that this industry has a high turnover rate and therefore businesses in this industry are more likely to commit to shorter leases (approximately 7 to 10 years). This compares to businesses in the manufacturing industry whom are more likely to commit to longer leases (approximately 15 years plus) as they are less able to relocate given the costs involved in moving plant equipment.

Knight Frank determine a future demand of 1,176 hectares of industrial land by 2031 which exceeds the 958.4 hectares of currently developed and undeveloped land. In the report, Knight Frank identify that there is 2,339 hectares of additional proposed employment land in the LGA but that this land needs to be rezoned, serviced and developed. If this does not occur, there is a danger that competing industrial precincts outside the LGA will capture the demand.

The report looks at the constraints to future industrial development in Liverpool LGA. The report finds that across Greater Sydney, 77% of all undeveloped zoned lots are smaller than 1 hectare in size. This trend is similar in Liverpool LGA where 94% of undeveloped zoned land is below 5 hectares. Knight Frank compare the landscape of Liverpool LGA to Blacktown and Penrith LGA's which can accommodate larger logistic users given the higher provision of larger lots.

Liverpool is well positioned to capitalise on the growth of industrial demand in Western Sydney. The LGA is close to major transport links such as the M5 and M7, as well as current infrastructure projects such as WestConnex and the Moorebank Intermodal Terminal and future road investments. Knight Frank identify that these infrastructure projects "will shift the industrial 'sweet spot' away from the M5-M7 motorways at Eastern Creek south towards the areas between the Northern Road and the M7" (Knight Frank, 2016). Knight Frank identify future opportunities for industrial precincts including Kemps Creek and Badgerys Creek, but note that these areas are not likely to be developable until the early to mid-2020s. The report finds that if Liverpool wants to capture big box demand, land to the west of the M7 will need to be unlocked.

In terms of growing the industrial precincts in Liverpool LGA, Knight Frank identify the need for the timing of new land release and supporting services to be coordinated and clear. Knight Frank suggest that this approach will attract buy in from institutions who 'have the capacity and capital to build development pipelines and attract tenants, compared with private developers who often bring a higher level of risk' (Knight Frank, 2016).

Other Council documents

Other work commissioned by Council outlines that planning for employment in the LGA will increasingly focus on industries complementary to WSA or centred around the Liverpool Health, Education, Research and Innovation Precinct.¹

The establishment of the WSA is expected to encourage industrial development around the site in its early phases, which leaves Liverpool in a good position to capitalise on demand for other commercial activities before they are developed at the WSA site (e.g. professional and administrative services and retail). Liverpool's transport and freight accessibility, and its location between the WSA and the Sydney CBD, also put it in a strong position to attract investment from airport-related sectors.

¹ PWC, 2017, 'Liverpool: the gateway to Sydney's Aerotropolis,' November 2017; PWC, 2017, 'Reimagining... the Liverpool Health, Education, Research and Innovation Precinct,' August 2017.

To capitalise on this potential, it is noted that effective planning of land uses around the WSA will be important, including protecting land for new industries and allowing for the development of large-scale precincts to accommodate different industries. These might include logistics and distribution, advanced food manufacturing and exports, medical technologies, and those related to defence and aerospace.

Health and education already play a significant role in Liverpool's economy, with health and knowledge workers making up around 20% of those in the LGA. Liverpool has a significant cluster of health and education institutions, which also benefit from proximity to the Liverpool CBD. The vision for the health and education precinct in the future is for it to capitalise on its existing strengths and encourage new investment through differentiation from other health and education precincts. The Liverpool precinct can be differentiated by the availability of commercial land, its strong identity and diversity, lower housing costs, and transport connections.

The development of an advanced manufacturing, automation and logistics hub where the existing manufacturing workforce, research institutions and transport connections can be leveraged has been suggested as part of the precinct in the future.

2.3 Regional influences

Moorebank Intermodal Terminal

The Moorebank Intermodal terminal, currently under construction, will be a significant piece of infrastructure in the Liverpool LGA, acting as a warehouse and distribution facility for the movement of freight containers between multiple transport modes. As well as its proximity to key freight lines, the site is close to existing industrial areas and expanding freight markets in South-west Sydney.²

It is expected that the Terminal will deliver significant economic benefits to the Liverpool LGA, with flow-on benefits for surrounding parts of Greater Sydney as well as the wider NSW economy. It is also expected to alter the types of jobs in the area, increasing demand for the construction, transport and finance and insurance sectors, with lower demand in primary industries, manufacturing and some servicing sectors. The project is expected to have a net positive impact, including through providing employment opportunities closer to where people live.³

The Terminal is noted as a key factor in the Western City District Plan in improving freight network efficiencies, and in better connecting port and airport activities. This is seen as key to achieving Planning Priority W10, for maximising freight and logistics opportunities as well as planning and managing industrial and urban services land.

Western Sydney Airport

WSA will become operational in 2026 and along with the associated Badgerys Creek Aerotropolis is expected to become a key driver of economic activity in Sydney's west. The establishment of WSA has been driven by Sydney's expected aviation demand and by its proximity to the city's existing priority growth areas and the Western Sydney Employment Area.⁴ It also responds to the need to provide more employment in the region.

The WSA is expected to provide a catalyst for further investment, jobs growth, and infrastructure development. The industries expected to benefit most from the WSA include

² Moorebank Intermodal Company, 2018, 'The project,' <http://www.micl.com.au/the-project-1/>

³ Deloitte, 2017, 'Economic and employment impacts of the Moorebank Intermodal Terminal and Western Sydney Airport,' prepared for Moorebank Intermodal Company Limited, <https://static1.squarespace.com/static/57721a5af7e0ab564bcfc84d/t/5a700e170d9297dd2e2b7bd3/1517293082304/MIC+WSA+Employment+Report+2017.pdf>

⁴ Department of Infrastructure, Regional Development and Cities, 2018, 'Western Sydney Airport,' <http://westernsydneyairport.gov.au/>

aviation, retail, transport and logistics, and professional services.⁵ Some of these industries typically rely on industrial zoned land.

Western Sydney City Deal

The Western Sydney City Deal is an agreement between the Australian Government, the NSW Governments and councils in the Western City District. The creation of the WSA and Badgerys Creek Aerotropolis is a focus of the Western Sydney City Deal. The six priority domains under the City Deal are:

- Connectivity – by road, rail, aviation and digital infrastructure,
- Jobs for the future – building on the WSA to drive business and investment growth,
- Skills and education – coordinated approach to education skills and training,
- Planning and housing – improving housing supply and affordability,
- Liveability and environment – ensuring the Western City is a great place to live, and
- Governance – shared vision and implementation plan for the Western City.

The City Deal identifies that the Aerotropolis will act as a catalyst for employment growth in Liverpool, Penrith and Campbelltown as well as the wider Western Parkland City. Liverpool LGA has strategic advantages which enable it take advantage of the opportunities provided by the WSA. A Western Sydney Investment and Attraction Office will be established in Liverpool which will focus on attracting investment to the Aerotropolis as well as existing industrial areas and employment centres.

Future transport corridors

Future Transport 2056 highlights several potential future transport corridors and freight network initiatives. The future transport corridors are under investigation and have not been committed to by the State Government. The investigation corridors include:

- North South Rail Link between Cudgegong Road, St Marys, Badgerys Creek Aerotropolis and Macarthur
- Western Sydney Airport – Badgerys Creek Aerotropolis to Parramatta train link
- Leppington to Western Sydney Airport- Badgerys Creek Aerotropolis train link
- Outer Sydney Orbital road and freight rail
- Sydney Metro City and Southwest extension between Bankstown and Liverpool
- M5 extension between Liverpool and the Outer Sydney Orbital

The majority of these transport investigation corridors are proposed for the Western City in light of the development of Western Sydney Airport and employment and population growth in strategic centres. The Western City District Plan identifies that integrating land use and infrastructure initiatives will aim to:

- Connect (and improve) public transport access to the new and existing metropolitan cluster and strategic centres
- Provide efficient north-south and east-west transport connectivity within and to the Western City District
- Prioritise the identification and protection of infrastructure corridors
- Provide industrial and freight activities with good access to the strategic freight network including motorways and rail.

⁵ Department of Infrastructure and Regional Development, 2016, 'An Airport for Western Sydney,' http://westernsydneyairport.gov.au/files/summary_brochure-an_airport_for_WS.pdf

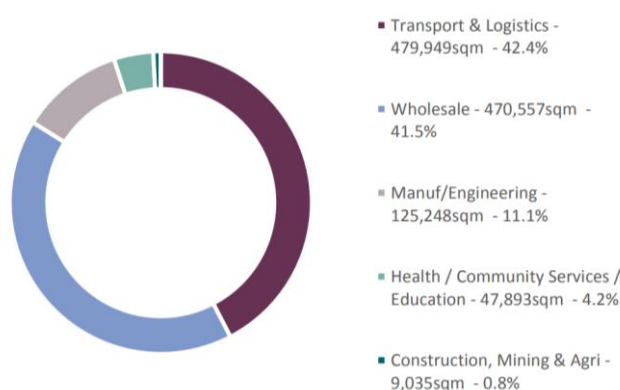
2.4 Market trends

The rise of e-commerce

Knight Frank (2017) reports that the rise of online retailing continues to underpin demand for warehousing, transport and logistics facilities across Greater Sydney. Retail sales have increased by 10% in the 12 months between August 2016 and 2017. Demand for warehousing, transport and logistics facilities is expected to accelerate with the recent arrival of Amazon (the Amazon distribution centre will be in Moorebank within the Liverpool LGA) which is forecast to boost Australia's retail turnover by up to 14% per annum. Other entrants include Alibaba and German supermarket chain Kaufland, which are actively seeking warehouse-style sites across Australia.

In light of this demand, Savills (2018) report that at December 2017, the Transport and Logistics sector accounted for approximately 42% of total industrial stock leased in Greater Sydney (refer to Figure 1).

FIGURE 1: LEASING ACTIVITY BY INDUSTRY TYPE AT DECEMBER 2017 (>1000 SQUARE METRES)



Source: Savills, 2018

Recent infrastructure investment

In June 2014, the NSW Government announced “Rebuilding NSW”, an initiative to solve infrastructure issues and support the State's growing population. Significant road infrastructure projects include WestConnex, which aims to connect several of Sydney's motorways, the widening of the M4 east of Parramatta, a duplication of the M5 East and NorthConnex. These projects provide the opportunity to improve the connectivity between the Northern and Outer West industrial precincts.

Western Sydney Airport is forecast to open in 2026. The Department of Infrastructure project that Western Sydney Airport will support almost 28,000 jobs by 2031⁶, including jobs in the airport and related jobs nearby. The Western Sydney Infrastructure Plan is a \$3.5 billion package of road investment which is underway to connect Western Sydney Airport with Greater Sydney.

The level of infrastructure investment in Western Sydney will provide an opportunity for development of employment and urban services land to complement the future operation of Western Sydney Airport. Future road and rail infrastructure investment will also enhance the freight and logistics network across Greater Sydney, contributing to economic growth. This will fuel demand for industrial land near major transport connections such as those which are being built around WSA.

⁶ Department of Infrastructure, Regional Development and Cities, 2018. 'Western Sydney Airport'. <http://westernsydneyairport.gov.au/>

Institutional investors

Knight Frank (2016) suggests that the key driver of demand for employment land comes from institutional demand, such as superannuation or private equity funds that are mandated to grow and expand their portfolios. Institutional demand offers largescale development pipelines, where land is purchased and often delivered within a five to ten-year timeline. Given the scale of these institutions and the competing needs of industrial businesses operating in Western Sydney, the competition is high.

Health and Education precincts

Liverpool has been identified as a Collaboration Area by the Greater Sydney Commission. Health and education precincts in the Eastern City, such as Sydney University and Royal Prince Alfred Hospital, are surrounded by industrial lands that support the function of the university and hospital. There is potential for Warwick Farm to accommodate a cluster of education, research, health and innovation services and facilities.

There is a continued and growing need to develop and test discoveries and innovations and to translate the research undertaken within health and education precincts into commercialised products. The growth of high-value manufacturing is closely aligned with health and education precincts. The ability of the Liverpool Collaboration Area to accommodate such facilities will strengthen the centre's global presence through an expansion of its scope.

Accelerated commercialisation of the research undertaken in the Collaboration Area will unlock significant potential to create new high-value jobs that otherwise may not be created in Liverpool.

2.5 Performance of the market

Pipeline of industrial floorspace supply

Leading property experts have explored the challenges in south west Sydney with the increasing demand for industrial land. JLL highlight that 'there is simply not enough land becoming available' (JLL, 2018). A consequence of this is increasing land values in established precincts and pressure for industrial investigation areas to be rezoned for development.

The NSW Department of Planning and Environment's Employment Land Development Monitor (ELDM) identified that in 2010, Greater Sydney had 1,012 hectares of undeveloped and serviced land. In 2017, this figure decreased to 663 hectares. JLL (2018) have calculated that approximately 100 hectares of industrial land is developed annually. Based on this, they calculate that there is approximately four years of industrial zoned and serviced land remaining in Greater Sydney.

The ELDM reports approximately 2,368 hectares of un-serviced land in Greater Sydney. Servicing this land is dependent on rental pre-commitments, which could be suppressed by high land values and rising occupancy costs. JLL (2018) note that the lead time to deliver serviced industrial land can be up to 15 months and is reliant on approval from Council.

There is approximately 6,654 hectares of potential industrial land surrounding Western Sydney Airport. The future role of this area in terms of land uses and the types of jobs that could be accommodated is currently under investigation. JLL (2018) has suggested that the level of uncertainty in this area is impacting the value of industrial lands and pre-commitments.

Savills (2018) report that in 2017, the Greater Sydney industrial market gained an additional 502,000sqm of industrial floorspace. Over 50% of this additional supply was delivered in Western Sydney.

JLL (2018) report that development completion levels in Western Sydney in 2017 were the highest in a decade. However, it was identified that supply in 2018 will exceed 2017 levels,

with over 524,000 sqm of development under construction and anticipated to be completed within the year.

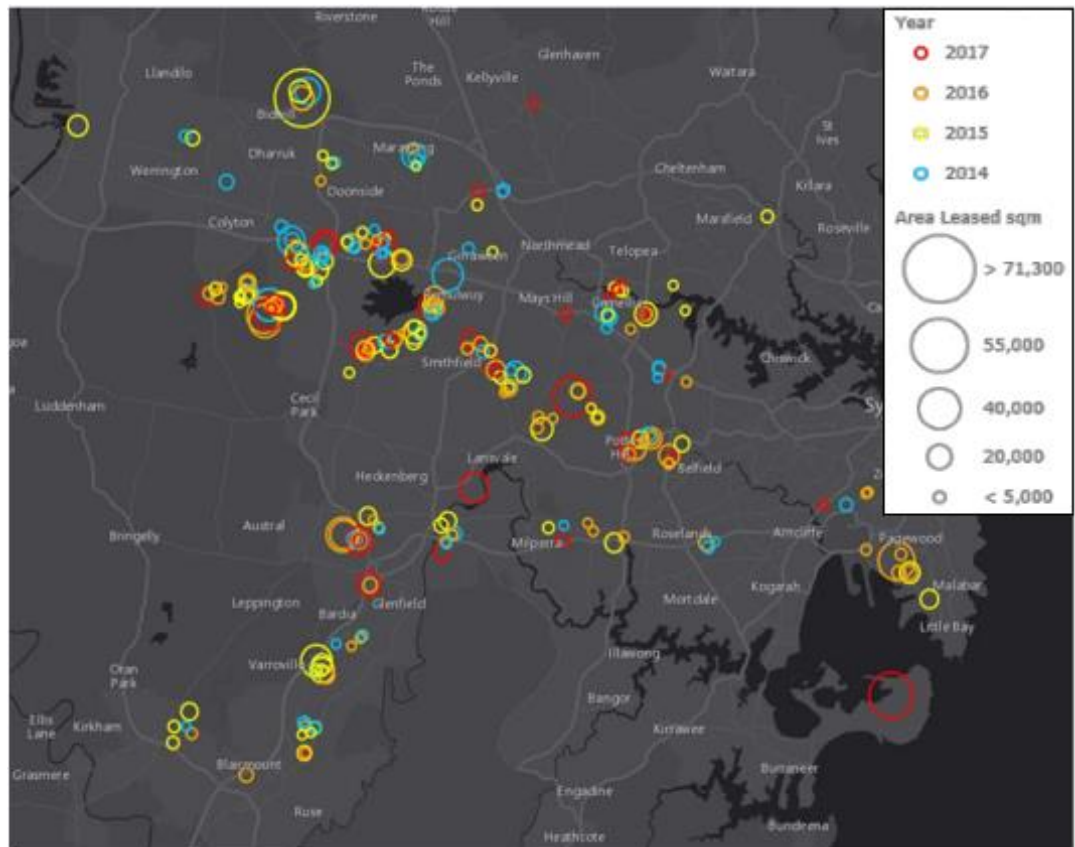
The take-up of industrial land is above historical averages

JLL (2018) report that gross take-up of industrial land in Greater Sydney has been well above the historical averages, particularly for Retail, Wholesale and Transport, Postal and Warehousing industry sectors. The South West, Outer South West and Outer North West (geographies defined by JLL) have experienced the greatest demand, achieving an average take-up of 845,000 square metres per annum. This is 48% above the 10-year average (JLL, 2018).

Savills (2018) report that in the 12 months to December 2017, approximately 1,132,000 square metres of industrial floorspace was taken-up for larger sites over 1,000sqm. This is almost 20% higher than the 10-year average of 950,000 square metres. Comparatively, smaller lots have experienced a reduction in take-up rates.

JLL (2018) map major tenant movements between 2014 and 2017. Figure 2 below highlights that between 2014 and 2017, Eastern Creek has absorbed ample tenant activity for a variety of floorspace sizes. In the South West region, Liverpool has experienced demand for smaller industrial floorspace (20,000 sqm) in the eastern part of the LGA and larger scales (up to 40,000sqm) in Hoxton Park. Demand for larger scale industrial floorspace in Hoxton Park and surrounding precincts has been driven by tenants such as Big W seeking appropriate floorspace for distribution facilities and within proximity to major arterial roads.

FIGURE 2: MAJOR INDUSTRIAL TENANT MOVEMENTS (2014 TO 2018)



Source: JLL, 2018

Rental value is above historical averages

Favourable economic conditions in NSW have contributed to an increase of 4.1% (between 2016 and 2017) in average industrial rental values across Greater Sydney, which is the strongest annual growth rate in 12 years (JLL, 2018).

Knight Frank (2016) highlight that favourable economic conditions in NSW have contributed to growth in prime rental values of approximately 5% across Greater Sydney. This rate is more than double the average over the past five years. Secondary rental growth rates were reported at approximately 3% at 2016. At a regional level, Knight Frank (2017) report that between 2016 and 2017, the south west has experienced strong rental growth of 10.2% for prime rental floorspace and 19% secondary rental floorspace.

Knight Frank (2016) highlight that pre-leasing activity is strong, particularly in Greater Sydney's west and south west regions. This level of growth is primarily attributed to recent government investment in infrastructure, low interest rates and competition for land in light of a shortage of supply.

In Liverpool LGA, Knight Frank (2016) report that between 2011 and 2016, prime rates increased by 15%, outperforming the growth of Greater Sydney with rental values reaching approximately \$115 per square metre at 2016. Knight Frank (2016) note that Moorebank has experienced growth of 1.8% for prime rental floorspace and secondary floorspace has remained stable.

With reference to Table 1, the south Sydney (this includes the industrial lands around Sydney airport) has experienced the greatest growth in net rental values for the prime market across Greater Sydney. Following this is the South West region (including Liverpool LGA), with net rental values increasing by 4.8% between 2016 and 2017.

The secondary market has experienced significant growth in net rental value in the South West, increasing by 12.3% between 2016 and 2017. As identified in Table 1, this rate compares to the North (achieving 8.9% growth) and South Sydney (8.7% growth) (JLL, 2018).

This level of growth marks a shift from a prolonged period of subdued rental growth. An increasing supply of industrial floorspace, driven not only by industry growth but by speculative developers interested in securing pre-commitments, has seen tenants signing rental agreements at competitive rates (Savills, 2018).

TABLE 1: NET RENTAL GROWTH (2016-2017)

Precinct	Prime	Secondary
North	4.7%	8.9%
South Sydney	6.8%	8.7%
Inner West	1.8%	5.3%
Outer North West	2.7%	2.0%
South West*	4.8%	12.3%
Outer Central West	4.2%	4.6%

Source: Jones Lang LaSalle, 2018

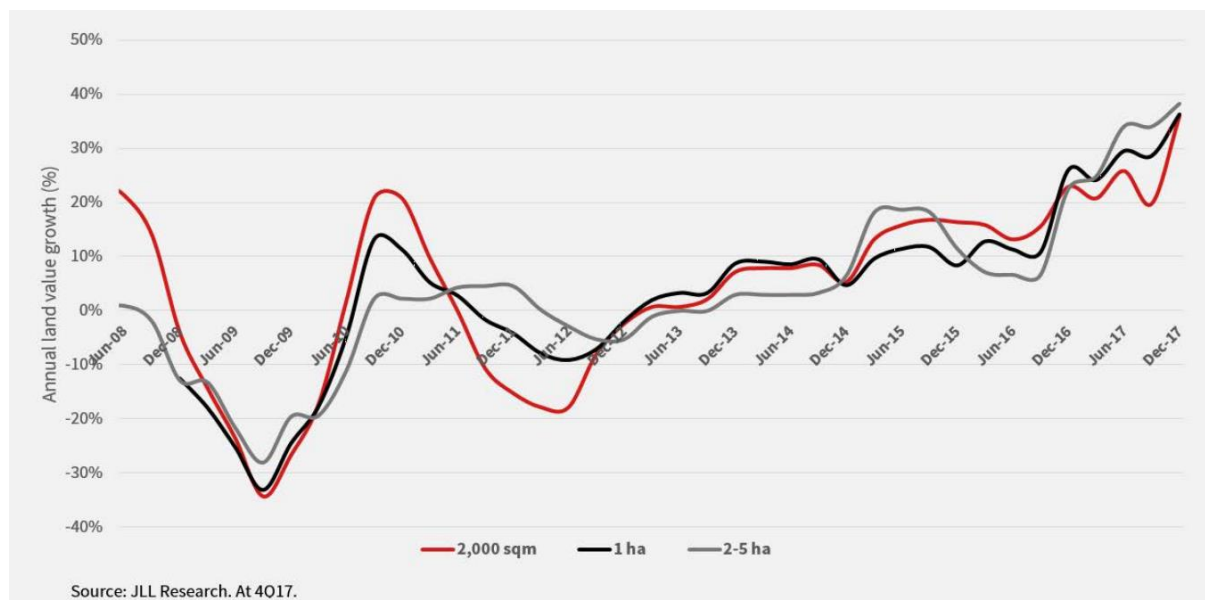
* This includes the Liverpool LGA.

Rising land values

At the end of 2017, average industrial land values in Greater Sydney increased by 37% (JLL, 2018). JLL (2018) note that this level of growth has not been recorded before. Figure 3 illustrates the relationship between annual land value growth and the size of industrial sites over time. Between December 2016 and 2017, industrial sites over 2.5 hectares experienced the greatest growth in land values. Smaller sites (2,000sqm) experienced a sharp decline in January 2017, however peaked at December 2017, reaching the same growth rate as 2-hectare sites.

Growth in land values reflect falling yields across the Greater Sydney industrial market. In South West Sydney, yields have fallen over the last five years from 8% to 6.37% in the prime market. Savills (2018) anticipate this trend will remain steady as investors continue to seek both core and non-core investment opportunities.

FIGURE 3: SYDNEY LAND VALUE GROWTH (2014 TO 2018)



Source: JLL, 2018

2.6 Summary

- The Greater Sydney Region Plan and the Western City District Plan highlight the importance of the provision of industrial land, particularly with the significant amount of population growth expected in Western Sydney.
- The Greater Sydney Commission recognises the importance of retaining, growing and enhancing industrial and urban services lands and has outlined policy directions to review and manage industrial land in the eastern half of Liverpool LGA and to plan for and manage industrial land in the western half.
- Providing adequate industrial land in the West is important to allow for job growth, reducing the need for residents to commute to other parts of Sydney.
- Investment in significant infrastructure, including the Moorebank Intermodal Terminal and the WSA, is expected to boost Liverpool's economy, and provide opportunities for new employment in the region.
- The Western Sydney City Deal is centred on the opportunities provided by the WSA and the development of a surrounding Aerotropolis, which Liverpool is expected to benefit from through its catalysing effect on employment and increased investment.
- Future supply of industrial lands is limited, which may be contributed to by uncertainty over the planning and delivery of WSA and the Badgerys Creek Aerotropolis, which is stalling planning and investment decisions.
- Industrial land take-up and industrial rental values are well above average in Greater Sydney and particularly in the west, with large lots attracting significant demand.
- Industrial land values have seen unprecedented growth, with large sites seeing the largest increases.

- Development around the WSA, particularly in its initial years, is expected to focus on industrial uses in industries complementary to the aviation sector, including transport and logistics, which will rely on the provision of suitable industrial land.
- The local policy context is increasingly focusing on the opportunities provided by the establishment of the WSA, as well as the Health and Education Precinct, building on the strength of existing assets while also attracting further investment.
- The need to diversify Liverpool's economy to capitalise on high-growth sectors and value-adding opportunities is also noted.

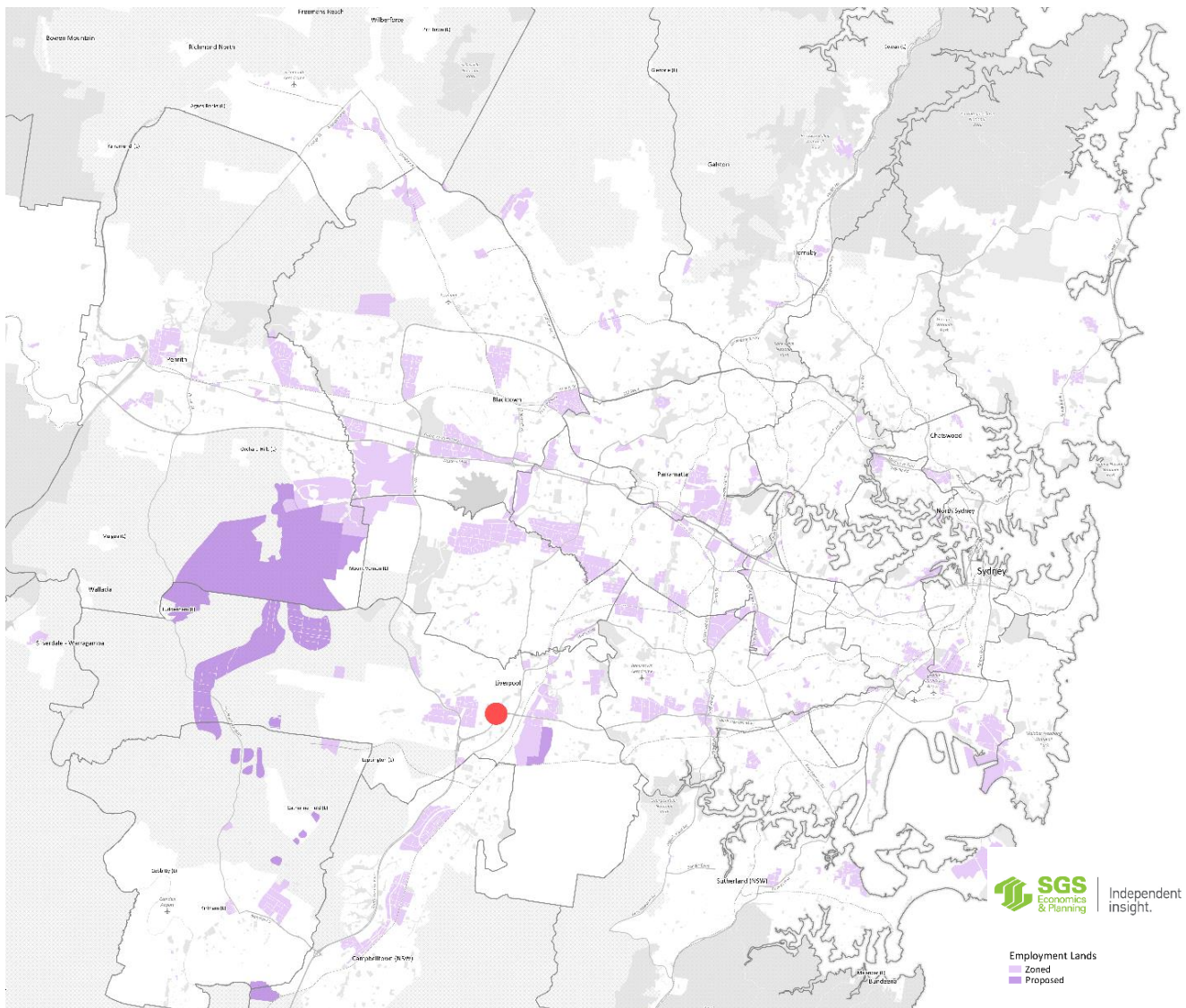
3. WESTERN CITY DISTRICT INDUSTRIAL PROFILE

This chapter establishes the strategic context of employment lands across Greater Sydney and profiles employment lands in the Western City District.

3.1 Industrial landscape of Greater Sydney

Figure 4 shows the strategic context of employment lands (zoned and proposed) across Greater Sydney. While industrial precincts are located throughout Greater Sydney, the size of the precincts in the Western City are much larger than the Central and Eastern Cities.

FIGURE 4: EMPLOYMENT LANDS ACROSS GREATER SYDNEY



Source: SGS Economics and Planning, 2018

3.2 Industrial landscape of the Western City District

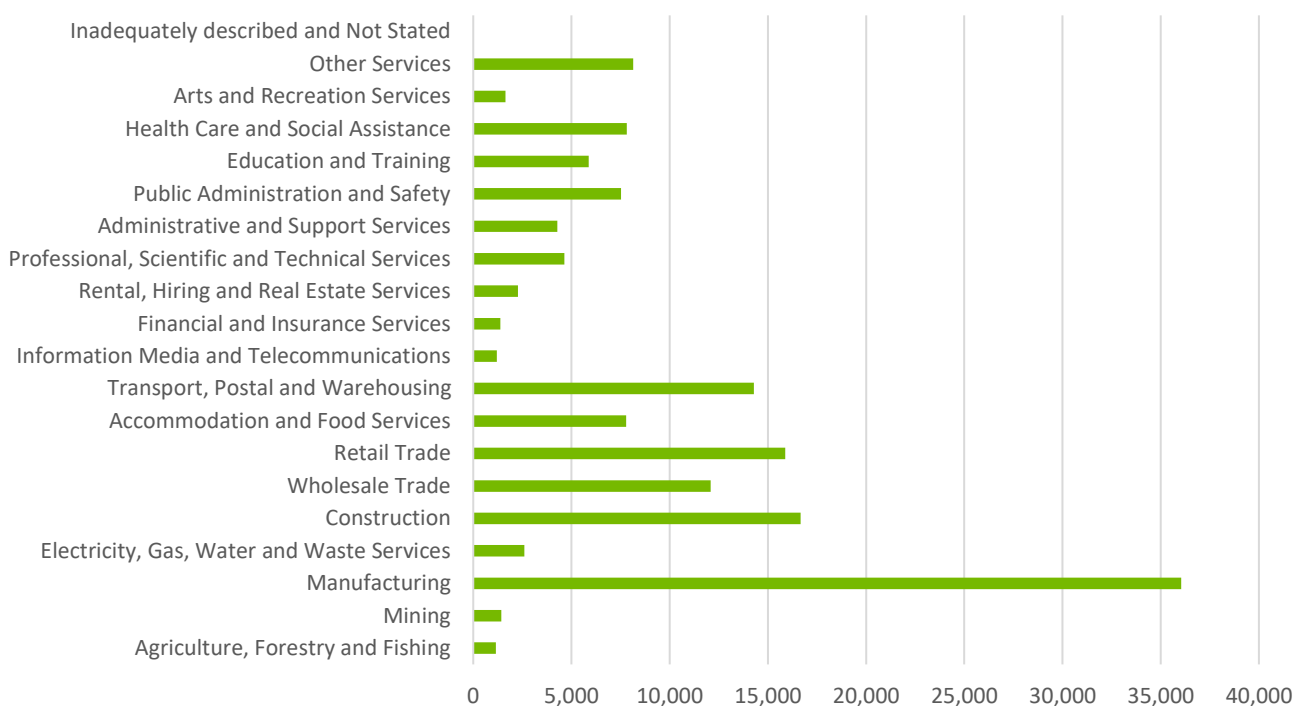
Current employment profile

In 2016, the Western City District contained 152,000 jobs in employment lands⁷, a 44% (47,000) increase since 2011. This accounts for a quarter of Greater Sydney's total jobs in employment lands and 41% of jobs in the Western City District.

Figure 5 below identifies the number of jobs in employment lands in the Western City District by industry (1 Digit ANZSIC). Manufacturing is the largest employer, accounting for 24% of jobs in employment lands in the Western District.

Construction (11%), Retail Trade (10%), Transport and Logistics (9%) and Wholesale Trade (8%) industries account for a considerable share of jobs in the District.

FIGURE 5: EMPLOYMENT PROFILE FOR THE WESTERN CITY DISTRICT'S EMPLOYMENT LANDS BY ANZSIC 1-DIGIT INDUSTRIES (2016)



Source: Transport Performance and Analytics (TPA) LU16 Forecasts and SGS Economics and Planning, 2018

⁷ Employment lands is defined by NSW Department of Planning's Employment Lands Development Monitor which essentially includes industrial zoned land.

Future employment profile

Over the next thirty years, jobs in employment lands in the Western City District are expected to increase by 86% (additional 131,000 jobs). The Professional Services industry is expected to experience the greatest growth during this period, increasing by 388%, although this is off a relatively low base of 4,600 jobs in 2016. This forecast reflects how jobs in the Western City District are expected to shift from a focus on manufacturing focus towards higher value skilled jobs. This is aligned with the Greater Sydney Commission's plans for a metropolis of three cities.

The greatest absolute increase in jobs is expected to be in the transport, postal and warehousing sector. The finance and insurance services (267% growth) and transport and logistics (145% growth) industries in employment lands in the Western City District are expected to grow to almost four and three times their current sizes respectively.

TABLE 2: JOB GROWTH IN THE WESTERN CITY DISTRICT EMPLOYMENT LANDS BY 1 DIGIT ANZSIC (2016 TO 2046)

Industry	2016	2046	Total change	% Change
Accommodation and Food Services	7,783	16,074	8,291	107%
Administrative and Support Services	4,275	9,958	5,683	133%
Agriculture, Forestry and Fishing	1,152	1,304	152	13%
Arts and Recreation Services	1,645	3,595	1,950	119%
Construction	16,672	28,582	11,910	71%
Electricity, Gas, Water and Waste Services	2,609	5,564	2,955	113%
Education and Training	5,884	11,944	6,060	103%
Financial and Insurance Services	1,380	5,063	3,683	267%
Health Care and Social Assistance	7,813	16,064	8,251	106%
Information Media and Telecommunications	1,205	2,546	1,341	111%
Manufacturing	36,040	41,120	5,081	14%
Mining	1,430	1,147	-283	-20%
Other Services	8,152	14,419	6,267	77
Public Administration and Safety	7,517	12,350	4,833	64%
Professional, Scientific and Technical Services	4,633	22,616	17,983	388%
Rental, Hiring and Real Estate Services	2,275	5,467	3,192	140%
Retail Trade	15,879	30,202	14,323	90%
Transport Postal and Warehousing	14,291	34,946	20,655	145%
Wholesale Trade	12,091	21,070	8,979	74%
Total	152,725	284,032	131,307	86%

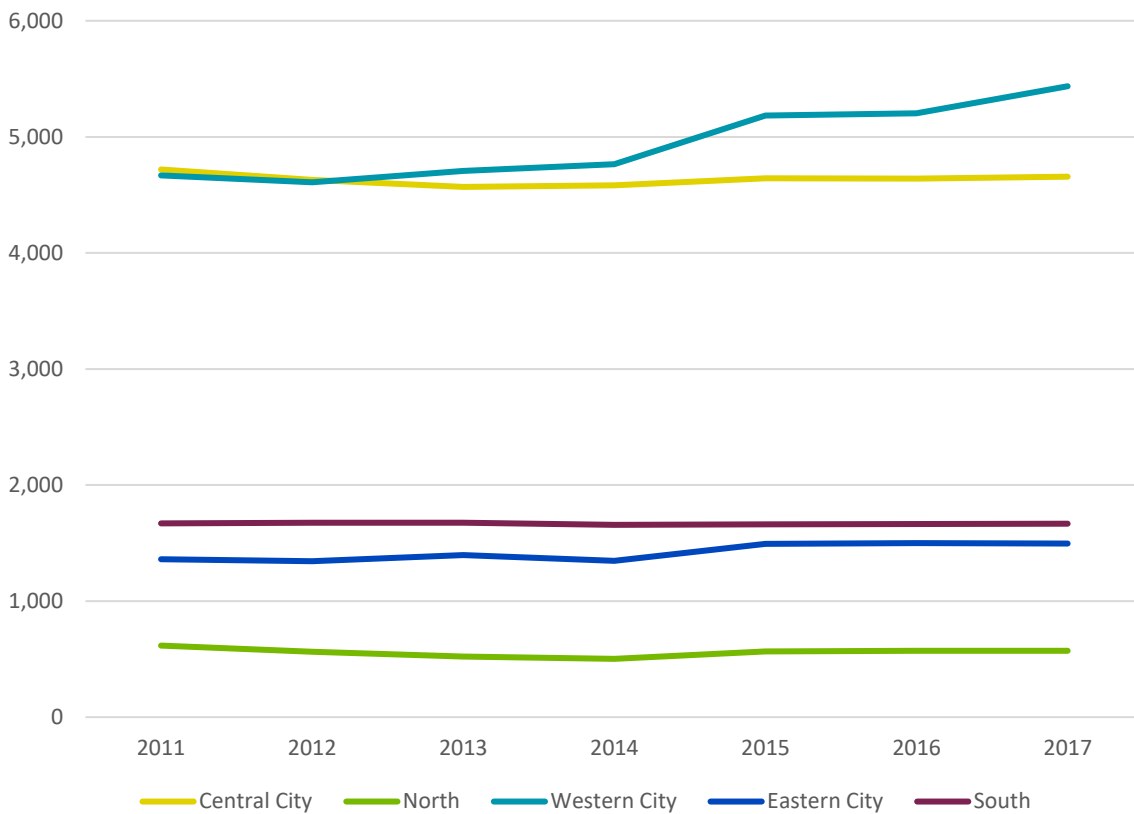
Source: TPA LU16 Forecasts, SGS Economics and Planning, 2018

Current supply of employment lands

Growth of the employment lands in the Western City District is dependent on the availability of suitably zoned land.

Figure 6 shows the growth in supply of zoned employment lands by district across Greater Sydney. Zoned employment lands in the Western City District have increased steadily since 2011 and continue to account for the greatest land area of zoned employment land supply compared to other Districts in Greater Sydney. The supply of employment lands in established areas in the Eastern City has remained consistent over the last six years.

FIGURE 6: ZONED EMPLOYMENT LAND (HA) BY DISTRICT IN GREATER SYDNEY (2011 TO 2017)

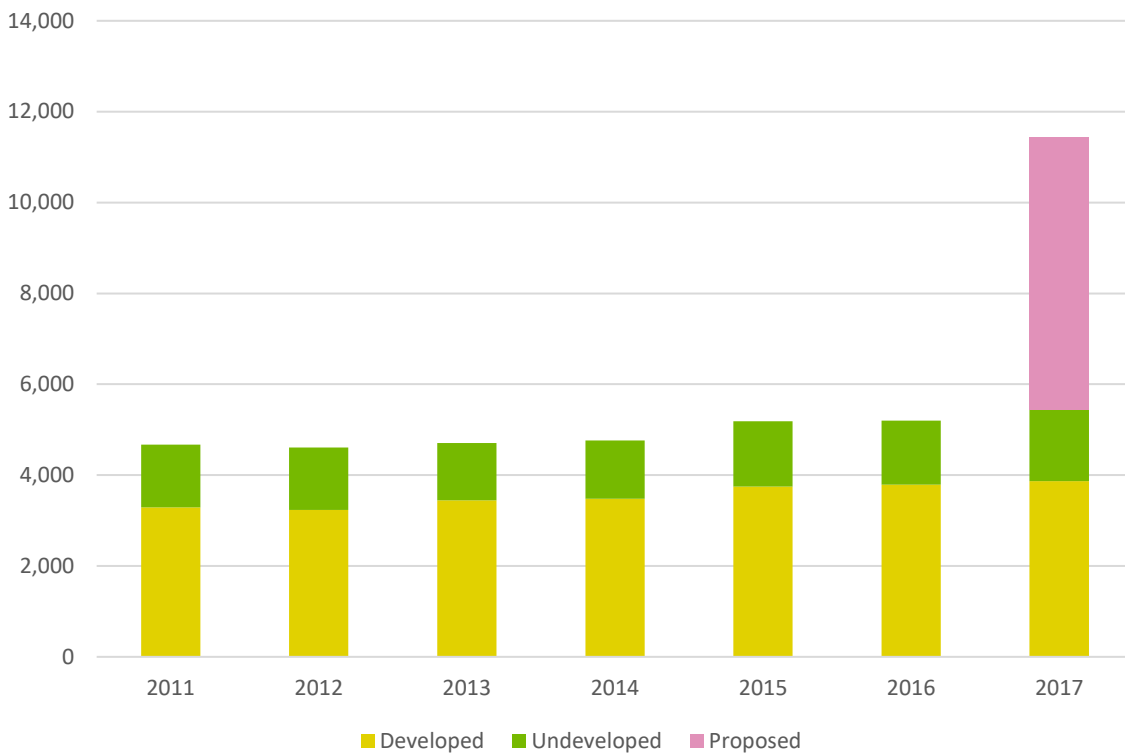


Source: NSW DPE, Employment Lands Development Monitor, 2017

As identified in Figure 7, there is a similar amount of land proposed (or under investigation) for future employment land as there is zoned for employment and either currently developed or undeveloped.

The proportion of developed and undeveloped land has remained roughly consistent over the six-year period of 2011 to 2017, with a median amount of 1,377 hectares of undeveloped land each year in the Western City District. In 2017, the amount of undeveloped land increased by 11% from 2016 to 1,570 hectares.

FIGURE 7: DEVELOPED, UNDEVELOPED AND PROPOSED EMPLOYMENT LANDS (HA) IN WESTERN CITY DISTRICT (2011 TO 2017)



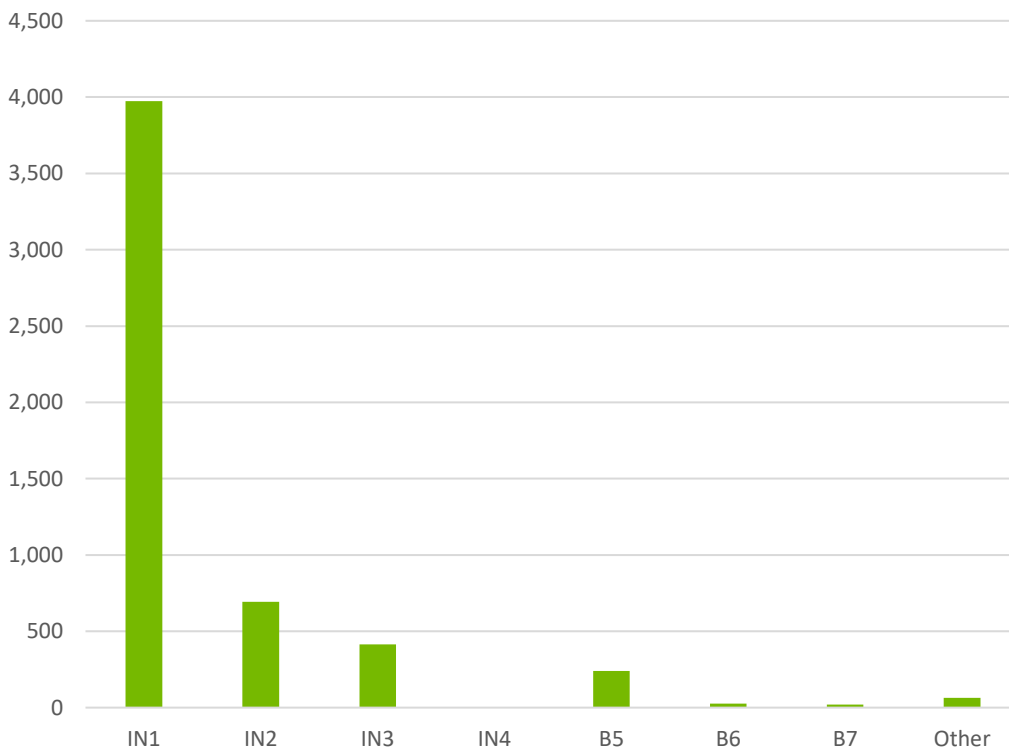
Source: NSW DPE, Employment Lands Development Monitor, 2017

Figure 8 illustrates the split in supply of employment lands across various land use zones in the Western City District. Most employment land (73%) in the Western City District is in the IN1 (General Industrial) zone. Approximately 13% of employment lands in the Western City District are in the IN2 (Local Light Industrial) and 8% in the IN3 (Heavy Industrial) zone.

There is a small proportion of employment lands located in the business zones including B5 (Business Development), B6 (Business Development) and B7 (Business Park).

The future role of employment lands in the Western City District is uncertain, particularly the land around Western Sydney Airport. It is important to understand the types of uses that are likely to locate near the airport in order to ensure the appropriate land use zone is applied to attract industrial jobs. The Professional, Scientific and Technical Services industry is forecast to experience significant job growth by 2046. There may be future competition with industrial uses and Professional, Scientific and Technical Services industries seeking land in business zones once Western Sydney Airport becomes operational.

FIGURE 8: CURRENT SUPPLY OF EMPLOYMENT LANDS BY LAND USE ZONE IN WESTERN CITY DISTRICT



Source: NSW DPE, Employment Lands Development Monitor, 2017 and SGS Economics and Planning, 2018

3.3 Adjoining LGAs

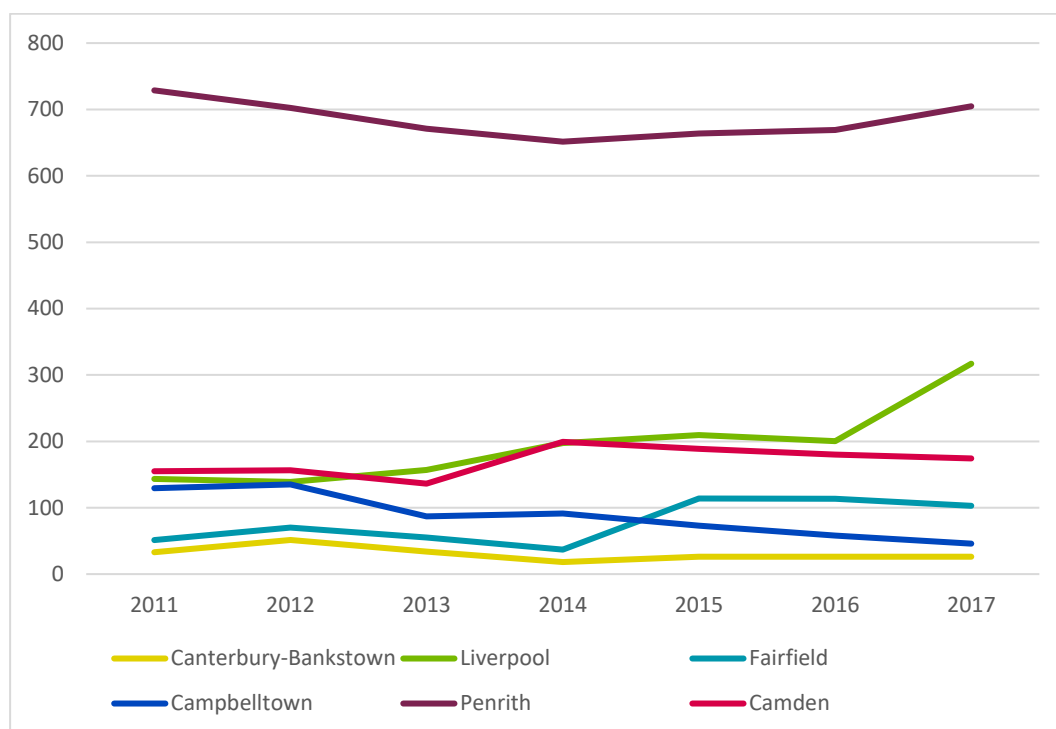
As shown in Figure 4, there are several large industrial precincts near the boundaries of Liverpool in adjacent LGAs. This includes substantial precincts at Bankstown Airport, Villawood, Smithfield, Wetherill Park, Ingleburn and Eastern Creek. The use and development of these precincts will have implications for the industrial landscape in Liverpool.

Figure 9 shows the amount of undeveloped industrial land in Liverpool LGA and in each of the councils adjoining Liverpool’s urban area. Liverpool and Penrith have the largest amount of zoned but undeveloped industrial land, with smaller areas in Camden and Fairfield and minimal supplies in Campbelltown and Canterbury-Bankstown. This reflects the status of Liverpool, Penrith, Camden and Fairfield as councils containing greenfield land which is yet to be developed, some of which is zoned for industrial development. By contrast, Campbelltown and Canterbury-Bankstown are more fully developed and have minimal land on which new industrial development can occur.

The precincts with the largest amount of undeveloped industrial land in the Canterbury-Bankstown, Fairfield, Campbelltown, Penrith and Camden LGAs are shown in Table 3. Seven of the ten precincts are located in the Penrith LGA and most of the precincts are in greenfield development areas.

The South of Sydney Water Pipeline and Erskine Park precincts, along with the adjacent Eastern Creek precinct in the Blacktown LGA, are part of the Western Sydney Employment Area. These precincts are near the intersections of the M4 and M7 motorways and are currently being developed by large institutional developers predominately for large-scale freight, logistics, warehousing and manufacturing purposes.

FIGURE 9: UNDEVELOPED INDUSTRIAL LAND (IN HECTARES) IN LIVERPOOL LGA AND THE IMMEDIATELY ADJOINING COUNCIL AREAS



Source: NSW DPE, Employment Lands Development Monitor, 2017

Of the precincts with large amounts of undeveloped land shown in Table 5, only Leppington North is proximate to the current and future population centres in Liverpool LGA. The only substantial portions of undeveloped land within the existing urban area are in Penrith LGA, Smeaton Grange (Camden), and a smaller undeveloped area at Wetherill Park in Fairfield (note that some of this land may have been developed since the compilation of this data in January 2017).

TABLE 3: TEN INDUSTRIAL PRECINCTS WITH THE MOST UNDEVELOPED INDUSTRIAL LAND (IN HECTARES) IN THE LGAS SURROUNDING LIVERPOOL

Precinct	LGA	Undeveloped	Developed	Total
South of Sydney Water Pipeline	Penrith	337.2	0	337.2
Erskine Park	Penrith	115.7	249.8	365.5
North Penrith	Penrith	92.4	167.8	260.2
Leppington North	Camden	70.8	0	70.8
South of Sydney Water Pipeline	Fairfield	51.3	200.8	252.1
Smeaton Grange	Camden	49.8	149.7	199.5
St Marys	Penrith	49.2	175.4	224.6
Mamre West	Penrith	46.9	0	46.9
Emu Plains	Penrith	38	93	131
Wetherill Park	Fairfield	31.5	527.6	559.1

Source: NSW DPE, Employment Lands Development Monitor, 2017

The average take-up of industrial land per year for Liverpool and each adjacent LGA between 2009-2016 is shown in Table 4. The largest take-ups have been in Liverpool and Penrith, which are the LGAs which have had the largest amount of undeveloped industrial land.

TABLE 4: AVERAGE ANNUAL TAKE-UP OF INDUSTRIAL LAND (IN HECTARES) IN LIVERPOOL AND ADJACENT LGAS FROM 2009-2016

LGA	Canterbury-Bankstown	Fairfield	Liverpool	Penrith	Camden	Campbelltown	Total
Average Take-up	2.3	8.9	17.8	22.4	7.0	9.1	74.5

Source: NSW DPE, Employment Lands Development Monitor, 2017

3.4 Summary

- The Western City District has the greatest supply of developed, undeveloped and proposed employment lands.
- Manufacturing, Construction, Transport and Logistics and Wholesale Trade industries employ a large proportion of jobs in the Western City District.
- These industries are forecast to grow considerably, playing an important role in the Western Sydney economy over the next 30 years. Transport and Logistics industries are forecast to grow almost three times their current sizes respectively over the next 30 years.
- Development of Moorebank Intermodal Terminal will be a significant player in driving demand for Transport and Logistics floorspace. It is important that established precincts and land under investigation appropriately support the growth of these industries, hence the importance of this study.
- Non-industrial uses such as Professional Services and Finance and Insurance Services are forecast to experience significant growth in employment lands. However, it is likely that land under investigation around Western Sydney Airport Growth Area will absorb much of the forecast growth of knowledge intensive jobs in employment lands (note that these sectors are also likely to grow in centres such as Liverpool which are not part of industrial precincts).
- Most of the precincts with large amounts of undeveloped industrial land in the LGAs adjoining Liverpool are in Penrith or in greenfield release precincts, with a substantial amount of undeveloped land in the Western Sydney Employment Area. There is little undeveloped industrially zoned land near the existing population centres of Liverpool LGA.

4. LIVERPOOL'S INDUSTRIAL PROFILE

This chapter establishes the employment profile and current supply of employment lands in Liverpool LGA.

4.1 Industrial landscape of Liverpool LGA

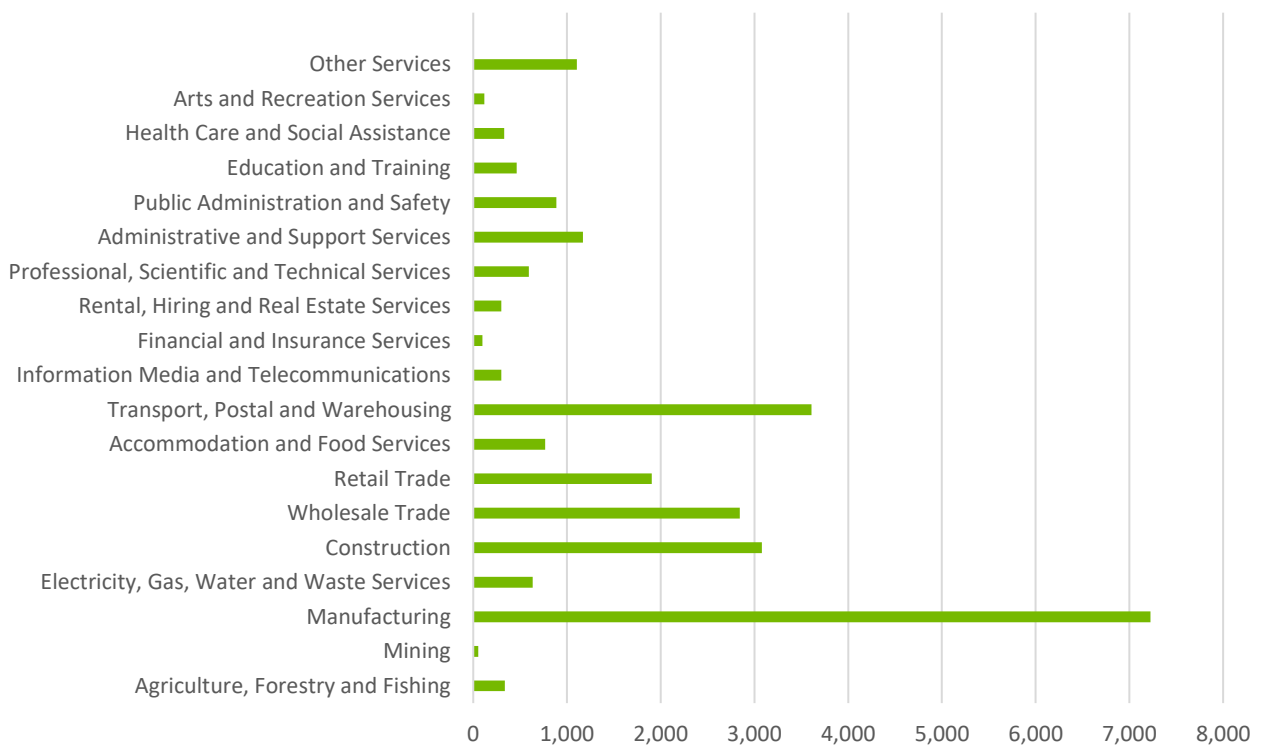
Current employment profile

There are currently 25,600 jobs in employment lands in Liverpool LGA, accounting for 17% of total jobs in employment lands in the Western City District and 33% of jobs in the Liverpool LGA. Between 2011-2016, jobs in employment lands in Liverpool LGA increased by 2% (or an additional 600 jobs).

Like the employment profile of the Western City District, a large proportion of jobs in Liverpool's employment lands are in Manufacturing (28%) and Transport, Postal and Warehousing (14%) (refer to Figure 10). Construction (12%) and Wholesale Trade (11%) also account for a large proportion of jobs in the LGA.

A small proportion (2%) of jobs in employment lands are in Professional, Scientific and Technical Services.

FIGURE 10: EMPLOYMENT PROFILE OF LIVERPOOL'S EMPLOYMENT LANDS BY ANZSIC (1-DIGIT) INDUSTRIES (2016)



Source: ABS, 2016 and SGS Economics and Planning, 2018

Industry specialisation

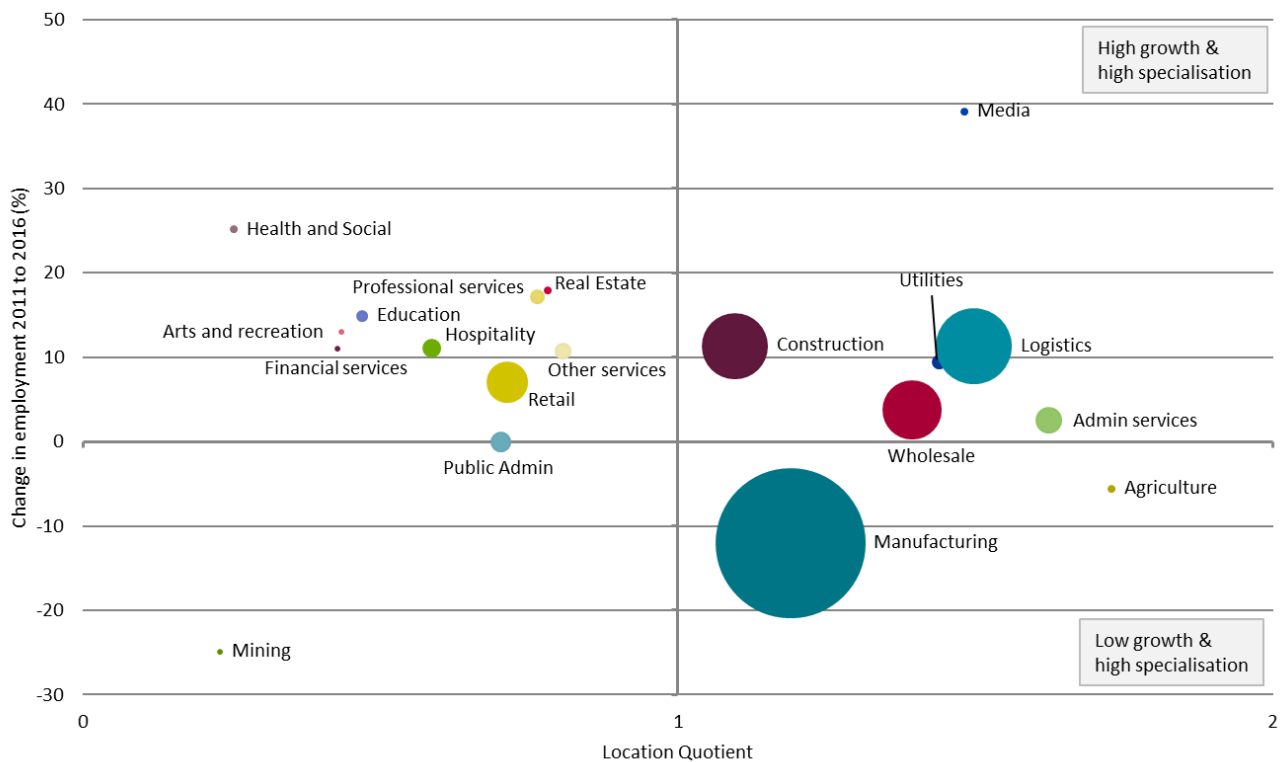
Liverpool's employment lands

A location quotient analysis has been undertaken to identify changes in the competitive mix and local economic structure. The Location Quotient identifies relative concentration and growth of industries to better understand where a local economy's competitive strength lies from an employment perspective.

Figure 11 shows the growth of industries located in the employment lands in Liverpool LGA between 2011 and 2016 compared to industries located in employment lands in Western Sydney. Of most interest are the industries in the top right quadrant – those that are both growing the most and are most specialised. The top right quadrant indicates relatively strong concentrations of specialisation in Liverpool's employment lands including Construction, Freight and Logistics, Wholesale, Administration services and Media compared to Western Sydney. Notably, manufacturing has experienced low job growth, yet continues to be specialised in Liverpool.

The top left quadrant shows industries that are growing in Liverpool's employment lands but not relatively concentrated compared to the Western Sydney economy, including Health and Social, Professional services, Education, Real Estate, Arts and recreation, Hospitality, Financial services, Other services, Retail and Public Admin.

FIGURE 11: LQ* OF JOBS IN LIVERPOOL'S EMPLOYMENT LANDS COMPARED WITH WESTERN SYDNEY'S EMPLOYMENT LANDS



Source: SGS, 2018

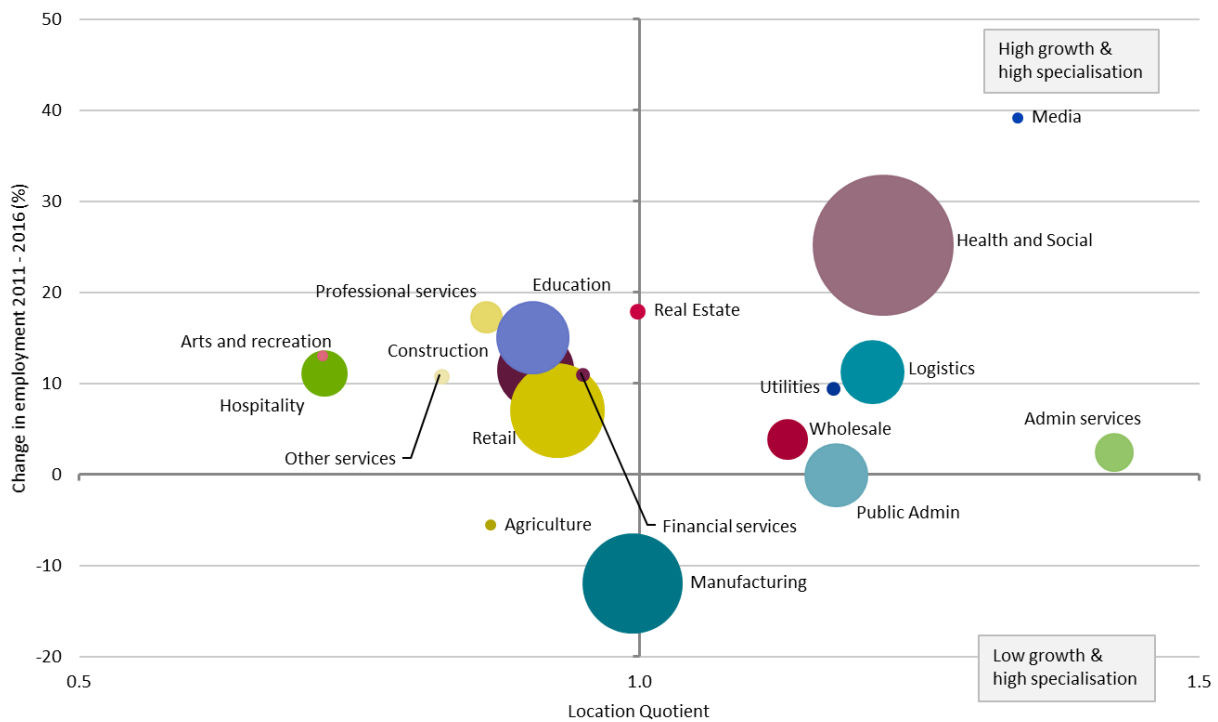
*Location Quotient

Total jobs in Liverpool

Figure 12 shows the industry specialisation of total jobs across Liverpool LGA (not just the employment lands). A significant difference is the high specialisation of the Health and Social Assistance industry in Liverpool compared to Western Sydney. This finding is well aligned with the Greater Sydney Commission’s strategic direction for the Liverpool Collaboration Area.

Other industries in the top right quadrant showing strong specialisation include Freight and Logistics, Wholesale, Administration Services and Media. The high specialisation and growth of these industries in Liverpool’s employment lands illustrates the importance of employment lands to Liverpool’s economy.

FIGURE 12: LQ* OF JOBS TOTAL JOBS IN LIVERPOOL COMPARED WITH TOTAL JOBS IN WESTERN SYDNEY



Source: SGS, 2018
 *Location Quotient

Future employment profile

Over the next 30 years, the number of jobs in employment lands in Liverpool are expected to more than double to reach around 59,300 jobs by 2046.

The highest rates of growth are expected to be seen in the Professional Services and Finance and Insurance Services industries, while the highest absolute increase in jobs is expected to be in transport and logistics. Industries attracted to Industrial precincts will still be some of the most significant employers in the LGA (Manufacturing, Transport, Postal and Warehousing and Wholesale Trade).

TABLE 5: PROJECTED JOB GROWTH IN LIVERPOOL'S EMPLOYMENT LANDS (2016 TO 2046)

Industry	2016	2046	Total change	% Change
Accommodation and Food Services	767	2,364	1,597	208%
Administrative and Support Services	1,172	1,914	742	63%
Agriculture, Forestry and Fishing	336	234	-102	-30%
Arts and Recreation Services	120	306	186	155%
Construction	3,078	5,835	2,757	90%
Electricity, Gas, Water and Waste Services	633	1,112	479	76%
Education and Training	463	899	436	94%
Financial and Insurance Services	99	1,416	1,317	1,330%
Health Care and Social Assistance	331	876	545	165%
Information Media and Telecommunications	301	500	199	66%
Manufacturing	7,224	7,466	243	3%
Mining	55	46	-9	-16%
Other Services	1,107	2,730	1,623	147%
Public Administration and Safety	888	1,720	832	94%
Professional, Scientific and Technical Services	595	4,568	3,973	668%
Rental, Hiring and Real Estate Services	299	482	183	61%
Retail Trade	1,905	4,518	2,613	137%
Transport Postal and Warehousing	3,610	16,166	12,556	348%
Wholesale Trade	2,843	6,125	3,282	115%
Total	25,825	59,278	33,453	130%

Source: TPA LU16 Forecasts, SGS Economics and Planning, 2018

Industrial Zones

Under the Liverpool Local Environmental Plan 2008 (LLEP2008), there are three industrial zones: IN1 General Industrial, IN2 Light Industrial and IN3 Heavy Industrial. The objectives of the IN1 General Residential Zone include to:

- Provide for a wide range of industrial and warehouse land uses
- Minimise adverse effects of industry on other land uses
- Encourage research and development by prohibiting land uses that are unsightly or unpleasant

The objectives of the IN2 Light Industrial Zone include to:

- Provide a wide range of light industrial, warehouse and related land uses
- Support the viability of centres
- Allow land uses that are compatible with industry and that can buffer heavy industrial zones while not detracting from centres of activity

The objectives of the IN3 Heavy Industrial Zone include to:

- Provide suitable areas for those industries that need to be separated from other land uses
- Preserve opportunities for a wide range of industries and similar land uses by prohibiting land uses that detract from or undermine such opportunities

TABLE 6: A SAMPLE OF THE USES PERMITTED OR PROHIBITED IN THE INDUSTRIAL ZONES IN THE LIVERPOOL LOCAL ENVIRONMENTAL PLAN 2008

Land Use	IN1	IN2	IN3
Depots	Y	Y	Y
Freight transport facilities	Y	N	Y
Garden centres	Y	Y	N
General industries	Y	N	Y
Heavy industrial storage establishments	N	N	Y
Heavy industries	N	N	Y
Industrial retail outlets	Y	Y	N
Information and education facilities	Y	Y	N
Light industries	Y	Y	Y
Mortuaries	Y	N	Y
Neighbourhood shops	Y	Y	N
Recreation facilities (indoor)	Y	Y	N
Resource recovery facilities	N	N	Y
Service stations	N	Y	N
Storage premises	Y	Y	Y
Take away food and drink premises	Y	Y	N
Timber yards	N	Y	N
Transport depots	Y	Y	Y
Truck depots	N	Y	Y
Vehicle repair stations	Y	Y	Y
Vehicle sales or hire premises	N	Y	N
Veterinary hospitals	N	Y	N
Warehouse or distribution centres	Y	Y	Y

Source: Liverpool Local Environmental Plan 2008

The permissibility of a sample of relevant industrial uses is shown in Table 6 for the IN1, IN2 and IN3 zones in Liverpool. Apart from heavy industrial uses there is a high degree of overlap between which uses are permissible in each zone, and IN1 permits uses varying from large scale sub-regional uses to local urban services. This partly reflects the aims of the zones to allow for a wide range of uses. The differences in permissibility between each zone seem to be primarily concerned with separating industrial uses with amenity impacts from sensitive receptors such as residential areas.

However, the permitted uses in each zone do not demarcate between local urban services and larger developments which support footloose businesses. For example, a large warehouse, logistics facility or manufacturing facility without significant environmental effects could locate in the IN2 zone. This would not be aligned with the IN2 zone objective of supporting the viability and operations of centres, which would require land to be reserved for urban services.

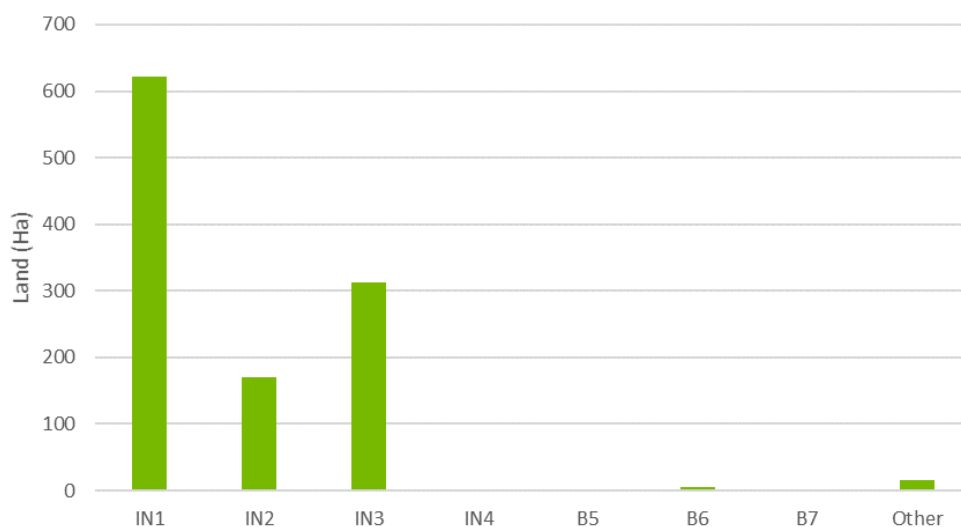
Current supply of employment lands

Figure 13 illustrates the distribution of employment lands within the industrial zones under the LLEP2008 and the State Environmental Planning Policy (Sydney Region Growth Centres) 2006.

Most of Liverpool's employment lands (622 hectares) are zoned IN1 (General Industrial). The rest of the supply is distributed in the IN2 (Light Industrial) (170 hectares) and IN3 (Heavy

Industrial) (313 hectares) zones. There is a small amount of employment land zoned B5 (Business Development), B6 (Enterprise Corridor) and other.

FIGURE 13: EMPLOYMENT LANDS IN LIVERPOOL BY ZONE (2016)



Source: NSW DPE, Employment Lands Development Monitor, 2018 and SGS, 2018

Table 7 identifies the distribution of employment lands by land use zone and employment precinct. Most of the IN1 (General Industrial) land is contained in Moorebank (referred to as Moorebank/Moorebank Defence Lands in the Department of Planning's Employment Lands Development Monitor), including the Moorebank Intermodal Terminal. This precinct is Liverpool's largest with 492 hectares of zoned employment land.

The Yarrunga/Prestons precinct has the most IN3 (Heavy Industrial) zoned land (230 hectares).

TABLE 7: EMPLOYMENT LANDS SUPPLY BY LIVERPOOL PRECINCT, 2017

Precinct	IN1	IN2	IN3	IN4	B5	B6	B7	Other
Moorebank/Moorebank Defence Lands	436	55	0	0	0	0	0	1
Future Industrial	0	0	0	0	0	0	0	0
Chipping Norton	0	37	64	0	0	0	0	-0
Priddle/Scrivener St/Warwick Farm Racecourse	36	0	0	0	0	0	0	-0
Yarrunga/Prestons	74	35	230	0	0	4	0	-0
Rossmore	0	0	0	0	0	0	0	0
Hoxton Park Airport/Cecil Park	37	3	0	0	3	0	0	-1
Sappho Road	17	0	0	0	0	0	0	0
Orange Grove	22	0	0	0	0	0	0	0
Kemps Creek	0	0	0	0	0	0	0	0
Cross Roads, Casula	0	0	18	0	0	0	0	-1
Austral	0	40	0	0	0	0	0	2
Proposed WSEA	0	0	0	0	0	0	0	0
Total	622	170	313	0	3	4	0	1

Source: NSW Department of Planning, 2017 and SGS, 2018

The industrial landscape of Liverpool is dominated by jobs in Manufacturing, Construction and Transport Postal and Warehousing. The objectives of the IN1 (General Industrial) zone encourage the operation of these industries.

Precincts such as Chipping Norton and parts of Moorebank mostly contain urban services industrial uses which require direct access to residential markets. However, these precincts contain a variety of land use zones.

4.2 Summary

- There are 3,276 hectares of zoned and proposed employment lands in Liverpool LGA. Of the total, 1,116 hectares are zoned for employment (developed and undeveloped) and the remainder is proposed. The proposed land under investigation for employment is in the western half of the LGA around the Western Sydney Airport Growth Area.
- Industries operating in Liverpool's employment lands are predominately situated in industrial zones and the B5 (Business Development) zone. The IN1 (General Industrial) zone contains most of the LGA's employment lands. The uses operating in the IN1 (General Industrial) zone vary from large scale subregional uses to local urban services. The application of the IN1 (General Industrial) zone doesn't necessarily reflect the different locational needs of uses in the zone.
- The Manufacturing industry is currently the largest industrial sector by jobs in the LGA. Manufacturing in Liverpool is specialised compared to all employment lands in Western Sydney and is forecast to grow slowly over the next 30 years. Freight and logistics, Construction and Wholesale industries also have a degree of specialisation in Liverpool's employment lands. The concentration of these industries is a defining attribute of Liverpool's economy.
- Non-industrial jobs in employment lands are forecast to experience strong growth to 2046. While the numbers of high-value and knowledge jobs is likely to grow in Liverpool City Centre, most of the growth of these jobs in employment lands is likely to be absorbed around Western Sydney Airport in concert with the development of the Badgerys Creek Aerotropolis.

5. PRECINCT PROFILING

This chapter establishes the precinct context and employment profile of the employment lands in Liverpool LGA.

5.1 Precinct profiling

An overview of the context of the built form and top industry of employment for each precinct in Liverpool LGA is presented below. The precincts are presented in alphabetical order.

The most recent data available for developed and undeveloped land is the Employment Land Development Monitor (ELDM) from January 2017. Analysis of satellite imagery indicates that industrial development has occurred rapidly since January 2017, so this data may not provide an accurate indication of the amount of undeveloped land.

Austral

Snapshot:

Employment: 68 jobs (0.3% of employment within Liverpool’s employment lands)

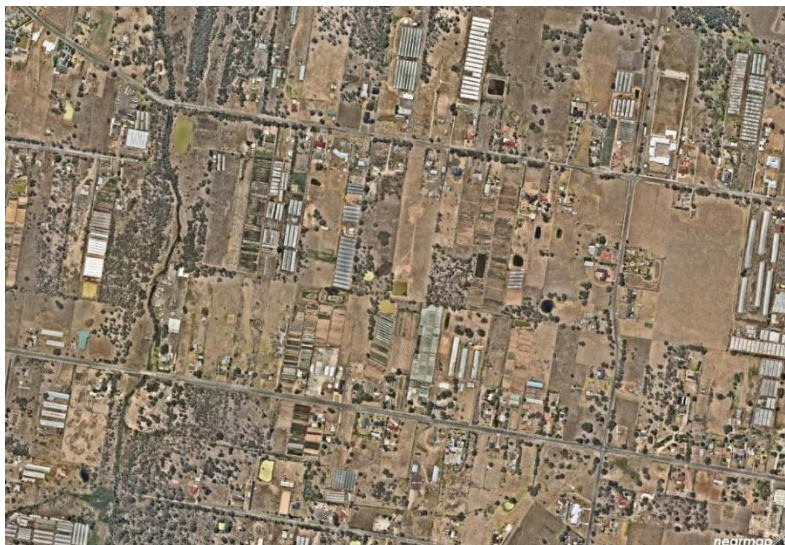
Developed lands: 0 Ha

Undeveloped lands: 41.8 Ha

Built form and location

Austral is located to the west of Liverpool (see Figure 14), just outside the urban area. While the precinct is zoned IN2 (Light Industrial), it remains entirely undeveloped, containing a mix of agricultural and rural residential uses. The precinct is located within a reasonable distance of the existing metropolitan approximately 5km west of the M7, however the expansion of urban development through the area will result in upgrades to the road network, along with the creation of new population centres.

FIGURE 14: AERIAL VIEW OF THE AUSTRAL PRECINCT

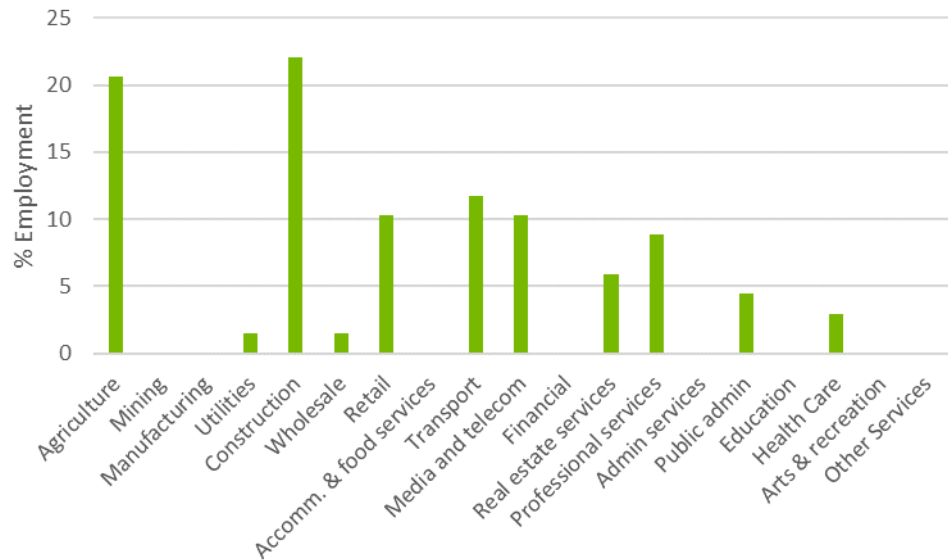


Source: Nearmap, 2018

Employment and industry profile

Given that the precinct and its surrounding areas are undeveloped, the employment profile of the area is small scale and reflects the range the uses of the land for agriculture or home-based businesses typically found in peri-urban areas.

FIGURE 15: AUSTRAL EMPLOYMENT BY 1-DIGIT ANZSIC INDUSTRY, 2016



Source: SGS Economics and Planning, 2018 based on TPA LU16 Forecasts

TABLE 8: AUSTRAL - TOP TEN INDUSTRIES OF EMPLOYMENT BY 3-DIGIT ANZSIC

Rank	Industry	Jobs
1	Mushroom and Vegetable Growing	18
2	Child Care Services	9
3	Land Development and Site Preparation Services	8
4	School Education	8
5	Sports and Physical Recreation Activities	8
6	Poultry Farming	7
7	Agriculture and Fishing Support Services	7
8	Building Structure Services	7
9	Building Installation Services	7
10	Other Goods and Equipment Rental and Hiring	7

Source: ABS Census 2016

Chipping Norton

Snapshot:

Employment: 3,657 jobs (14.2% of employment within Liverpool's employment lands)

Developed lands: 100 Ha

Undeveloped lands: 1 Ha

Built form and location

Chipping Norton is located to the east of the Liverpool centre. It is an established industrial precinct comprising IN2 and IN3 zones with a built form consisting predominantly of industrial strata units, some with large total floorplates. A mix of properties have a significant amount of hardstand or lot space, providing for uses such as freight yards and recycling centres (see Figure 16:).

The precinct has a good level of accessibility, accessing the arterial road network via Newbridge Road, with access to the M5 Motorway in 5-8 minutes.

It is starting to see a presence of population serving or large format retail businesses such as CrossFit, Kennards Hire and Flower Power, particularly along the edges of the industrial area which front residential uses.

FIGURE 16: AERIAL VIEW OF THE CHIPPING NORTON PRECINCT

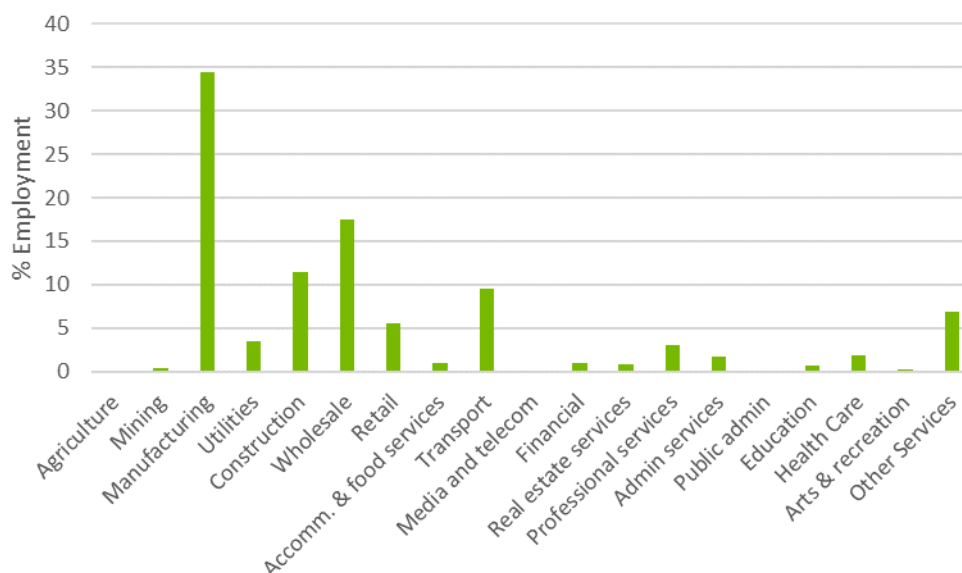


Source: Nearmap, 2018

Employment and industry profile

Manufacturing uses dominate employment within the precinct, making up 35% of total employment. Significant employment within the precinct is also found within the wholesaling, construction services and transport postal and warehousing industries. There is a notable number of jobs within the automotive repair services and motor parts retailing sectors.

FIGURE 17: CHIPPING NORTON - EMPLOYMENT BY 1-DIGIT ANZSIC INDUSTRY, 2016



Source: SGS Economics and Planning, 2018 based on TPA LU16 Forecasts

TABLE 9: CHIPPING NORTON - TOP TEN INDUSTRIES OF EMPLOYMENT BY 3-DIGIT ANZSIC

Rank	Industry	Jobs
1	Road Freight Transport	272
2	Domestic Appliance Manufacturing	258
3	Automotive Repair and Maintenance	133
4	Building Installation Services	123
5	Manufacturing, nfd	107
6	Motor Vehicle and Motor Vehicle Parts Wholesaling	89
7	Polymer Product Manufacturing	83
8	Furniture, Floor Covering and Other Goods Wholesaling	71
9	Electrical Equipment Manufacturing	70
10	Warehousing and Storage Services	67

Source: ABS Census 2016

Crossroads, Casula

Snapshot:

Employment: 697 jobs⁸

Developed lands: 6.1 Ha

Undeveloped lands: 10.8 Ha

Built form and location

Crossroads is located south west of the Liverpool and Casula centres (see Figure 18). The precinct is located immediately adjacent to the junction of the M5 and M7, placing it in a position of high value for freight and logistics uses. To the north it is bordered by a cluster of bulky goods retail developments, which includes stores such as Costco, Bunnings Warehouse, and a range of other smaller businesses.

It is important to note that the data reported in the NSW Department of Planning and Environment's Employment Lands Development Monitor may not reflect the uptake of "undeveloped land" given the rapid rate of development in growth precincts (or precincts under investigation). A project is underway by AMP Capital to develop a logistics centre on the entire area of the precinct, providing tenancies ranging in size from 4,000m² to 20,000m².

FIGURE 18: AERIAL VIEW OF THE CROSSROADS PRECINCT



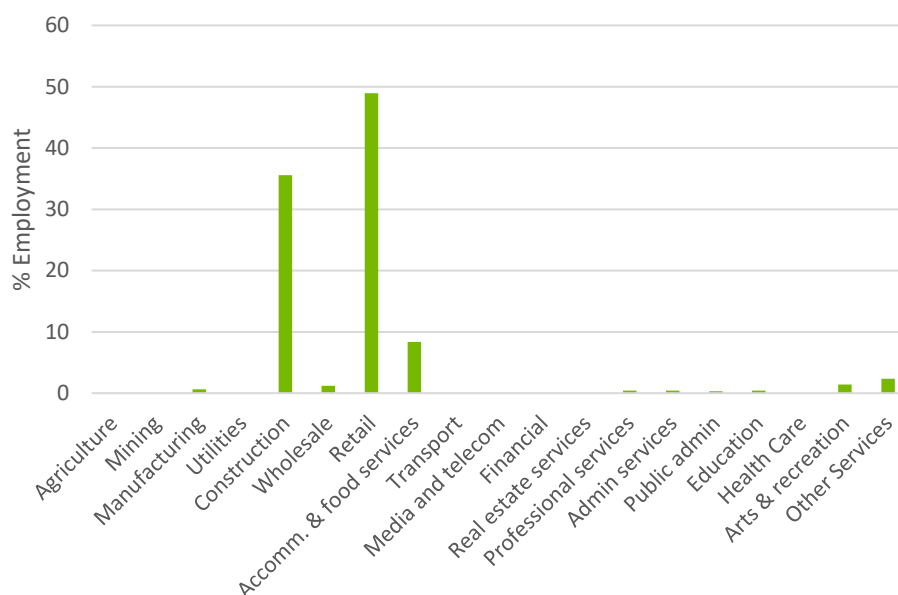
Source: Nearmap, 2018

⁸ Note that while the jobs counts for the other precincts are sourced from TPA 2016 projections which use 2011 as a base year, the Crossroads precinct had no employment in 2011 so the TPA projection cannot be used. This job count is from the 2016 census, and so is not directly comparable.

Employment and industry profile

Figure 19 and Table 10 show the employment profile of the area including the Crossroads Industrial Precinct and the adjoining bulky goods retail redevelopment. As the industrially zoned part of the precinct was not developed in 2016, almost all jobs in the precinct were associated with retail trade or with the construction of the precinct.

FIGURE 19: CROSSROADS - EMPLOYMENT BY 1-DIGIT ANZSIC INDUSTRY, 2016



Source: SGS Economics and Planning, 2018 based on ABS Census 2016

TABLE 10: CROSSROADS - TOP TEN INDUSTRIES OF EMPLOYMENT BY 3-DIGIT ANZSIC

Rank	Industry	Jobs
1	Pharmaceutical and Other Store-Based Retailing	209
2	Hardware, Building and Garden Supplies Retailing	92
3	Furniture, Floor Coverings, Houseware and Textile Goods Retailing	79
4	Cafes, Restaurants and Takeaway Food Services	58
5	Recreational Goods Retailing	54
6	Electrical and Electronic Goods Retailing	47
7	Supermarket and Grocery Stores	30
8	Pubs, Taverns and Bars	30
9	Department Stores	26
10	Warehousing and Storage Services	13

Source: ABS Census 2016

Potential Future Industrial

Snapshot:

Employment: 725 jobs (2.8% of employment within Liverpool's employment lands)

Developed lands: 0 Ha

Undeveloped lands: 0 Ha

Built form and location

There is a large tract of land running through Bringelly and Badgerys Creek around the boundary of the WSA site (see figure 18) which has been designated as potential future industrial land (the precinct is called Future Industrial in the ELDM). The precinct currently contains no land zoned for industrial use and is predominantly occupied by a mix of intensive agriculture, interspersed with some extensive agriculture and rural residential uses.

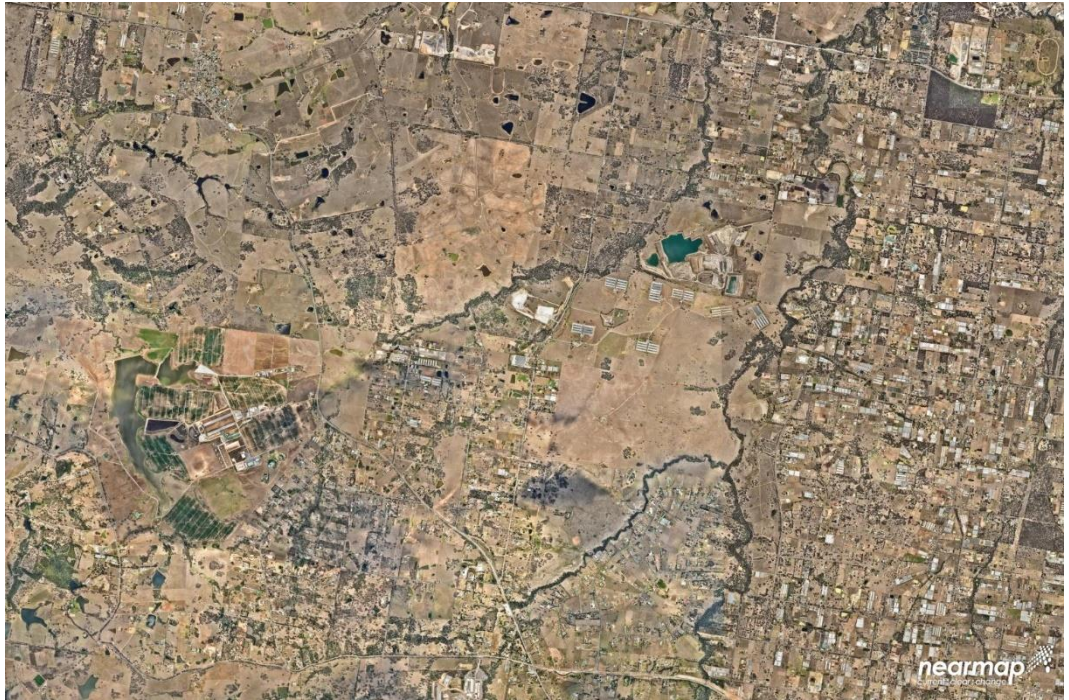
The designation of this land for future industrial use dates to before policies regarding the Badgerys Creek Aerotropolis or the metropolis of three cities were developed. The area south-west of WSA is now intended to be one of the four centres of the Western Parkland City, and substantial amounts of infrastructure are being planned in the area. It is understood that the NSW Department of Planning and Environment is reviewing the land use planning framework for this area in light of the change in strategic context.

The Badgerys Creek Aerotropolis is mapped in the Greater Sydney Region Plan and Western City District Plan as being south-east of WSA, potentially occupying some of this precinct. As a result, some of the land in this precinct may be designated for other uses in the future, and it is unclear exactly how much industrial land will be delivered.

The uncertainty around the future use of this precinct is likely to limit the willingness of developers to commit to development of the land for industrial purposes. This is evidenced by the mix-used concepts which were developed for several large land holdings in this area and submitted to the GSC in response to the exhibition of the Draft South-West District Plan and Draft Western City District Plan.

Over the next twenty years, the precinct is expected to change radically because of its location immediately adjacent to the planned Western Sydney Airport. The significant infrastructure investments planned or underway within the area, including the construction of the planned M12 motorway at the northern extent of the precinct and upgrades to the Northern Road and Bringelly Road, will significantly enhance access by road. An extension of the heavy rail network is also planned through the area.

FIGURE 20: AERIAL VIEW OF THE FUTURE INDUSTRIAL PRECINCT

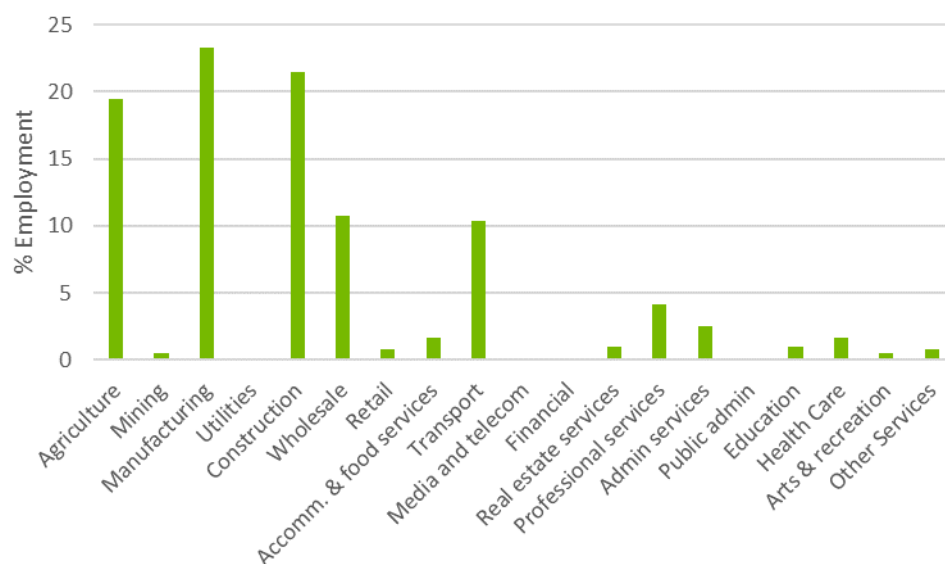


Source: Nearmap, 2018

Employment and industry profile

Owing to its nature as an undeveloped site, the precinct contains little employment and maintains an employment profile typical of a peri-urban area, with dominant sectors including agriculture, food product manufacturing and construction.

FIGURE 21: FUTURE INDUSTRIAL - EMPLOYMENT BY 1-DIGIT ANZSIC INDUSTRY, 2016



Source: SGS Economics and Planning, 2018 based on TPA LU16 Forecasts

TABLE 11: FUTURE INDUSTRIAL - TOP TEN INDUSTRIES OF EMPLOYMENT BY 3-DIGIT ANZSIC

Rank	Industry	Jobs
1	Land Development and Site Preparation Services	42
2	Agricultural Product Wholesaling	40
3	Meat and Meat Product Manufacturing	39
4	Mushroom and Vegetable Growing	34
5	Road Freight Transport	25
6	Building Structure Services	20
7	Poultry Farming	16
8	Other Construction Services	10
9	Heavy and Civil Engineering Construction	9
10	Other Social Assistance Services	8

Source: ABS Census 2016

Hoxton Park Airport/Cecil Park

Snapshot:

Employment: 373 jobs (1.4% of employment within Liverpool's employment lands)

Developed lands: 41.1 Ha

Undeveloped lands: 1.5 Ha

Built form and location

The Hoxton Park Airport/Cecil Park precinct sits on the western fringe of the Liverpool urban area (see Figure 22). The precinct is almost entirely made up of the distribution centre and warehousing for Big W, however smaller developments including a multi-storey distribution centre, bus depot and Bunnings make up the remainder of occupied land within the precinct.

The precinct is well connected to the road network, with access to the M7 Motorway immediately at the southern extent of the precinct, and the junction of the M5 and M7 Motorways being located approximately 4.5km south-west.

FIGURE 22: AERIAL VIEW OF THE HOXTON PARK PRECINCT

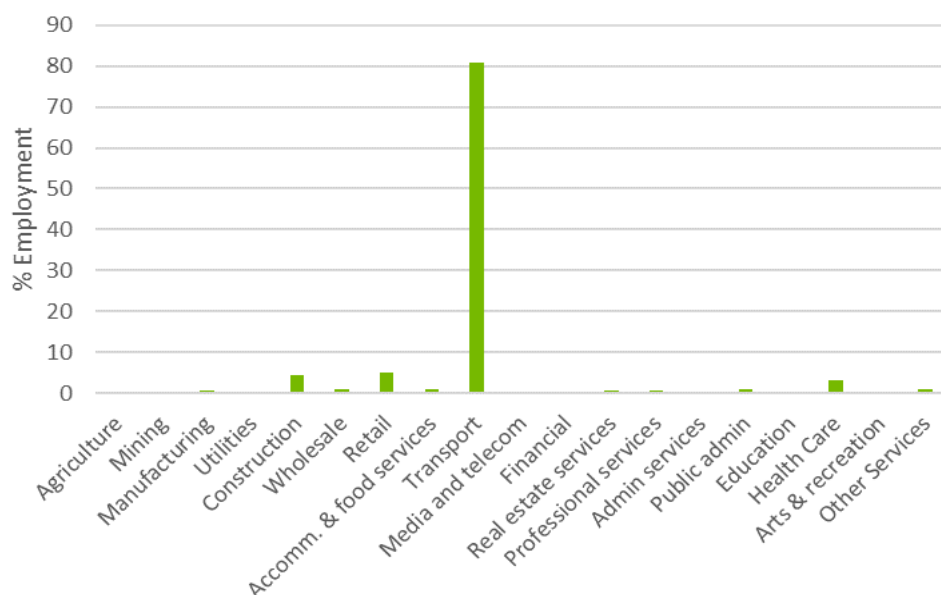


Source: Nearmap, 2018

Employment and industry profile

The dominance of the Big W Logistics Centre within the precinct is reflected in its employment profile, with jobs overwhelmingly found within the Transport, Postal and Warehousing industry⁹. There is a small proportion of retail jobs in the precinct. This is mainly attributable to the presence of Blum, which has a hardware retail showroom on site.

FIGURE 23: HOXTON PARK EMPLOYMENT BY 1-DIGIT ANZSIC INDUSTRY, 2016



Source: SGS Economics and Planning, 2018 based on TPA LU16 Forecasts

TABLE 12: HOXTON PARK - TOP TEN INDUSTRIES OF EMPLOYMENT BY 3-DIGIT ANZSIC

Rank	Industry	Jobs
1	Machinery and Equipment Repair and Maintenance	70
2	Warehousing and Storage Services	64
3	Department Stores	55
4	Hardware, Building and Garden Supplies Retailing	36
5	Road Passenger Transport	28
6	Supermarket and Grocery Stores	25
7	Furniture, Floor Covering and Other Goods Wholesaling	17
8	Residential Building Construction	16
9	Road Freight Transport	11
10	Transport, Postal and Warehousing, nfd	10

Source: ABS Census 2016

⁹ It should be noted that inclusion of a range uses such as 'Department Stores' and 'Road Freight Transport' within the list of fine-grain industries (Table 128) are likely referring to the Big W distribution centre, with the differences resulting from variance in the classification of census responses by the ABS. As such it is recommended that little reliance be placed upon the specific fine grain industries listed for this precinct.

Kemps Creek

Snapshot:

Employment: 641 jobs (2.5% of employment within Liverpool's employment lands)

Developed lands: 0 Ha

Undeveloped lands: 0 Ha

Built form and location

Kemps Creek is located to the west of Liverpool, outside the urban area. As with the Future Industrial precinct in Bringelly and Badgerys Creek, the uses planned for Kemps Creek may change in response to the changed policy context in the area around WSA.

Kemps Creek is a planned precinct for future industrial use, and so presently has zero hectares of zoned industrial lands. Current land uses within the precinct are comprised of a mix of intensive agriculture and rural residential uses, interspersed with a range of small scale manufacturing, transport and construction services uses (see Figure 24).

At present the precinct has access to the metropolitan road network via the M7, which is located 4.5–6.5km east of the precinct via Elizabeth Drive. The precinct is positioned to the immediate south of the indicative alignment for the planned M12 Motorway, giving it a strategic position on this link between the Western Sydney Airport and the M7.

FIGURE 24: AERIAL VIEW OF THE KEMPS CREEK PRECINCT

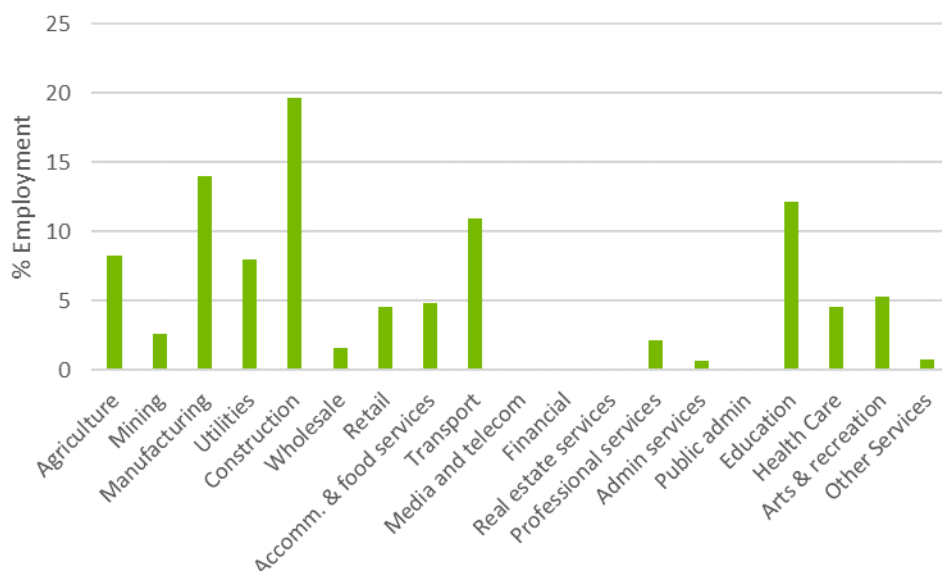


Source: Nearmap, 2018

Employment and industry profile

Owing to its nature as an undeveloped site, the precinct displays the employment profile of a peri-urban area, with a range of small-scale uses reflective of the broader area, such as small Freight or Manufacturing operators, small-medium scale Construction services, Agriculture and Education (see Figure 25).

FIGURE 25: KEMPS CREEK EMPLOYMENT BY ANZSIC 1-DIGIT INDUSTRY, 2016



Source: SGS Economics and Planning, 2018 based on TPA LU16 Forecasts

TABLE 13: KEMPS CREEK - TOP TEN INDUSTRIES OF EMPLOYMENT BY 3-DIGIT ANZSIC

Rank	Industry	Jobs
1	School Education	65
2	Road Freight Transport	46
3	Mushroom and Vegetable Growing	30
4	Clubs (Hospitality)	26
5	Pharmaceutical and Toiletry Goods Wholesaling	21
6	Residential Building Construction	13
7	Building Installation Services	13
8	Construction Material Mining	13
9	Basic Ferrous Metal Product Manufacturing	13
10	Land Development and Site Preparation Services	11

Source: ABS Census 2016

Moorebank/Moorebank defence lands

Snapshot:

Employment: 9,373 jobs (36% of employment within Liverpool's employment lands)

Developed lands: 324.4 Ha

Undeveloped lands: 168.7 Ha

Built form and location

The Moorebank/Moorebank defence lands precinct is located south-east of Liverpool City centre and contains Moorebank Logistics Park, defence force facilities and wholesalers. The precinct's built form consists of a mix of development types. A mixture of fine-grain industrial strata units and small-medium floorplate single tenant warehouses provides for a dense concentration of businesses in the North-Eastern portion of the precinct. The areas fronting the Georges River and the northern side of the M5 motorway consist mostly of large floorplate freight and logistics centres and single tenant warehouses. Part of the area immediately north of the M5 motorway is used for the storage of cars.

The area to the south of the M5 Motorway has historically been occupied by defence uses. However, the development of the Moorebank Intermodal Terminal and the associated Moorebank Logistics Park, currently being developed by Qube, will result in the construction of large floorplate freight and logistics warehouses totalling approximately 850,000m² of floorspace. There are also some existing industrial uses immediately south of the M5 Motorway, comprising a cluster of warehouses of mixed size along with a sizeable piece of land currently utilised by the Defence Joint Logistics Unit.

The precinct has access to the motorway network via the M5 on-ramps located on Moorebank Avenue and Heathcote Road, and is situated near the junction of the M5 and M7 motorways approximately 4.5km to the west of the precinct along the M5. The precinct has good access to the arterial road network, bus services are provided through the precinct, and some parts of the precinct fall within the 800m walking catchment of Liverpool railway station.

There are currently proposals to rezone some of the land in this precinct for mixed-use development. This includes the large sites north of Newbridge Road and west of Bridges Road which have historically been mapped as a future part of the Liverpool City Centre. The precinct is part of the Liverpool Collaboration Area, and some parts of it may be recommended for rezoning as a result of this process.

FIGURE 26: AERIAL VIEW OF MOOREBANK/MOOREBANK DEFENCE LANDS PRECINCT



Source: Nearmap, 2018

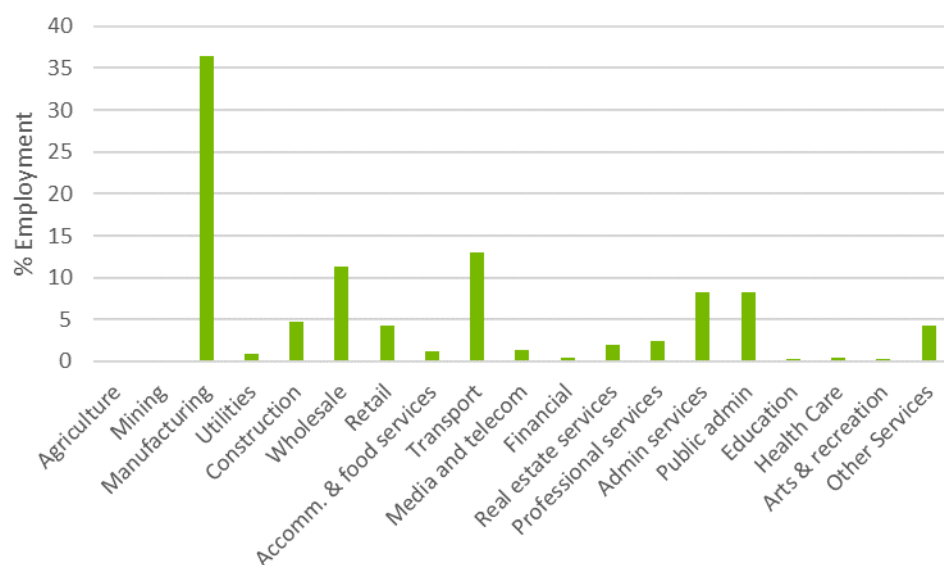
Employment and industry profile

The precinct is the largest in the LGA in terms of land area and number of industrial jobs. Manufacturing provides approximately 35 percent of the precinct's employment and is the largest sector in terms of jobs at both the fine and coarse grain levels of analysis. Large employers within the precinct include electrical equipment manufacturing and polymer product manufacturing, with Prysmian and Joyce Foam Products holding large tenancies north of Newbridge Road, as well as a range of smaller operators throughout the precinct.

Many people are employed in road transport or warehousing and storage services, and these sectors are expected to grow significantly in the future with the development of the Moorebank Logistics Park and Intermodal Terminal. Other notable concentrations of employment are in automotive repair and maintenance and printing services.

Amazon has recently confirmed that Moorebank will be the location of the company's future distribution facility in Sydney.

FIGURE 27: MOOREBANK EMPLOYMENT BY 1-DIGIT ANZSIC INDUSTRY, 2016



Source: SGS Economics and Planning, 2018 based on TPA LU16 Forecasts

TABLE 14: MOOREBANK - TOP TEN INDUSTRIES OF EMPLOYMENT BY 3-DIGIT ANZSIC

Rank	Industry	Jobs
1	Electrical Equipment Manufacturing	564
2	Other Machinery and Equipment Wholesaling	443
3	Road Freight Transport	319
4	Printing and Printing Support Services	287
5	Bakery Product Manufacturing	276
6	Automotive Repair and Maintenance	252
7	Polymer Product Manufacturing	248
8	Warehousing and Storage Services	216
9	Manufacturing, nfd	189
10	Employment Services	145

Source: ABS Census 2016

Orange Grove

Snapshot:

Employment: 543 jobs (2.1% of employment within Liverpool's employment lands)

Developed lands: 21.6 Ha

Undeveloped lands: 0 Ha

Built form and location

The Orange Grove precinct is located immediately north-west of Liverpool centre (see Figure 28). The northern portion of the precinct borders a homemaker centre and a factory outlet as well as medium sized bulky goods retail developments. The southern portion of the precinct supports industrial uses across a mix of industrial strata unit and light industrial developments.

The precinct is well connected to major arterial routes, being bordered by the Cumberland Highway to its west and Hume Highway to its south. Its proximity to Liverpool City Centre and surrounding residential areas suggests it would be well suited for continuing light industrial use. There is an increasing presence of bulky goods retail to the north of the precinct. Retaining existing local light industrial and urban services uses may become a challenge if this trend continues.

FIGURE 28: AERIAL VIEW OF THE ORANGE GROVE PRECINCT

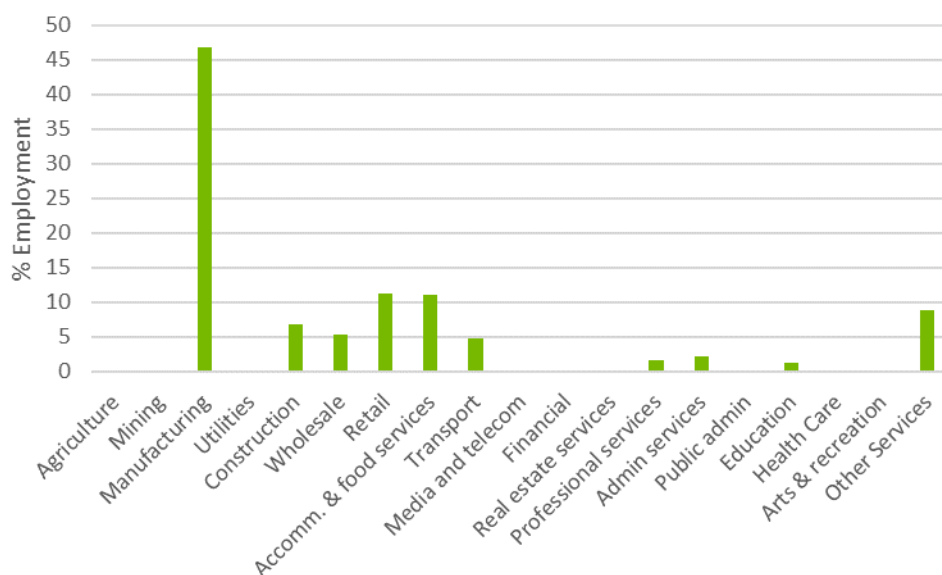


Source: Nearmap, 2018

Employment and industry profile

Figure 29 and Table 15 show the employment profile of the area including the Orange Grove Precinct and the adjacent bulky goods retailing area. At a coarse grain, employment is predominantly found within the Manufacturing industry, with over 45% of the area's employment (see Figure 29). At a finer grain level, the retailing activities found within the bulky goods retailing centres to the north of the precinct are prevalent within the top 10 industries by 3-Digit ANZSIC, which suggests that the manufacturing employment is made up by a high intensity of small-scale firms. The presence of Service NSW in the homemaker centre is also noted within the employment profile of the area.

FIGURE 29: ORANGE GROVE EMPLOYMENT BY 1-DIGIT ANZSIC INDUSTRY, 201



Source: SGS Economics and Planning, 2018 based on TPA LU16 Forecasts

TABLE 15: ORANGE GROVE - TOP TEN INDUSTRIES OF EMPLOYMENT BY 3-DIGIT ANZSIC

Rank	Industry	Jobs
1	Bakery Product Manufacturing	192
2	Clothing, Footwear and Personal Accessory Retailing	162
3	Cafes, Restaurants and Takeaway Food Services	109
4	Specialised Food Retailing	85
5	Electrical and Electronic Goods Retailing	69
6	Furniture, Floor Coverings, Houseware and Textile Goods Retailing	48
7	State Government Administration	46
8	Furniture, Floor Covering and Other Goods Wholesaling	36
9	Automotive Repair and Maintenance	34
10	Grocery, Liquor and Tobacco Product Wholesaling	28

Source: ABS Census 2016

Priddle/Scrivener Street/Warwick Farm Racecourse

Snapshot:

Employment: 1,770 jobs (6.9% of employment within Liverpool's employment lands)

Developed lands: 23.2 Ha

Undeveloped lands: 12.8 Ha

Built form and location

The Priddle/Scrivener Street/Warwick Farm Racecourse precinct is located to the immediate east of Liverpool City Centre. The Priddle/Scrivener Street component of the precinct is mostly comprised of medium-large floorplate light industrial or freight and logistics uses, with a small number of industrial strata units in the centre of the precinct. This part of the precinct is bounded by healthcare uses associated with Liverpool Hospital in south-west and provides a buffer for the Liverpool Water Recycling Plant, which is located immediately to the east.

The Warwick Farm Racecourse portion of the precinct (commonly called Coopers Paddock) is located east of the Liverpool Water Recycling Plant and is currently being developed into a logistics centre. The centre consists of over 55,000m² of floorspace, with 33,000m² of this having already been leased. This area accounts for the 12.8ha of the precinct which was considered undeveloped in January 2017.

FIGURE 30: AERIAL VIEW OF PRIDDLE/SCRIVENER ST/WARWICK FARM RACECOURSE



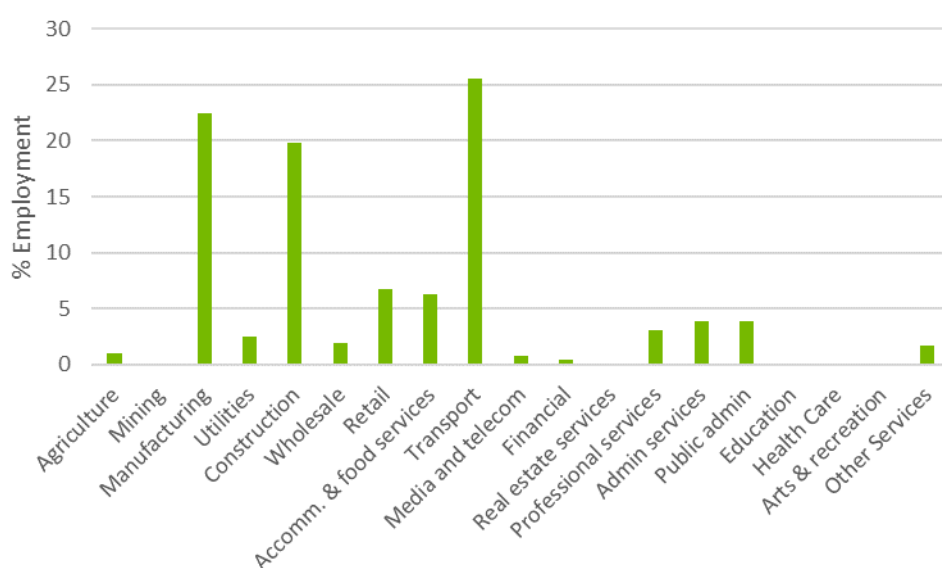
Source: Nearmap, 2018

Employment and industry profile

Figure 31 and Table 2 show the employment profile for the area including the Priddle/Scrivener Street and Warwick Farm Racecourse precincts and the adjacent horse training precinct. Transport services feature strongly within the employment profile of this area at both the coarse and fine grain level, with the proportion of employment within these sectors likely to increase given the development of the new logistics centre in Coopers Paddock which occurred after the 2016 Census was conducted. The absence of construction services at the finer-grain level of analysis indicates that the proportion of employment within this industry (see Figure 31) is likely to be composed of transient jobs associated with this development, as opposed to permanent employment within the precinct.

Manufacturing uses are also prominent, with the 2-Digit industry analysis identifying the significant employment role that Hannanprint and Visy play within the precinct in printing and paper manufacturing respectively.

FIGURE 31: PRIDDLE/SCRIVENER ST/WARWICK FARM EMPLOYMENT BY 1-DIGIT ANZSIC INDUSTRY, 2016



Source: SGS Economics and Planning, 2018 based on TPA LU16 Forecasts

TABLE 16: PRIDDLE/SCRIVENER ST/WARWICK FARM - TOP TEN INDUSTRIES OF EMPLOYMENT BY 3-DIGIT ANZSIC

Rank	Industry	Jobs
1	Other Transport Support Services	223
2	Printing and Printing Support Services	207
3	Horse and Dog Racing Activities	145
4	Converted Paper Product Manufacturing	110
5	Road Freight Transport	93
6	Hospitals	72
7	Postal and Courier Pick-up and Delivery Services	28
8	Electrical Equipment Manufacturing	22
9	Water Supply, Sewerage and Drainage Services	15
10	State Government Administration	13

Source: ABS Census 2016

Rossmore

Snapshot:

Employment: 127 jobs (0.5% of employment within Liverpool's employment lands)

Developed lands: 0 Ha

Undeveloped lands: 0 Ha

Built form and location

Rossmore is a planned industrial precinct located to the north of Bringelly Road in the locality of Rossmore (approximately 4.5km west of Leppington Station). It currently contains no zoned employment lands and is occupied by agricultural and rural residential uses (see Figure 32).

The precinct has access to the arterial road network via Bringelly Road, which is currently being widened to two lanes per direction. This will provide accessibility to the planned network of arterial roads within the broader land release areas of Western Sydney.

FIGURE 32: AERIAL VIEW OF THE ROSSMORE PRECINCT

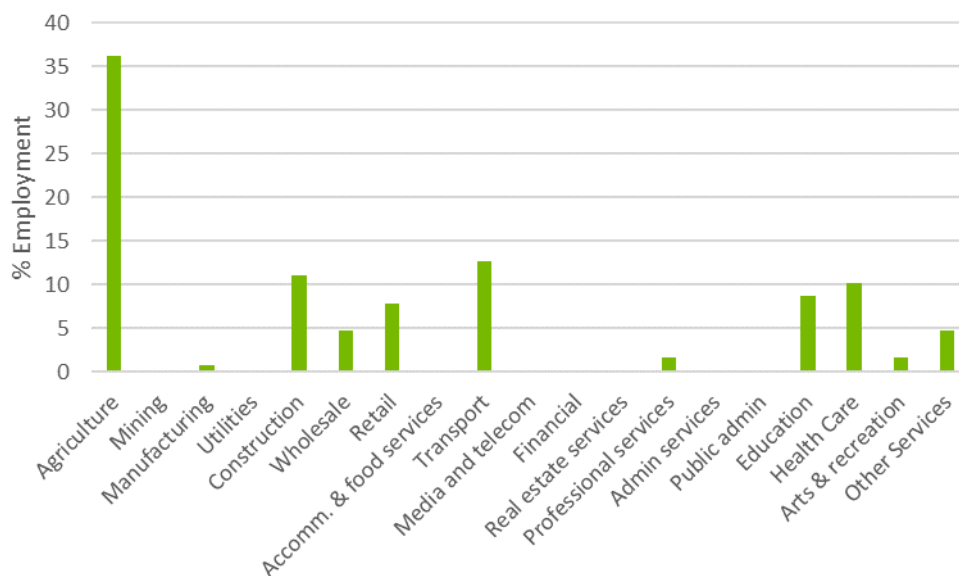


Source: Nearmap, 2018

Employment and industry profile

Owing to its nature as an undeveloped area, the precinct contains relatively small numbers of jobs and maintains an employment profile typical of a peri-urban area dominated by agriculture (see Figure 33).

FIGURE 33: ROSSMORE EMPLOYMENT BY 1-DIGIT ANZSIC INDUSTRY, 2016



Source: SGS Economics and Planning, 2018 based on TPA LU16 Forecasts

TABLE 17: ROSSMORE - TOP TEN INDUSTRIES OF EMPLOYMENT BY 3-DIGIT ANZSIC

Rank	Industry	Jobs
1	Mushroom and Vegetable Growing	47
2	School Education	43
3	Child Care Services	13
4	Other Social Assistance Services	13
5	Automotive Repair and Maintenance	11
6	Road Freight Transport	9
7	Poultry Farming	9
8	Public Order and Safety Services	8
9	Building Structure Services	7
10	Building Cleaning, Pest Control and Gardening Services	6

Source: ABS Census 2016

Sappho Road

Snapshot:

Employment: 981 jobs (3.8% of employment within Liverpool's employment lands)

Developed lands: 16.8 Ha

Undeveloped lands: 0.7 Ha

Built form and location

The Sappho Road precinct is located 2km north east of the Liverpool City Centre, approximately halfway between Liverpool and Cabramatta. It is flanked by parkland, low density housing and the Warwick Farm Racecourse (see Figure 34). The precinct is comprised almost entirely of large format retail developments and a display home centre. It has a high level of accessibility to the arterial road network via the Hume Highway and the entire precinct is located within an 800m radius of Warwick Farm Railway Station.

The precinct does not currently support any industrial uses, and the ability for industry uses to locate on the site would likely be constrained by the presence of higher value retailing uses.

FIGURE 34: AERIAL VIEW OF THE SAPPHO ROAD PRECINCT

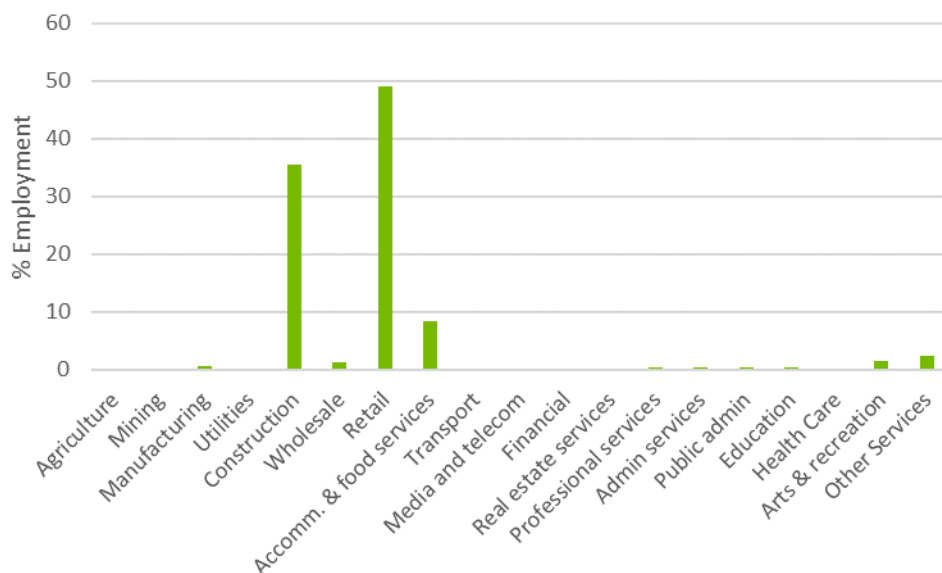


Source: Nearmap, 2018

Employment and industry profile

Almost all the employment within the precinct is within the Retail trade or Construction industries. Automotive retailing is the dominant use within the precinct owing to the presence of the Peter Warren car dealerships which occupy most of the precinct. A display home centre for Masterton homes and a homemaker centre result in the presence of a significant proportion of jobs falling within the Construction and other retailing sectors.

FIGURE 35: SAPPHO ROAD EMPLOYMENT BY 1-DIGIT ANZSIC INDUSTRY (2016)



Source: SGS Economics and Planning, 2018 based on TPA LU16 Forecasts

TABLE 18: SAPPHO ROAD - TOP TEN INDUSTRIES OF EMPLOYMENT BY 3-DIGIT ANZSIC

Rank	Industry	Jobs
1	Motor Vehicle Retailing	363
2	Residential Building Construction	165
3	Cafes, Restaurants and Takeaway Food Services	59
4	Horse and Dog Racing Activities ¹⁰	53
5	Furniture, Floor Coverings, Houseware and Textile Goods Retailing	26
6	Building Construction, nfd	17
7	Electrical and Electronic Goods Retailing	15
8	Motor Vehicle Parts and Tyre Retailing	9
9	Sports and Physical Recreation Activities	7
10	Architectural, Engineering and Technical Services	6

Source: ABS Census 2016

¹⁰ Whilst the Warwick Farm Racecourse is not located in the precinct, it does fall within the boundaries of both the TPA travel zones and ABS Census Destination Zones with which this data was extracted, and as such are shown herein.

Yarrunga/Prestons

Snapshot:

Employment: 7,260 jobs (28% of employment within Liverpool's employment lands)

Developed lands: 265.4 Ha

Undeveloped lands: 80.1 Ha

Built form and location

Yarrunga/Prestons sits to the south west of Liverpool in a location of strategic importance immediately adjacent to the junction of the M5 and M7 motorways (see Figure 36). The portion of the precinct which is located to the north-east of the M7 is nearly fully developed. This area is comprised of a mix of medium to large floorplate warehouses accommodating light industrial uses, industrial strata units and several large floorplate freight and logistics centres. A diverse range of businesses occupy this area. This includes manufacturing activities of varying sizes and with a range of population serving uses, including large format retailing on the north-eastern periphery of the precinct.

On the south-west side of the M7, the industrially zoned land is under rapid development, with large scale distribution centres (including the Aldi distribution centre) being interspersed with a mix of light industrial and urban services uses.

FIGURE 36: AERIAL VIEW OF THE YARRUNGA/PRESTONS PRECINCT

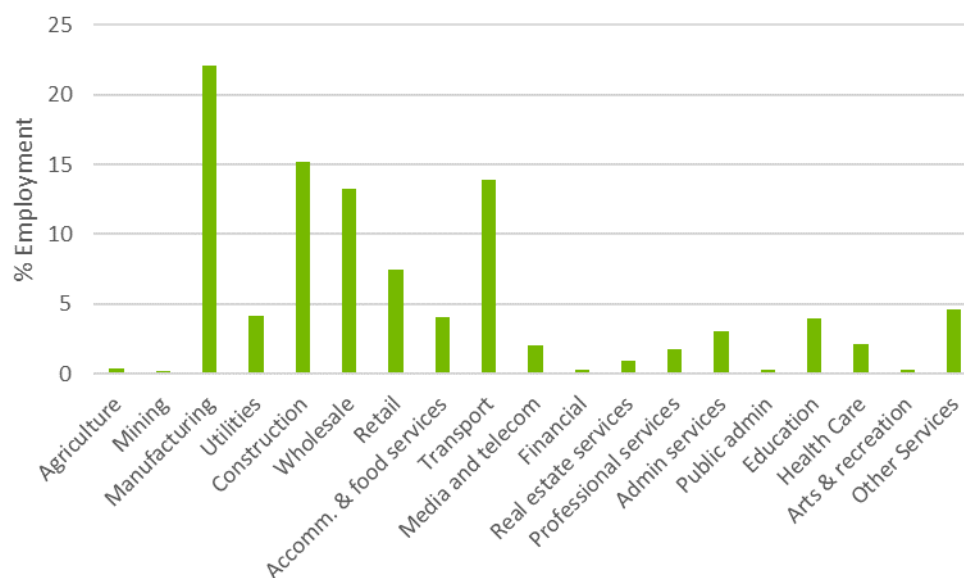


Source: Nearmap, 2018

Employment and industry profile

Yarrunga/Prestons accounts for almost a third of Liverpool LGA's employment within industrial lands. At a coarse level, most jobs are in the Manufacturing, Construction, Transport, Postal and Warehousing, and Wholesaling industries (see Figure 37). At a finer grain, the predominant industries are road transportation or warehousing, as well as a several construction support services. Despite not being industrial activities, School Education and Clubs are present in the top 10 list of industries at the 3-Digit level owing to the Amity College and Liverpool Catholic Club both being located within the precinct.

FIGURE 37: YARRUNGA/PRESTONS EMPLOYMENT BY 1-DIGIT ANZSIC INDUSTRY, 2016



Source: SGS Economics and Planning, 2018 based on TPA LU16 Forecasts

TABLE 19: YARRUNGA/PRESTONS - TOP TEN INDUSTRIES OF EMPLOYMENT BY 3-DIGIT ANZSIC

Rank	Industry	Jobs
1	Road Freight Transport	473
2	Warehousing and Storage Services	406
3	Supermarket and Grocery Stores ¹¹	368
4	Building Installation Services	273
5	Other Machinery and Equipment Wholesaling	266
6	Electrical Equipment Manufacturing	191
7	Manufacturing, nfd	179
8	Building Completion Services	169
9	School Education	167
10	Clubs (Hospitality)	161

Source: ABS Census 2016

¹¹ As AZNSIC classifications are allocated based on industry of the employing business, it is highly likely that this figure represents employment within the Aldi distribution centre.

5.2 Summary

This section of the report provides an overview of the function and role of each employment precinct in Liverpool LGA. There are two different types of industrial uses in Liverpool LGA: local and subregional.

Local industrial uses

Established employment lands in the east of the LGA such as Chipping Norton, Orange Grove and part of Moorebank are more traditional urban services containing local light industrial uses that serve the local population such as automotive repair and maintenance, printing services, furniture wholesaling, building installation services and storage services. These precincts typically have smaller lot sizes and a larger amount of strata development. These precincts have essentially reached capacity.

Subregional industrial uses

Large format subregional industrial uses are located in precincts such as Yurrunga/Prestons which contain operations such as road freight transport and larger-scale manufacturing. Recent development in these precincts (such as Yurrunga/Prestons) is skewed towards large-format strategic industrial operations such as freight and logistics – for example Toll and Aldi. These are important distribution facilities at a metropolitan scale but do not necessarily have to locate in Liverpool. These types of businesses are more interested in proximity to transport networks including motorways, markets and airport than the characteristics of the place they locate in.

In Liverpool the precincts with capacity are mostly those with subregional strategic industrial uses. Austral has recently been rezoned for employment lands. While the uses in Austral are predominately vegetable growing, the precinct has the capacity to accommodate approximately 40 hectares of employment land. Yurrunga/Prestons precinct is strategically located to the south west of Liverpool with proximity to the M5 and M7 motorways and in the most recent data available (from January 2017) had 80 hectares of undeveloped zoned employment land. Recent aerial imagery and the rapid pace of recent development indicates that the current amount of undeveloped land is likely to be much less.

Notably, much of the new development in established precincts is of facilities geared towards large-format operators. These developments are often driven by institutional investors and developers (for example Charter Hall) who prefer larger pre-committed tenants.

The proposed land currently under investigation for future employment uses will contribute to this capacity. There is a significant amount of land which is currently planned for investigation for employment use, including the Future Industrial, Rossmore and Kemps Creek precincts. These precincts would provide up 1,611 hectares of employment lands, although their planned uses may change to accommodate the Badgerys Creek Aerotropolis. The following chapter will explore the supply and demand balance for local industrial and subregional industrial uses in Liverpool LGA.

6. SUPPLY AND DEMAND OF INDUSTRIAL LAND

This chapter looks at the future supply and demand of industrial land in the Liverpool LGA. A suitability analysis has been undertaken to determine appropriate locations for subregional and local industrial uses.

6.1 Introduction

A supply and demand analysis has been undertaken to determine future supply of local industrial and subregional industrial uses.

In this analysis, industrial uses permitted in the IN1 (General Industrial) and IN3 (Heavy Industrial) zones are considered subregional industrial uses and industrial uses permitted in the IN2 (Local Light) zones are considered local light industrial uses.

Table 16 shows the characteristics of subregional and local industrial uses. Other non-industrial uses operating in employment land have been accounted for in the analysis.

TABLE 20: CHARACTERISTICS OF SUBREGIONAL AND LOCAL USES IN EMPLOYMENT LANDS

Type	Characteristics
Subregional	<ul style="list-style-type: none"> ▪ Clustered in industrial areas ▪ Service a broader catchment ▪ Larger lot sizes and often with large warehouse buildings ▪ Large degree of functional hardstand for service delivery ▪ Physical separation from residential development ▪ Low degree of public transport accessibility ▪ High car and truck access ▪ Close proximity to arterial roads and motorway on and off ramps ▪ Possible access to freight rail ▪ Examples: subregional warehousing and freight and logistics.
Local	<ul style="list-style-type: none"> ▪ Clustered in industrial areas ▪ Service a local area – people do not travel great distances for the service ▪ Small industrial lot sizes ▪ Workshop buildings sometimes with office functions ▪ Large degree of functional hardstand for service delivery ▪ Close to surrounding residential and commercial community

Source: SGS, 2018

6.2 Current supply

Current supply is defined as land that is currently zoned as industrial land. There is currently 1,116 hectares of industrially-zoned land in the LGA. The majority are zoned IN1 (622 hectares), IN3 (313 hectares) and IN2 (170 hectares). The remainder are a mix of B5, B6 and other¹². A further 2,160 hectares are proposed, giving a total of 3,276 hectares of actual or possible industrial land in the Liverpool LGA.

According to the NSW DP&E's 2017 Employment Lands Development Monitor (ELDM), 799 hectares of this are developed and 317 hectares are undeveloped. However, this is anticipated to overstate the undeveloped capacity since the most recent ELDM data is from January 2017 and the pace of development in Liverpool's industry precincts over the past 18 months has been significant.

Forecast supply is based on the amount of land identified by the NSW Government for future employment purposes. There are 996 hectares of potential future industrial land in Liverpool that could come online over the next 20 years if appropriate servicing infrastructure was delivered.

Noting the trends impacting on Liverpool's industrial lands, this report makes the following assumptions regarding supply:

- Strategically located sites in the Moorebank and Warwick farm precincts will be rezoned away from industrial zonings to reflect the growing role of Liverpool as a major Western Sydney CBD (as identified in the GSC's Collaboration Area designation) and the need for commercial and residential expansion. This results in a net loss of 50 hectares.
- That 1,164 hectares of land proposed around the south-west of Western Sydney Airport currently zoned as rural but earmarked for future industrial zoning has been excluded as part of the future supply. This is because it is not considered to be likely that it will come online in the study's timeframe and is not currently suitable for industrial use
- That the remaining future industrial land will be released in a staged way to accommodate gradual growth around the airport and Badgerys Creek Aerotropolis. This report assumes 25% release every five years.

Based on these future supply assumptions, by 2036 there will be 2,062 hectares of zoned employment lands. This is a net increase of 946 hectares from 2016.

Table 21 reports the current (2016) supply of employment lands and forecast supply to 2036.

TABLE 21: EMPLOYMENT LANDS SUPPLY, 2016-2036 (HECTARES)

Year	Currently zoned (developed and undeveloped) industrial land*	Future release of industrial land**	Total supply
2016	1,116	0	1,116
2021	1,066	249	1,315
2026	1,066	498	1,564
2031	1,066	747	1,813
2036	1,066	996	2,062

Source: NSW DPE, Employment Lands Development Monitor, 2017 and SGS, 2018

*Assumed reduction in the supply of local light industrial zoned land of 50 hectares in 2021 following the rezoning of Moorebank north precinct

**Assumes 25% of proposed land is released every 5 years from 2021

¹² NSW DP&E Employment Lands Development Monitor, January 2017

6.3 Future demand

Method

Demand has been identified by converting employment forecasts across the Liverpool LGA by ANZSIC category to land use. This uses a method that converts jobs by ANZSIC to jobs by Broad Land-Use Categories (BLCs). These are classifications developed by SGS to better articulate the built form of jobs in industrial precincts and has been developed by multiple site audits. The broad steps for this method are as follows:

- Convert jobs by ANZSIC category to jobs by Broad-Land Use Category (BLC) to better reflect how jobs are represented in built form (generated through SGS's ANZSIC to BLC conversion matrix which is based on multiple previous employment land studies).
- Apply standard observed jobs to floorspace ratios to convert jobs to floorspace in square metres (based on previous analysis).
- Apply Liverpool's precinct-specific Floorspace Ratios (FSRs) in reverse to floorspace to give a projected future demand for employment and industrial land.

Analysis

To better understand the locational characteristics of future demand, it has been identified by the likely zoning it would require, in line with the descriptions of subregional and local in Section 6.1. Broadly speaking, subregional uses are more aligned with an IN1 or IN3 zoning and local uses with an IN2 zoning. This process makes the following assumptions:

- The relationship between jobs and floorspace remains fixed over the 20-year period
- Demand is only calculated from growth *within* the Liverpool LGA. It does not make allowances for the potential of other industries that may be displaced from LGAs in the Central and Eastern Cities looking for a new home
- That in 2016, there is no unmet demand
- Businesses displaced by proposed rezonings in Moorebank and Warwick farm add to the future demand.
- That non-industrial jobs forecast in industrial precincts are not accommodated

By 2036, there is forecast to be 268 hectares of net additional demand for subregional industrial land and 122 hectares of additional demand for local industrial uses (390 hectares in total). Table 22 shows the future demand for subregional (IN1 & IN3) and local industrial (IN2) uses.

TABLE 22: NET ADDITIONAL DEMAND FOR SUBREGIONAL INDUSTRIAL USES, 2016-2036 (CUMULATIVE) (HECTARES)

Year	Additional Subregional industrial demand (IN1 & IN3)	Additional Local industrial demand (IN2)	Total additional demand
2016	0	0	0
2021	96	49	145
2026	155	70	225
2031	216	94	310
2036	268	122	390

Source: SGS, 2018, based on TPA LU16 forecasts

6.4 Supply-demand gap

Overall land supply-demand gap

When looking at industrial land as a uniform land use type, without the distinction of the different roles and functions that operate in the various precincts, it is forecast that by 2036, there is projected to be sufficient land to meet future need. This is due to the expected release of industrial land around Western Sydney Airport (Table 23).

TABLE 23: TOTAL SUPPLY DEMAND GAP FOR INDUSTRIAL LAND, 2036

	Industrial land supply (hectares)
Developed supply	749
Undeveloped supply	+ 317
Proposed future land	+ 996
Current demand	- 799
Future demand	- 390
Supply surplus / (gap)	873

Source: SGS, 2018, based on TPA LU16 forecasts

However, this does not paint an accurate picture of the future requirements of industrial uses in Liverpool and the alignment of future land releases from a location and operational perspective. The following sections break this into subregional and local analyses.

Subregional industry (IN1 and IN3) land supply-demand gap

As outlined in Table 20, subregional industries have certain locational and operational characteristics that define them. The location of the future industrial precincts around Western Sydney Airport align with the characteristics and are likely to attract large-format businesses in industries such as freight and logistics, warehousing and advanced manufacturing (at least in the early phases of the airport's development).

The remaining zoned but undeveloped land in the LGA (317 hectares as of January 2017) is also likely to attract these uses, given the pattern of development witnessed in Prestons and around the Moorebank Intermodal terminal.

This report therefore assumes that future demand for subregional industry is likely to be attracted to these precincts. As Table 24 illustrates, assuming that land release around the airport keeps pace with demand, there is likely to be over 1,000 hectares of surplus land by 2036.

TABLE 24: TOTAL SUPPLY DEMAND GAP FOR SUBREGIONAL (IN1 AND IN3) INDUSTRIAL LAND, 2036

	Industrial land supply (hectares)
future supply*	1,271
future demand**	- 268
Supply surplus/(gap)	1,003

Source: SGS, 2018, based on TPA LU16 forecasts

* consists of all current undeveloped land (with the exception of Austral) and 996 hectares of proposed future industrial land

** Demand from industries suited to IN1 or IN3 zoning

This indicates that subregional uses are well catered for in the LGA over the next twenty years and that future supply is sufficient for growth beyond that, and/or to absorb demand created outside of the LGA.

The assumed take-up rate of industrial land around Badgerys Creek would require a buoyant industrial land market and proactive delivery of servicing and transport infrastructure ahead of the development of the airport. Nonetheless, there is a large difference between the size of the future supply and the size of the future projected demand, and this would remain the case even with a much slower uptake of industrial land. The conclusion that there is sufficient industrial land in the LGA for subregional uses in the medium-long term is a result of the large amount of land in the future industrial precincts and is not sensitive to the development assumptions used.

Local industry (IN2) land supply-demand gap

As outlined in Table 20, local industries have certain locational and operational characteristics that define them. While the land around the airport is likely to suit the needs of subregional uses, it is unlikely to be in the right locations for the expansion of local population and business serving industries that currently locate in the eastern precincts of the LGA.

The only precinct currently zoned IN2 with clearly identified capacity is Austral (42 hectares). With future demand expected to be 122 hectares, there is likely to be a shortage of 80 hectares of suitably zoned and located industrial precincts that can cater toward these types of industries (Table 25).

TABLE 25: TOTAL SUPPLY DEMAND GAP FOR SUBREGIONAL (IN1 AND IN3) INDUSTRIAL LAND, 2036

	Industrial land supply (hectares)
future supply - Austral	42
future demand*	122
Supply surplus/ (gap)	(-80)
Possible future land - Moorebank	96
Potential surplus/ (gap)	16

Source: SGS, 2018, based on TPA LU16 forecasts

* Demand from industries suited to IN2 zoning

** The 96 hectares forms part of the proposed industrial lands total of 996 hectares

While supply *en masse* appears to be sufficient, the supply of appropriately zoned land in the LGA for local industrial uses is not.

If the estimated remaining SP2-zoned land in the southern portion of the Moorebank Defence Lands precinct (approximately 96 hectares) is available for IN2 use, then the supply-demand gap would be replaced by a slight surplus of 16 hectares.

Take up of current supply

It is estimated that between 2026 and 2031, Liverpool's current supply of zoned but undeveloped industrial land will be exhausted. This is based on employment growth projections and current amount of undeveloped supply. If development over the past 18 months has been significant in undeveloped land identified in January 2018, this could potentially be sooner.

The more acute shortage is in IN2-zoned land. While Austral has 42 hectares zoned, it is undeveloped and unserviced. With minimal vacancy across other precincts, and a loss of industrial land likely as part of the Collaboration Area place strategy, land for these uses will be exhausted much sooner.

6.5 Suitability analysis

Purpose

A suitability analysis has been undertaken to determine areas best suited for the two types of industrial uses that make up employment lands – subregional and local.

Method

A series of attributes have been measured to determine the location of land suitable for employment lands. The distance between each attribute and the centre point of each geographical area in the Liverpool LGA has been calculated. The attributes include:

- Average lot size
- Proximity to arterial roads
- Proximity to motorways
- Proximity to bus stops
- Proximity to hospitals
- Proximity to local centre
- Proximity to on and off ramps
- Proximity to population density
- Proximity schools
- Proximity to strategic centres
- Proximity to train stations
- Proximity to universities and TAFEs.

Figure 38 and Figure 39 show the findings of the most suitable and less suitable locations for subregional and local industrial land. Suitability has been calculated in comparison to land across the Western City District, with the most suitable 10% of land shown in the darkest colour. The land shaded yellow is not necessarily not appropriate for future employment land, but rather less suitable.

Suitability of industrial uses in Liverpool LGA

Local industry

Figure 38 shows the most suitable land for local industrial uses across Western Sydney. This map shows the difference between the locational needs of subregional industrial uses and local industrial uses. Local industrial uses need to locate with proximity to areas of population density. The suitability map shows this, with a higher concentration of more suitable locations to the east of the Liverpool LGA, particularly clustered around strategic centres.

Relocating further west is not viable for most businesses SGS consulted with as the markets they serve are mostly located in surrounding residential areas. However, as land to the west of the current urban area is developed in the future, parts of the western half of the LGA will become more suitable for local industrial uses.

Businesses such as Daikin Air Conditioners, who are based in the Chipping Norton precinct, suggested that if they were to relocate, they would move to an established precinct in the south west, such as Greystanes. This is primarily due to the need to be located in proximity to customers in surrounding residential areas as well as other businesses that they share work with such as construction companies.

Further, consultation with BCP Precast, who are currently located in Moorebank, identified that Moorebank contains a mix of “smaller operators and big guys”. BCP Precast manufacture and supply precast concrete products to the mining and construction industries, however the business is diversifying, and they cannot expand where they are as rent is not affordable. A barrier to expansion is the need to find 20,000 to 30,000 square metres of floorspace within 10 kilometres given the nature of concrete batching. Consultation noted that Austral provides this floorspace and it is close markets in the north and south via the M7, however “the zoning

is not right” and “the airport is not up and running yet, so we are not prepared to move that far yet”.

Cleanaway, located in Moorebank, is an example of a business that needs to locate in a local urban services industrial precinct. Consultation with Cleanaway found that the business is growing, and they are seeking a larger premise, however need to stay in the Liverpool LGA to serve clients such as local households, Liverpool hospital, Westfield and Council. It was noted that “our location in Moorebank is very important as it picks up client base in the south west”. However, the challenge for Cleanaway is finding an appropriate site within proximity to Liverpool centre. It was highlighted that “we are always looking for sites to be closer to customers. We looked at a potential site at Qube, Moorebank, however the buildings are too big for what we want”. Cleanaway identified that their request to subdivide a site was declined. This indicates that demand in the precinct is high, driven by subregional industrial uses.

Subregional industry

Figure 39 shows the land most suitable to accommodate subregional industrial uses across Western Sydney. Subregional industrial uses are characterised by businesses that are more ‘footloose’ in their locational requirements and have locational requirements such as large lots and separation from competing land uses.

The suitability analysis illustrates that land to the east of the LGA around Liverpool City Centre is less suitable for subregional industrial uses. This is partly driven by the dense population to the east and the need for local industrial uses to serve the needs of the local market. Accessibility characteristics such as access to major motorways such as the M5 and M7 drive the suitability for large format subregional uses in the centre and western part of the LGA. Furthermore, any future supply of Liverpool’s industrial lands around Western Sydney Airport Growth Area is, due to its location and strategic intent, geared towards attracting large-format industrial businesses.

Consultation with Colliers found that 70% of industrial businesses looking to locate in Liverpool LGA are freight and logistics industries. These businesses are often pushed out of gentrified inner city industrial areas such as Alexandria or relocating from other areas in the west due to limited capacity for expansion such as Silverwater.

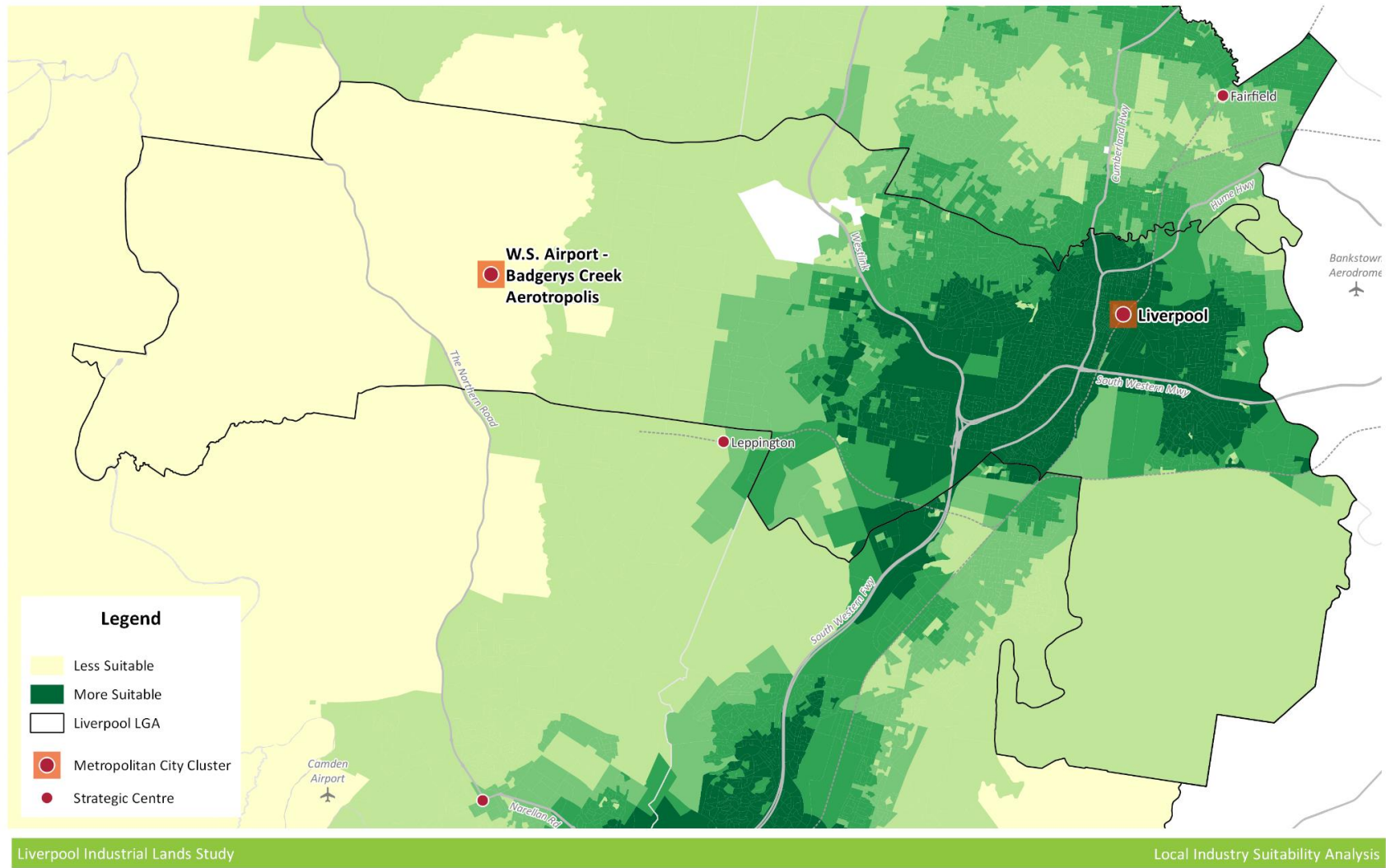
These industries preference access to the M5 and M7 motorways, Moorebank Intermodal Terminal and the future Western Sydney Airport. The M5 provides east-west connections, linking Port Botany and metropolitan Sydney to employment lands in the west. The M7 currently provides north-south connections on the fringe of metropolitan Sydney. This will essentially be the role of the future Outer Sydney Orbital.

At the moment, Moorebank has the capacity and locational characteristics to accommodate subregional industries.

The employment lands in Liverpool have recently attracted big players like Toll with a distribution centre in Preston, Big W with a distribution centre in Hoxton Park and Aldi in Prestons. Notably, Amazon has just committed to a site at Moorebank.

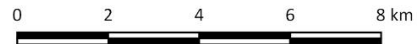
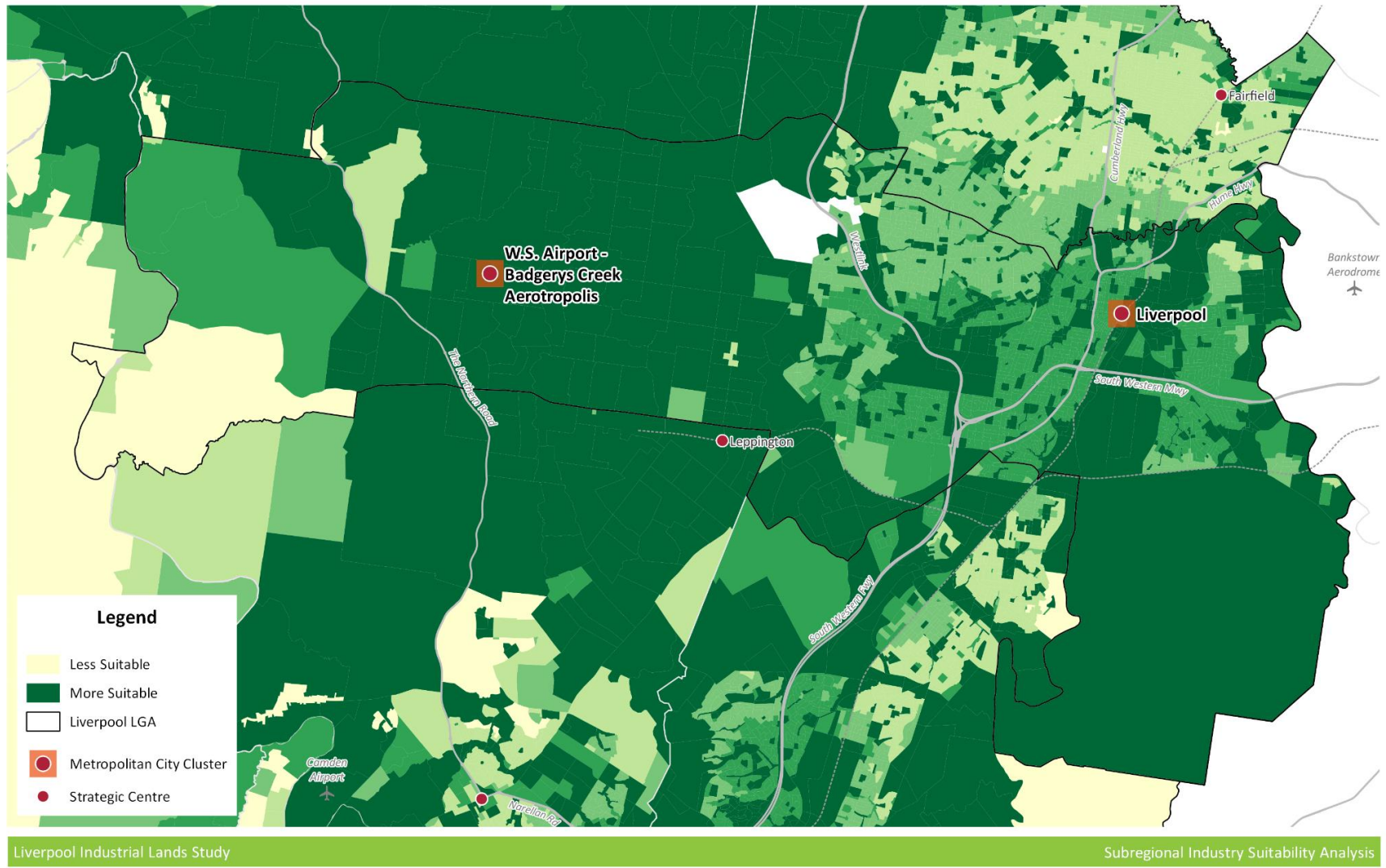
The Austrian joinery company Blum is located in Hoxton Park and has a unique approach to operation. Consultation with Blum found that unlike other businesses of a similar nature, capacity is not a barrier to growth. Blum are located in a multi-storey warehouse with robotics operating storage and packaging, exporting 45-foot containers ten times per week. Blum purchased the adjoining site with the intent to expand, however instead of expanding a single storey and absorbing more land, Blum increased the height of the building.

FIGURE 38: LOCAL INDUSTRY SUITABILITY



Source: SGS, 2018

FIGURE 39: SUBREGIONAL INDUSTRY SUITABILITY



Source: SGS, 2018

Travel Times

Figure 40 shows the 30-minute travel catchments of the Chipping Norton, Austral, and Future Industrial Precincts by public transport and car. This illustrates where businesses in an existing precinct such as Chipping Norton could relocate within a 30-minute travel distance in order to maintain relationships with suppliers, customers and their workforce. The travel catchments of these precincts are illustrative of the characteristics of each of the precincts in Liverpool LGA.

The 30-minute private vehicle catchment of the Future Industrial Precinct covers a large area in the western portion of the Liverpool LGA as well as parts of the Penrith and Camden LGAs. Most of the land within these catchments is currently used for agricultural and rural residential purposes, and so local industrial businesses locating here would be hampered in their ability to service a large residential area and to interact with a broad range of businesses within existing industrial precincts.

The Austral precinct can be reached in under 30 minutes by private vehicle from most existing industrial precincts in Liverpool LGA, including Prestons and Moorebank. Its catchment covers most of the existing residential land in the Liverpool LGA as well as residential growth areas in Liverpool and Camden Councils. While it currently has low local industry suitability, the size and coverage of its private travel catchment illustrates that residential development in the future is likely to change this.

While public transport travel to the Future Industrial and Austral precincts is theoretically possible within 30 minutes, current services are infrequent and offer limited utility. This would limit the accessibility of these precincts to a broad workforce based upon current infrastructure and public transport services.

Access to the motorway network is more important to subregional industrial businesses than high levels of accessibility to population centres, and so the limited population within 30 minutes travel of the Future Industrial Precinct is less problematic for subregional industrial development. In addition, while the catchments shown in Figure 40 are calculated based upon travel times with existing infrastructure, future transport projects such as the M12 and upgrades to the Northern Road and Bringelly Road will increase accessibility to the Future Industrial and Austral Precincts.

The travel catchments of the Prestons and Chipping Norton precincts cover a much larger part of the existing developed urban area than those of the Austral and Future Industrial Precincts. This illustrates their greater suitability for local industrial services than future industrial areas.

Prestons' location at the intersection of the M7 and M5 makes it accessible from a large area by car, and its position alongside the Liverpool-Parramatta T-Way makes it relatively accessible by public transport. Chipping Norton is less accessible by public transport, and its 30-minute private vehicle catchment does not extend over residential growth areas or future industrial precincts west of the Western Sydney Parklands. However, its catchment does cover large parts of the Bankstown and Fairfield LGAs as well as the existing urban parts of Liverpool LGA.

FIGURE 40: THE 30 MINUTE TRAVEL CATCHMENTS BY PUBLIC AND PRIVATE TRANSPORT OF FOUR INDUSTRIAL PRECINCTS WITHIN LIVERPOOL LGA



Source: SGS, 2018

6.6 Summary

Forecast demand

While industrial land supply across the LGA exceeds the future demand forecasts, future land supply is not in the right place for certain industries. Subregional industries are likely to have sufficient supply, both in terms of undeveloped land and proposed future land in the western part of the LGA.

However, land for locally-focused industries that seek smaller sites and need to be close to businesses or residential populations is under-provided. Only one undeveloped precinct (Austral) was identified that suits these needs, although Crossroads also has the locational characteristics required to play a role in supporting these industries. This leaves a gap of an estimated 80 hectares by 2036.

Exacerbating this constraint on current supply is the likelihood that larger precincts, such as the Moorebank Intermodal Terminal and adjacent business park, are likely to attract businesses from across Sydney, not just within Liverpool. These precincts already appear to be curating a mix of businesses, rather than simply providing new land for existing businesses in the surrounding area to expand into. This erodes the ability of these sites to absorb future demand originating in the Liverpool LGA.

There are potential future precincts close to Liverpool that may be able to provide additional IN2-zoned land, subject to other development constraints. These are the southern portion of the Moorebank Defence Lands (north of the East Hills railway line), Crossroads and Austral in the future.

Suitability

The supply coming online over the next twenty years in both Liverpool and Penrith is likely to meet the demand for larger-scale industrial operations. Recent developments in precincts such as Prestons and the Moorebank Business Park are an example of this type of development.

What is not being adequately provided are local precincts supporting a diverse range of business close to established centres or markets. These are the industrial precincts with urban services or local light industry uses such as storage, machinery and equipment repair, construction supplies and food manufacturing. These industries require smaller lots and proximity to customers or suppliers and are less able to relocate than footloose businesses. As shown in Figure 38, these types of businesses typically want to locate in established areas.

The challenge

With much of the remaining supply being taken up by larger industries and new supply catering towards these businesses, the needs of smaller-scale, locally-focused urban services and other mixed industry businesses are not being met. **This gives rise to what could be considered the industrial equivalent of the Missing Middle.**

The challenge for Liverpool City Council is to accommodate the future growth of urban services land by identifying suitable locations for such precincts, ensuring prioritisation of servicing to accommodate short-to-medium term growth and providing suitable locations to support the continued growth of the Industrial Missing Middle.

7. INSIGHTS

7.1 Insights

Shift in the Western Sydney economy

There has been a concerted pivot towards Western Sydney at a policy level. The Greater Sydney Commission's vision for a metropolis of three cities focuses on the ability to access employment within 30 minutes by public transport.

Government planning and investment in Western Sydney Airport, Western Sydney Employment Area and the Western Sydney City Deal is shaping the future of the Western Sydney economy. The Western Sydney City Deal plays a fundamental role in the growth of the Western Sydney economy, delivering opportunities provided by Western Sydney Airport and the development of a surrounding aerotropolis. The land uses in the Western Sydney Employment Area are important in driving the growth of the Western Sydney economy.

The population of the Western City District is forecast to increase by 49% to 3,055,173 by 2036. This level of population growth will increase the need for local population serving industrial uses. Local population serving industrial uses such as car mechanics and building materials locate in densely populated areas with access to residential markets. The challenges for local industrial precincts located on the fringe of Sydney include the capacity of established precincts with no room to expand and pressure for rezoning in light of rising land values.

Industrial lands policy

Previous metropolitan plans have not recognised the importance of retaining industrial lands. The Greater Sydney Commission is shaping policy for industrial lands across Greater Sydney as evident in Objective 23 of the Greater Sydney Region Plan. The Plan identifies that industrial and urban services land in the metropolitan area play a vital role in the economy and will need to accommodate a wide range of businesses supporting Sydney's overall productivity. The Plan identifies the need for all planning authorities to effectively manage industrial land in a way that reflects the needs of their local context. Three approaches are outlined in the plans: retain and manage, review and manage and plan and manage. The review and manage approach applies to the developed eastern part of Liverpool LGA, while the plan and manage approach applies to the western half of the LGA.

State of the market

Consultation with industry experts has indicated that demand across South-West Sydney is high with the Western Sydney economy shifting to the south west. In Liverpool, land values are increasing as a result of limited supply and growing demand (Stockland, 2018). This has driven the lowest vacancy rates Liverpool has experienced in two years (AMP Capital, 2018).

Consultation with Charter Hall indicated that this level of demand is driven by affordability with land values in the south west more affordable than the inner west and central west and the displacement of industrial uses in inner Sydney due to residential development. Small scale businesses (<10,000sqm) pushed out of inner city locations are looking to relocate in the Liverpool area are struggling to find land small enough to meet their needs.

Stockland identified that owner occupiers are competing with institutions who want to invest in quality stock in Liverpool. This is mostly new stock in new industrial development precincts.

The demand for large format industrial sites is driven by the increasing presence of freight and supply chain industries in South-West Sydney. Consultation with industry experts suggests that Moorebank is currently the most desirable location given the size and quality of stock and access to motorways connecting to Port Botany and other regions.

In terms of industrial sales, industrial sites under 20,000 sqm are highly contested. Charter Hall suggest that smaller industrial lots in established precincts to the east of the LGA are selling for between \$2 million and \$10 million. This value is partly due to the shortage of smaller lots and the greater yield potential (multi-unit static developments).

Between 2011 and 2016, prime rates in Liverpool increased by 15%, outperforming the growth of Greater Sydney with rental values reaching approximately \$115 per square metre in 2016 (Knight Frank, 2016). Moorebank has experienced growth of 1.8% for prime rental floorspace and secondary floorspace has remained stable. This level of growth marks a shift from a prolonged period of subdued rental growth. An increasing supply of industrial floorspace has seen tenants signing rental agreements at competitive rates. This has been driven by speculative developers interested in securing pre-commitments as well as by industry growth.

Servicing employment lands

Consultation with Stockland found that the entire Western Sydney industrial market has a lack of supply and is constrained by the inability to service land. Consultation with business operators and industry experts found that there is a need for coordination from service providers in recently rezoned precincts, which could come from Council.

For precincts under investigation, the level of uncertainty around the timing and first movers for development have been highlighted as a significant challenge. No-one wants to move this far west yet as the airport is not operational and the land is not serviced. There is a need for the NSW Government to communicate a clear signal to developers and service providers the likely timing for development to take place.

The ELDM reports approximately 6,654 hectares of land is under investigation for employment uses around Western Sydney Airport and Western Sydney Employment Area. Consultation with AMP Capital found that a lot of this land is in private ownership. This is a problem because the landowners have different intentions and expectations regarding the sales value of land and its potential future use connected with the Badgerys Creek Aerotropolis. Developers will not express interest until the land is zoned industrial. Access to fund management is difficult in an uncertain climate.

Servicing employment lands is dependent on rental pre-commitments, which could be suppressed by high land values and rising occupancy costs. JLL (2018) note that the lead time to deliver serviced industrial land can take up to 15 months and is reliant on approval from Council. JLL (2018) has suggested that the level of uncertainty of rural land in this area is impacting the value of industrial lands and pre-commitments.

Application of industrial zones

The uses operating in the IN1 (General Industrial) zone vary from large scale subregional industrial uses to local urban services. The application of the IN1 (General Industrial) zone doesn't necessarily reflect the different locational needs of these distinct uses in the zone.

Large-scale subregional industrial uses generally have a wider market catchment, providing jobs beyond the LGA. These uses are not tied to the locational characteristics of a precinct as they value access to major motorways. In comparison, local urban service industrial uses need to locate with proximity to the local population they serve. Relocating further west is often not an option as it is a greater distance from the market they serve.

The application of land use zones does not align with the operational characteristics of these two distinct uses.

Liverpool's industrial landscape

Liverpool has clearly defined employment lands precincts. The built form structure varies with old, new, large and small precincts. Precincts in the east of the LGA are established and mostly contain local industrial uses, however there are some subregional industrial uses on larger sites. New release precincts are tailored to the subregional industries that operate large format businesses.

Consultation has highlighted operational issues in some established precincts. Various businesses identified local congestion as a major barrier to economic growth. Some established precincts such as Chipping Norton and Warwick Farm have narrow local roads, creating congestion and parking implications. Businesses located in the Warwick Farm precinct are facing land use conflicts with trucks competing with horse traffic on the local narrow roads. Businesses operating in precincts that are poorly serviced by public transport such as Hoxton Park identified this as an issue in seeking to ensure that not all employees are car dependent.

There are 3,276 hectares of zoned and proposed employment lands in Liverpool LGA. Of this, 1,116 hectares are zoned for employment (developed and undeveloped) and the remainder is proposed or under investigation. Industries operating in Liverpool's employment lands are predominately distributed across Liverpool LGA in the industrial zones and B5 (Business Development) zone. Notably, the IN1 (General Industrial) zone contains most of the LGA's employment lands.

Liverpool's economy is shifting from one dominated by manufacturing towards one accommodating a mix of knowledge intensive jobs. The Manufacturing industry is currently the largest industrial employer and is forecast to grow slowly over the next 30 years. The transport and logistics sector is specialised in the LGA and is expected to have the highest absolute growth over the next thirty years. Non-industrial jobs such as Professional, Scientific and Technical Services are also forecast to experience significant growth. While growth in these sectors will occur in centres such as the Liverpool City Centre, much of the growth of these high value jobs in employment lands is likely to occur around Western Sydney Airport in connection the Western Sydney Airport and Badgerys Creek Aerotropolis.

Growth of Liverpool's employment lands

Development of the Western Sydney Airport and Moorebank Intermodal Terminal and proximity to major motorways such as the M5 and M7 will likely increase demand for subregional industrial uses such as freight and logistics. Land under investigation for future employment uses in the western part of the LGA currently contains uses such as market gardens and vegetable growing.

The future employment land precincts of Rossmore, Kemps Creek and part of the broader Western Sydney Airport Growth Area will provide significant amounts of employment land if rezoned for industrial uses. It is important to understand the economic role of this future precinct in terms of its relationships with strategic centres in the Western City District and WSA as well as the future spatial form of the Badgerys Creek Aerotropolis before land use zones are applied.

Recent planning for the Collaboration Area provides an opportunity for industrial precincts near Liverpool centre (such as Warwick Farm) to accommodate industrial uses that specialise in medical research and development. As identified in Chapter 2, the presence of universities in the Liverpool City Centre means there is a growing need to develop and test discoveries and innovations and to translate the research undertaken within the precinct into commercialised products. The growth of high-value manufacturing is closely aligned with health and education precincts and the ability to accommodate facilities such a biotech hub will contribute to the growth of Liverpool's economy.

7.2 Next steps

It is evident that the Liverpool economy is changing, driven by major new infrastructure, an evolution in the role and function of Liverpool CBD and a growing population.

These myriad changes present a complex land use challenge for Liverpool to ensure that this evolution is supported while retaining the economic backbone in industrial jobs that defines Liverpool today.

This has implications for how land is used and managed. Chapter 8 provides recommendations to managing this transition with respect to industrially-zoned land in the LGA.

8. RECOMMENDATIONS

This chapter provides recommendations to retain, manage and grow Liverpool’s employment lands.

8.1 Introduction

Strategies have been developed to retain and manage existing established precincts and facilitate the growth of proposed precincts to the west of the LGA. The strategies are framed around three areas of focus:

- Strategy 1: Ensure sufficient supply to meet future demand
- Strategy 2: Manage industrial precincts
- Strategy 3: Economic development initiatives

Actions and a supporting rationale are provided for each strategy.

8.2 Strategies and actions

Strategy 1: Ensure sufficient supply to meet future demand

TABLE 26: STRATEGY 1 ACTIONS AND RATIONALE

Action	Rationale
<p>1.1 Retain and protect all existing industrial precincts in the LGA that is not identified as required as part of the Collaboration Area Place Strategy</p> <p><i>Do not permit rezoning of any industrial precincts, including the Goodman site, Orange Grove and Chipping Norton.</i></p>	<p>The Collaboration Area Place Strategy identifies the need for some current industrial sites (North of Newbridge Road) to be considered as part of an expanded Mixed-use centre. The loss of this supply, coupled with the project demand for IN2-related uses, requires the preservation of all other remaining precincts to support the future growth of industries seeking an industrial precinct location.</p>
<p>1.2 Identify and zone suitable sites for new IN2 (Light Industrial) land east of Kemps creek. *</p> <p><i>Increase supply of industrial land specifically suited to meet the needs of future businesses that seek the locational and lot-size characteristics of precincts that accommodate smaller scale operations (for instance Chipping Norton). This could be through an expansion of the existing Austral industrial precinct.</i></p> <p><i>This would be done in concert with the recommendation Actions in Strategy 2.</i></p>	<p>Preserving land around the airport will not entirely address the volume and character of demand for industrial sites. There is a demand now for industrial land that accommodates local urban services uses within proximity to population densities. Projected demand for this type of industry activity is an additional 122 hectares by 2036. Land to the east of Kemps Creek would serve the surrounding residential area, the growth catchment of Leppington to the south and is well connected to Camden Valley Way and the M5 and M7 motorways.</p> <p>This area is identified as most suitable for local industries in the Suitability analysis.</p>
<p>1.3 Consider remaining SP2-zoned land on former Moorebank Defence lands precinct for IN2. *</p> <p><i>Increase the supply of IN2 land close to Liverpool CBD and existing residential areas by re-zoning the currently undeveloped land, with accompanying environmental impact assessment. This would be done in concert with the recommendation Actions in Strategy 2.</i></p>	<p>Businesses attracted to IN2-zoned land often require proximity to centres and residential population. They also act as a buffer between the heavier IN1 uses to the west and the residential uses to the east.</p> <p>Assuming that this land has not been committed already, this would provide approximately 96 hectares of industrial land zoned IN2 to meet future demand. This area is identified as most suitable for local industries in the Suitability analysis. Priority should be placed on the site’s role as native habitat.</p>

Action	Rationale
<p>1.4 Rezone Crossroads IN3 zone to IN2 *</p> <p><i>Increase the supply of IN2 land by re-zoning the currently undeveloped land at Crossroads to IN2 to increase supply.</i></p>	<p>Crossroads is near to population-serving areas and could work effectively as an IN2 zoned precinct catering to small businesses. With sufficient land elsewhere in the LGA for IN3-related uses, Crossroads would add much needed land to meet future need.</p> <p>This area is identified as most suitable for local industries in the Suitability analysis.</p>
<p>1.5 Understand future industrial opportunities in the Western Sydney Airport Growth Area</p> <p><i>Work closely with the Greater Sydney Commission, INSW, Department of Planning and Environment and the Western Sydney City Deal team to better identify the strategic role and function of the Badgerys Creek Aerotropolis and Western Sydney Airport Growth Area.</i></p>	<p>The opportunities created by the Western Sydney Airport and the creation of the Badgerys Creek Aerotropolis will cause a significant change in the economic focus of Western Sydney. It is important that land uses around the Western Sydney Airport support its function and leverage competitive advantages to create a successful aerotropolis. The future roles of industrial land in this area must be understood before land is zoned.</p>
<p>1.6 Concentrate future IN1 and IN3 land provision in the proposed future industrial lands around Western Sydney Airport</p> <p><i>Staged release of industrial land around the airport should align with evolving role of Western Sydney Airport and Badgerys Creek Aerotropolis.</i></p>	<p>There are significant industrial land releases proposed around Western Sydney Airport. The role and function of the Aerotropolis and wider Western Sydney Priority Growth Area is likely to attract businesses aligned with freight and logistics, warehousing, defence and advanced manufacturing, due to their proximity to the airport motorways. These are likely to require large lot sizes and require separation from other land uses such as residential.</p>
<p>1.7 Ensure sufficient supply of IN2-zoned land around Western Sydney Airport.</p> <p><i>Monitor growth of light industrial and urban services industries seeking to locate in future industrial precincts to ensure that there is sufficient provision of suitable lot sizes.</i></p> <p><i>Where IN2 is considered appropriate, it can be used as a buffer between heavier industrial uses and other surrounding uses such as residential or commercial.</i></p>	<p>The maturation of the Western Sydney Airport is likely to require the provision of supporting industries as businesses establish in the Aerotropolis. Like businesses in existing centres, they will require supporting businesses to locate near them. Supply of sufficient IN2 zoned land, coupled with the recommended Actions in Strategy 2, would assist in supporting these businesses.</p>
<p>1.8 Co-ordinate land release and utility connections, with priority on servicing Austral first</p> <p><i>Work with utility providers such as Sydney Water, RMS and power companies and NSW DP&E to identify a rolling sequence of industrial land releases to ensure that the new supply comes on line fully serviced.</i></p> <p><i>This may include identifying a Council liaison officer to work with these providers to ensure that their Capital Works programs align with anticipated land release.</i></p>	<p>There is a need for certainty around the servicing of future employment lands. A lack supporting utilities and services (such as sewer, water and roads), or uncertainty over the timing of provision, is a barrier to industrial development. Ensuring the priorities of the Greater Sydney Commission, Department of Planning and utility providers are aligned will provide a clear signal to developers when land is coming available.</p>
<p>1.9 Increase connectivity to public transport</p> <p><i>Work with TfNSW to identify precincts coming online so that future bus routes can be planned to service them.</i></p>	<p>Consultation with businesses identified that a number of employees commute to work via public transport. Co-ordinating accessibility as part of at the land release process will provide further certainty to businesses who are looking to locate in the LGA's precincts.</p>

Action	Rationale
<p>1.10 Plan for future industrial lands to West of LGA once Outer Sydney Orbital corridor is confirmed.</p> <p><i>This may involve a reconfiguration of industrial lands under investigation to maximise the freight opportunities that OSO provides.</i></p>	<p>The Outer Sydney Orbital corridor has been identified by Transport NSW and the Greater Sydney Commission as a fundamental need to support the long-term economic growth of Western Sydney. The OSO provides a second north-south connection and will relieve freight and distribution capacity from the M7. The corridor would connect the LGA to the broader Eastern Seaboard road network and expand the reach of businesses to through this wider economy.</p> <p>The corridor has not been confirmed, however it is important that Council continue engagement in the project to ensure land in the corridor is reserved for employment uses and not lost to other uses.</p>

*** Note:** This report identifies three separate actions to increase the supply of IN2-zoned land. In total these would release more than sufficient land to meet the future demand for local uses. In practice, it is likely that there will be competition from other industrial and non-industrial uses. As such, this report puts forward these actions separately to provide guidance for Council when assessing their options.

Strategy 2: Manage industrial precincts

TABLE 27: STRATEGY 2 ACTIONS AND RATIONALE

Action	Rationale
<p>2.1 Review permissible uses and objectives of IN1, IN2 and IN3 zones to more clearly demarcate the role and function of current and future zones</p> <p><i>Better separation of the functions, particularly to strengthen the role of the IN2 zone as a local industry and urban services classification.</i></p> <p><i>This could include:</i></p> <ul style="list-style-type: none"> ▪ Removal of 'Light industries' from IN3 ▪ Removal of 'Transport depots' from IN2 	<p>The IN1 (General Industrial) zone contains a mix of local and heavy industrial uses, creating land use conflicts, parking and congestion issues and lack of opportunity for smaller uses to expand. This is exacerbated by the prevalence of IN1 zoned precincts around Liverpool City Centre that operate more like IN2 precincts.</p> <p>Ensuring that local and heavy uses cluster in separate precincts suited to their operational and locational needs will help to facilitate more optimal uses within the precincts.</p> <p>It may take the form of IN2 uses acting as a buffer to the heavier uses in IN1 or IN3 zones (for example in Chipping Norton)</p>
<p>2.2 Review operating permits in the IN1 zone to ensure precincts maximise their role and align with zone intent.</p> <p><i>Ensure that businesses locating in IN1 zones are not constrained by noise or operating requirements that have an adverse impact on their operations.</i></p>	<p>Consultation with businesses (mostly operating in the IN1 zone) highlighted that Council operating permits are a significant barrier to economic growth. External influencing factors such as local congestion and greater travel times are impacting on distribution. There is a need for Council to review current controls for operating permits to precincts optimal operations.</p>
<p>2.3 Apply maximum lot size requirements in IN2 zones (up to 1 hectare)</p> <p><i>Structure IN2 zone lot configurations to be attractive to small to medium-sized businesses and industrial strata units to mitigate against site amalgamation for larger uses.</i></p>	<p>The "traditional" light industrial precincts to the east of the LGA are increasingly dominated by new, larger developments geared towards freight and logistics and large-scale warehousing (for instance the Aldi and Toll facilities in Prestons). These are often controlled by institutional investors and large-scale developers such as Charter Hall and Mirvac, who can curate the businesses that locate in their facilities.</p> <p>These are being developed at the expense of smaller scale precincts with a greater number of smaller lots (such as Chipping Norton), however these uses are important to support smaller businesses.</p>

Action	Rationale
<p>2.4 Introduce B7 zoning into Liverpool LEP and re-zone the Warwick Farm/Scrivener Street precinct (currently IN1) to align with Liverpool Health and Education precinct growth</p> <p><i>Identify and promote the precinct as the focus for advanced manufacturing and health-related fabrication and translation services.</i></p>	<p>The identification of Liverpool as a Collaboration Area and the future investment in Liverpool Hospital provides a significant opportunity to concentrate the attraction of advanced manufacturing uses to this precinct that align with current and future bio-medical research and translation opportunities.</p> <p>The introduction of a new zoning use to the LEP and applying this to the precinct adjacent Liverpool Hospital will identify this precinct as distinct from other industrial uses and align with the maturation and expanded capabilities of the Liverpool Health and Education Precinct.</p>
<p>2.5 Encourage industrial uses permissible in B6 zone to locate along Hume Highway corridor and restrict in IN zones</p> <p><i>Encourage uses that benefit from a visual presence in the B6 corridor.</i></p>	<p>The B6 zone contains a mix of uses, mostly retail bulky goods which tend to locate on major road corridors (such as Hume Highway and Elizabeth Drive) as they require a visual presence. These uses are also permissible in the IN1 and IN2 zones. Maximising the function of the B6 corridor could alleviate some pressure on In-zoned precincts close to Liverpool CBD.</p>
<p>2.6 Increase building height limits and Floorspace ratio controls in IN1 and IN3 zones to encourage innovative and higher density industrial land uses.</p> <p><i>Coupled with clear land use controls to ensure industrial function remains.</i></p>	<p>Increasing land use efficiency on industrial sites can assist some businesses and industries in making better use of larger sites and allow potential intensification in precincts. A good example of this is the Blum facility (located in Hoxton Park) that demonstrates the ability to expand operations, grow the business through innovative design without requiring additional land. Council should support initiatives for higher density industrial uses, particularly the large-format single story uses.</p>

Strategy 3: Economic development initiatives

TABLE 28: STRATEGY 3 ACTIONS AND RATIONALE

Action	Rationale
<p>3.1 Continue to engage with and support smaller-scale local businesses, via Council's Economic Development team, to understand their locational and operational needs</p> <p><i>This should be done when considering expansion or addition of new industrial precincts (Action 1.2) and on an ongoing basis as industries evolve and the impact of the Badgerys Creek Aerotropolis become more apparent.</i></p>	<p>To best reflect the needs of businesses in any future industrial precinct, ongoing engagement with businesses will help Council to best plan the layout and structure. This also has the added benefit of signalling to the market what is happening and attracting businesses from the inception.</p> <p>Liverpool's economy is transitioning, and the Western Sydney Airport, coupled with advances in manufacturing processes, will have an effect over the medium-to-long term. However, the local businesses that support the local population and economy will still be required and must be part of the future of Liverpool's industrial profile.</p>
<p>3.2 Work with South West Sydney Local Health District, Ingham Institute and Universities to identify specific built form and land-use requirements for future high-tech development</p> <p><i>Identify what industry and research partnerships may seek to have a presence in the precinct. For example, ANSTO and other research institutes.</i></p> <p><i>Aligned with Action 2.4</i></p>	<p>The Warwick Farm and Scrivener precinct will provide complementary floorspace for the advanced manufacturing, research and translation opportunities that develop as part of the Liverpool Health and Education Precinct.</p> <p>It is important that this evolving precinct establishes Liverpool as a pre-eminent place for health-related research translation.</p>

Action	Rationale
<p>3.3 Partner with TAFE NSW and other vocational training providers to align skills of the local population to the skill requirements of jobs in the local economy.</p> <p><i>Ensure skills meet the needs of the future workforce and that clear pathways between education and workforce are established.</i></p>	<p>A high proportion of local residents are employed in industrial jobs. As the population continues to grow and employment lands expand, it is important that local skills are matched with local jobs. The 30-minute city concept is at the core of the GSC’s strategic policy direction for Sydney and with public transport relatively limited in Liverpool, ensuring that people living in the area can work locally is important. This requires skills to be taught locally and industry partnerships established to provide clear pathways from study to the workforce.</p> <p>The growth of ‘Advanced Manufacturing’ reinforces this need, with traditional manufacturing skills potentially being less relevant to locally-based jobs in the future. Upskilling the current workforce and equipping the future workforce with the appropriate skills is important if Liverpool is to take advantage of this industry transition.</p>
<p>3.4 Continue to strengthen engagement with Moorebank Intermodal Terminal, through ongoing engagement with council’s Economic Development Team</p> <p><i>Ensure that IMT is actively engaged with the wider Liverpool economy and that the new industrial precincts surrounding Moorebank IMT meet the needs of local businesses.</i></p>	<p>The Moorebank Intermodal Terminal presents numerous opportunities to strengthen the freight and logistics roles of the Local Liverpool economy by enhancing connectivity to Port Botany, WSA, regional NSW and interstate. The land around the Intermodal Terminal is in high demand. It is important that Council continue to engage with relevant state government parties and the Moorebank Intermodal Terminal to ensure connectivity to other employment precincts across Western Sydney to strengthen economic growth.</p>
<p>3.5 Retain the Rural zoning of land to the west of the LGA to retain the opportunity for a future agribusiness function aligned with the Western Sydney Airport freight function.</p> <p><i>Review in 5-10 years as the WSA function becomes clear and the need for the proposed industrial zoning in that area becomes clearer.</i></p>	<p>Liverpool’s western reaches contain highly productive agricultural uses that serve Greater Sydney. The future role of WSA as a freight port connected to South-East Asia presents an opportunity for Liverpool to support the agri-business aspirations of the Airport. This may take the form in the future as a hybrid mix of rural and industrially-zoned land, with multiple functions.</p> <p>The current earmarking of this land for industrial may remove this opportunity. Holding off until the airport is operational and firmer commitment on the Outer Sydney Orbital corridor would protect this land from being developed too early and removing the possibility of this future economic asset.</p>

GLOSSARY

Developed Industrial Land is land that is both zoned for industrial use and currently developed.

Employment Land Development Monitor (ELDM) is a source of information released by the NSW Department of Planning and Environment which contains information about land supply, development and servicing of all industrial precincts and business parks in the Greater Sydney and Newcastle regions.

Employment Lands/Industrial Lands includes all land that is zoned for industrial or similar purposes. They may be developed for a variety of uses such as manufacturing, warehousing and logistics, service industries, research and development, urban services and utilities.

Footloose Businesses are those which are not strongly tied to a particular location. They are able to move and locate in a variety of places in response to changing market conditions.

Industrial Precincts are areas of industrial or future industrial land which are listed in the ELDM. This land can be developed, undeveloped or marked for future investigation for industrial use.

Planned Industrial Land is land that has been identified in a NSW Government planning policy for future industrial use, but which has not yet been zoned for that purpose.

Specialised Industries are clustered in a particular area. They may share interact and share common inputs and outputs, providing a competitive advantage over other locations.

Servicing Infrastructure provides services such as water, electricity, gas and sewerage. This infrastructure must be provided to land before it can be developed for urban purposes.

Urban Services are a collection of industries that support the development, operation and liveability of the city. They comprise of a diverse mix of industries including storage, building construction, postal services and building support services. Unlike heavy manufacturing or major freight and logistics activities, their relationship with local businesses and communities means they cannot be confined to the outskirts of a city or otherwise isolated from residential areas.

Undeveloped Industrial Land is land that is zoned for industrial use but is currently vacant or unused. This land may or may not be serviced.

Zoning means the land uses zones applied to land under a Local Environmental Plan or State Environmental Planning Policy. Zones identify objectives for land use as well as permitted and prohibited land uses.

APPENDIX

Urban services land

TABLE 29: DEFINING USES IN URBAN SERVICES LAND BY ANSZIC INDUSTRIES

1 Digit	2 Digit	4 Digit
Rental, Hiring and Real Estate Services	Rental Hiring Services (except Real Estate)	
Administration and Support Services	Building Cleaning, Pest Control and other Support Services	
Retail Trade	Motor Vehicle and Motor Vehicle Parts Retailing	
Other Services	Repair and Maintenance	
Manufacturing	Printing (including the reproduction of recorded media)	
Electricity, Gas, Water and Waste Services	Electricity supply	
Electricity, Gas, Water and Waste Services	Gas supply	
Electricity, Gas, Water and Waste Services	Water supply, Sewerage, and Drainage Services	
Electricity, Gas, Water and Waste Services	Waste Collection, Treatment and Disposal Services	
Wholesale Trade	Basic Material Wholesaling	
Transport, Postal and Warehousing	Road Transport	
Transport, Postal and Warehousing	Postal and Courier Pick-up and Delivery Services	
Transport, Postal and Warehousing	Transport Support Services	
Transport, Postal and Warehousing	Warehousing and Storage Services	
Construction	Building Construction	
Construction	Heavy and Civil Engineering Construction	
Construction	Construction Services	
Retail Trade	Other Store Based Retailing	Hardware, Building and Garden Supplies Retailing, nfd
Retail Trade	Other Store Based Retailing	Hardware and Building Supplies Retailing
Retail Trade	Other Store Based Retailing	Garden Supplies Retailing

Source: SGS, 2018

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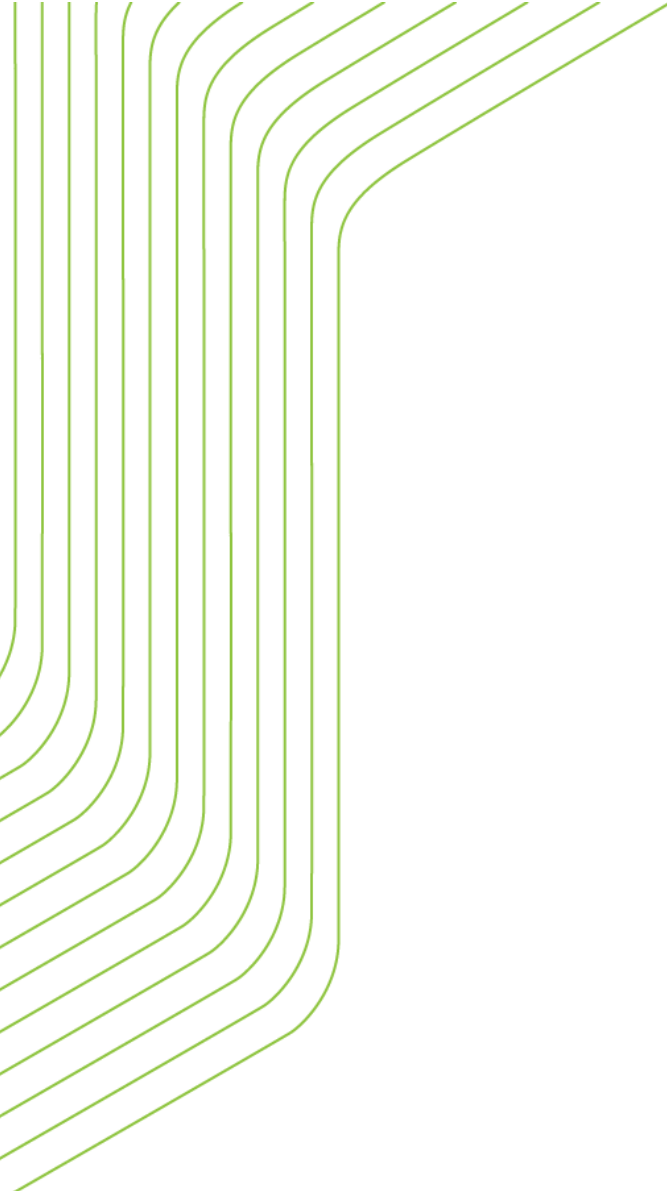
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FINAL SUPPLEMENT TO LIVERPOOL INDUSTRIAL EMPLOYMENT LANDS STUDY

Prepared for:
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EXECUTIVE SUMMARY & RECOMMENDATIONS

Sydney's industrial landscape is rapidly changing, with increased global competition emphasising a requirement for innovation and specialisation in order to establish a competitive niche, which is particularly true for larger industrial users which require scale. Alternatively, continued population growth has created significant demand for localised industrial services including those businesses within the building industry, and maintenance and repairs e.g. auto repairs. The latter is important as almost nine in ten of all industrial businesses within the Liverpool LGA employ less than four workers (including sole trading businesses), meaning they provide the backbone of blue collar jobs within the Liverpool LGA. The key takeout in regards to how Liverpool's existing industrial lands differ from the broader Sydney region is that the bulk of businesses (and hence jobs) service the local population.

Industrial employment lands within the Liverpool LGA are characterised by a wide range of employment and business types. At a high level, there are 44,817 jobs located within the SA2 regions which accommodate existing industrial lands, with manufacturing based employment accounting for 46% of blue collar jobs. This alone puts Liverpool in a unique position as the LGA is reliant on manufacturing based employment (equipment manufacturing, bakery product manufacturing etc.) yet broader indicators suggest a continued decline in manufacturing employment is expected.

At a macro level, this report and Knight Frank's May 2016 Industrial Employment Lands Study report highlights two key emerging themes. They are:

1. The need to release/realise larger tracts of appropriately zoned and serviced employment lands in key precincts, which in turn will capture 'big box' developers and keep occupiers in the Liverpool LGA (as opposed to tenants locating/relocating to Penrith and/or Blacktown LGAs).
2. Rezone and or protect (where appropriate – see section 2.1 for detail on each precinct) existing developed employment lands in the 'eastern' precincts of the Liverpool LGA which caters towards smaller business/industrial user groups which account for the majority of existing industrial businesses within the Liverpool LGA.

Following these two recommendations and as part of the review of key precincts, there is potential for repositioning of some existing industrial areas within the LGA. At the same time, it is recommended that it is important and strategic to clarify the desired future role and character of the individual precincts noting that each has particular local issues and conditions that will influence the manner and extent of future industrial uses. By way of commentary, we note the following:

- A number of the precincts are located in areas that historically were urban fringe areas and now are surrounded and adjoin residential areas. The result appears to be a number of practical limits to their operating and prospects of expansion or intensification. Specifically
 - The mixing of residential and industrial traffic on the local road network
 - The locating of housing on land adjoining industrial and the resulting land use conflict.

The relevant key directions and the strategic drivers as outlined in this report will result in a number of implications for the existing and future industrial employment lands in the Liverpool LGA. Some high level recommendations include but are not limited to:

- A significant opportunity to generate new industrial employment areas in the Bringelly Road Enterprise Corridor alongside the upgrade of Bringelly Road and the Northern Road
- Council should reinforce its position in the continued provision of the original strategic location of employment land on either side of the Western Sydney Airport land to ensure the provision of future industrial employment land for the LGA.
- It is recommended that Council investigate the introduction of development incentives in precincts such as Yarrunga/Prestons, Moorebank, Chipping Norton and the Len Waters Estate for manufacturing, construction and wholesale/logistics industries to recognise the role of the region in these specific industries and to protect these strategically located industrial areas.
- The potential future extension of the Sydney Metro from Bankstown to Liverpool provides an opportunity - the potential for Metro stops provides an opportunity to reposition select industrial precincts to make best use of this heightened accessibility and the principal of intensifying development within a walking distance of such stations (Transit Oriented form of Development).
- The long term locating of new 'heavier' industry, in particular those that maybe characterized as 'offensive or hazardous' maybe more appropriately directed towards areas where they are least constrained by the potential for land use conflict. Specifically, Prestons and Moorebank (being the area to the south of the M5 Motorway) are not close or adjacent to existing residential areas and provide an opportunity to maintain an appropriate and planned buffer.
- The presence of large-box warehousing demand in Prestons, Moorebank and Hoxton Park confirms the strategic location of Liverpool in terms of the M5, M7, future M12 and longer term, the M9 Western Orbital. This is a key comparative advantage for Liverpool and confirms the importance of preserving and consolidating this role for each precinct, noting the practical limits to any expansion of Hoxton Park.
- By reviewing the local planning framework, which considers the rezoning of some industrial zoned land to either a B5 (Business development), B6 (Enterprise Corridor) or B7 (Business Park), the precincts would facilitate greater flexibility in regards to development and user types which could be accommodated.

In considering both the character of the established industrial areas and the emergence of newer more recent areas, and the potential for additional employment areas as a result of new infrastructure, we would recommend that a review be undertaken of the current industrial zoning framework in order to determine whether it reflects a more contemporary and long term positioning of the role and character of precincts within the LGA. Specifically and by way of example:

- a) A review as to whether a wider business zone (including B5 - Business development, B6 - Enterprise Corridor or B7 - Business Park zone) is more appropriate for the Sappho Road (Warwick Farm North) industrial area.
- b) A review as to whether the best and highest order employment use for Orange Grove is more business (B5 - Business development, B6 - Enterprise Corridor or B7 - Business Park zone) in

- recognition of its proximity to the Liverpool City Centre and hospital, whilst also encouraging the location and retention of viable industrial uses
- c) The further consolidation of the role of Yarrunga/Prestons as a strategic freight, logistics and warehousing hub for Liverpool and Western Sydney.
 - d) The potential to encourage the locating of heavier industry that might be characterized as offensive and/or hazardous industries in areas where buffer can be address land use conflicts such Moorebank South and Yarrunga/Prestons.
 - e) Examine ways to further encourage and consolidate the established roles of Moorebank, Yarrunga/Prestons and Chipping Norton industrial areas as the major employment generating clusters for the LGA together with adopting measures to promote the locating of certain uses in those precincts that appear to have a comparative advantage for that use. The specific details of those measures is subject to further investigations however in principle recommend that consideration be given to the adopting and/or amending of planning controls that make it “easier” to locate in the precincts of Yarrunga/Prestons and Moorebank where there are larger englobo parcels and existing lots capable of accommodating logistics and warehousing. It is recommended also that the additional measure of say a financial incentive by way of a reduction in Section 94 development contributions be considered provided there is a policy decision made by Council to “subsidise” infrastructure where there is a greater public benefit in supporting local employment. Such financial incentives would need to be investigated to determine the extent to which they would have a real and practical impact on investment decisions to locate within the Liverpool LGA.
 - f) The potential to review the zoning at the Priddle/Scrivener Street (Warwick Farm) industrial precinct as vehicle and truck access is constrained (on average, the width of both streets is 11.5m with street parking offered on both sides). Consequently, the inferior truck access to the precinct affects the precincts desirability, while residential and other competing uses to the north support this view (rezoning) given the conflicting land uses.

BACKGROUND TO THE REPORT

The Liverpool City Council is undertaking a review of its current Local Environmental Plan. As part of the review the Council has instructed a number of consultants/advisors to provide detailed background studies which are required to be prepared to inform the review of the plan.

For this report it was noted that the Council would like to expand on the Consultancy Assignment that Knight Frank Consulting delivered in May 2016, noting that the purpose of that study was to focus on larger sites likely to capture activity from institutional groups. It was understood that Liverpool City Council requires a supplement to the previously prepared study, expanding the analysis to cover all industrial employment lands in the Liverpool LGA, including small and medium sized sites. The Supplement Industrial Employment Lands Study is a separate body of work from the initial Study, however draws on a number of similar themes and discussions.

This report has been jointly prepared by Knight Frank Consulting and Knight Frank Town Planning.

1.0 INDUSTRIAL MARKET TRENDS – SYDNEY & LIVERPOOL

1.1 TRENDS AND DRIVERS

A look at emerging trends occurring in industrial land markets across Sydney reveals how the use of industrial land is changing. Increased global competition has emphasised a requirement for innovation and specialisation in order to establish a competitive niche. This has resulted in changes to the way new estates are being planned and positioned, with lots needing to be more flexible and adaptable to tenant needs and requirements. At the other end of the spectrum, it has also been observed that the growth in the requirement for industrial land servicing the needs of local community/trades has also increased. This includes those involved in the building industry, and maintenance and repairs e.g. auto repairs. The latter is crucial for the Liverpool LGA as existing employment lands are dominated by smaller businesses servicing the local population.

Key industrial trends identified across Sydney include:

- More flexible lot sizes, which can accommodate a broader mix of industrial user groups,
- Bigger more efficient warehousing,
- Greater accessibility by road, rail and public transport for both business and employees,
- Convenient location close to growing residential areas and hence access to workforce,
- Greater importance placed on competitive advantage,
- Reduction in cost in order to be more competitive.

For Sydney's South West, leasing activity has been solid over the past two years. Diminishing stock levels and rising rents in established inner ring locations has provided motivation for industrial businesses to relocate to suitable sites in close proximity to major rail and road networks within Sydney's South West. However, this trend has been most prevalent for businesses who service other businesses as opposed to servicing local residents.

In regards to the Liverpool LGA, demand for industrial lands has been strong with the focus being firmly concentrated in Prestons, Moorebank and Chipping Norton, highlighted by the most recent 2015 Employment Lands Development Program Report, which is highlighted in section 1.2.

With almost nine in 10 industrial businesses in Liverpool's existing employment lands employing four or less workers (including sole trading/non employing), demand remains heavily concentrated in small lots, typically sized below 1,500m², while solid demand for smaller strata titled industrial premises exists.

Unlike large industrial precincts located to the north, namely being Eastern Creek and Erskine Park, Liverpool has a large reliance on smaller businesses that provide services to the local population, compared to businesses that mainly deal with other businesses. This makes sense as current employment lands are surrounded by residential uses. These businesses include automotive repairs (including panel beaters), waste management provisions, storage facilities for concrete batching and plant and equipment hire. However, it is important to note that there is also a large presence of larger users currently located in the LGA, with examples including the ALDI distribution centre and Visy.

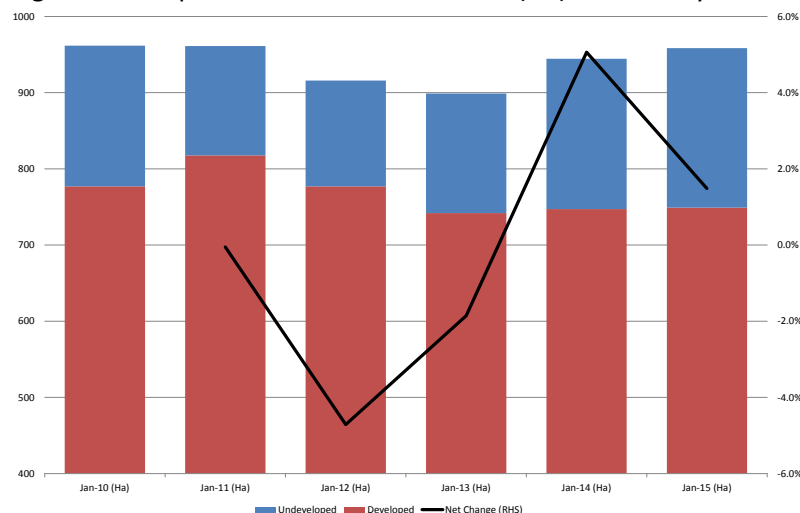
The primary driver for the demand of small lot industrial space has been population growth, as a larger resident base creates additional demand for services. The majority of demand is considered to be from light industries, in that they are less capital intensive, have a lower environmental impact and are consumer oriented businesses. With population growth in South West Sydney expected to outstrip growth across the broader Sydney region, demand for localised services will amplify. Some sectors are highly competitive in the Liverpool LGA where in a substantive way, the high rate of residential building and strong population growth has created significant demand for particular industries, namely being construction and consumer services.

Looking ahead, it is important that the Liverpool LGA’s employment lands be preserved in order to capture future market demand. In some cases, given the high provision of light industrial industries, some precincts may require further assessment for rezoning to higher employing business zones which will still facilitate, and accommodate, growth in light industrial businesses. By maintaining employment lands, the current and future needs of local residents will be met.

1.2 LIVERPOOL LGA – KEY THEMES FROM THE 2015 ELDP

As per the 2015 Employment Lands Development Program (ELDP) report, there were 209.4 ha of zoned employment lands within the Liverpool LGA which was yet to be developed, accounting for 6.9% of Sydney’s undeveloped zoned industrial employment lands. Based on historical take-up rates, there is theoretically sufficient land for another 14 years and beyond (average of the last seven years).

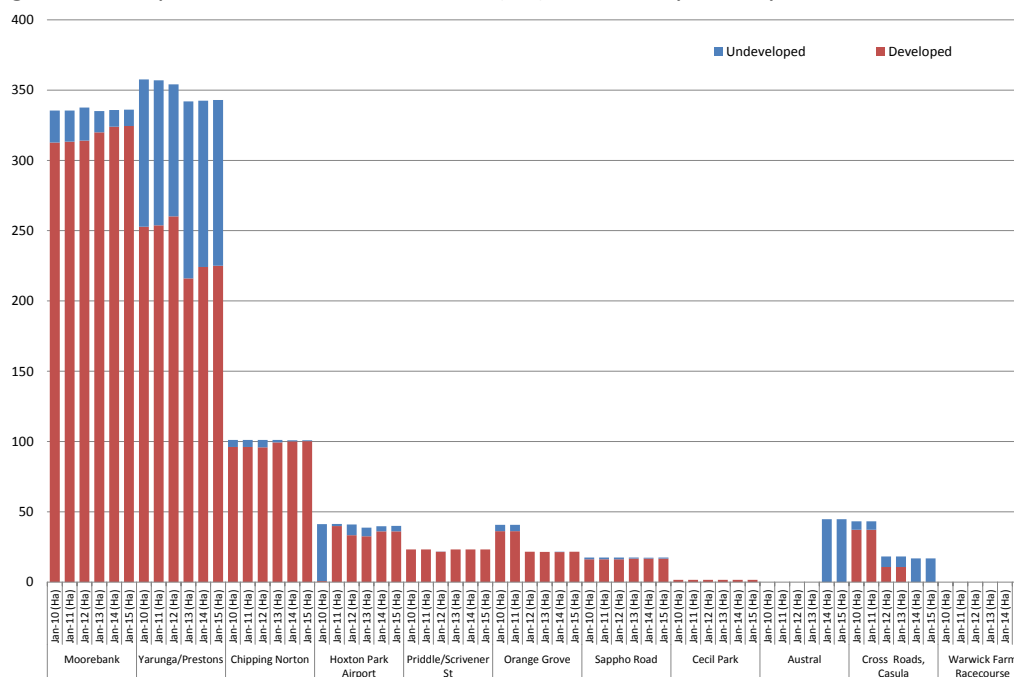
Figure 1. Liverpool LGA Zoned Land Status (Ha) – last five years



Source: Knight Frank Research, Employment Lands Development Program, Department of Planning and Environment

Over half of all undeveloped land zoned as industrial employment land in the Liverpool LGA is located in the Preston’s precinct (56.4%, or 118 ha), and a further 21.4% is located in Austral (44.8 ha), as part of the newly rezoned South West Growth Corridor (see Figure 2). An additional, 41.4 ha (19.8%) of undeveloped zoned industrial employment land is split almost evenly between Warwick Farm Racecourse (Coopers Paddock), Cross Roads, Casula and Moorebank. The remaining 2.5% or 5.2 ha of Liverpool LGA’s zoned industrial employment land are located amongst Chipping Norton, Hoxton Park Airport (Len Waters Estate) and Sappho Road (Warwick Farm North) precincts.

Figure 2. Liverpool LGA Zoned Land Status (Ha) – last five years, by Precinct



Source: Knight Frank Research, Employment Lands Development Program, Department of Planning and Environment

While there is capacity for future development at selected precincts in the Liverpool LGA, the majority of this land is not serviced which will consequently limit development over the next five years unless adequate land is serviced. The most recent available data from NSW Planning (ELDP, 2015), indicated undeveloped and serviced land within the Liverpool LGA had declined to 41.1 ha (see Figure 3). This figure represents 9.1% of all undeveloped and serviced land across the Sydney Metropolitan region. This Liverpool LGA total represents a 7.6% fall in undeveloped and serviced land compared with 2010, and a 14.2% drop over the most recent year as land uptake has outpaced the rate of new land parcels being serviced.

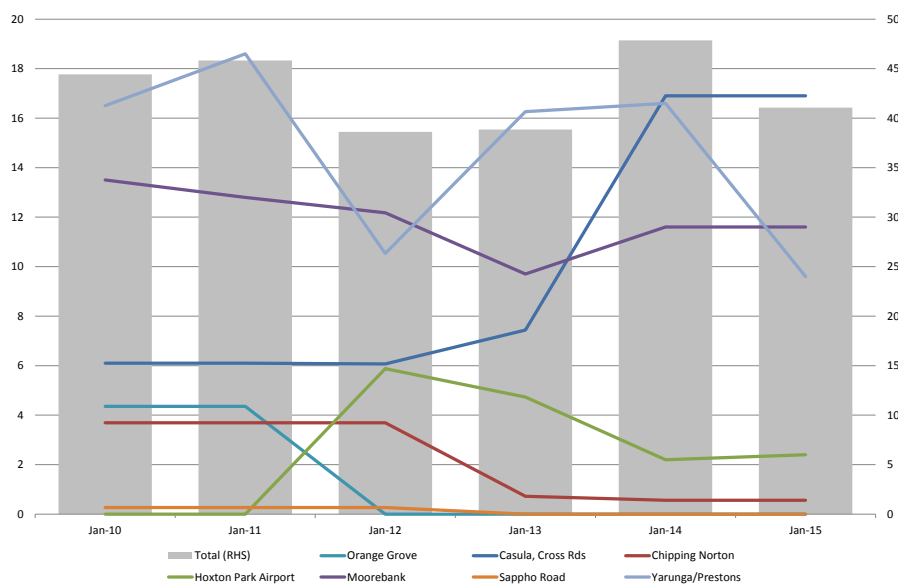
To give some context as to why this amount of serviced land implies a relative shortage of available inventory for imminent development, the average take up of land has been approximately 15 ha per annum since 2008, reflecting a possible 2.8 years of available supply (see Figure 4). Although the average take up of land has fallen to around 5.5 ha per annum over the past four years, which would reflect a possible 7.5 years of available supply. In 2010 take-up of land reached 44.4 ha, which suggests that, the current land availability could be developed in one year. Take-up refers to land that has been consumed by industrial development (i.e. vacant employment lands which have been developed). It is defined as the point at which development has commenced on a site and the site is therefore no longer available for development.

The Government is yet to formally provide a framework on how to service undeveloped land. While institutional developers have a relatively greater capacity to fund this cost, it is a considerable impediment for smaller privates. This is providing institutional developers with the opportunity to control the market share of developments over the next two to three years.

Larger private land holders have the potential to compete in the short term development cycle, however

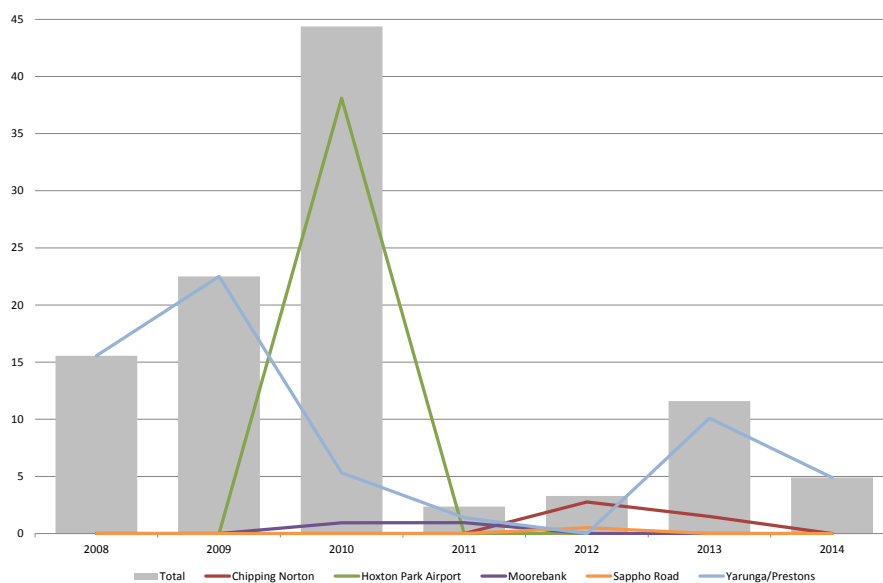
have shown limited urgency to progress the development of land holdings to this point in time. This has been shown by the bulk of development within the Liverpool LGA having been developed by the major institutions over the last 5-10 years.

Figure 3. Undeveloped and Serviced Land (Ha) – by Precinct, 2008-2014



Source: Knight Frank Research, Employment Lands Development Program, Department of Planning and Environment (unpublished data for Chipping Norton, Orange Grove and Sappho Road (Warwick Farm North))

Figure 4. Take-up of Employment Land (Ha) – by Precinct, 2008-2014



Source: Knight Frank Research, Employment Lands Development Program, Department of Planning and Environment (unpublished data for Chipping Norton, Sappho Road (Warwick Farm North))* Take-up analysis only includes lots greater than 100m² and does not include existing lots which were already partially developed. The figures will therefore contain a small under estimation of total take-up.

I.3 SUPPLY CHALLENGES - SERVICES REQUIRED

As mentioned in Knight Frank's May 2016 Industrial Employment Lands Study report for Council, in order to facilitate development, the servicing of undeveloped and zoned land within the Liverpool LGA is required to accommodate short and medium term employment growth. Beyond this, consideration should also be taken for land which is not currently zoned for industrial uses but is likely in the future. Anecdotal evidence from key industrial developers highlighted that the provision of services was key in the development of industrial land. Put simply, developers require certainty with sites and without servicing being readily available, there is no certainty, particularly in relation to timing.

In terms of Liverpool City Council's role in the above, the Council has the ability to fast track services. In turn, this will assist in reducing hurdle rates and make development easier and cheaper which in turn will keep gross rents competitive. The main components of the key services required are electricity, water and sewer. These are highlighted below.

Electricity Supply To provide certainty for developers, readily available electricity supply is needed. All businesses who occupy industrial areas are reliant on electricity for operational needs. Proactive forward planning is required as there is a considerable difference between electricity supply for residential uses and industrial uses, given that upgrades are typically required to accommodate usage.

Water and Sewer Supply Water and sewer supply is an important consideration for industrial users, particularly manufacturers.

Similarly, road infrastructure upgrades and improvements to public transport servicing the Liverpool LGA's industrial areas is also an important consideration. While there are major infrastructure works occurring throughout the Liverpool LGA and South West Sydney, it is recommended that Council engage in discussions with the relevant transport agencies. This includes provisions for additional/improved road access.

2.0 CURRENT INDUSTRIAL LAND

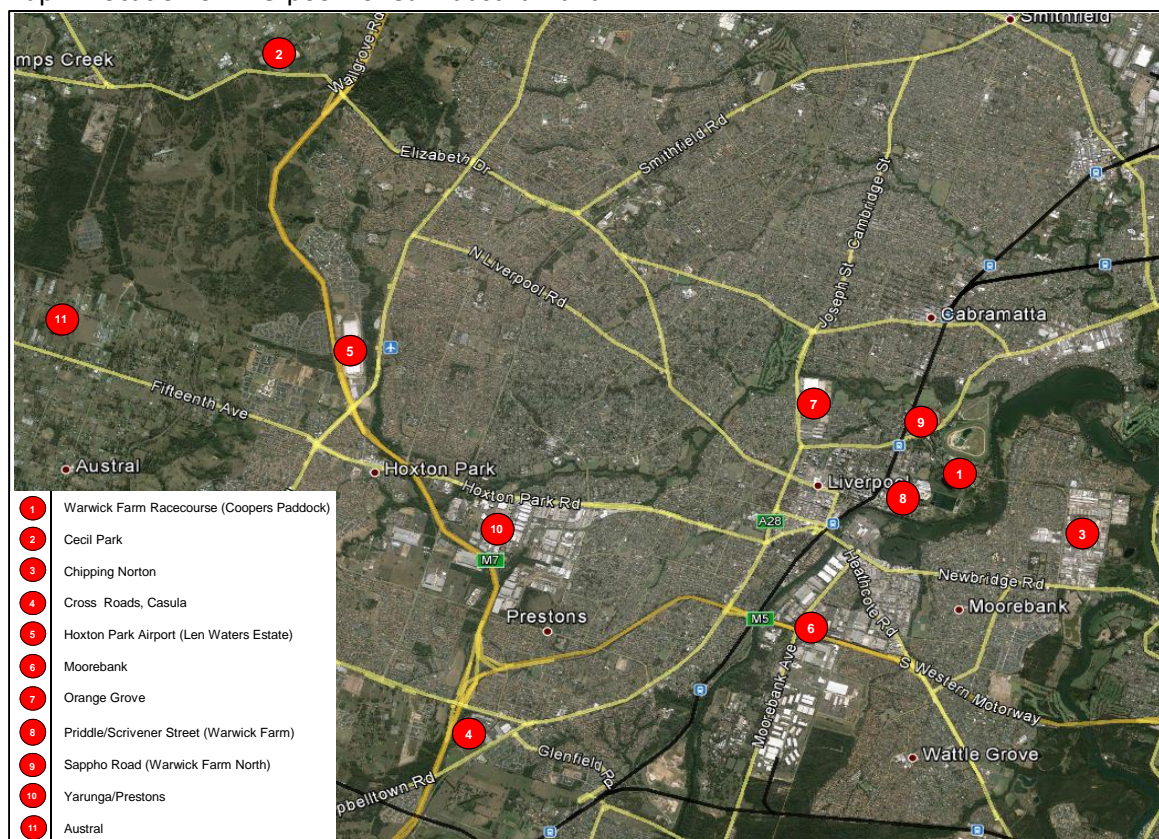
Utilising the industrial precincts identified within the 2015 Employment Lands Development Program (ELDP), there are 11 zoned industrial precincts scattered throughout the Liverpool LGA, all of which vary in size and include a mix of industries. As at January 2015, there were 958.4 ha of zoned industrial employment lands within the LGA, of which 749 ha were developed.

Although fragmented and spread throughout the LGA, the bulk of Liverpool’s industrial zoned land is located at either Prestons or Moorebank, collectively accounting for 71% of zoned industrial land within the LGA. Of note, the majority of this land has been developed. With the exception of Chipping Norton (100.9 ha), other industrial precincts within the LGA are relatively small in terms of industrial zoned land (sub 50 ha).

The following precincts were identified as part of the 2015 ELDP:

- Warwick Farm Racecourse (Coopers Paddock) • Austral • Cecil Park* • Chipping Norton
- Cross Roads, Casula • Hoxton Park Airport (Len Waters Estate) • Moorebank
- Orange Grove • Priddle/Scrivener St (Warwick Farm) • Sappho Road (Warwick Farm North)
- Yarrunga/Prestons

Map 1. Location of Liverpool Zoned Industrial Land



Source: Knight Frank Research

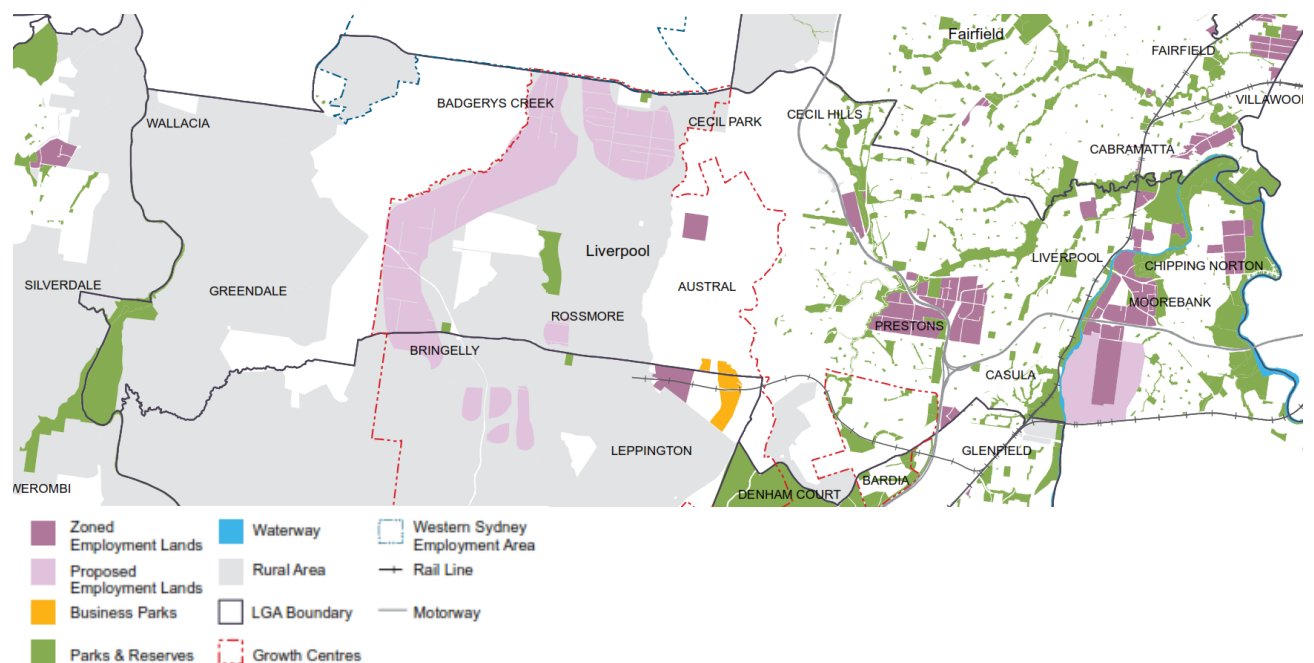
(*note; analysis of Cecil Park has been excluded from this report given its small land use offering of 1.6ha)

2.1 OVERVIEW OF EXISTING INDUSTRIAL ZONED PRECINCTS IN THE LIVERPOOL LGA

The following overview has been prepared based on a review of the current zonings, mix of existing uses and field inspection. For comparative purposes, the industrial precincts have been categorised in the same manner as that adopted by the 2015 Employment Lands Development Program Report (Employment Report) prepared by the Department of Planning and Environment. The overview and description of each precinct is set out below.

Map 2 below illustrates the extent of existing and proposed industrial/employment lands in the Liverpool LGA as per the Employment Report as at January 2015. It is noted however that the map describes areas zoned for industrial purposes and not areas currently used for that purpose. It is noted that for example, Sappho Road (Warwick Farm North) is largely used for automotive sales. Accordingly and whilst the Employment Report is a useful indicator of land supply, it needs to be read in conjunction with the existing land uses suggesting that the figures within that report are a moderate overestimation of the availability of industrial lands in the LGA.

Map 2. Existing and Proposed Employment Lands in the Liverpool LGA



Source: Department of Planning and Environment

2.1.1 YARRUNGA/PRESTONS

The Yarrunga/Prestons Industrial Area is one of the largest industrial areas in the Liverpool LGA. The industrial area is predominantly zoned IN3 Heavy Industrial with an area of land zoned IN2 Light Industrial in the north-eastern sector and areas of land zoned IN1 General Industrial along the southern and south-eastern edge of the industrial area.

The industrial area is well connected in terms of road access. The M7 Motorway Bernera Road interchange is located within the industrial area. The M5/M7 Motorway interchange is located less than 800 metres from the southern edge of the industrial area. The strategic location of this industrial area allows for direct links from the M7 to the Sydney CBD, Port Botany, Sydney Airport, the future Western Sydney Airport at Badgerys Creek, the greater metropolitan region and interstate freeways.

Access to public transport servicing the industrial area is limited. Bus stops along Kurrajong Road, Wonga Road and Hoxton Park Road provide connections to areas such as Liverpool, Casula, Ingleburn, Carnes Hill and West Hoxton.

The industrial area zoned IN1 and IN2 adjoins residential areas zoned R2 Low Density and R3 Medium Density on the southern and eastern edges. An Environmental Management and Special Infrastructure (drainage) and Recreation zones provide a buffer between the IN3 and adjoining R2 residential zone to the west. An R4 High Density residential zone is located adjacent to an IN1 zone at the northern part of the industrial area.

Vehicular access to the surrounding residential areas to the south and east of the site are largely shared with access into and around the industrial area.

Land allotments within the industrial area are fragmented in parts. The size of allotments within the industrial area varies from 1,500 square metres to 28 hectares.

The strategic location of the Yarrunga/Prestons industrial area on the M7 Motorway and near the M5 Motorway is significant to the existing and future freight, logistics, warehousing and distribution land uses that are likely to significantly contribute to employment generation in the Liverpool LGA. Recent developments in the industrial area include the Aldi Distribution Centre, Inghams, Mainfreight Facility, Biz Holdings and Sydney Water.

As indicated within the Western Sydney Infrastructure Plan, the location of the Yarrunga/Prestons industrial area will also benefit from the planned upgrade of Bringelly Road and the Northern Road as well as the future M12 Motorway providing direct connections from the M7 Motorway to the Western Sydney Airport.

Improvements in public transport servicing the industrial area as the newer land release in parts of the industrial area continue to develop will be important to attracting well-known companies to locate in Yarrunga/Prestons and increase the employment generating capacity of the LGA.

Two areas of land zoned B6 Enterprise Corridor directly adjoin the industrial zoned land to the north of the industrial area. While the B6 zone allows for some light industrial uses with consent, it also permits some types of residential accommodation development such as multi-dwelling housing and shop-top housing which could reduce the employment generating capacity of the adjoining industrial lands due to a potential for land use conflict. Council should carefully consider any future rezoning proposals to rezone industrial land to B6 Enterprise Corridor within or adjoining the Yarrunga/Prestons Industrial Area.

Map 3. Yarrunga/Prestons Zoning Map



Source: NSW Department of Planning and Environment

2.1.2 MOOREBANK

The Moorebank Industrial Area is one of the largest industrial areas in the Liverpool LGA. The industrial area is predominantly zoned IN1 General Industrial with an area of land zoned IN2 Light Industrial in the north-western sector.

The northern and southern parts of the industrial area are well connected in terms of road access. The M5 Motorway Moorebank Avenue interchange and Heathcote Road interchange is located within the industrial area.

Parts of the northern-western sector are within an 800 metre radius of the Liverpool Train Station. Buses service the industrial area with connections from Liverpool Train Station.

The surrounding residential areas are predominantly buffered by recreation and waterway zones and defence land, however an established residential area is land-locked in the interior of the northern portion of the industrial area adjoining land zoned IN1 on two edges and IN2 on one edge with a recreational area zone on the other. A second residential area adjoins IN1 zoned land in the southern portion of the industrial area on one edge only. Vehicular access to these residential areas is largely shared with access into, and around, the industrial area.

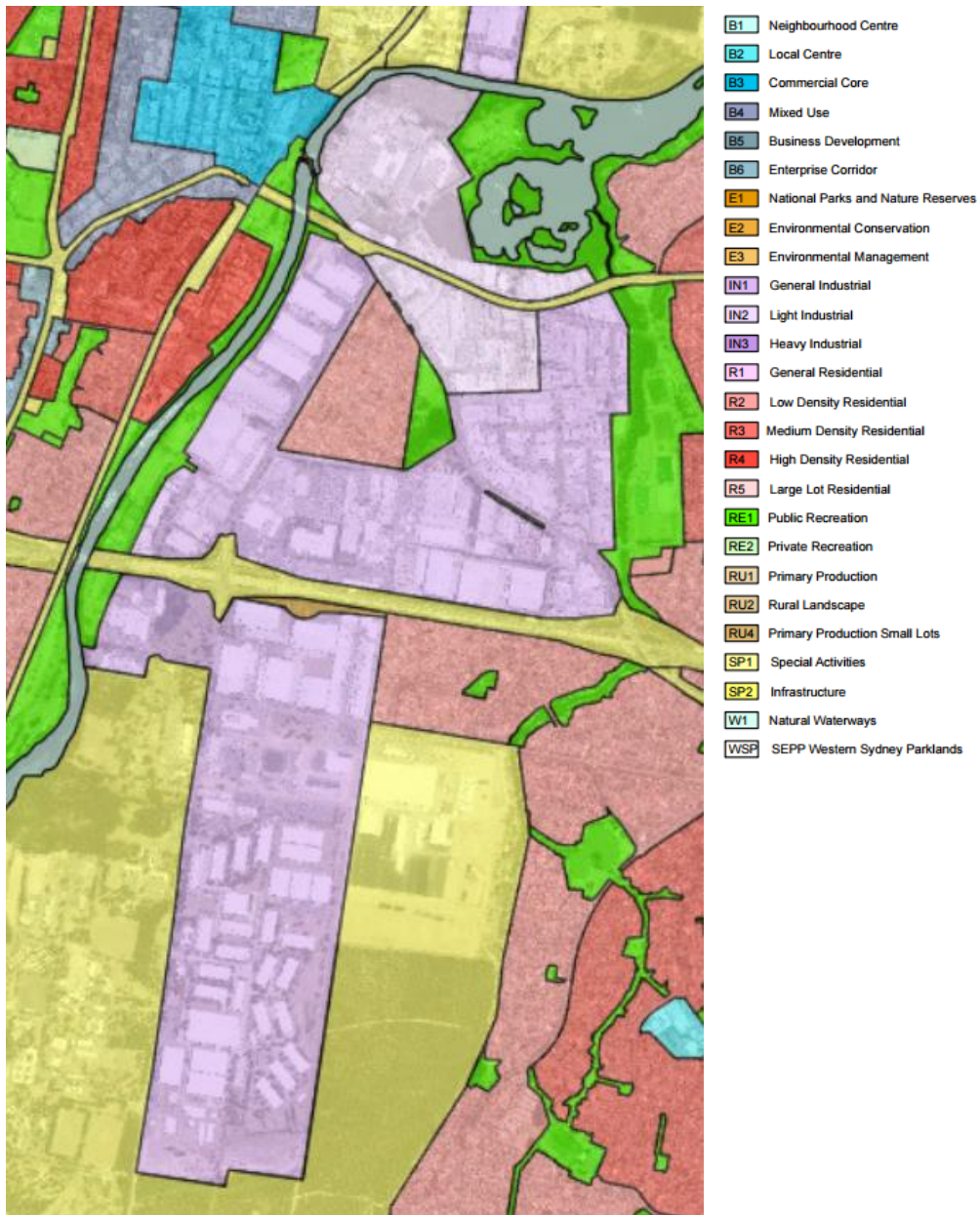
Land allotments within the industrial area are fragmented in parts. The size of allotments within the industrial area varies from 325 square metres to 83 hectares.

The strategic location of the Moorebank industrial area on the M5 Motorway is also important to the existing and future freight, logistics, warehousing and distribution land uses that are likely to significantly contribute to employment generation in the Liverpool LGA. The future M12 Motorway as indicated within the Western Sydney Infrastructure Plan will provide direct connections from the industrial area to Western Sydney Airport at Badgerys Creek. Newbridge Road currently provides a connection from the northern part of the industrial area to Bankstown Airport.

It is noted that in the southern portion of the industrial area, concept approvals have been granted for two intermodal terminals in Moorebank. The proposed intermodal terminal to the east of Moorebank Avenue is a private intermodal terminal known as the SIMTA Intermodal. The proponent for the intermodal terminal to the west of Moorebank Avenue is the Australian Government Department of Finance and Deregulation. It is known as the Moorebank Intermodal Terminal (MIT). The freight intermodals will be a destination for freight containers transported from the port via rail. From this terminal the freight containers will be distributed by trucks to their various destinations. The Environmental Impact Statement prepared for the assessment of the SIMTA Intermodal concept plan has indicated that the operation of the MIT Intermodal will generate approximately 2,174 jobs during its operation.

Parts of the Moorebank industrial area are located within the study area for the extension of the Sydney Metro line between Bankstown and Liverpool stations. A metro station in the Moorebank industrial area would improve public transport accessibility. The opportunity to allow employees to access their workplace via public transport will assist in attracting and maintaining the existing and future employment generating uses in the Moorebank industrial area.

Map 4. Moorebank Zoning Map



Source: NSW Department of Planning and Environment

2.1.3 CHIPPING NORTON

The Chipping Norton Industrial Area is a large industrial area in the Liverpool LGA. The industrial area is predominantly zoned IN3 Heavy Industrial with an area of land zoned IN2 Light Industrial along the northern and western edges of the industrial area.

In terms of road access, vehicles accessing the industrial area can connect to the Hume Highway via Governor Macquarie Drive and can connect to the M5 Motorway via Newbridge Road and either Moorebank Avenue or Heathcote Road. Access to public transport servicing the industrial area is limited. Bus stops along Newbridge Road and Governor Macquarie Drive provide connections to areas such as Liverpool, Bankstown, Burwood and Strathfield.

The industrial area zoned IN2 adjoins residential areas zoned R2 Low Density and R3 Medium Density on the northern and western edges. It is noted that this is a potential source of land use conflict between residential and non-residential use in terms of the manner in which industrial uses are likely to operate such as hours of operation, noise and/or odour. It is noted from a field inspection that there is a wide variety of industrial activities established in Chipping Norton, some of which may result in the potential for such conflict. It is noted that Governor Macquarie Drive accommodates a mix of residential and industrial traffic and in turn may be a limiting factor to further expansion and/or intensification of industrial uses particularly those involving the use of heavy transport including the use of B-doubles. An RE1 Recreation zone provides a buffer between the IN3 and adjoining Georges River to the east. A B6 Enterprise Corridor zone, RE2 Private Recreation zone and an E2 Environmental Management zone are adjacent to the south of the industrial area. Vehicular access to the surrounding residential areas to the north and west of the site area is largely shared with access into and around the industrial area.

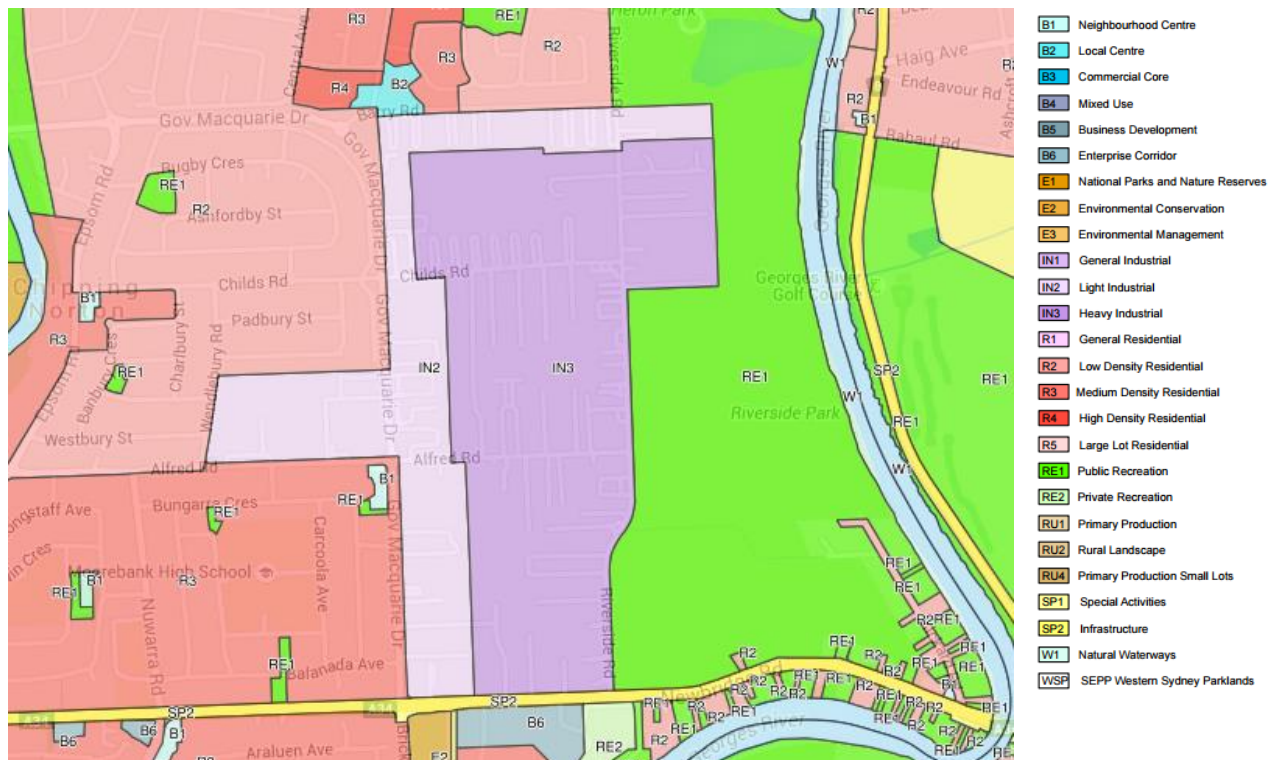
Land ownership within the industrial area is fragmented in parts. The size of allotments within the industrial area varies from 470 square metres to 4.1 hectares.

The location of the Chipping Norton industrial area is significant to the Bankstown Airport. The airport is located approximately 1.2 kilometres from the industrial area. A *Plan for Growing Sydney* nominates Bankstown Airport as a “transport gateway”. The Plan indicates a priority to “*work with council to identify and protect strategically important industrial-zoned land in and near Bankstown Airport-Milperra for future employment purposes*”. Newbridge Road to the south of the industrial area currently provides a direct connection from the industrial area to Bankstown Airport. However, to increase activity at Chipping Norton, the upgrading of Newbridge Road, to improve capacity, could assist in stimulating the area.

While the industrial area is one of the older and established industrial areas in the LGA, an improvement in public transport servicing the industrial area will be essential in attracting new development to occur and to assist in increasing the employment generating capacity of the LGA.

To stimulate new development in the industrial area and assist in increasing the employment generating potential of the LGA, Council may wish to consider the allowance of a range of development incentives for the Chipping Norton industrial area.

Map 5. Chipping Norton Industrial Zoning Map



Source: NSW Department of Planning and Environment

2.1.4 CROSS ROADS, CASULA

The Cross Roads, Casula industrial area is a small industrial area (approximately 21 hectares in area) in the Liverpool LGA. The industrial area is zoned IN3 Heavy Industrial.

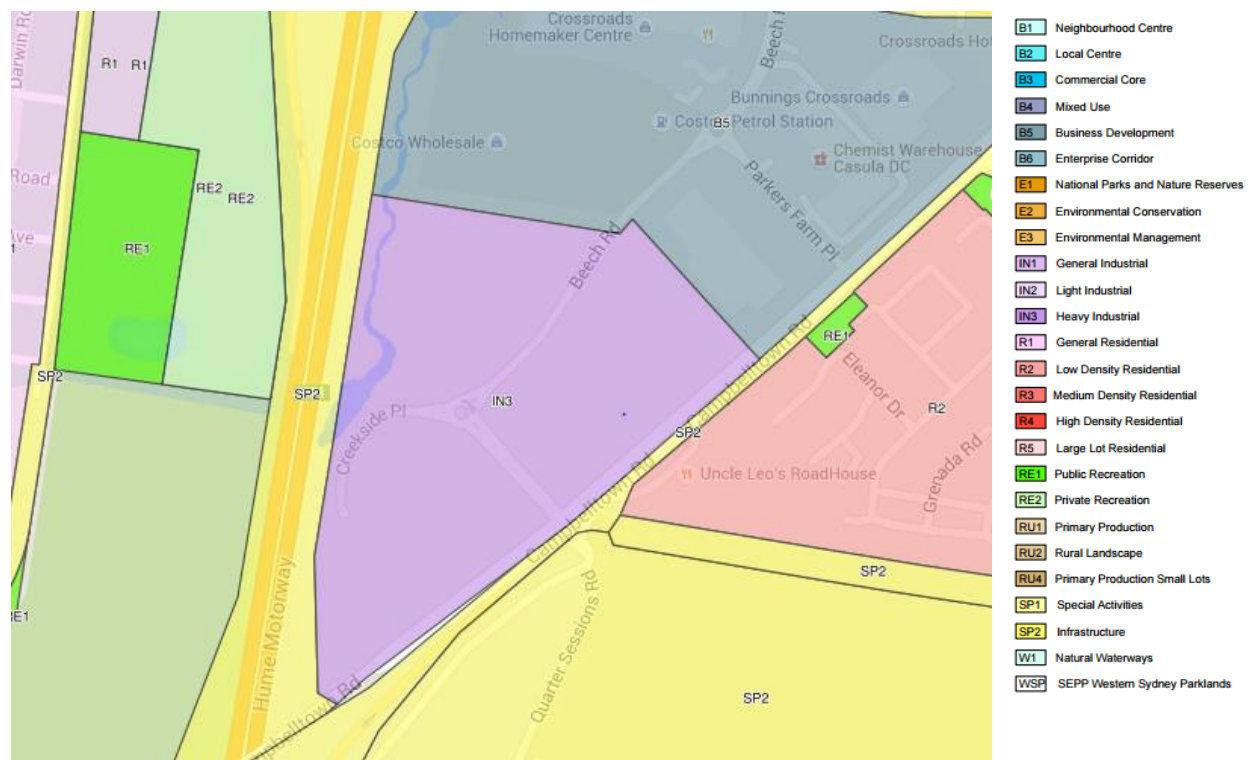
The industrial area is well connected in terms of road access. The M7 Motorway Camden Valley Way interchange is located in close proximity to industrial area. The M5/M7 Motorway interchange is located approximately 1 kilometre from the industrial area. The location of this industrial area allows for direct links from the M7 to the Sydney CBD, Port Botany, Sydney Airport, the future Western Sydney Airport at Badgerys Creek, the greater metropolitan region and interstate freeways.

Access to public transport servicing the industrial area is very limited. Bus stops along Camden Valley Way provide irregular connections to areas such as Narellan, Prestons and Bringelly.

The industrial area adjoins the M7 Motorway to the west and a B5 Business Development zone to the north-east. The Campbelltown City Council LGA is adjacent to the site to the south-east. On this land are residential development zoned R2 Low Density Residential and an SP2 Educational Establishment zone for the use of the Glenfield Park Special School.

The industrial area appears part of a new subdivision and has not yet been developed. The area is comprised of two main allotments. Given the recent anecdotal evidence of solid demand for the AMP Crossroads logistics centre the current Heavy Industrial (IN3) zoning is considered appropriate. However, given the adjoining B5 Business Development zoning, Council may wish to consider rezoning this land to a lighter Industrial Zone (IN1 or IN2). This will still permit industrial uses and warehousing and distribution centre uses in close proximity to the M7 Motorway and is likely to result in a reduced impact on the amenity of the adjacent residential and educational establishment uses. Furthermore, Council can be satisfied that the land could continue to generate employment for the LGA.

Map 6. Casula Crossroads Industrial Zoning Map



Source: NSW Department of Planning and Environment

2.1.5 HOXTON PARK AIRPORT (LEN WATERS ESTATE)

The Hoxton Park Airport (Len Waters Estate) industrial area is a small industrial area (approximately 21 hectares in area) in the Liverpool LGA and occupies the site of the former Hoxton Park Airport. The industrial area is zoned IN1 General Industrial and IN2 Light Industrial.

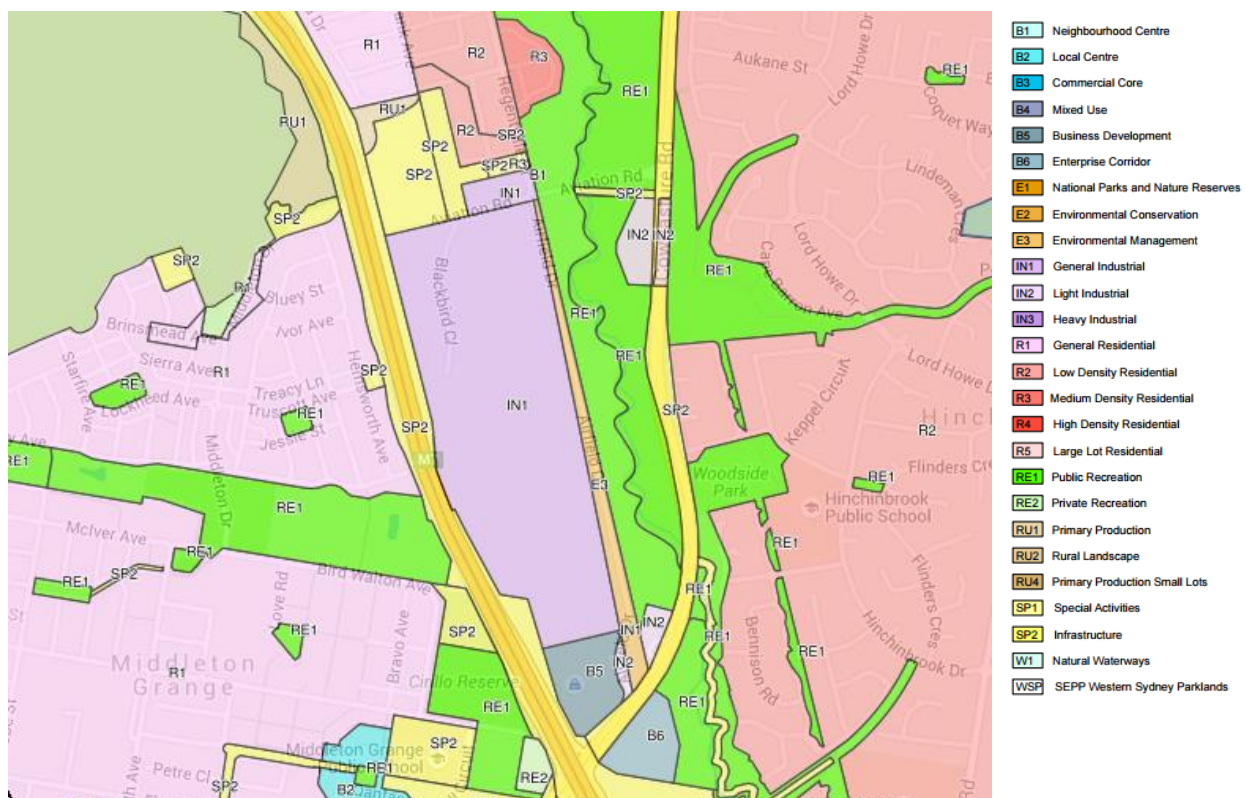
The industrial area is well connected in terms of road access. The industrial area has direct access to the M7 Motorway Cowpasture Road interchange. The location of this industrial area allows for direct links from the M7 to the Sydney CBD, Port Botany, Sydney Airport, the future Western Sydney Airport at Badgerys Creek, the greater metropolitan region and interstate freeways.

The industrial area is not well serviced by public transport. The closest bus stop is located approximately 450 metres from the northern boundary of the industrial area and provides a connection to Liverpool. The main part of industrial area adjoins the M7 Motorway to the west, a B5 Business Development zone to the south, an E3 Environmental Management zone to the east and an SP2 Drainage Infrastructure zone to the north. The area also contains four smaller pockets of IN2 Light Industrial land.

The industrial area is a recent new subdivision and has been recently developed. The main industrial area contains the distribution centres of Big W, Woolworths and Masters and some undeveloped allotments. The strategic location of this industrial area on the M7 Motorway is significant to the existing and future freight, logistics, warehousing and distribution land uses that are likely to significantly contribute to employment generation in the Liverpool LGA. The smaller pockets of industrial land contain a service station, a bus depot and vacant land.

As indicated within the Western Sydney Infrastructure Plan, the location of the industrial area will also benefit from the future M12 Motorway providing direct connections from the M7 Motorway to the Western Sydney Airport.

Map 7. Hoxton Park Airport (Len Waters Estate) Industrial Zoning Map



Source: NSW Department of Planning and Environment

2.1.6 WARWICK FARM RACECOURSE (COOPERS PADDOCK)

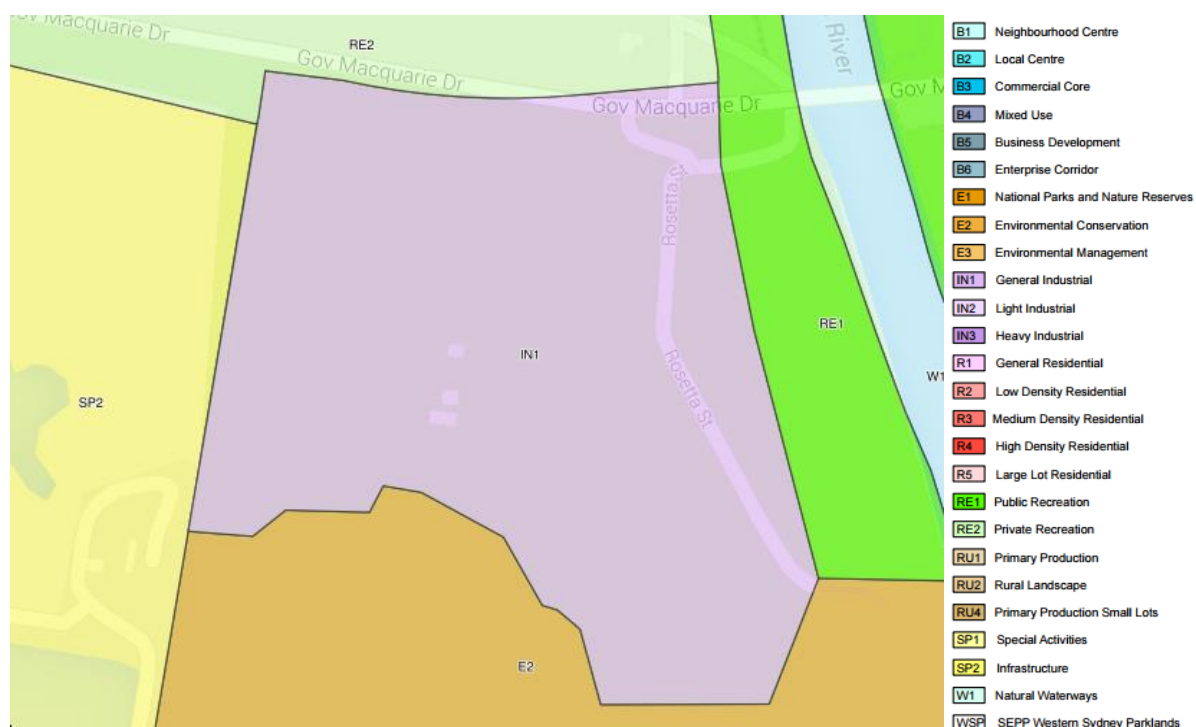
The Warwick Farm Racecourse industrial area, also known as Coopers Paddock, is a small pocket of industrial land (approximately 11.4 hectares in area) in the Liverpool LGA. The industrial area is zoned IN1 General Industrial.

In terms of road access, access to the Hume Highway via Governor Macquarie Drive is available to the site. The site is not well serviced by public transport. The closest bus stop is located approximately 600 metres from the northern boundary of the industrial area and provides a connection to Liverpool.

The site adjoins an SP2 Sewage system zone to the west (the Liverpool Water Recycling Plant), a RE2 Private Recreation zone to the north (the Warwick Farm Racecourse), an E2 Environmental Conservation zone to the south and an RE1 Public Recreation zone to the east providing a buffer to the Georges River.

It is noted that development consent was granted in April 2016 by the Joint Regional Planning Panel for the construction and use of four (4) warehouse facilities on the Coopers Paddock site including associated internal access roads and 345 car parking spaces (to be developed by Stockland). The total GFA for the four (4) warehouse facilities including ancillary office areas is 51,723sqm. The approved use of the warehouse facilities are for warehouse and distribution facilities. The extent to which the land could be further developed for a range of industrial uses and potentially at a greater density may be limited by its proximity to environmentally sensitive lands and the adjacent Liverpool Water Recycling Plant.

Map 8. Warwick Farm Racecourse (Coopers Paddock) Industrial Zoning Map



Source: NSW Department of Planning and Environment

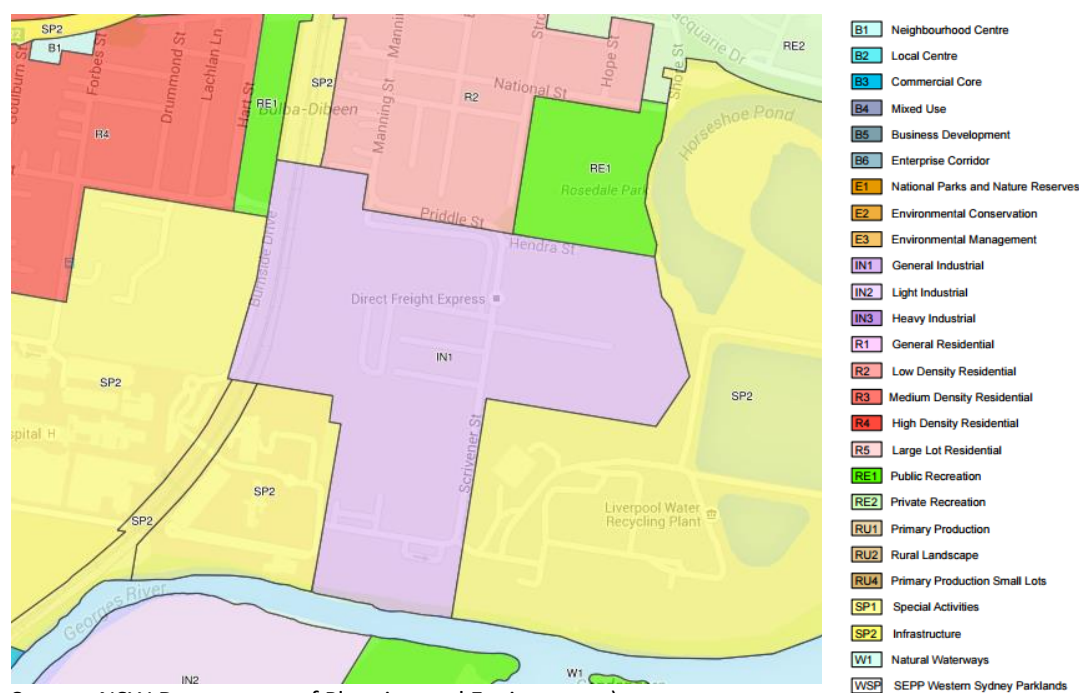
2.1.7 PRIDDLE/SCRIVENER STREET (WARWICK FARM)

The Priddle/Scrivener Street (Warwick Farm) industrial area is a small pocket of industrial land (approximately 25 hectares in area) in the suburb of Warwick Farm in the Liverpool LGA. The industrial area is zoned IN1 General Industrial. In terms of road access, access to the Hume Highway via Governor Macquarie Drive and the local street network is available to the industrial area. The local road network to access the industrial area is shared with the adjoining residential area to the north. Warwick Farm train station is a 550 metre walk from the northern part of the industrial area.

The site adjoins an SP2 Sewage system zone to the east and south-east (the Liverpool Water Recycling Plant) (STP), a W1 Waterway zone (the Georges River) to the south, a RE2 Private Recreation zone to the north (the Warwick Farm Racecourse), an RE1 Public Recreation zone, R2 Low Density Residential zone and SP2 Railway infrastructure zone to the north and an SP2 Health Services Facility (Liverpool Hospital) to the west and south-west.

The assumption has been made that there is a requirement for an odour buffer to protect the ongoing operating of the STP as strategic infrastructure. In turn, an assumption that this will limit the potential for a range of more sensitive uses and a limit on the intensification of development in the area within any such buffer. An increase in industrial density and potential for new development within the industrial area is limited given its proximity to the surrounding residential and health services uses adjoining the site. It is assumed that the industrial area acts as a buffer to these areas from the Liverpool Water Recycling Plant. The limits on accessibility into the industrial area and sharing this access with the adjoining residential area are also a limitation.

Map 9. Priddle/Scrivener Street (Warwick Farm) Industrial Zoning Map



Source: NSW Department of Planning and Environment)

2.1.8 SAPPHO ROAD (WARWICK FARM NORTH)

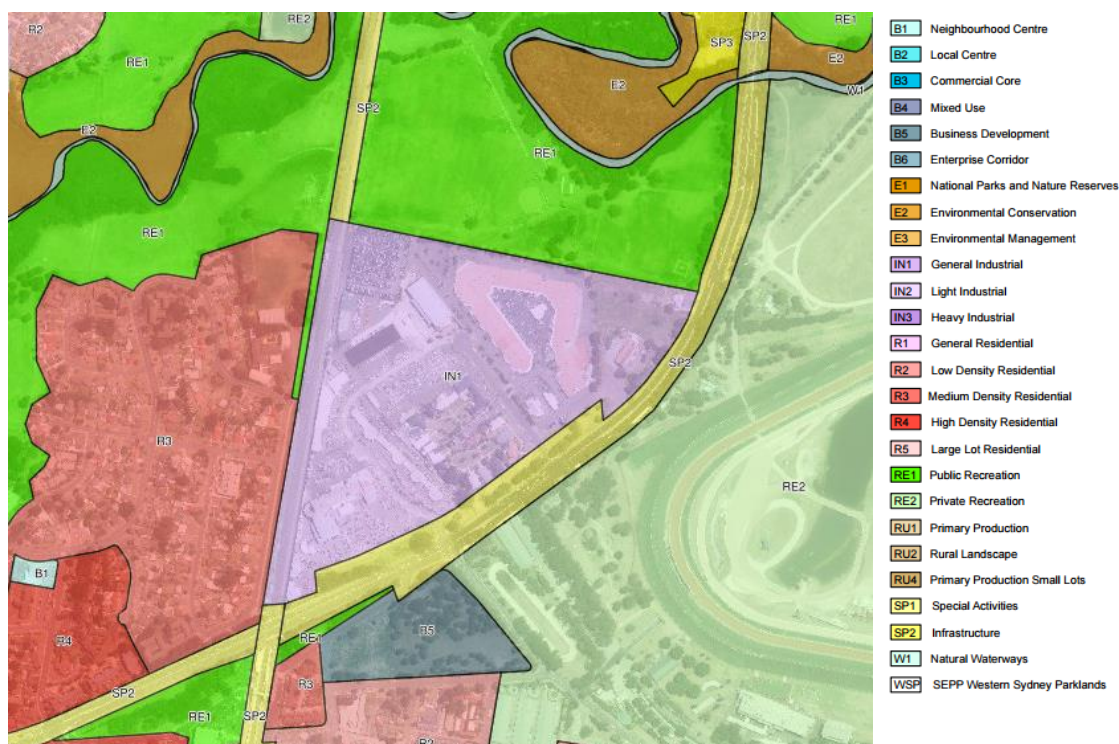
The Sappho Road (Warwick Farm North) industrial area is a small pocket of industrial land (approximately 20 hectares in area) in the suburb of Warwick Farm in the Liverpool LGA. The industrial area is zoned IN1 General Industrial.

Warwick Farm train station is a 400 metre walk to the main entrance of the industrial area. Bus stops along the Hume Highway frontage of the industrial area provide connections to Fairfield and Liverpool. In terms of vehicular access, the Hume Highway is directly accessible from the industrial area.

The site adjoins an RE1 Public recreation zone to the north, an R3 Medium Density Residential zone to the west (albeit separated by a railway line, just north of the Warwick Farm Station which acts as a buffer from the industrial zone). The Hume Highway adjoins the south-eastern boundary of the industrial area (SP2 Infrastructure zone) and the Warwick Farm Racecourse is located to the east of the industrial area (separated by the Hume Highway).

A number of uses occupy the industrial area including motor vehicle dealerships, project home displays, bulky goods premises, motel accommodation and food and drink premises. Given the known established uses existing within this site, and its close proximity to the Liverpool City Centre and Health cluster Council may wish to consider rezoning the land to either a B5 (Business development), B6 (Enterprise Corridor) B7 (Business Park) zone.

Map 10. Sappho Road (Warwick Farm North) Industrial Zoning Map



Source: NSW Department of Planning and Environment

2.1.9 ORANGE GROVE

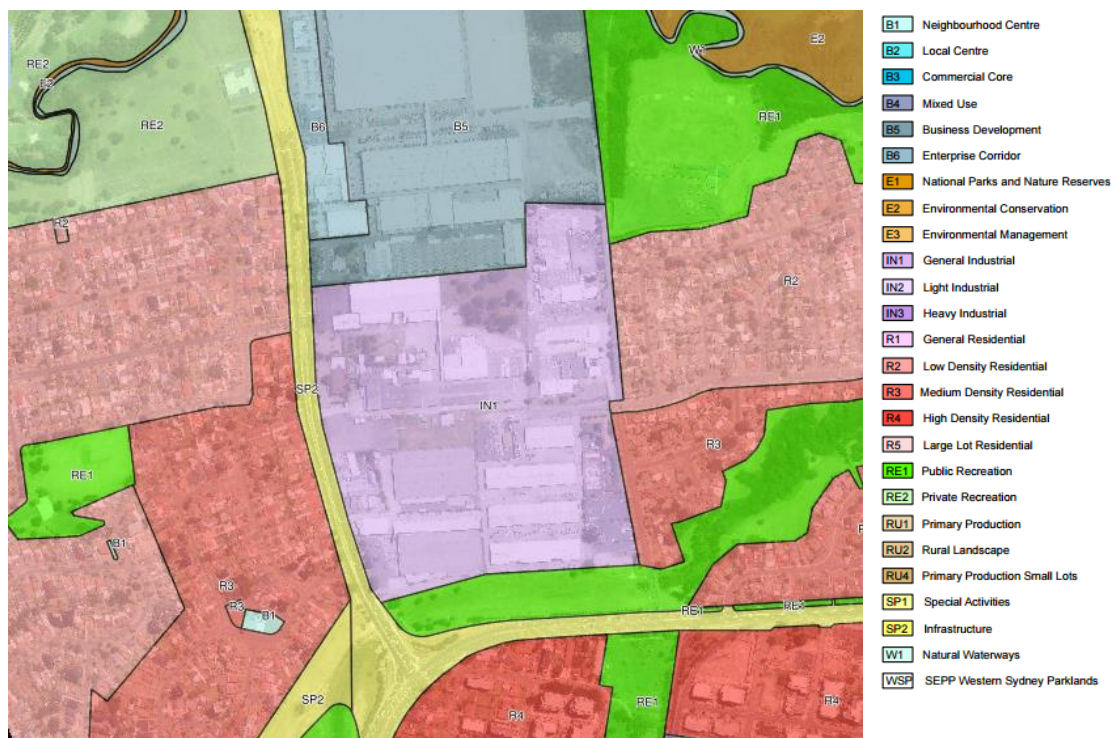
The Orange Grove industrial area is a small pocket of industrial land (approximately 22 hectares in area) in the suburb of Warwick Farm in the Liverpool LGA. The industrial area is zoned IN1 General Industrial and is located to the north of the Liverpool town centre.

Public transport access to the industrial area is available on the Cumberland Highway frontage and provides connections to Liverpool and Badgerys Creek. In terms of vehicular access, the Hume and Cumberland Highways are directly accessible from the industrial area.

The site adjoins a B5 Business Development zone to the north, an R2 Low Density Residential and R3 Medium Density Residential zone to the east, an RE1 Public Recreation zone to the south, the Cumberland Highway to the west (SP2 Infrastructure zone) providing a buffer to residential zones further to the west.

The location of the Orange Grove industrial area is in close proximity to the Liverpool city centre and at the junction of the Cumberland and Hume Highways. The industrial area is largely underutilized and it is evident that the general industrial zoning of the land is not the “highest and best use” for land in this location. Council may wish to consider rezoning the land for higher density employment lands such as B5 (Business development), B6 (Enterprise Corridor) or B7 (Business Park) zone in recognition of its proximity to the Liverpool City Centre and hospital, whilst also encouraging the location and retention of viable industrial uses.

Map 11. Orange Grove Industrial Zoning Map



Source: NSW Department of Planning and Environment

2.1.10 AUSTRAL

Under the State Environmental Planning Policy (Sydney Regions Growth Centres) 2006 (SEPP), the Austral precinct was rezoned for urban development in 2013. As part of the rezoning, an area of land of approximately 41 hectares in the Austral precinct has been rezoned IN2 Light Industrial. Gurner Avenue is located to the north of the industrial area and Fifteenth Avenue to the south. The land has not yet been developed.

Existing public transport servicing the site is limited however it is expected that improvements in public transport will be realized as the overall precinct develops.

The site adjoins undeveloped land zoned R2 Low Density Residential to the north and east, an RU6 Transition zone to the west and an R2 Low Density Residential zone to the south separated by Fifteenth Avenue.

The IN2 zone under the SEPP provides for a limited range of uses including light industries, depots, landscaping material supplies, hotel or motel accommodation and neighbourhood shops. It is unclear as to the basis of the zoning for light industry of the Austral precinct. Whilst it will be well placed to service the new urban releases, the range of permissible uses suggest it will provide for a wider mix of employment rather than just a conventional industrial precinct. The timing of the release and/or availability of land at Austral is subject to the provision of trunk infrastructure in conjunction with the staged sequencing of new urban release areas, the timing of which is not known.

Map 12. Austral Industrial Zoning Map



Source: NSW Department of Planning and Environment

2.2 BUSINESSES AND JOBS WITHIN EXISTING INDUSTRIAL PRECINCTS

Industrial employment lands within the Liverpool LGA are characterised by a wide range of employment and business types. As identified by Map 1 (page 12), existing industrial employment lands are surrounded by residential provisions, allowing a large number of local workers to live close to their place of employment. To highlight what types of industries (both businesses and jobs) are located within existing industrial lands, we have analysed ABS Counts of Australian Businesses data (2015) and ABS 2011 Census employment by industry (level 3) data for place of work. With the smallest level of readily data available at an SA2 level, we have identified relevant SA2 regions which accommodate the dominant existing industrial employment lands within the LGA. Notably, they are:

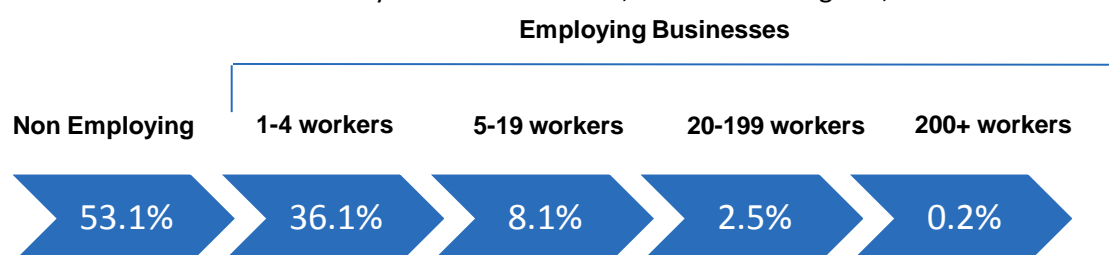
SA2 Region	Industrial Precincts
Chipping Norton – Moorebank	Chipping Norton, Moorebank
Holsworthy - Wattle Grove	Moorebank (Moorebank IMT site)
Liverpool - Warwick Farm	Warwick Farm Racecourse (Coopers Paddock), Orange Grove, Priddle/Scrivener Street (Warwick Farm), Sappho Road (Warwick Farm North)
Prestons - Lurnea	Yarrunga/Prestons
Green Valley - Cecil Hills	Hoxton Park Airport (Len Waters Estate)

2.2.1 BUSINESSES

As at June 2015, there were 9,465 businesses (all industries) located within the SA2 regions highlighted above, 55% of which were non employing/sole trading. Of the employing businesses located within the selected SA2 regions, the majority employ between one and four workers, while there are 13 businesses employing 200 or more workers. This highlights Liverpool’s significant weighting towards smaller businesses.

From an industrial perspective, there are 4,359 businesses in industries who typically occupy industrial land. In line with broader business trends, 53.1% of businesses are sole trading/non employing, while a further 36.1% employ between one and four workers. With just seven industrial businesses employing 200 or more workers within the selected SA2 regions, it suggests that market appetite in Liverpool’s existing industrial precincts for larger warehousing/manufacturing space has been low as larger users in the past are more than likely to have migrated north to Eastern Creek/Erskine Park where significant big box warehousing is available.

Figure 5. % of industrial businesses by number of workers, selected SA2 regions, June 2015



Source: ABS, Knight Frank Research

Based on a conservative employment density ratio of 25 employees per hectare, this suggests that the bulk of industrial demand in Liverpool's existing industrial precincts would be for sub 1,500m² tenancies. Key observations by SA2 region were:

- The Chipping Norton – Moorebank SA2 region has the largest number of industrial businesses within the Liverpool LGA with 1,043.
- In comparison to other SA2s, the Chipping Norton – Moorebank SA2 region has a significant skew towards manufacturing businesses, majority of which employ between one and 19 workers (60%).
- A large concentration of construction businesses are located in the Liverpool - Warwick Farm and Green Valley - Cecil Hills SA2 regions. Businesses of this nature include residential construction services (cabinet makers, bathroom supplies etc.).
- Wholesale trade businesses are more than likely to gravitate towards the Chipping Norton – Moorebank SA2 region, there are 221 businesses in the industry located there.
- The representation of transport, postal and warehousing businesses was evenly spread thought the selected SA2 regions.

Table 1. Count of Businesses by industrial industries within selected SA2 regions, June 2015

	Chipping Norton - Moorebank	Holsworthy - Wattle Grove	Liverpool - Warwick Farm	Prestons - Lurnea	Green Valley - Cecil Hills	Total
Manufacturing	246	36	114	134	68	598
<i>Non employing</i>	68	19	38	33	41	199
1-4	79	14	52	46	24	215
5-19	69	0	16	43	3	131
20-199	30	3	5	12	0	50
200+	0	0	3	0	0	3
Construction	351	227	548	422	524	2,072
<i>Non employing</i>	148	122	420	214	290	1,194
1-4	155	98	115	161	223	752
5-19	43	7	13	39	8	110
20-199	5	0	0	8	3	16
200+	0	0	0	0	0	0
Wholesale Trade	221	47	66	100	42	476
<i>Non employing</i>	70	24	33	29	20	176
1-4	83	17	20	40	22	182
5-19	48	6	9	18	0	81
20-199	16	0	4	13	0	33
200+	4	0	0	0	0	4
Transport, Postal and Warehousing	207	112	258	271	294	1,142
<i>Non employing</i>	102	84	193	153	161	693
1-4	84	25	62	108	128	407
5-19	10	3	3	7	5	28
20-199	11	0	0	3	0	14
200+	0	0	0	0	0	0
Other	18	5	12	20	16	71
<i>Non employing</i>	8	5	12	17	9	51
1-4	7	0	0	3	7	17
5-19	3	0	0	0	0	3
20-199	0	0	0	0	0	0
200+	0	0	0	0	0	0
Total	1,043	427	998	947	944	4,359

Source: ABS, Knight Frank Research

2.2.2 EMPLOYMENT

At a high level, there are 44,817 jobs located within these SA2 regions. Of the selected SA2 regions, the Liverpool – Warwick Farm area accounts for 41% of jobs within the selected SA2 regions, a large share of which are white collar based given the Liverpool CBD’s location within the SA2. From an industrial employment perspective, there are 15,883 jobs within the selected SA2 regions with the Chipping Norton – Moorebank SA2 region representing the largest share of jobs at 6,807, followed by the Prestons – Lurnea SA2 region (4,193 jobs).

Looking at specific SA2 regions, each are unique in that the composition of employment varies greatly. Overall, the Chipping Norton – Moorebank and Holsworthy - Wattle Grove SA2 regions had a large skew towards manufacturing based employment, accounting for 55% and 53% respectively. Alternatively, a more diverse industrial employment base was evident in the other selected SA2 regions. For Green Valley – Cecil Hills, which incorporates the Hoxton Park Airport site (Len Waters Estate), there is a skew towards construction (e.g. Masters Home Improvement) and transport, postal and warehousing employment (e.g. Big W distribution centre).

Table 2. Industrial based jobs within selected SA2 regions

	Chipping Norton - Moorebank	Holsworthy - Wattle Grove	Liverpool - Warwick Farm	Prestons - Lurnea	Green Valley - Cecil Hills	Total
Manufacturing	3,758	764	1,140	1,617	46	7,325
Construction	517	177	739	681	188	2,302
Wholesale Trade	1,322	318	316	958	44	2,958
Transport, Postal and Warehousing	1,062	183	538	779	157	2,719
Other	148	3	159	158	111	579
Total	6,807	1,445	2,892	4,193	546	15,883

Source: ABS, Knight Frank Research

Drilling down further to ABS level 3 data for the selected SA2 regions, the following key observations were made:

- Road freight transport was the largest employer, representing 1,530 jobs, double the total for any other industry. The representation of road freight transport jobs was concentrated in the Chipping Norton – Moorebank and Prestons – Lurnea SA2 regions where businesses such as Mainfreight Transport are located there.
- In terms of manufacturing based employment, the dominant sub-sectors were electrical equipment manufacturing (689 jobs), bakery product manufacturing (489 jobs) and polymer product manufacturing (469 jobs) which includes fibreglass products.
- With a large number of businesses within the selected SA2 regions servicing the local population, there was a considerable presence of construction sub sectors in the selected SA2 regions. Building installation services and residential building construction industries were the largest construction

sub sectors, employing 603 and 586 persons respectively. This was particularly true for Prestons – Lurnea and Liverpool - Warwick Farm SA2 regions.

- Other notable sub sectors include motor vehicle and motor vehicle parts wholesaling, however this was largely confined to the Chipping Norton – Moorebank SA2 region.
- Given that Aldi’s distribution centre is located within the Prestons – Lurnea SA2 region, there is a large presence of grocery, liquor and tobacco product wholesaling in the SA2, employing 206 persons as at 2011.

The key takeout in regards to how Liverpool’s existing industrial lands differ from the broader Sydney region is that the bulk of businesses (and hence jobs) service the local population. It must be noted that there are also a number of larger users who occupy industrial land within the LGA including the Aldi (distribution centre) and Visy.

Given this skew towards smaller, localised business, it is important for Liverpool City Council to continue to support and encourage growth for these sectors and industries. This can be done by broadening the zoning/permitted use parameters to accommodate a larger mix of industries within current precincts.

Table 3. Top ABS Level 3 industrial employment industries by selected SA2 regions

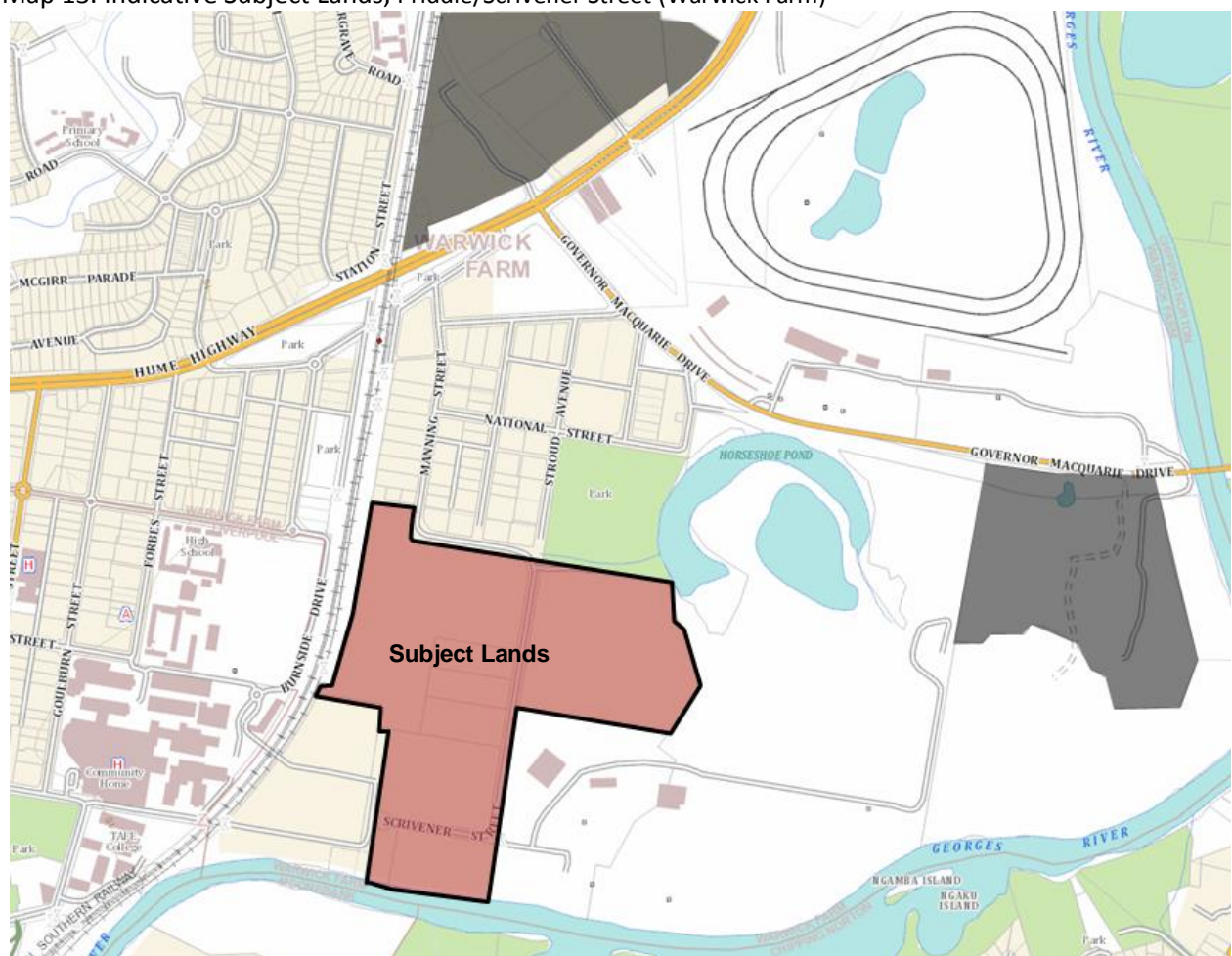
	Chipping Norton - Moorebank	Holsworthy - Wattle Grove	Liverpool - Warwick Farm	Prestons - Lurnea	Green Valley - Cecil Hills	Total
Road Freight Transport	683	61	198	506	82	1,530
Manufacturing (not defined)	439	36	95	168	7	745
Electrical Equipment Manufacturing	248	298	92	51	0	689
Building Installation Services	182	52	116	209	44	603
Residential Building Construction	80	45	290	138	33	586
Other Machinery and Equipment Wholesaling	160	163	28	222	3	576
Bakery Product Manufacturing	233	26	207	17	6	489
Furniture, Floor Covering and Other Goods Wholesaling	218	20	64	171	9	482
Polymer Product Manufacturing	370	5	22	72	0	469
Printing and Printing Support Services	365	3	27	64	0	459
Grocery, Liquor and Tobacco Product Wholesaling	103	39	74	206	12	434
Motor Vehicle and Motor Vehicle Parts Wholesaling	305	7	51	65	0	428
Domestic Appliance Manufacturing	222	97	28	23	0	370
Other Transport Support Services	126	64	131	34	4	359
Building Completion Services	58	36	73	114	63	344
Warehousing and Storage Services	126	24	11	166	5	332
Other Wood Product Manufacturing	96	3	18	195	3	315
Meat and Meat Product Manufacturing	9	4	159	141	0	313
Furniture Manufacturing	161	5	49	91	0	306
Professional and Scientific Equipment Manufacturing	82	168	23	4	5	282
Other	2,541	289	1,136	1,536	270	5,772
Total	6,807	1,445	2,892	4,193	546	15,883

Source: ABS, Knight Frank Research

2.3 CASE STUDY – WARWICK FARM

Warwick Farm, located immediately north of the Liverpool CBD is a strategic employment node within the Liverpool LGA. As per the 2015 ELDP and for the purpose of this analysis, we have analysed the area known as Priddle/Scrivener Street (Warwick Farm). The indicative boundary is shown below.

Map 13. Indicative Subject Lands, Priddle/Scrivener Street (Warwick Farm)



Source: Knight Frank Research

Note – shaded black areas are other industrial zoned lands

Under the Liverpool Local Environmental Plan (2008), the subject precinct is zoned IN1 General Industrial. This land use zoning permits (with consent) a wide range of industrial based activities such as freight transport facilities, light industries, storage premises, transport depots, vehicle body repair workshops, vehicle repair stations, warehouse or distribution centres

The subject precinct is surrounded by a varied mix of land uses including residential and horse stables to the north, the Liverpool Hospital to the West, Georges River to the south and the Liverpool Water Recycling Plant to the East. Also in close proximity is the Warwick Farm Racecourse and the adjacent industrial land

(12.8 ha), which is being developed by Stockland (Coopers Paddock) while further to the north is the nearby industrial land of Sappho Road (Warwick Farm North - 16.8 ha), which is home to car dealerships (Peter Warren), Masterton Homes and the Warwick Farm Hometown Centre.

In total, there are 23.2 ha of industrial zoned land within the subject precinct, all of which has been developed (2015 ELDP). Current uses operating on the site include freight forwarding, warehouse and distribution and packaging and paper manufacturing. There is also a large presence of smaller business located at 29-31 and 33 Scrivener Street who service local residents including auto repairs/mechanics and local construction businesses (see Table 4).

Table 4. Current Tenant Mix, Priddle/Scrivener Street (Warwick Farm) Industrial Lands

Street Address	Business Name	Core function/service
8 Priddle Street	Hannanprint	Print/Paper Manufacturing/Packaging
8 Priddle Street	Stockwell International	Freight Forwarding/Transport Solutions
20 Scrivener Street	Direct Freight Express	Freight Forwarding/Transport Solutions
41 Scrivener Street	Visy	Print/Paper Manufacturing/Packaging
20 Scrivener Street	Tru Blue Beverages	Wholesale Seller
29-31 Scrivener Street	MTA Autoparts	Automotive Repairs
29-31 Scrivener Street	BT Constructions	Construction
29-31 Scrivener Street	T&T Kitchens and Shop fitting	Construction
29-31 Scrivener Street	Evolution Auto Repairs	Automotive Repairs
29-31 Scrivener Street	TNN Kitchens	Construction
29-31 Scrivener Street	Colours Unlimited	Automotive Repairs
29-31 Scrivener Street	SMW Built-in Wardrobes	Construction
29-31 Scrivener Street	Head2work	Rehabilitation Service
29-31 Scrivener Street	Enterpraise	N/A
29-31 Scrivener Street	All Auto Spares	Automotive Repairs
29-31 Scrivener Street	GMN Smash Repairs	Automotive Repairs
29-31 Scrivener Street	Viman Smash Repairs	Automotive Repairs
29-31 Scrivener Street	Food Storage/Preparation	Food Wholesaling
33 Scrivener Street	28 Gate Christian Centre	Religion
33 Scrivener Street	Modern Design Wardrobes	Construction
33 Scrivener Street	W.F. Plastics	Packaging/Cleaning Supplies
33 Scrivener Street	Embroidery House	Embroidery/Clothing Retailing
33 Scrivener Street	Cabinetry	Furniture Manufacturer
33 Scrivener Street	Anavada Upholstery	Furniture Manufacturer
33 Scrivener Street	Dry Cleaners	Clothing
42 Scrivener Street	Gamma Illumination	Lighting Manufacturer
48 Scrivener Street	HY Quest Solutions	Hydrological/Meteorological Manufacturing

Source: Knight Frank Research

**Derived from Knight Frank Research's inspection of the subject precinct (14/06/2016)*

From our inspection, it appears that the vacancy rate is low with no visible vacancies identified. However, speaking to Knight Frank agents operating in the area, there is 4,000m² available for lease at 8 Priddle Street. Feedback from the marketing campaign of the current vacant space has highlighted that, despite the sites

comparatively cheap rental offering (20% below market levels) - due to its poor truck access and conflicting interests with other uses (in particular horses) - interest has been minimal. Poor truck access and confined street access was identified in our inspection of the site, as highlighted by the photos below. Given these competing uses, Council may wish to investigate alternative access arrangements to the precinct.

Figure 6. Field Inspection Photos – Warwick Farm



Source: Knight Frank Research (14/06/2016)

At the same time, the area appeared to be quite vibrant due to the low vacancy in the area and activity of workers. Drawing upon both BTS employment estimates at a travel zone level and our observations from inspection, Knight Frank estimates there to be 1,300 to 1,500 jobs within the subject lands. Unlike other industrial precincts in the Liverpool LGA and elsewhere in Sydney, there is a moderate skew towards manufacturing employment where 500 manufacturing jobs are estimated to be within the precinct, representing 33-38% of jobs. Key employing industries include:

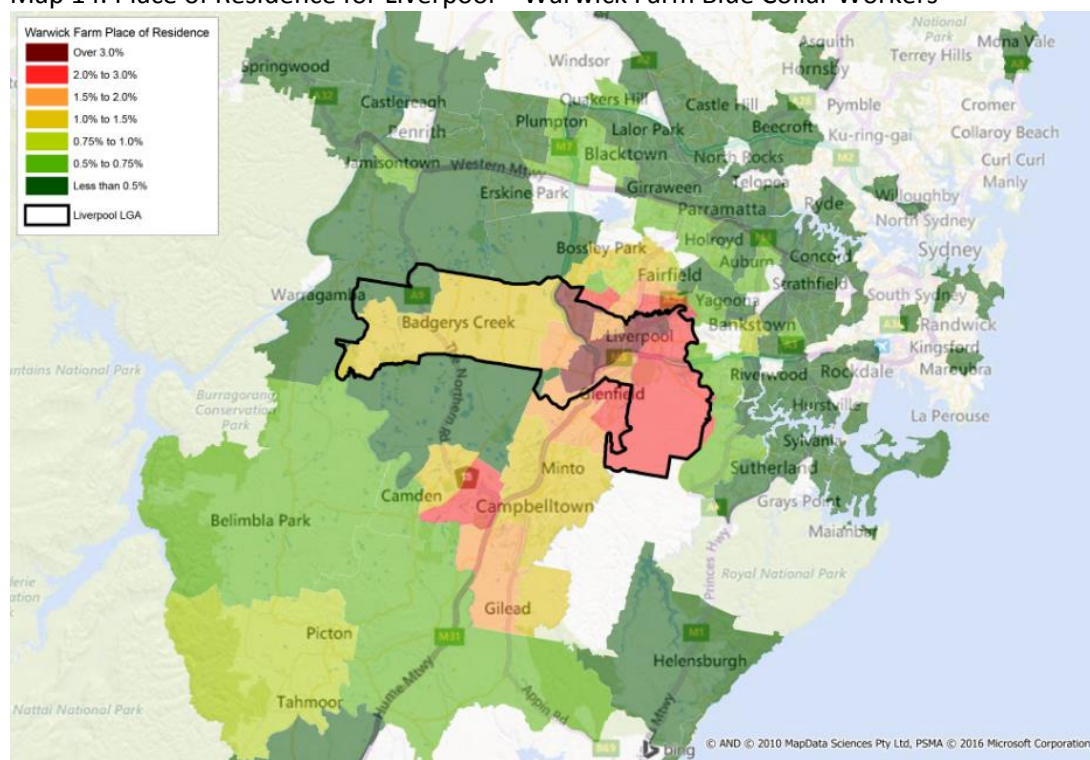
- Transport, Postal and Warehousing – given Direct Freight Express’s location within the precinct
- Construction – there is a strong presence of local construction businesses at 29-31 and 33 Scrivener Street
- Pulp, Paper and Converted Paper Product Manufacturing – Visy and Hannanprint
- Furniture and Other Manufacturing

2.3.1 WHERE WORKERS LIVE

The workforce of Warwick Farm is very localised in that the majority live in close proximity to Warwick Farm. This is important as it provides local residents employment opportunities close to home. In addition, and to the benefit of the Liverpool LGA, this will mean that the bulk of their spending is done in Liverpool. Drawing upon ABS Census Place of Work and Place of Usual Residence data, we are able to see where workers of the Liverpool – Warwick Farm SA2 live. Given the SA2 includes the Liverpool CBD and Liverpool hospital precincts, we have drawn upon blue collar industries only.

As at 2011, 31% of blue collar workers in the Liverpool – Warwick Farm SA2 lived in the Liverpool LGA, majority of which lived in the immediate Liverpool – Warwick Farm SA2 region (10.2%). By SA2 region, the next dominant destinations of where workers of the Liverpool – Warwick Farm SA2 live include Green Valley - Cecil Hills, Prestons – Lurnea and Cabramatta – Lansvale SA2s. Map 14 below highlights the areas in which workers from the Liverpool – Warwick Farm SA2 live.

Map 14. Place of Residence for Liverpool – Warwick Farm Blue Collar Workers



Source: ABS, Knight Frank Research

2.3.2 VIABILITY OF THE PRECINCT

Our examination has highlighted that the subject lands has a large presence of ageing secondary industrial stock and is likely to require investment/development in the near future (next five to ten years) to remain compatible with prevailing market demand and need. Similarly, vehicle and truck access, which is provided through Priddle and Scrivener Street is arguably not ideally suitable for heavy trucks (on average, the width of both streets is 11.5m with street parking offered on both sides), while other competing uses (including residential and horse stables) to the north supports this view. Similarly, anecdotal feedback with Knight Frank agents operating in the area confirm that leasing enquiry within the precinct is low given its poor vehicular access.

While the subject precinct has a high occupancy rate with just 4,000m² available for lease, market activity in the light industrial sector is evolving with businesses increasingly gravitating towards newer premises given the associated operational efficiencies. While larger occupiers, particularly within transport, postal and warehousing sub sectors have relocated to more suitable sites along key road and transport networks (Prestons, Eastern Creek etc.) from established locations, smaller businesses who service the local population will still require to be located close to residents. This is the case for the subject precinct with a high provision of local auto repairs/mechanics and construction businesses who service the local community.

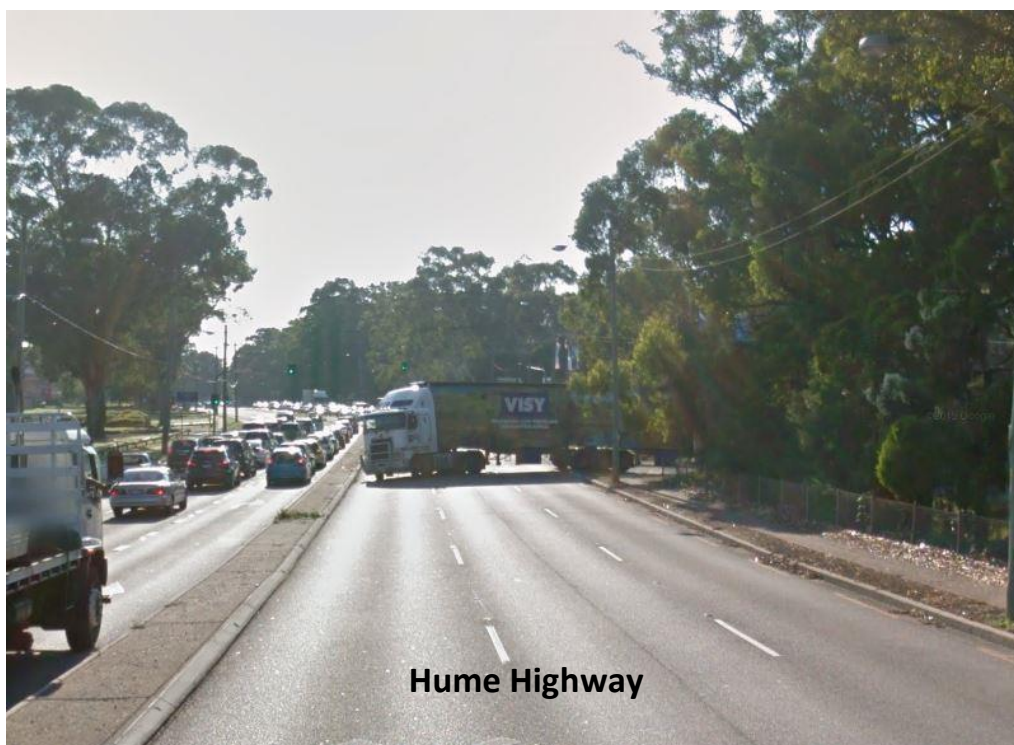
In this context, it is important that existing industrial lands such as the subject precinct be preserved for employment uses, ultimately allowing Liverpool residents to continue to work close to where they live. However, while the current precinct's zoning of IN1 General Industrial accommodates a broad range of industrial users, it is expected that the viability of the current zoning is not compatible with prevailing and anticipated market conditions. In this environment, it is recommended that Liverpool City Council explore the option to broaden the subject precinct's zoning/permitted use parameters to accommodate a larger mix of industries. Not only could this potentially lead to a greater employment outcome, it would also encourage and support smaller local businesses to remain close to where their workers live. Given the ageing stock base within the precinct, it is important that Council encourages development which can be achieved through a more flexible zoning provision.

We have assessed road issues faced by current tenants, having regard for both directions i.e. goods on-route to the site, and goods that have been dispatched from the site to other locations in Sydney. The following observations have been made:

- Width of both Priddle and Scrivener Streets is not supportive of trucks. On average, the width of both streets is 11.5 metres. With street parking offered on both sides, truck access is limited.
- Left hand turn onto the Hume Highway (the main arterial road from the subject precinct) from Warwick Street is single lane only. This movement is constrained, and not conducive to large vehicular usage and movement (see Figure 7).
- Congestion within the precinct is high given it's shared between industrial freight traffic, local workers and horse movements to and from stables.
- Congestion along Hume Highway is not supportive of inbound and outbound truck movements.

N.B 1 – This analysis is high level. For an in depth analysis of the subject precinct including testing the precincts viability and suitability as industrial land, a separate in-depth study would need to be undertaken.

Figure 7. Trucks turning from Warwick Street onto the Hume Highway



Source: Street View - Google Maps (April 2013)

2.4 CASE STUDY – CITY OF SYDNEY EMPLOYMENT LANDS: NEW START UP HUB

Across Sydney, other Councils have rezoned industrial lands to other business employment zones to encourage additional jobs growth and facilitate the development of underutilised industrial lands which are no longer operating at their highest and best use. To highlight this, we have undertaken a high level case study of the City of Sydney Employment Lands which were rezoned in mid-2015. This case study discusses the concept, provides the framework for further discussion and presents a snapshot of the principles addressed by another Sydney council. The rezoning of the precinct has proved successful with early indicators suggesting the area has become an attractive option for new start-ups and tech businesses.

As discussed in the previous section of this report (2.3 Case Study - Warwick Farm) there are areas and locations that are zoned IN1 Industrial across the Liverpool LGA which, with changing economic drivers, land use conflicts and access issues would need to be investigated in terms of their future viability and opportunities.

In the context of the above statement, the City of Sydney's southern employment lands are some of the most strategically important in NSW, however their future viability began to be questioned. The southern employment lands is an area of approximately 265 hectares in size within the suburbs of Alexandria and Rosebery. It stretches from the southwest corner of the Green Square Town Centre to the south west corner of the LGA. Generally the area is bordered by Gardners Road to the south, McEvoy Street on the west and Mentmore Avenue and Botany Road on the east. The southern employment lands are located in the Global Economic Corridor between some of Australia's major trip generators such as Sydney Airport, Port Botany and Sydney CBD.

Until recently most of the area was zoned for General Industrial purposes. As such a range of industrial businesses are currently located in the area. These include industrial activities, such as manufacturing, wholesale trade, transport and logistics related industries, postal activities and warehousing. However, changes in the Australian (and NSW) economy mean there is now less need for industrial-zoned land close to the inner-city. New forms of business and enterprise are emerging, such as high tech industry, creative spaces and retail and distribution facilities. These activities require flexible places to locate and grow close to their customers at the airport and inner-city.

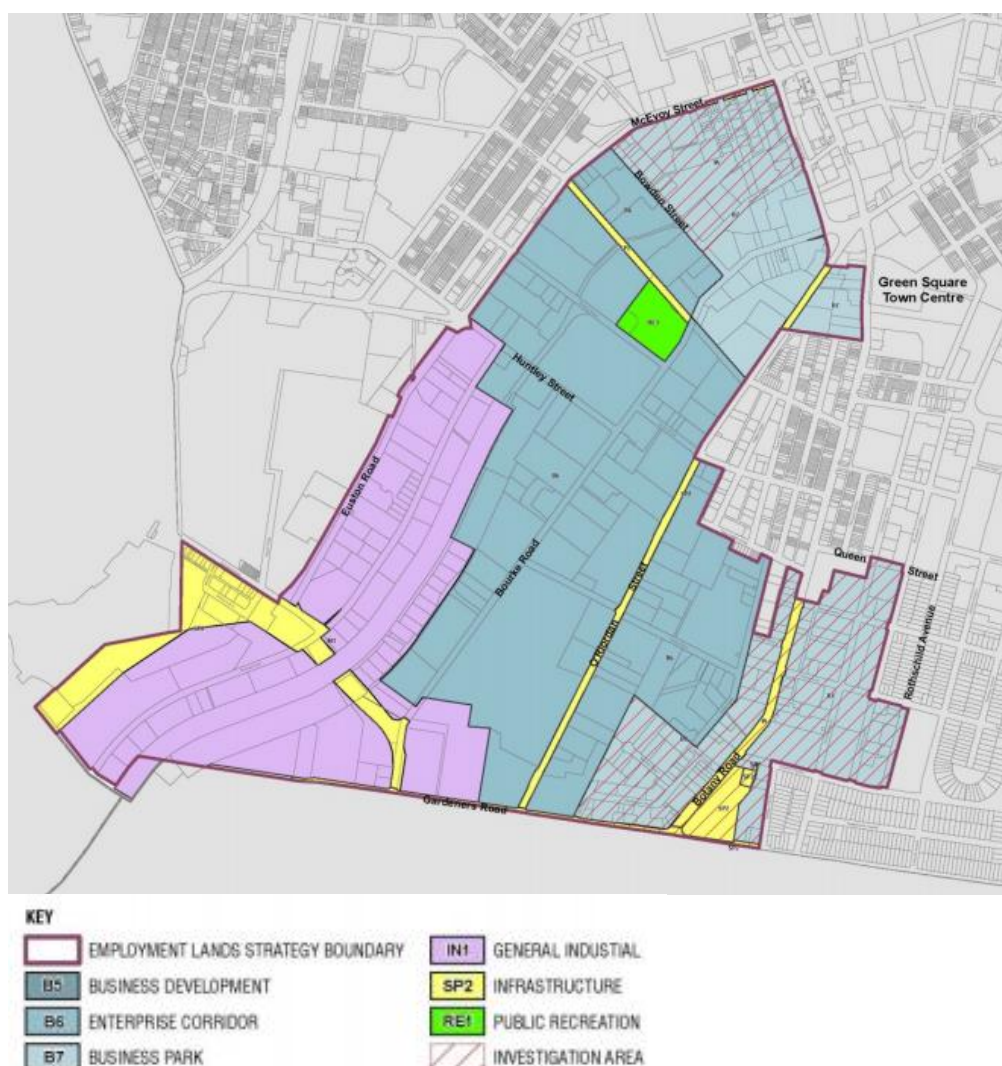
In June 2015 most of the southern employment lands were rezoned to allow for a wider range of business activities and employment opportunities (see Map 15). However, in recognition of the strategic importance of retaining sufficient space for industrial activity over time, a portion of the employment lands retained their IN1 General Industrial zoning. These lands are essential to the efficient functioning of the City and will ensure activities associated with key state infrastructure, including Sydney Airport and Port Botany, and other activities that require access to the Sydney CBD, can continue to locate in the LGA.

Other areas within the employment lands were moved toward more flexible land use zones. It was argued that this would generally allow existing uses to continue, but over time would also facilitate a more flexible approach to land use. Parts of the employment lands would facilitate higher density employment and new economic activities such as new industrial uses, creative uses, knowledge industry development and flexible commercial, retail, industrial and community spaces.

A City of Sydney economic study identified a clear demand for a range of business uses, including many commercial-type uses that have to date been prevented from being accommodated in the southern employment lands owing to the current planning restrictions. There was strong demand for adaptively reused space by retail and other commercial businesses as well as creative uses traditionally located in Surry Hills and Paddington.

This rezoning approach was supported by a literature review of prominent thinkers on cities and economic geography including Enrico Moretti, Richard Florida and Edward Glaeser. They argue that successful modern urban economies are built around knowledge and creative industries, and attracting firms and workers in these industries, depends on economically diverse, dense and mixed use environments. These industries thrive in environments where they can cluster together with other ‘like’ uses/users, creating opportunities for synergies, knowledge sharing and collaboration to strengthen and grow a cluster.

Map 15. City of Sydney Southern Employment Lands, Proposed Zonings



Source: City of Sydney (B5 on the above map key refers to Moore Park Employment lands)

It is designed that the rezoning of Industrial land to B6 (Enterprise Corridor) and B7 (Business Park) zones will help facilitate a wide variety of economic activities, as well as 'other' uses likely to attract and support higher value activities and promote better amenity. The long term aspiration for the new zones is to create a mixed business precinct facilitated by a flexible approach to land use. In the short to medium term the zone is likely to remain reasonably industrial in character, with higher value uses moving in slowly over time.

The proximity of the proposed Business zones to the new Green Square Town Centre makes the area an attractive location for the knowledge and creative industries to locate. The 'just out of centre' location makes it more affordable, while at the same time ensuring easy access to the services and amenities located in the new town centre. Other benefits include its proximity to the Green Square train station, and to an educated and accessible workforce. All of these factors are driving considerations for these kinds of knowledge and creative industries when they are choosing where to locate their business.

In addition, the changes from General Industrial to B6 and B7 zones will form a more intense use of land for employment than what was previously occupied. Therefore, rezoning's would add to the quantity of people that could be employed rather than reduce job opportunities as traditional heavier industrial uses (predominantly warehousing and distribution, transport and logistics, depots) provide limited opportunity for densification.

NB1: Planning for the City of Sydney southern employment lands was done in consultation with the community, landowners, government organisations and key stakeholders such as Sydney Airport and Port Botany.

NB 2: Information for this case study has been taken from a number of City of Sydney reports.¹²³

2.4.1 LESSONS LEARNT AND OPTIONS APPLICABLE TO THE LIVERPOOL LGA

The Primary role of the employment lands is to facilitate new business and industry opportunities, provide employment across a range of sectors, and provide for strategic industrial activity and essential urban services. A more flexible approach, as per the City of Sydney example, to land use in certain precincts across the Liverpool LGA, could help to facilitate higher density employment and help sustain new economic activities.

There were a number of lessons learnt in this case study which can be applied to the Liverpool LGA. Similar to the Liverpool LGA, it was identified that the City of Sydney needed to support and accommodate more jobs into the future and the key constraint to this was the limited availability of land in close proximity to the CBD and transport nodes.

The previous General Industrial zoning of the land was seen as a prohibitor to this growth as it did not encourage the development of older, underutilised sites. By adopting more flexible planning controls to parts of the City of Sydney's southern employment lands, it facilitated and encouraged higher density employment uses. At a high level, key lessons and options applicable to the Liverpool LGA include:

¹ <http://www.cityofsydney.nsw.gov.au/vision/major-developments/southern-employment-lands#page-element-dload>

² http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0007/232459/Adopted-Planning-Proposal.pdf

³ http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0003/232464/2C.-PP-Attach-C_EL-strategy.pdf

- **Proximity to other business clusters** – Given the City of Sydney’s southern employment lands proximity to higher density employment uses (namely being the CBD), it was seen as a logical decision to “broaden the CBD boundaries”. For Liverpool, there are a number of industrial precincts in close proximity to the CBD which may be better served under a business zone including a B5 (Business development), B6 (Enterprise Corridor) or B7 (Business Park) zone. These precincts include Orange Grove, Priddle/Scrivener Street (Warwick Farm), Sappho Road (Warwick Farm North) and the Cross Roads, Casula, as it would help facilitate new business and industry opportunities and accelerate their redevelopment and regeneration.
- **It will take time to evolve** - Importantly, the development of new industry clusters will not occur at once and it was recognised that the newly rezoned land would evolve over time as development progressively occurs. However, like the City of Sydney, the Liverpool LGA needs to be proactive by rezoning key precincts to facilitate this growth and development aspiration.
- **Access to infrastructure** – it was identified that the rezoning of land would lead to increased congestion of road networks. The City of Sydney was proactive in lobbying key stakeholders to ensure transport improvements would occur. Although they were broader State and Federal Government initiatives, examples include the WestConnex road project and the Sydney Metro rail project where the addition of a station at Central and Waterloo would alleviate some pressure on local road networks. For the Liverpool LGA, the potential extension of the Sydney Metro from Bankstown to Liverpool, including a station at Moorebank and the upgrading of Newbridge Road, would significantly improve the public transport accessibility for a number of industrial precincts, accentuating their attractiveness as a business zone to either a B5 (Business development), B6 (Enterprise Corridor) or B7 (Business Park) zone to facilitate further employment growth.
- **Access to affordable housing** – it was recognised that as employment grows in the City of Sydney’s southern employment lands, so too would demand for affordable housing. While this was seen as a large constraint for the City of Sydney given the high cost of housing in the area, Liverpool has a significant competitive advantage in that housing is significantly cheaper by comparison.
- **Promotion of flexibility** – By rezoning underutilised industrial land to higher order business zones, including B5 (Business Development), B6 (Enterprise Corridor) and B7 (Business Park), more flexibility in regards to both development, and the types of industries that could be accommodated, was given. While it remains early stages, there is evidence that the new zoning controls which encouraged flexibility has begun to support an increase in start-up and tech businesses moving into the area. A similar outcome could occur at Liverpool, particularly in the precincts close to the CBD, hospital and existing rail stations, including Orange Grove, Priddle/Scrivener Street (Warwick Farm) and Sappho Road (Warwick Farm North).

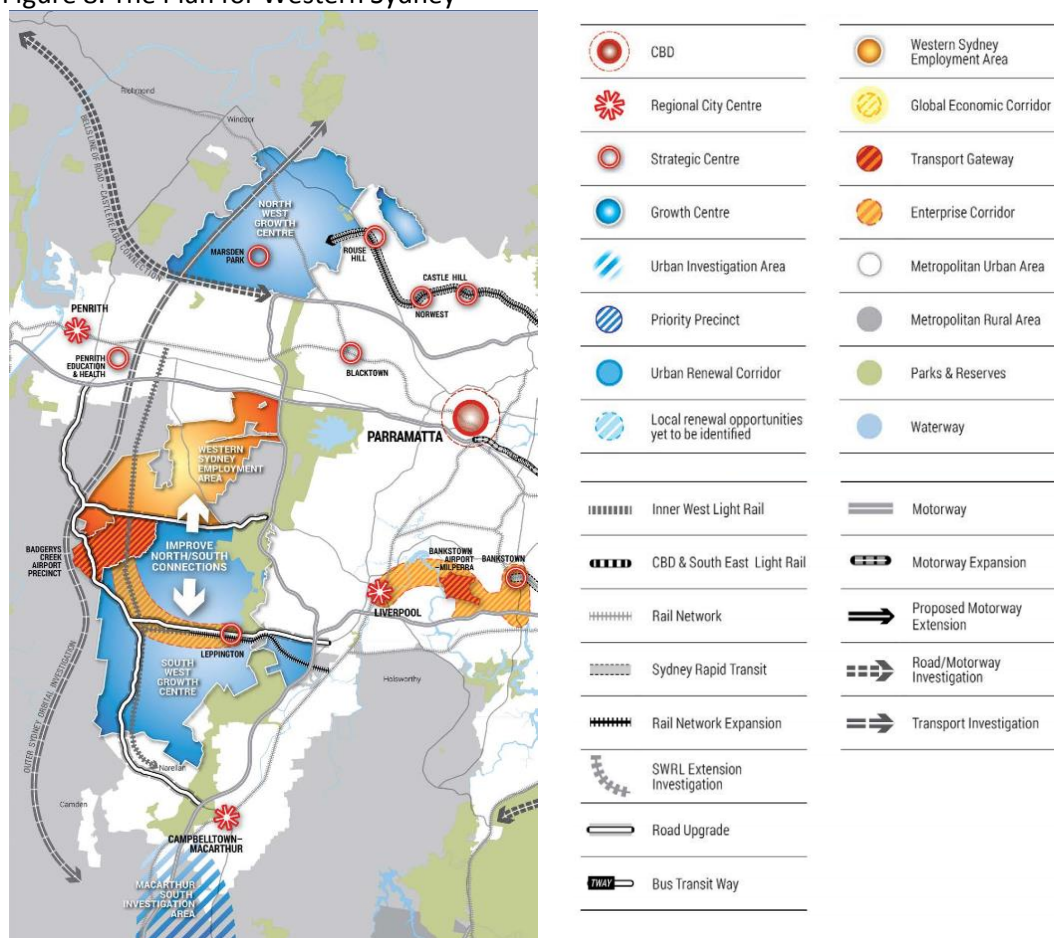
3.0 OVERVIEW OF METROPOLITAN AND SUB-REGIONAL STRATEGIC FRAMEWORK FOR INDUSTRIAL EMPLOYMENT LANDS IN THE LIVERPOOL LGA

An overview of the strategic framework has been prepared in order to understand the planning policy directions to which Council needs to respond together with the strategic drivers that will influence the locating and type of future industrial employment, as well as protecting and enhancing existing industrial lands, which will provide significant employment generation for the LGA. These strategic drivers include:

- A Plan for Growing Sydney (the Plan) prepared by the Department of Planning and Environment, which details the NSW Government's plan for the future of the Sydney Metropolitan Area over the next 20 years. The Plan provides key directions and actions to guide Sydney's productivity, environmental management, and liveability, including the delivery of housing, employment, infrastructure and open space. Figure 8 below demonstrates the plan for Western Sydney specifically.
- Western Sydney Airport (Badgerys Creek Airport). This airport will be a major catalyst for industrial employment and economic growth in Western Sydney and in the Liverpool LGA in particular. The project will be one of the largest infrastructure projects in Australia and works have already commenced on the road networks supporting the future airport.
- Bankstown Airport. An existing airport in close proximity to established industrial areas in the Liverpool LGA. A new Master Plan for Bankstown Airport was approved in 2015. According to the Plan, it is predicted that aircraft movements at Bankstown Airport will increase over the next 20 years.
- The M12 Motorway which is proposed to be built under the Western Sydney Infrastructure Plan. The Motorway will run east-west between the Northern Road and the existing M7 Motorway. The Motorway will direct access to the Western Sydney Airport, will improve freight movements throughout western Sydney, and is expected to service the Western Sydney Priority Land Release Area and the Western Sydney Employment Area. The Western Sydney Infrastructure Plan is illustrated under Figure 9.
- The upgrading of Bringelly Road. Identified in the Western Sydney Infrastructure Plan, Bringelly Road will be upgraded to a divided road of between four and six lanes.
- The upgrading of the Northern Road. As also identified in the Western Sydney Infrastructure Plan the project will upgrade approximately 35 kilometres of the Northern Road between Penrith and Narellan. The road will comprise a minimum four lane divided road and up to an eight divided road with dedicated bus lanes. The upgrade will include interchanges with the new M12 Motorway, the M4 Motorway and Bringelly Road.
- The M9 Orbital. A suitable corridor is currently under investigation to preserve an area for the provision of a north-south connection future motorway, freight rail and where practical a passenger rail line.

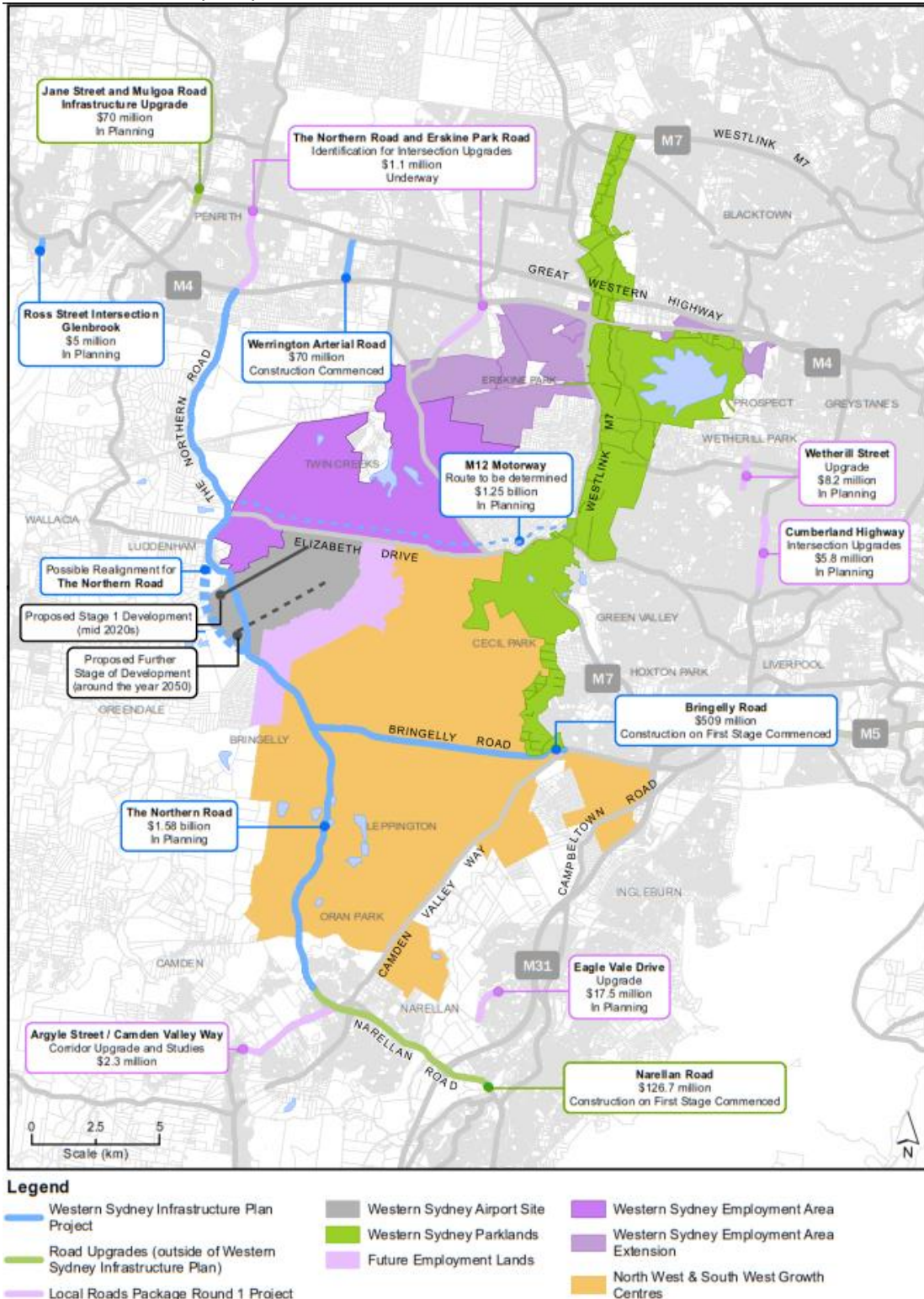
- Sydney Metro extension from Bankstown to Liverpool. A study area has been identified for investigation between Bankstown and Liverpool for the potential extension of the Sydney Metro line.
- Western Sydney Priority Growth Area. The State Government is planning to release a draft Land Use and Infrastructure Strategy which will outline the planning around the Western Sydney Airport including new industrial employment land opportunities. The Strategy is likely to include a new special infrastructure contribution levy.
- Western Sydney Employment Area. While not located in the Liverpool LGA, the Western Sydney Employment Area is located to the north of the LGA and will have direct connections to the new airport.
- South-West Rail Link Extension. It is understood that a corridor will be preserved for an extension of the South-West Rail Link. According to Transport for NSW, a number of core stations are proposed in the existing and planned centres of Rossmore, Bringelly, North Bringelly, Oran Park and Narellan. A station is also proposed at Badgerys Creek to serve the Western Sydney Airport.

Figure 8. The Plan for Western Sydney



Source: Department of Planning and Environment

Figure 9. The Western Sydney Infrastructure Plan.



Source: Department of Planning and Environment

The table below identifies the key directions and actions and comments in ‘A Plan for Growing Sydney’ relevant to the future of industrial employment lands in the Liverpool LGA.

Table 5. Key directions and actions relevant to the future of industrial employment lands in Liverpool

Direction	Action	Comment
1.4 Transform the productivity of Western Sydney through growth and investment	1.4.1 Improve transport links and creates a new services centre and industrial precinct to support the growth of Badgerys Creek Airport	The Plan indicates that the Government will preserve land for complimentary airport-related activity including freight-related uses.
	1.4.2 Develop new strategic employment corridors along transport infrastructure investments that will service Badgerys Creek Airport	<p>The Plan indicates that the Government will:</p> <ul style="list-style-type: none"> • Facilitate an enterprise corridor enabling a wide range of commercial uses from Leppington to the airport along Bringelly Road. • Facilitate development opportunities to leverage off improved transport connections such as improvements to Elizabeth Drive, the Northern Road and Bringelly Road • Maximise opportunities to increase economic activity and jobs growth in the Bankstown to Liverpool corridor through a flexible regulatory environment. This includes the potential for further economic activity within the Bankstown Airport-Milperra transport gateway
1.5 Enhance capacity at Sydney’s gateways and freight networks	1.5.2 Support the productivity of the freight network by identifying buffers around key locations on the freight network	<p>The Plan indicates that the Government will:</p> <ul style="list-style-type: none"> • Work with local councils to reduce unnecessary barriers to efficient freight movements • Make sure the development assessment processes consider the needs of the freight industry • Work with local councils to identify where buffer measures in local planning controls could help to minimise the impact of development on the efficient functioning of the freight industry

1.7 Grow strategic centres – providing more jobs closer to home	1.7.2 Improve councils' access to data on the demand and supply of homes, office and retail space	The Plan indicates that the Government will work with councils through the Employment Lands Development Program to provide a stronger evidence base for evaluation decisions in relation to proposed and existing industrial land by providing demand and supply data sets on industrial development including freight and logistics
1.8 Enhance linkages to regional NSW	1.8.1 Improve productivity and access to services through improved transport links to regional NSW	The Plan indicates that the Government will preserve a corridor for the Outer Sydney Orbital to improve freight connections from Regional NSW to Sydney Airport and Ports
1.9 Support priority economic sectors	1.9.2 Support key industrial precincts with appropriate planning controls	The Plan indicates that the Government will: <ul style="list-style-type: none"> • Undertake an analysis of Sydney's stock of industrial zoned land to identify key industrial precincts and use the findings to: <ul style="list-style-type: none"> - Determine where improved planning controls are required to better protect industrial land from conversion to other uses; - Identify where improved and innovative planning controls will allow for the ongoing evolution of industrial activities to more intensive commercial activities; and update the <i>Industrial Lands Strategic Assessment Checklist</i>. • Assess new proposals to convert existing industrial zoned land to other uses under the <i>Industrial Lands Strategic Assessment Checklist</i>.

The Plan identifies specific priorities for the south-west subregion which includes the Liverpool LGA. The relevant priorities for industrial employment lands in the Liverpool LGA are as follows:

- Investigate the long-term potential to locate a major enterprise corridor between Leppington and Bringelly, linked to the extension of the South West Rail Link
- Protect land to serve Sydney's future transport needs, including intermodal sites and associated corridors
- Recognise and strengthen the subregion's role in Sydney's manufacturing, construction and wholesale/logistics industries by maximising existing employment lands particularly in Fairfield and Liverpool.
- Identify and protect strategically important industrial-zoned land.
- Strengthen the diverse benefits to the economy proposed by Badgerys Creek Airport
- Work with council to investigate potential future uses of land located east of Georges River and north of Newbridge Road
- Plan as a transport gateway focused on the Badgerys Creek Airport site as part of the Western Sydney Employment Area/Badgerys Creek Airport Precinct transformational place

4.0 KEY TRENDS IN INDUSTRIAL BUILDING ACTIVITY

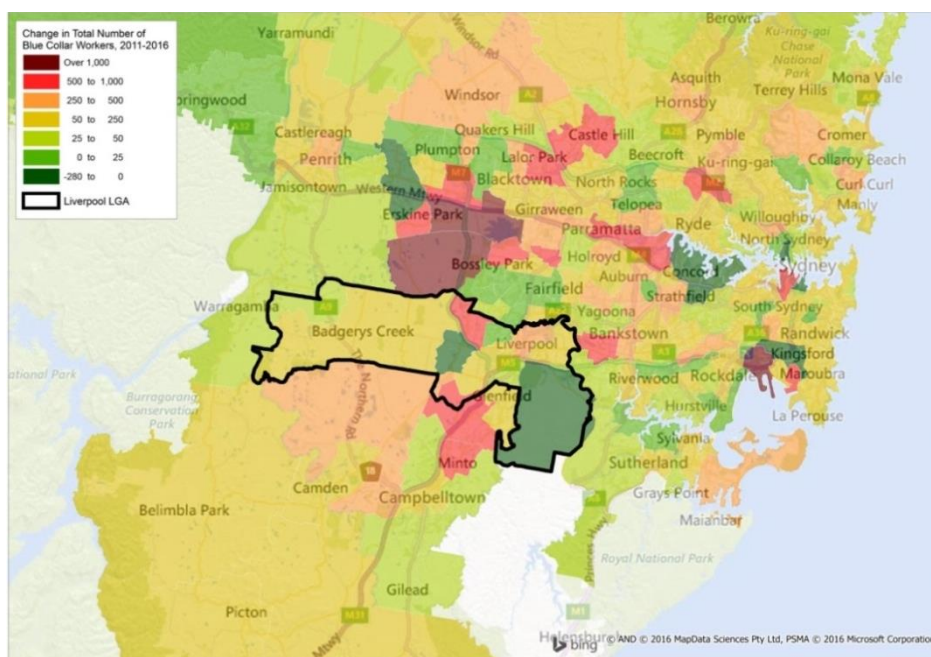
The Sydney industrial market has evolved rapidly over the past decade, not only in terms of location but also built form and development size. This section of the report highlights these trends.

4.1 TRENDS IN BUILDING LOCATION

Map 16 below highlights regions (by SA2) where employment growth in the dominant industrial industries (Manufacturing, Construction, Wholesale Trade and Transport, Postal & Warehousing) has occurred during the five year period of 2011-16. Importantly, the data has been projected out to 2016 (from 2014) and is reliant on demand being met by suitable employment land. In the case where appropriate supply is not available, demand would have shifted elsewhere.

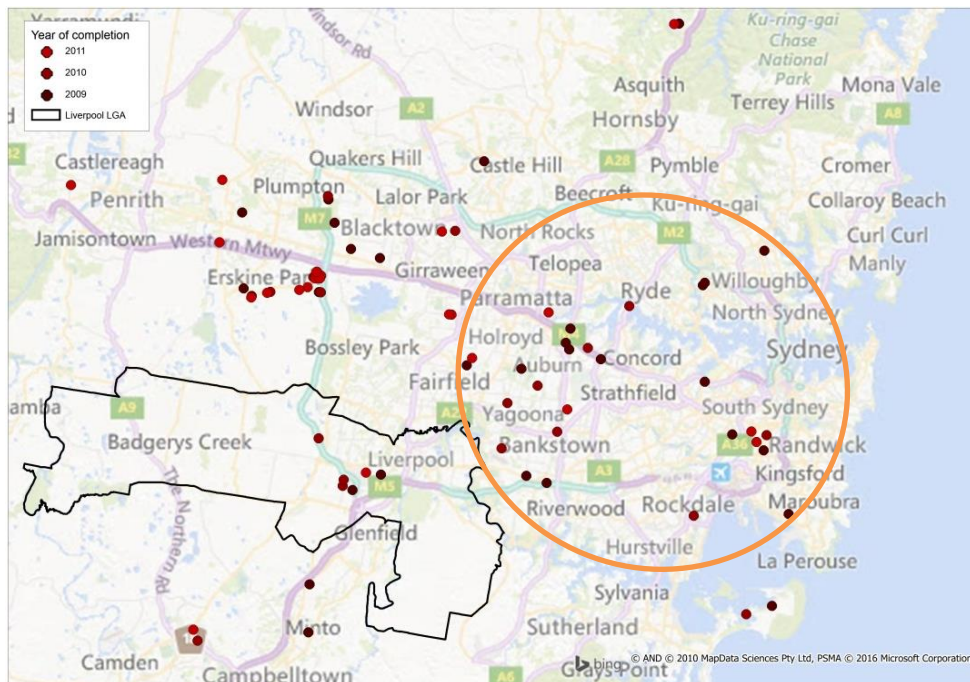
Between 2011 and 2016 precincts to the north of the Liverpool LGA have become the most buoyant in terms of the industrial employment growth (alongside the SA2 region including the Sydney Airport). Furthermore, in recent years the bulk of Sydney's industrial take-up and development activity has occurred in the Blacktown and Penrith LGAs, as highlighted by Map 17 and Map 18 on the following page. Industrial take-up and development has namely been concentrated in selected precincts including Eastern Creek and Erskine Park where there is ease of access to major arterial roads and availability of undeveloped land. The three Maps begin to exemplify the gravitational shift of industrial businesses to Western Sydney. This is illustrated by the lack of development within the inner ring (represented by the orange shape overlayed on Map 17 and Map 18) during the most recent three year period (2014-16) compared with location of development during 2009-11.

Map 16. Industrial Based Employment Gains, 2011-2016



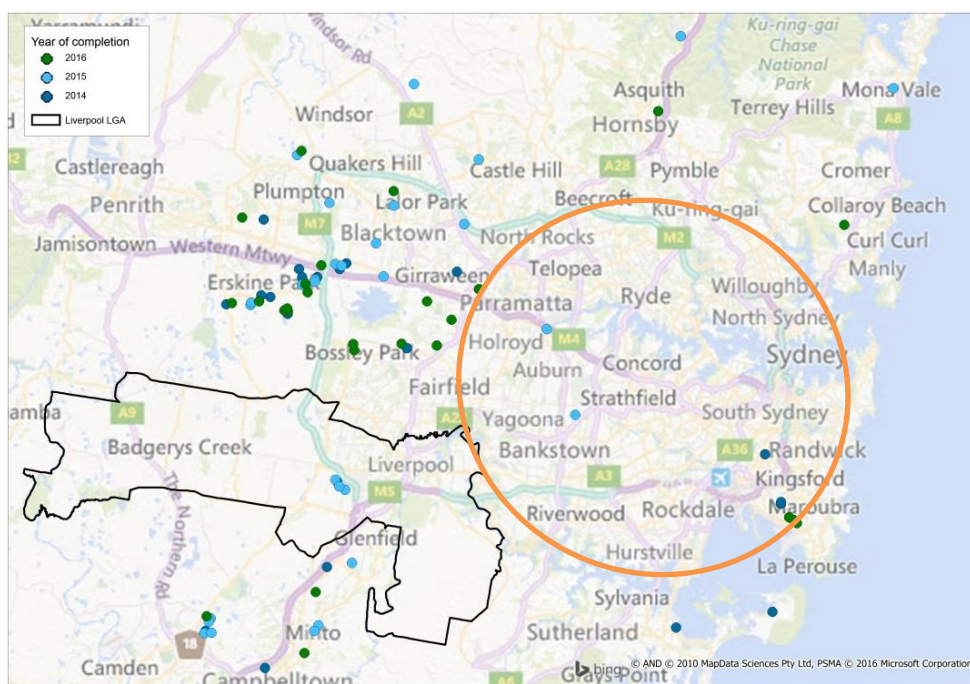
Source: Knight Frank Research, BTS

Map 17. Industrial Development Activity, 2009-2011



The migration of industrial user groups to Sydney's Outer Western suburbs has been an ongoing trend that is continuing to shape the location of new industrial assets. This trend is even more evident over the past three years (2014-16). This is highlighted by the rapid increase in both the number of, and space developed in the Outer West region and the lack of growth across traditional industrial areas of the South and Inner West (Figure 10 and Figure 11).

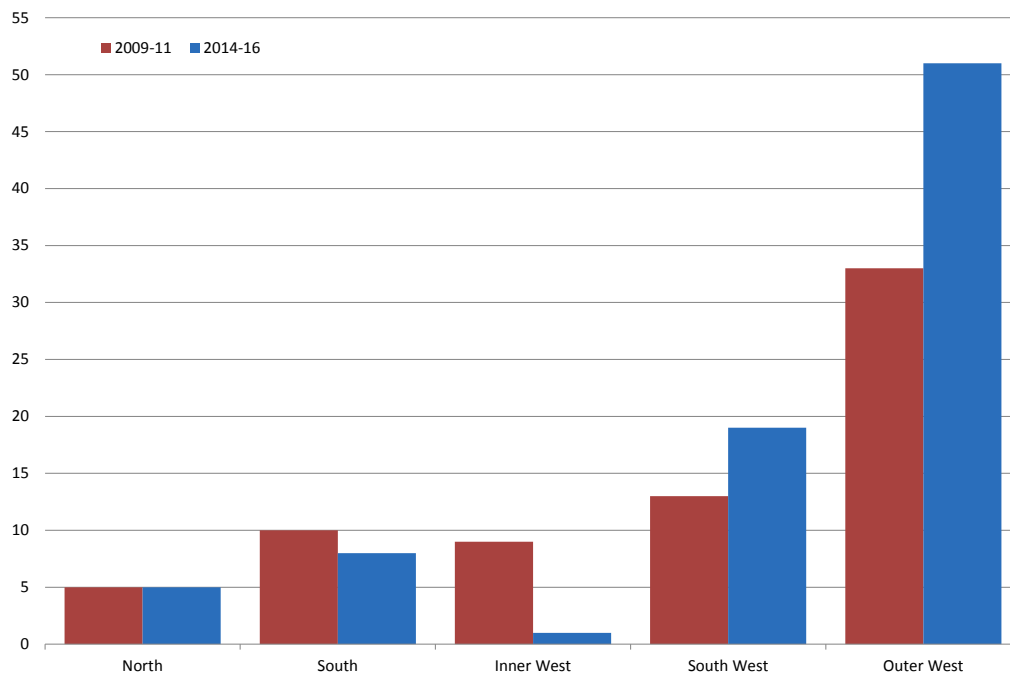
Map 18. Industrial Development Activity, 2014-2016



While the availability of relatively cheaper greenfield land in combination with industrial user groups seeking supply chain efficiencies derived from locations at major transport hubs has driven this pattern, the provision of appropriate land remains a critical issue for users and developers alike. It is important to note for Liverpool City Council that 2012 saw a spike in industrial development across the Liverpool LGA which is not depicted on these maps.

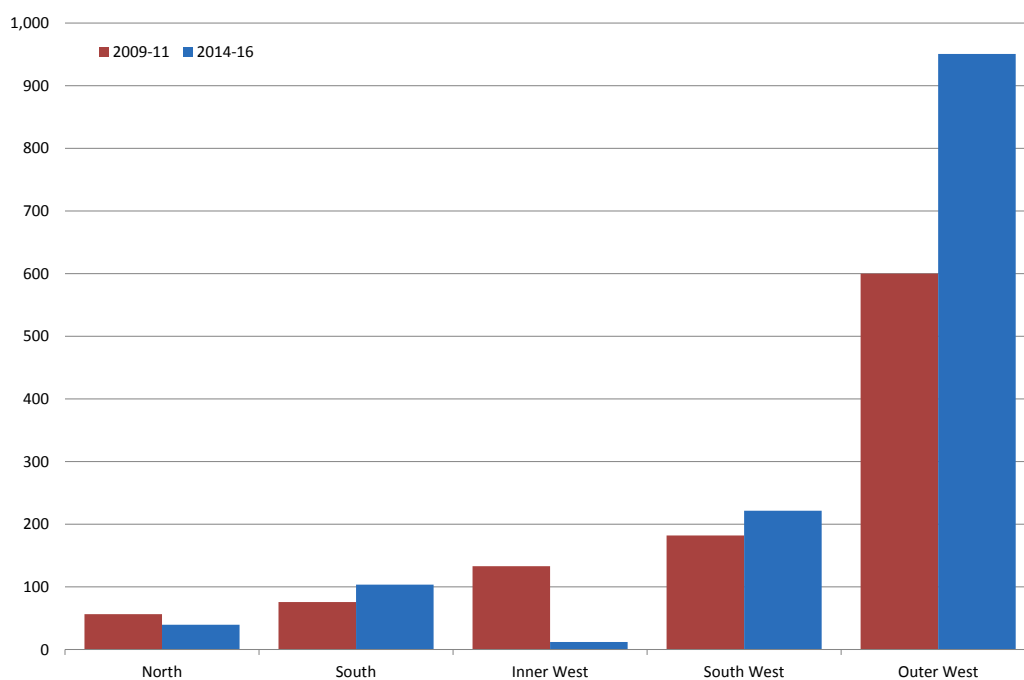
Source: Knight Frank Research

Figure 10. Industrial New Supply, by Region and Number of Developments - 2009-11 vs. 2014-16



Source: Knight Frank Research (*regions are Knight Frank defined regions)

Figure 11. Industrial New Supply, by Region and Total Developed Area (000's m²) - 2009-11 vs. 2014-16



Source: Knight Frank Research (*regions are Knight Frank defined regions)

4.2 TRENDS IN BUILDING TYPE

Using ABS approvals data, we are able to ascertain trends in industrial built-form type. Across the Liverpool LGA, warehouses represented the dominant industrial built form option. In value terms, approximately 85.4% of all industrial approvals in the Liverpool LGA since July 2014 were for warehouses which include storage sheds and typical warehouse and logistic provisions. Alternatively, factories only represented 4.2% of approvals (by value) in the Liverpool LGA over the same period while the remaining 10.4% was in the form of ‘other’ industrial formats which includes agricultural buildings.

In comparison to the adjacent LGAs of Blacktown and Penrith, Liverpool has a skew towards warehouse construction (77.9% for Blacktown and 63.7% for Penrith). At the same time, approvals for factories have been well below the adjacent LGAs and Greater Sydney (see Table 6). However, we note the majority of these approvals have been in locations in close proximity to major road networks including Prestons and Hoxton Park. This trend ties up with broader industrial market developments.

Table 6. Value of Industrial Approvals by Type, selected LGAs & Greater Sydney, July 2014-March 2016

	Liverpool LGA	Blacktown LGA	Penrith LGA	Greater Sydney
Factories	4.2%	22.0%	7.1%	13.1%
Warehouse	85.4%	77.9%	63.7%	70.7%
Other	10.4%	0.1%	29.2%	16.1%
Total	100.0%	100.0%	100.0%	100.0%

Source: ABS, Knight Frank Research

The dominance of warehouse typologies is indicative of increased transport and logistics activity in the Liverpool LGA given its proximity to major arterial roads. This reaffirms the needs for Liverpool City Council to rezone land in order for larger industrial user groups to locate to the LGA, capturing demand that would otherwise have established in precincts to the north of the Liverpool LGA, including Eastern Creek and Erskine Park where land is available. However, we note demand for existing ‘eastern’ industrial precincts (i.e. Moorebank, Chipping Norton and Priddle/Scrivener Street -Warwick Farm) remains underpinned by smaller users who service the local population. For these areas, preservation of existing warehousing/employment lands is required in order for jobs to remain in the LGA.

Similarly, the progression of the Moorebank Intermodal Terminal is likely to strengthen demand for warehouse development, particularly in the form of storage (containers) sheds. In addition, a lesser share of factory development across Sydney reconciles with the relocation of domestic manufacturing activity to offshore locations.

Drilling down further, we are able to determine which built forms have been prevalent in particular SA2 regions. Across Liverpool’s dominant industrial regions, namely being Prestons, Warwick Farm, Chipping Norton and Moorebank, industrial approvals (by value) since July 2014 have been skewed towards warehousing, representing 91.9% of approvals over the period. The skew was most pronounced within the

Prestons – Lurnea SA2 region due to availability of land and proximity to road networks while there was a larger representation of factory approvals in the Liverpool – Warwick Farm SA2 region.

Table 7. Value of Industrial Approvals by Type, selected Liverpool SA2 Regions, July 2014-March 2016

	Prestons - Lurnea	Liverpool - Warwick Farm	Chipping Norton - Moorebank	Total
Factories	3.4%	32.1%	8.9%	4.1%
Warehouse	94.6%	49.0%	70.5%	91.9%
Other	2.0%	19.0%	20.7%	4.1%
Total	100.0%	100.0%	100.0%	100.0%

Source: ABS, Knight Frank Research

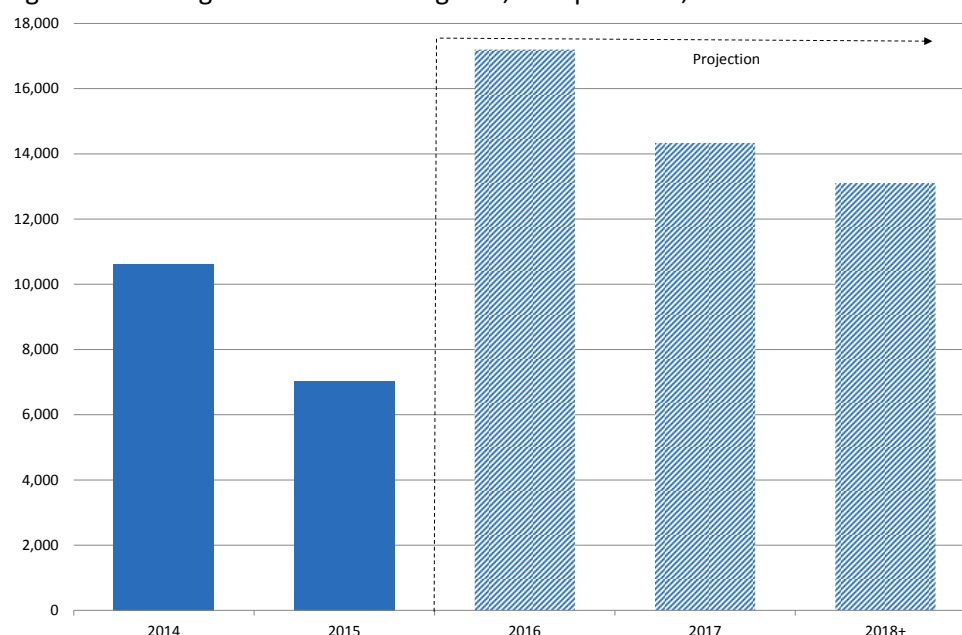
With much of Sydney’s industrial growth over the past five years stemming from logistic and transport (particularly 3PL groups) users seeking warehousing space along key road networks, recent industrial approval activity in the Liverpool LGA suggests the area is well placed to capitalise on future demand for industrial space, particularly in areas such as Prestons and Hoxton Park. However, we note demand in inner industrial precincts are expected to remain supported by smaller users, typically occupying less than 1,500m².

4.3 TRENDS IN BUILDING SIZE

Looking at industrial projects which have been constructed over the past two years within Liverpool, the average industrial construction size was 8,820m². Underpinned by the construction of an additional 13,260m² warehouse at the Mainfreight facility at Prestons, the average building size constructed during 2014 was 10,630, considerably above the 7,023m² for 2015.

Looking ahead, the average construction size of industrial facilities within the LGA is expected to increase over the next three years as demand for transport and logistics warehousing space increases, where typically these users occupier larger sheds of 10,000m²+. During 2016, the average industrial building earmarked for construction is set to measure 17,200m², which is largely off the back of Charter Hall’s development of 402 Hoxton Park Road, Prestons to accommodate the new East Coast head office for Automotive Holdings Group. Thereafter, average building sizes are expected to remain well above historical levels during 2017 and 2018. There is however a number of developers looking at developing a variety of warehouse sizes, highlighted by Stockland’s Coopers Paddock project at Warwick Farm where warehousing space will range from 3,415m² to 23,674m².

Figure 12. Average Industrial Building Size, Liverpool LGA, 2014-2018+



Source: Knight Frank Research

However, we note data is skewed towards larger industrial developments predominantly focused at areas such as Prestons, Hoxton Park and the Stockland site at Warwick Farm where institutions can realise scale and efficiencies. For Liverpool’s existing ‘eastern’ industrial precincts, little development has occurred due to a lack of developable land, the majority of which is surrounded by residential land uses.

5.0 DEMAND OUTLOOK

In line with Knight Frank's May 2016 Liverpool Industrial Employment Lands Study, the outlook for industrial land demand in the Liverpool LGA has been derived from BTS employment projections and employment density ratios for the industries which utilise industrial land. While the previous demand projections were high level by industry type, the projections in this report drill down to a more minute level for manufacturing employment, thereby giving a greater understanding of the types of industrial land that will be in demand over the next 15 years.

5.1 EMPLOYMENT PROJECTIONS

Over the 2016-2031 period, the Liverpool LGA is anticipated to experience jobs growth of 30,885, at which point there are expected to be 107,843 jobs within the Liverpool LGA. In terms of blue collar industries which relate to industrial land demand, jobs growth of 7,432 is anticipated over the same period, majority of which (54%) are expected in Transport, Postal & Warehousing industries. Underpinned by the Intermodal Terminal, Moorebank is set to capture the bulk of these jobs, while Elizabeth Hills (Hoxton Park Airport/Len Waters Estate precinct) is also earmarked for considerable growth in Transport, Postal & Warehousing industries over the 2016-2031 period.

In line with Liverpool's strategic location within Sydney's South West Growth Centre, construction employment is anticipated to grow by 1,279 jobs over the 2016-2031 period. While BTS projections do not provide a sub-sector split, Knight Frank Research anticipates residential building construction and associated sub sectors (electricians etc.) will represent the bulk of these gains while solid growth is also anticipated to stem from construction of Badgerys Creek Airport. Construction employment growth is expected to be relatively evenly spread throughout the LGA, however notable areas include Bringelly, Prestons and Chipping Norton.

Similarly, wholesale trade employment growth is expected to measure 1,677 jobs over the 2016-2031 period, with Knight Frank expecting motor vehicle parts wholesaling, basic material wholesaling and hardware goods wholesaling to represent the largest share of job gains. Notable areas expected to experience growth for this industry include Bringelly, Moorebank (Intermodal Terminal) and Prestons.

Overall, manufacturing employment is forecast to be moderate with growth of 492 jobs over the period (2016-2031). By sub sector, the following observations were made:

- Basic Chemical and Chemical Product Manufacturing, which includes fertilisers, pharmaceutical and medical product manufacturing are anticipated to experience the largest employment growth over the period (+280 jobs).
- Jobs growth of 198 in Furniture and Other Manufacturing.
- Loss of jobs in seven manufacturing sub sectors including Polymer Product and Rubber Product Manufacturing, Pulp, Paper and Converted Paper Product Manufacturing and Fabricated Metal Product Manufacturing.

Of the manufacturing industries expected to experience growth, Chipping Norton, Moorebank (existing industrial lands) and Prestons are expected to capture the majority of future demand. Alternatively, the

largest loss in manufacturing employment is earmarked to occur at Priddle/Scrivener Street (Warwick Farm) as a result of a decline in Pulp, Paper and Converted Paper Product Manufacturing.

5.2 LAND DEMAND PROJECTIONS

To determine the anticipated future demand for industrial lands in the Liverpool LGA, we have applied employment density ratios for the industry sectors which primarily utilise industrial land. As per Knight Frank's previous report, these projections relate to net land demand (or allotment demand) and do not include provision for roads, reserves and buffers. High impact industry uses, and those reliant on heavy vehicle access, will require greater provision for roads, reserves and buffers than lower impact areas such as service industry precincts.

As noted earlier in the report, BTS projections provide a sub sector split for manufacturing industries. These sub sectors have been broken down to determine the likely demand for industrial land in the Liverpool LGA.

In line with Knight Frank's previous report, BTS employment projections imply that there will be a need for 1,176 hectares of industrial land by 2031, an increase of 427 hectares from the 749 developed hectares identified by the 2015 ELDP Report.

Table 8. Industrial Employment and Land Projections

Industry	Total Employment				Emp/ha	Estimated Land Demand				Land Demand (2016-2031)
	2016	2021	2026	2031		2016	2021	2026	2031	
Food Product Manufacturing	1,663	1,666	1,669	1,671	35	48	48	48	48	0
Beverage and Tobacco Product Manufacturing	172	188	209	219	35	5	5	6	6	1
Textile, Leather, Clothing and Footwear Manufacturing	377	364	359	359	35	11	10	10	10	0
Wood Product Manufacturing	451	457	459	455	35	13	13	13	13	0
Pulp, Paper and Converted Paper Product Manufacturing	265	241	222	220	35	8	7	6	6	-1
Printing (including the Reproduction of Recorded Media)	545	533	523	522	40	14	13	13	13	-1
Petroleum and Coal Product Manufacturing	70	84	102	109	25	3	3	4	4	2
Basic Chemical and Chemical Product Manufacturing	689	799	892	970	25	28	32	36	39	11
Polymer Product and Rubber Product Manufacturing	589	584	569	547	25	24	23	23	22	-2
Non-Metallic Mineral Product Manufacturing	454	451	440	425	25	18	18	18	17	-1
Primary Metal and Metal Product Manufacturing	415	433	437	439	25	17	17	17	18	1
Fabricated Metal Product Manufacturing	541	533	519	508	25	22	21	21	20	-1
Transport Equipment Manufacturing	303	296	291	286	35	9	8	8	8	0
Machinery and Equipment Manufacturing	1,911	1,942	1,978	2,009	30	64	65	66	67	3
Furniture and Other Manufacturing	1,631	1,703	1,769	1,829	30	54	57	59	61	7
Construction	4,499	4,887	5,466	5,778	25	180	195	219	231	51
Wholesale Trade	3,946	4,680	5,159	5,623	25	158	187	206	225	67
Transport, Postal and Warehousing	5,206	7,060	8,154	9,190	25	208	282	326	368	159
Total	23,728	26,903	29,215	31,160		880	1,007	1,099	1,176	296
Average Annual Increase		635	462	389			25	18	15	20

Source: Knight Frank Research, BTS

Note: Industrial land projections are based on using the same employment density ratios over the forecast period.

Similar to broader Sydney industrial trends, demand is expected to be most pronounced within the Transport, Postal & Warehousing sector where 159 hectares of industrial land is expected to be required by 2031. Overall, industrial land demand within the manufacturing sector is anticipated to be weak over the 2016-2031 period, however varying greatly by industry sub-sector. By sub-sector, demand is expected to be strongest for Basic Chemical and Chemical Product Manufacturing and Furniture and Other Manufacturing.

Table 9 highlights key the areas and industries which are projected to experience solid employment gains over the 2016-2031 period.

Table 9. Selected Employment Growth Precincts

Precinct	Employment growth (2016-2031)	Key Industries
Moorebank Intermodal Terminal	1,925	Transport, Postal and Warehousing, Wholesale Trade, Petroleum and Coal Product Manufacturing
Bringelly	1,309	Transport, Postal and Warehousing, Wholesale Trade and construction
Elizabeth Hills (Hoxton Park Airport/Len Waters Estate)	605	Transport, Postal and Warehousing
Prestons	668	Transport, Postal and Warehousing, Construction and Basic Chemical and Chemical Product Manufacturing
Chipping Norton	302	Transport, Postal and Warehousing, Wholesale Trade, Basic Chemical and Chemical Product Manufacturing and Construction
Moorebank	575	Furniture and Other Manufacturing, Transport, Postal and Warehousing and Wholesale Trade
Warwick Farm	126	Construction, Transport, Postal and Warehousing

Source: BTS, Knight Frank Research

It is important to note that the Sydney Metropolitan Plan 'A Plan for Growing Sydney' uses Bureau of Transport Statistics, Small Area Employment Forecasts (2014) for their employment targets. Given the land demand forecasts within this report have been derived from the same dataset, the two projections will align. While these targets are ambitious (40,165 additional jobs between 2011 and 2016), in our opinion, these projections can be sufficiently met if appropriate land is rezoned and serviced to accommodate future growth.

6.0 WHAT DOES THIS MEAN FOR EXISTING EMPLOYMENT LAND?

Given the localised nature of current industrial businesses operating in the LGA, the majority of which employ four or less workers, demand within Liverpool's existing industrial precincts is expected to remain solid, especially in the inner industrial areas which cater towards smaller businesses including Chipping Norton, Moorebank and Priddle/Scrivener Street (Warwick Farm). The forecast for strong population growth in the Liverpool LGA and broader South West Sydney region supports this view. However, we also note (as per the Knight Frank May 2016 Liverpool Industrial Employment Lands Study report) industrial demand from larger user groups in the Liverpool LGA is expected to gravitate towards the undeveloped land parcels between Northern Road and the M7 (i.e. Kemps Creek, West Hoxton etc.), land adjacent to the Moorebank Intermodal Terminal, Prestons and Hoxton Park.

In effect, existing industrial land in the LGA is expected to remain tightly held by smaller localised businesses that require warehousing/manufacturing space of 1,500m² or less. However, given the older style nature of current industrial provisions, redevelopment of some precincts is likely to be needed over the coming five to ten years. To facilitate the development, some of the existing employment lands may be better served by higher employing zones such as a B5 (Business development), B6 (Enterprise Corridor) or B7 (Business Park) zone, which offer flexibility in regards to the user types which could be accommodated in the area. At a high level, potential areas which should be investigated further for potential rezoning include:

- **Orange Grove** - The industrial area is largely underutilised and it is evident that the general industrial zoning of the land is not the “highest and best use” for land in this location, particularly given its close proximity to the Liverpool city centre and health cluster. The rezoning of the area to either a B5 (Business development), B6 (Enterprise Corridor) or B7 (Business Park) zone whilst also encouraging the location and retention of viable industrial uses may be appropriate.
- **Priddle/Scrivener Street (Warwick Farm)** – The precinct is not suitable for heavy trucks as the area is also characterised by residential and other competing uses. Given these competing uses, Council may wish to investigate alternative access arrangements. Similarly, Council may wish to consider broadening the subject precinct's zoning/permitted use parameters (to a B5 Business Development, B6 Enterprise Corridor or B7 Business Park zone) to accommodate a larger mix of industries which will progressively evolve over time.
- **Sappho Road (Warwick Farm North)** - Given the known established uses existing within this site, and its close proximity to the Liverpool City Centre and Health cluster Council may wish to consider rezoning the land to either a B5 (Business development), B6 (Enterprise Corridor) B7 (Business Park) zone.
- **The Cross Roads, Casula** - Given the relatively small and isolated nature of the industrial area compared to other areas in the Liverpool LGA and the adjoining B5 Business Development zoning, Council may wish to consider rezoning this land to a B5 (Business development), B6 (Enterprise Corridor) or B7 (Business Park) zone. This will still permit light industrial uses and warehousing and distribution centre uses in close proximity to the M7 Motorway and is likely to result in a reduced impact on the amenity of the adjacent residential and educational establishment uses.
- See section 6.2 for further commentary.

6.1 IMPACTS FROM THE MOOREBANK INTERMODAL TERMINAL

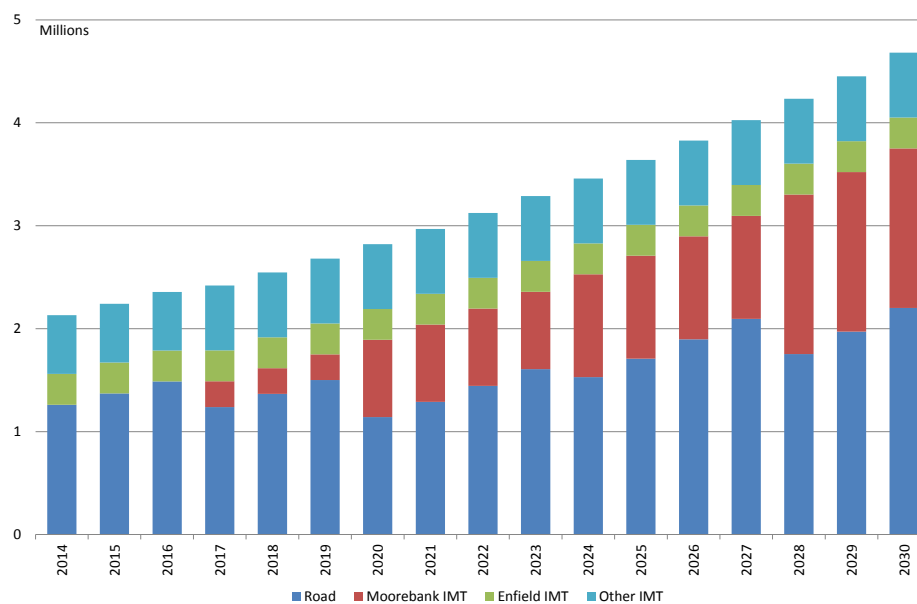
The dominance of Western Sydney as a location for industrial development has been strongly underpinned by large-scale infrastructure investment. Over the past decade, road transport has come to dominate the movement of freight from Port Botany in the absence of additional rail freight capacity.

Unlike a number of other Australian cities, Sydney is predominantly a net importer of containerised freight. Currently, the Sydney container freight market is almost entirely dependent on Port Botany which is one of state's key container port facilities. The use of rail freight is currently only a small proportion of total import and export volumes through Port Botany, with Knight Frank estimating road transport to currently account for around 50-60% of freight movements in and out of Port Botany (see Figure 13).

Overall, the addition of the Moorebank Intermodal Terminal (IMT) will provide an efficient solution for improved movement of container freight between Port Botany and South West Sydney while at the same time represents a significant shift in the transport economics for the broader Sydney region. Current plans suggest the site layout has a sustainable practical capacity of approximately 1.05 million twenty-foot equivalent unit (TEU) p.a. for the IMEX facility, and 0.5 million TEU p.a. for the interstate terminal. The current 'sweet spot' to the north of the Liverpool LGA around the M4 and M7 intersection has the potential to see pent up demand move further south towards the Moorebank IMT. This outcome bodes well for the Liverpool LGA as industrial development could shift away from the M4 and M7 intersection and down the M7. The widening of Northern Road as part of the Western Sydney Infrastructure Plan will help facilitate this movement.

Once the Moorebank IMT is complete and operational, road freight movements through inner western Sydney will become less frequent (see Figure 13). This outcome means that inner western locations will become much less valuable for industrial redevelopment (Kingsgrove, Riverwood, Padstow etc.), while at the same time increasing demand for industrial demand within Liverpool. The range of freight being transported along the road network is set to drop sharply as the Moorebank IMT begins operation, particularly after the completion of stage two.

Figure 13. Projected TEU Movements from Port Botany (2014-2030)



Source: Knight Frank Research

Note: based on TEU volumes growth of 5% per annum

As freight movements (presented as TEUs) more than double at Port Botany by 2030, this outcome will greatly reduce freight traffic along key arterial roads. In the short term, road freight will continue as the main mode for distribution and logistics of containerised goods. In this case, demand for warehouse space and distribution facilities is expected to remain strong in the short to medium term at locations within proximity to the M4/M7 and M5/M7 Sydney Orbital intersections.

With the Moorebank Intermodal precinct expected to include up to 850,000m² of warehouse space, of which will be released to the market on a sustained basis, inbound demand from other areas of Sydney is expected to be solid. Currently, there is approximately 240,000m² of warehousing space being marketed for lease at the Moorebank IMT with anecdotal evidence from agents indicating a considerable pick-up in the level of tenant enquiry for this space. Similarly, feedback from Knight Frank agents suggest tenant enquiry has been solid in other industrial precincts in Liverpool, particularly Prestons and AMP's undeveloped Crossroads Logistics Centre at Casula given their proximity to the Moorebank IMT and the existing road networks of the M5, M7 and the Hume Highway.

6.1.1 LIKELY TENANTS

Unlike the Liverpool LGA's existing employment lands which primarily accommodate smaller localised users, the Moorebank IMT will be attractive for tenants who rely on container movements to and from Port Botany. For these users, such as third party logistics (3PL) operators, by locating adjacent to an IMT (in this case within the warehousing space as part of the Moorebank IMT precinct), operational efficiencies can be achieved given their scale of operations. The motivation is that larger tenants such as 3PL groups will be able to use the adjacent warehousing space within the IMT precinct as the focal point of their operations, while using it as a base for their broader freight movements throughout Sydney and NSW. Given that these groups have tended to gravitate towards Eastern Creek in the past, the addition of these users to the area will generate a greater employment outcome for the Liverpool LGA.

It is important to note that not all businesses who require industrial land will want to be close to an IMT. For businesses which service the local population (automotive repairs etc.), the motivation to locate near an IMT is low as they do not rely on supply chain efficiencies (from Port Botany) to do business. For these users, proximity to residents is vital, so demand for current industrial precincts in Liverpool is anticipated to remain strong.

Overall, the progression of the Moorebank IMT is expected to be positive for the Liverpool LGA as it is likely to result in an influx of businesses who may have not established a presence in the LGA without it. As such, this will result in a net increase in employment, while providing local employment opportunities for local residents.

6.2 STRATEGIC IMPLICATIONS FOR THE FUTURE INDUSTRIAL EMPLOYMENT LANDS IN THE LIVERPOOL LGA

According to BTS, the forecasted increase in industrial employment in the Liverpool LGA by 2031 will be an additional 7,432 jobs (from 2016). Whilst the mix of future of industrial employment is subject to further review, it is important that the Council positions its land use planning response to accommodate this forecasted increase in jobs. This land use planning response is likely to be by way of a combination of both an increase in the amount of land set aside together with importantly ensuring a sufficiently flexible regulatory zoning framework to accommodate changes in industry and market trends in terms of employment types.

Based on the Employment Report noting the suggested limitations, the existing industrial land stock in the Liverpool LGA is considerable and a strategically important employment asset for both the LGA and Western Sydney. It confirms the comparative advantage of Liverpool in a wider regional setting particularly in terms of transport, freight and logistics. The existing land supply however does have a number of practical limits and/or barriers to further development and intensification when accounting for the specific features and attributes of particular precincts.

Noting the above, there is an opportunity for Council to reposition its strategy towards the long term provision of industrial employment land noting the practical limits to the continuing use of certain precincts and the emergence of new areas reflecting the investment in regional infrastructure. The following describes the implications for industrial employment lands in the LGA based on both the strategic drivers and a general commentary on certain key precincts.

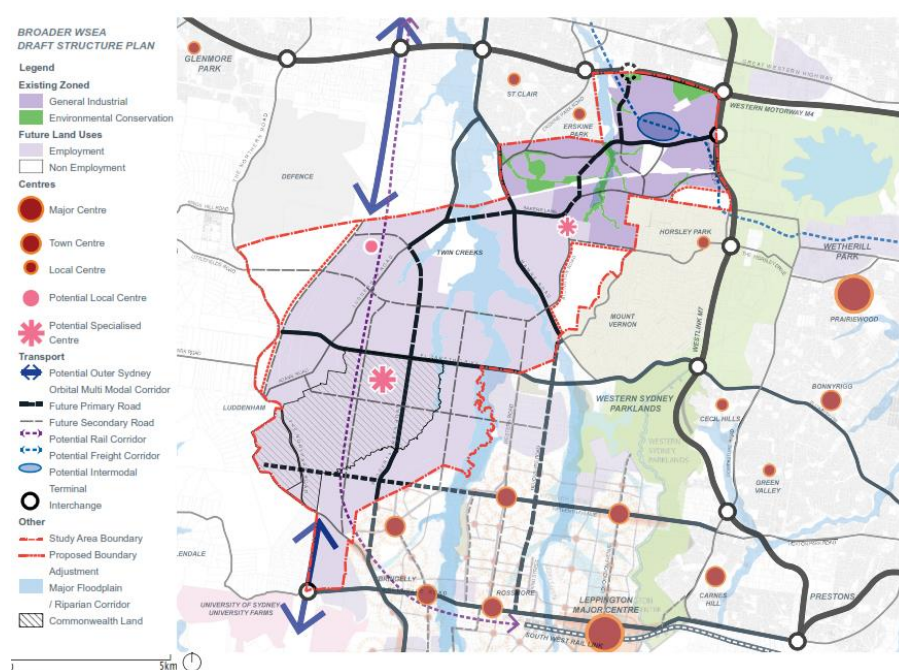
6.2.1 STRATEGIC DRIVERS' COMMENTARY

The relevant key directions and actions from A Plan for Growing Sydney (the Plan) in conjunction with the strategic drivers as previously outlined will result in a number of implications for the existing and future industrial employment lands in the Liverpool LGA. These implications are as follows:

- A significant opportunity to generate new industrial employment areas in the Bringelly Road Enterprise Corridor as identified in A Plan for Growing Sydney alongside the upgrade of Bringelly Road and the Northern Road. This has the potential to both consolidate the role of Prestons at its eastern “bookend” coinciding with the intersection of the M5 and M7 Motorways together with providing a greater level of accessibility to the proposed western most industrial employment areas in and adjacent to Badgerys Creek Airport. This opportunity will significantly contribute to the currently limited stock of undeveloped industrial lands in the LGA. Part of the enterprise corridor falls within the Western Sydney Priority Growth Area which involves the preparation of a Land Use and Infrastructure Strategy by the Department of Planning and Environment in conjunction with Liverpool City Council. The Council should use this opportunity to promote with the State Government to the delivery of additional and importantly serviced industrial land within this enterprise corridor.

- The Plan identifies opportunities to protect and enhance the existing industrial employment lands in the Bankstown to Liverpool Enterprise Corridor including Chipping Norton and Moorebank industrial areas. In order to effectively protect the existing industrial areas, the Plan has identified the use of a flexible regulatory framework environment. Furthermore, as the Bankstown to Liverpool Enterprise Corridor has been identified as an area of significance in servicing the future Western Sydney Airport and the existing Bankstown Airport which are both identified as transport gateways in the Plan, it is important that Council begin engaging in discussions with the Roads and Maritime Authority and lobbying the State Government to upgrade Newbridge Road and associated local roads to provide adequate vehicular access. It is also recommended that Council undertake research to determine a future regulatory framework to protect these industrial areas as the Plan mentions. It is also noted that a priority for Liverpool for the subregion is to investigate potential future uses of land located east of Georges River and north of Newbridge Road.
- The draft Broader Western Sydney Employment Area Structure Plan nominated a large area on the eastern side and a smaller portion on the western side of the Western Sydney Airport in the Liverpool LGA for future employment uses (see Map 19). In October 2015, the State Government announced a broader investigation into opportunities for new jobs and homes around Western Sydney Airport known as the Western Sydney Priority Growth Area. The new Western Sydney Priority Growth Area (illustrated on Map 20) will guide new infrastructure investment and identify new employment areas as well as residential areas in proximity to public transport.

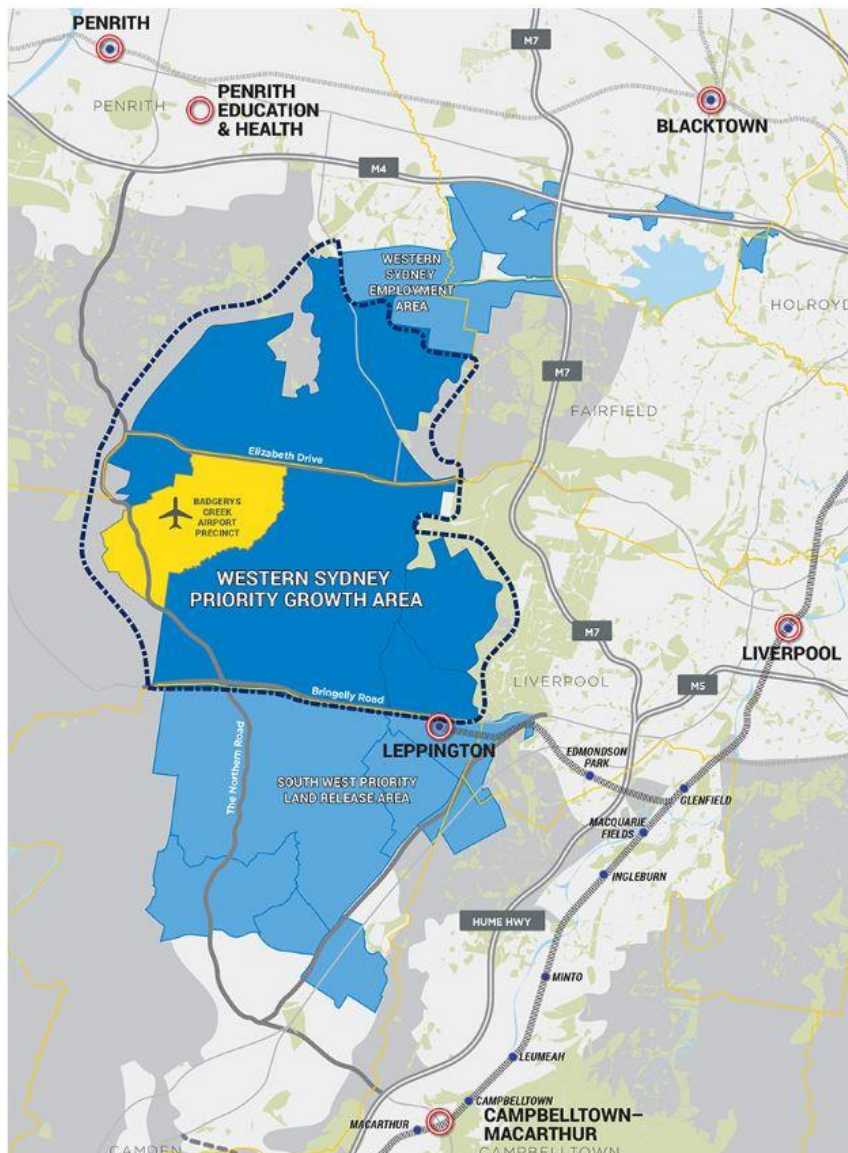
Map 19. The draft Broader Western Sydney Employment Area Structure Plan



Source: Department of Planning and Environment

The location of the originally proposed employment land on either side of the airport land remains a significant strategic location due to its proximity to the future airport, the future M12 Motorway, the Northern Road (soon to be upgraded) and the existing M7 Motorway. It will be important for Council to reinforce its position in the continued provision of the original strategic location of employment land on either side of the Western Sydney Airport land. This follows and aligns with the State Government’s preparation of the draft Land Use and Infrastructure Strategy to ensure the provision of future industrial employment land for the LGA.

Map 20. The Western Sydney Priority Growth Area



Source: Department of Planning and Environment

- The Employment Lands Development Program 2015 is a valuable tool in understanding the developed and undeveloped zoned land in the Liverpool LGA by industrial precinct. The Plan seeks for Government to work with councils through the Employment Lands Development Program to provide a stronger evidence base for evaluation decisions in relation to proposed and existing industrial land by providing demand and supply data sets on industrial development including freight and logistics.

While land may be zoned for industrial uses, the review of the existing industrial areas has revealed that certain industrial areas are being utilised for uses better characterised as a broader mix of business uses. In this regard, it is considered that the amount of zoned industrial land in the LGA and stated in the Employment Report does not reflect the actual amount of zoned land used for industrial purposes nor therefore the extent of land available for industry. It is recommended that Council engage with the State Government to discuss how to undertake a more accurate describing of industrial land.

- The review of existing industrial land in the Liverpool LGA undertaken in a previous section of the report has identified the Yarrunga/Prestons, and Moorebank industrial areas as strategically important land due to their significant land area and direct connections to the M7 and M5 Motorways. Similarly, the Len Waters Estate is significant in its direct access and location on the M7 Motorway. It is recommended that Council investigate the introduction of development incentives in these precincts for manufacturing, construction and wholesale/logistics industries to recognise the role of the region in these specific industries and to protect these strategically located industrial areas.

While not as well linked in terms of access to the Motorways, the Chipping Norton industrial estate is a large industrial area in the LGA and is in close proximity to the Bankstown Airport, nominated as a transport gateway in the Plan. Given these significant attributes of the Chipping Norton industrial area, it is recommended that Council undertake investigations into the provision of development incentives for certain industries in order to protect this industrial area.

Such development incentives should take a whole Liverpool LGA industrial precincts approach, including a combination of measures that seek to discourage and or/limit the further locating of uses in inappropriate areas whilst encouraging their locating within alternative precincts within the LGA. In doing so, it is noted of course that there will be a number of existing developments and uses otherwise already approved and established that will continue to operate in all precincts. Those measures should be subject to specific “testing” as to their impact on specific precincts however by way of example, suggest the following be considered:

- Requiring a minimum allotment size for warehousing and distribution that is capable of accommodating large service vehicles and including potentially B-doubles. Noting

the generally smaller size and older, established uses in for example, Chipping Norton, such a requirement is likely by default to encourage such uses to locate in those precincts where purpose built and planned large lot subdivisions can be developed such as Moorebank south and Yarrunga/Prestons.

- A review of the current Section 94 contributions applicable to the Yarrunga/Prestons industrial area which we note is currently based on a per square metre levy. A review of this contribution by way of consideration to a reduction has the potential to be a direct and tangible financial “lever” to influence decisions as to where to locate specific industries. Any such review is of course subject to Council ensuring a balance between the need to provide the necessary supporting infrastructure and the public benefit arising from encouraging greater local employment.
- The potential future extension of the Sydney Metro from Bankstown to Liverpool provides an opportunity to provide significantly improved public transport connections to the Moorebank industrial area. The location of Metro stops in or in close proximity to the industrial area will significantly improve the public transport accessibility for employees and will assist in protecting strategically important industrial zoned land.

The potential for Metro stops provides an opportunity to reposition parts of these industrial precincts to make best use of this heightened accessibility and the principal of intensifying development within a walking distance of such stations. Repositioning the precinct involves identifying the range of highest and best land uses that will most effectively utilise land in and adjacent to the significant public investment in a Metro rail station. By way of comparison, in terms of other industrial employment areas we note the following:

1. The current construction of the Metro station at Norwest Business Park
2. The prior construction of the station portals at Macquarie Park
3. The proposed construction of a Metro station at Sydenham and the recent release by the Department of Planning and Environment of the proposal for the transformation of the older industrial area into a range of “start-up” businesses.

This transit oriented form of development is also consistent with unlocking the investment potential in the new Metro rail as evidenced in the precinct planning being undertaken by State Government in and around the Metro stations already identified on the network.

6.2.2 KEY PRECINCT COMMENTARY

As part of the review of key precincts and in turn the potential repositioning of the industrial areas within the LGA, it is recommended that it is important and strategic to clarify the desired future role and character of the individual precincts noting that each has particular local issues and conditions that will influence the manner and extent of future industrial uses. By way of commentary, we note the following:

1. A number of the precincts are located in areas that historically were urban fringe areas and now are surrounded and adjoin residential areas. Specifically, Chipping Norton and Moorebank (north). The result appears to be a number of practical limits to their operating and prospects of expansion or intensification. Specifically;
 - The mixing of residential and industrial traffic on the local road network
 - The locating of housing on land adjoining industrial and the resulting land use conflict.It suggests that the long term locating of new 'heavier' industry, in particular those that maybe characterized as 'offensive or hazardous' maybe more appropriately directed towards areas where they are least constrained by the potential for land use conflict. Specifically, Prestons and Moorebank (south of the M5 Motorway) are not close or adjacent to existing residential areas and provide an opportunity to maintain an appropriate and planned buffer.
2. The principal industrial precincts of Chipping Norton, Moorebank and Prestons comprise a wide mix of uses confirming the appropriateness of a broad industrial zone noting the already mentioned issue of new heavy industrial uses locating in certain precincts. All three have a critical mass in terms of scale that make each an important and strategic contributor to industrial employment.
3. The presence of warehousing and logistics, particularly in Yarrunga/Prestons, Moorebank and Hoxton Park Airport (Len Waters Estate) confirms the strategic location of Liverpool in terms of the M5, M7, future M12 and longer term, the M9 Western Orbital. This is a key comparative advantage for Liverpool and confirms the importance of preserving and consolidating this role for each precinct, noting the practical limits to any expansion of Hoxton Park.
4. The Orange Grove industrial area is largely underutilized and it is evident that the general industrial zoning of the land is not the "highest and best use" for land in this location. Council may wish to consider rezoning the land for higher density employment uses including B5 (Business development), B6 (Enterprise Corridor) or B7 (Business Park) whilst also encouraging the location and retention of viable industrial uses. Given its city edge location, this precinct would be appropriate for higher densities subject to a detailed local master plan.
5. Following our review of the Priddle/Scrivener Street (Warwick Farm) precinct, vehicle and truck access, which is provided through Priddle and Scrivener Street, is arguably not ideally suitable for heavy trucks, while residential and other competing uses to the north supports this view. However,

the area is a large employer within the LGA and in this case the precinct should be preserved for employment uses. Council may wish to consider alternative access arrangements to the precinct and broadening the subject precinct's zoning/permitted use parameters to accommodate a larger mix of industries/employment uses noting:

- i) its locational advantage of being within close proximity to the Liverpool health cluster and the Liverpool CBD suggesting the potential for allied health and research uses such as that now established in, and adjacent to, the Westmead health precinct and Macquarie University.
- ii) confirm and clarify the extent to which any odour buffer associated with the Liverpool Water Treatment Plant is a limit to either specific uses or density of development. Subject to the outcome of this review, it may be appropriate to reconsider the land use zoning of this area by way of say the "unlocking" of the area for a wider range of uses or alternatively, a further limiting.

6.2.3 IMPLICATIONS OF LOCAL PLANNING FRAMEWORK

In considering both the character of the established industrial areas and the emergence of newer more recent areas, and the potential for additional employment areas as a result of new infrastructure, we would recommend that a review be undertaken of the current industrial zoning framework in order to determine whether it reflects a more contemporary and long term positioning of the role and character of precincts within the LGA. Specifically and by way of example:

- a) A review as to whether a wider business zone (including B5 - Business development, B6 - Enterprise Corridor or B7 - Business Park) is more appropriate for the Sappho Road (Warwick Farm North) industrial area.
- b) A review as to whether the best and highest order employment use for Orange Grove is more flexible business and employment lands than general industrial, particularly given its close proximity to the Liverpool CBD.
- c) The further consolidation of the role of Yarrunga/Prestons as a strategic freight, logistics and warehousing hub for Liverpool and Western Sydney.
- d) The potential to encourage the locating of heavier industry that might be characterized as offensive and/or hazardous industries in areas where buffer can be address land use conflicts such Moorebank South and Yarrunga/Prestons.
- e) The potential to allow development incentives in the Moorebank, Yarrunga/Prestons and Chipping Norton industrial areas to stimulate and encourage industrial development and reaffirm the employment generating potential of the LGA in these areas. Incentives for specific land uses which will rely on and will most benefit from the strategic location of the industrial area such as freight, logistics, warehousing and distribution should also be considered.
- f) By reviewing the local planning framework, which considers the rezoning of some industrial zoned land to either a B5 (Business development), B6 (Enterprise Corridor) or B7 (Business Park), the precincts would facilitate greater flexibility in regards to development and user types which could be accommodated.

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FINAL LIVERPOOL INDUSTRIAL EMPLOYMENT LANDS STUDY

Prepared for:
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33 Moore Street,
Liverpool NSW 2170
SYDNEY

by Knight Frank Consulting

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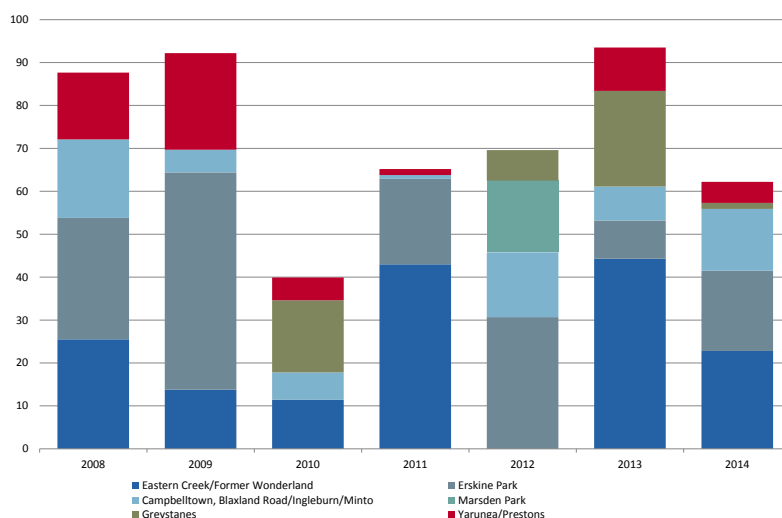
EXECUTIVE SUMMARY

This report has independently considered the current market conditions and factors affecting supply of industrial employment lands across the Liverpool Local Government Area (LGA) and the wider South West Sydney Metropolitan region where it impacts the Liverpool LGA. The report also aims to highlight both the nature and extent of likely future demand for industrial employment lands within the Liverpool LGA and identify locations and stock required for future industrial land-uses within the Liverpool LGA.

Over the last decade, industrial businesses have relocated to Western Sydney. Rising rents in established inner industrial regions and greenfield residential development (and hence population growth) motivated industrial businesses to move out to Western Sydney.

Significant investment in road and freight infrastructure facilitated this movement with industrial development, and hence take-up, being most pronounced at the intersection of the M4 and M7 i.e. Eastern Creek (see Figure 1 below). Similarly, although take-up has slowed moderately in recent years, Prestons, located at the intersection of the M5 and M7 Motorways within the Liverpool LGA, has enjoyed solid industrial demand, supported by its ability to offer more affordable industrial land. Since 2008, take-up of employment lands across Sydney has totalled 1,138.7 ha, equating to an average take-up rate of 162.7 ha per annum. However, 45% of this total has been concentrated in a few select precincts. Figure 1 below shows employment land take-up within the major selected precincts and highlights solid demand around Eastern Creek/Former Wonderland (Blacktown LGA) and Erskine Park (Penrith LGA).

Figure 1. Employment Land Take-up, by Selected Precincts, 2008-2014 (ha)



Source: Knight Frank Research, Employment Lands Development Program, Department of Planning and Environment

The most recent available data from NSW Planning (Employment Lands Development Program, 2015), indicated undeveloped and serviced land within the Liverpool LGA had declined to 41.1 ha. This Liverpool LGA total represents a 7.6% fall in undeveloped and serviced land compared with 2010, and a 14.2% drop over the most recent year as land uptake has outpaced the rate of new land parcels being serviced. To give some context as to why this amount of serviced land implies a relative shortage of available inventory for

imminent development, the average take up of land has been approximately 15 ha per annum since 2008, reflecting a potential available supply of 2.8 years. However, based on future employment projections for the Liverpool LGA industrial land demand is set to total 1,176 hectares by 2031, an increase of 427 ha from the 749 developed ha identified by the 2015 EDLP Report. Annual growth in demand is projected to be 25 ha per annum between 2016 and 2021 before reducing to 18 ha per annum over the 2021-2026 period and 15 ha per annum over the five years to 2031.

Looking ahead, major infrastructure projects will ultimately determine the direction and magnitude of demand for industrial space in Sydney. In this case, the prospects for industrial development within the Liverpool LGA appear solid given its proximity to both existing transport infrastructure links such as the M5 and M7 Motorways and future infrastructure projects such as the WestConnex, Moorebank Intermodal Terminal and Sydney's second airport at Badgerys Creek.

Overall, the impacts of road, air, rail and port investment are expected to stimulate industrial development in South West Sydney. The Moorebank Intermodal Terminal would provide an efficient solution for improved movement of container freight between Port Botany and South West Sydney. The current 'sweet spot' to the north of the Liverpool LGA around the M4 and M7 intersection will be challenged by the Moorebank IMT. The WestConnex project and widening of the M5 will also shift industrial market impetus to the South West. In addition, locations to the south of the M4 and M7 junction will become more appealing due to relative affordability.

Consequently, the centre of gravity for industrial development should continue to move away from the M4 and M7 intersection, down the M7 and to the west of the M7 i.e. between Northern Road and the M7. The widening of Northern Road as part of the Western Sydney Infrastructure Plan will be a catalyst for industrial development in the region, as it will also facilitate direct access to the north west resident population market. Suitable precincts in Kemps Creek, West Hoxton and Badgerys Creek are expected to emerge.

However, with the bulk of land between Northern Road and the M7 (i.e. Kemps Creek, West Hoxton etc.) currently not zoned for industrial uses nor connected to services, these areas are not likely to be readily developable to industrial users until early to mid-2020s. However, it is important that this land is unlocked to accommodate the shift in demand south.

In order to capture future occupier demand within Liverpool, activity from institutional groups such as Goodman, Dexus, and Charter Hall etc. must occur. Land ownership represents the largest barrier for industrial development within the Liverpool LGA as the majority of land is held by smaller privates. The Liverpool LGA needs a greater presence of institutions as they are the groups who have the capacity and the capital to develop and bring tenants to the area. Put simply, smaller privates cannot compete with institutions as they struggle to take on projects of scale. From an occupier perspective, privates cannot complete in pre-leasing opportunities as occupiers require certainty which institutions can provide.

To offset this and attract institutions, Liverpool City Council needs to provide a clear blueprint of timing and servicing to bring land online. This will provide certainty to the area, thereby allowing institutions to pay the type of rates that the privates are prepared to divest their land, so that they can build scale. Without certainty an institution will not become active, nor pay the rates that privates on 5 acre lots are willing to sell for.

Key Industrial Indicators for the Liverpool LGA

Indicator	Comment
Changing needs of industrial tenants	<ul style="list-style-type: none"> • There has been a decline in the demand for industrial facilities within the manufacturing sector, making way for a large increase in big-box warehousing/logistics facilities. • In response to cheaper rents, industrial businesses have gravitated towards Western Sydney, further strengthened by access to major transport infrastructure. Over the past 12 months, 65% of Sydney's leasing activity for existing buildings (5,000m²+) has been concentrated in the western regions of the Outer West and South West. Rezoning to accommodate alternative uses in inner and middle ring locations (particularly South Sydney) have also accelerated this trend. • The drive for operational efficiencies continues to underpin a clear tenant preference for prime stock, with 77% of gross absorption over the past 12 months (year to April 2016) in the Outer West and South West regions comprising prime (A-grade) stock. • Recent demand has largely stemmed for large, new and efficient warehouses which are suitable for distribution facilities and logistics operations. Similarly, the accommodation they require has also grown in size with many now requiring 15,000m²+ facilities. • Occupiers seeking supply chain efficiencies are driving development as they seek to design facilities which improve efficiencies, ultimately allowing them to control supply chain costs (rents only usually represent 5-10% of total supply chain costs). • Further outward migration of industrial based businesses is expected, however without appropriately available land within the Liverpool LGA, they will seek accommodation in other precincts across Sydney.
Liverpool's opportunities	<ul style="list-style-type: none"> • The large labour force located within the Liverpool LGA will ensure there is demand from Industrial occupiers wanting to be based within access to this labour force. • The Liverpool LGA has a unique position as it provides ease of access to Sydney's major transport infrastructure networks including road (M5 and M7 Motorways), rail links (including intermodal terminals providing connection to the Port of Sydney) and will ultimately benefit from a second Sydney airport at Badgerys Creek. • Logistics users will ultimately locate their operations in precincts with good accessibility to infrastructure (roads, rail etc.) → The Liverpool LGA is well placed to capture this demand. • Liverpool presents the first real opportunity for "big box" development as users migrate down the M5 Motorway. • As land within the LGA is rezoned and demand in existing industrial precincts remains strong there will be demand for more zoned employment land. • Liverpool LGA (as part of State Government statutory framework such as the Priority Growth Areas and South West Growth Area) has reserved approximately 2,340 ha for employment uses. However, to capture demand, this land needs to be unlocked. • The opportunity for Liverpool to utilise passenger rail (currently terminating at Leppington) into a broad acre new Industrial precinct will provide a significant advantage over competing precincts such as Erskine Park and Eastern Creek. • Liverpool has the opportunity to capture migrating demand as the focus shifts south of the M4 Motorway. The precinct to the west of the M7 and immediately south of Elizabeth Drive holds the greatest prospect for Liverpool.

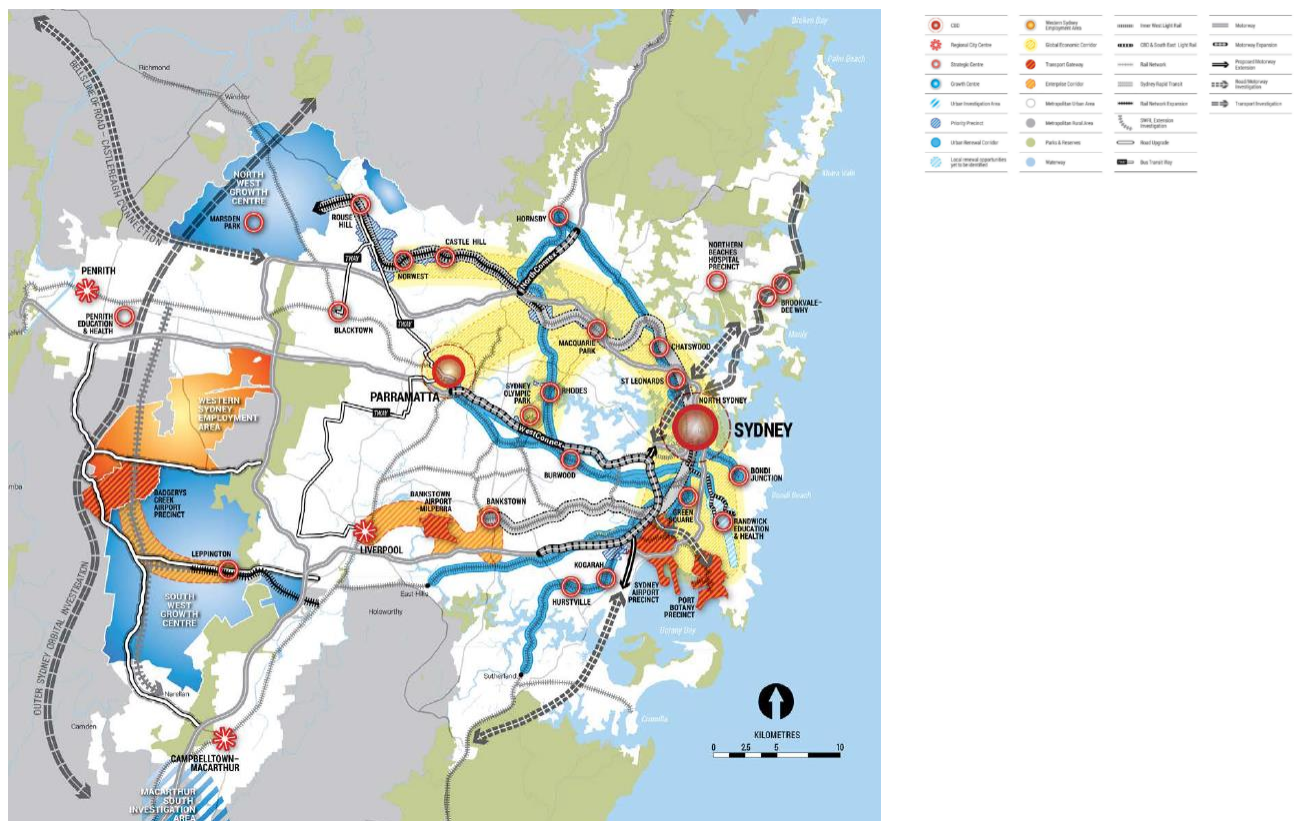
Key risks/threats

- Liverpool is also contemplating rezoning and gentrification in some of their established precincts (Moorebank) to accommodate alternative uses including mixed-use development. This would lead to a reduction in available industrial land across the Liverpool LGA. The ability for the Liverpool LGA to capture these displaced tenants is vital to the conservation of jobs within the LGA.
- With the bulk of developable zoned and serviced land now largely being absorbed, the unlocking of land for the next phase of growth is needed.
- The last remaining larger parcels of un-developed zoned and easily serviceable land within the Liverpool LGA are located in Prestons, Austral and the Cross Roads in Casula.
- Liverpool is running out of zoned serviced land. Based on average take-up rates since 2008, there is approximately 2.8 years' worth of available supply. Future land needs to be rezoned and serviced to accommodate growth.
- Lack of larger lots → there has been significant growth in the number of 10,000m² users.
- Despite there being approximately 2,340 ha reserved for future employment uses within the LGA, the hardest part of unlocking this land is having to rely upon the private sector to rezone and service the land.
- Due to the fragmented nature of the land ownership within the future employment zones (mostly small lot 2 ha rural residential) larger groups are struggling to obtain the scale required to achieve a feasible broad acre lot subdivision development.
- Landowners typically (once advised their land has been "reserved" for employment purposes within the statutory framework) expect traditional industrial land rates when considering divesting.
- The cost to re-zone, service and sub-divide land can be as much (per m²) or higher than what the large industrial developers are prepared to pay to the landowner (per m²).

1.0 LIVERPOOL LGA IN CONTEXT

The importance to the Liverpool LGA of industrial employment lands is paramount. The State Government Metropolitan Strategy identifies Liverpool as a ‘Regional City’ for the South West, and is the major employment destination, transport hub and main regional retail centre for the South West. Future population growth within Liverpool, including from mixed use redevelopment and new residential estates like Middleton Grange, Edmondson Park and Elizabeth Hills, and surrounding areas within the LGA will generate the need for provision of employment lands in the local area. As such, Liverpool City and its surrounds will need to further develop as the retail, service and employment destination for the South West.

Map 1. Subject Area in Context



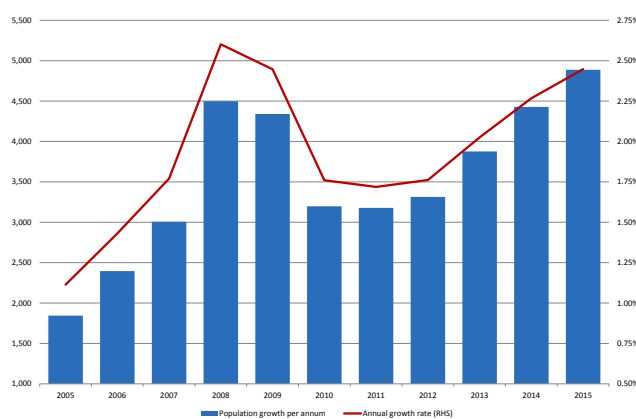
Source: A Plan for Growing Sydney, Department of Planning and Environment

Liverpool City Council has also adopted a one job per house benchmark to guide development within the Liverpool LGA to help ensure the balanced provision of employment in line with residential development¹. This is to ensure that the LGA does not miss out on the opportunity for job creation and growth, which is in line with the establishment of an enterprise corridor which runs through the LGA. This enterprise corridor has the aim of attracting investment, stimulating employment generating development and maximising opportunities to increase economic activity.

¹ <http://www.liverpool.nsw.gov.au/planninganddevelopment/strategic-planning/prestons-employment-lands>

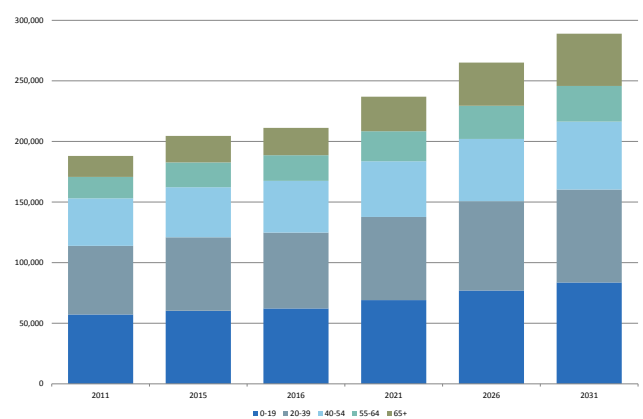
In order for the Liverpool LGA to economically prosper, job creation will be a necessity going forward, as future population growth and demographic change is expected to outpace past growth. Looking ahead, strong population growth is expected to eventuate over the next 15 years, underpinned by significant infrastructure works, the development of residential housing estates and the area’s attractiveness amongst families, due to its relative housing affordability. The resident population is expected to increase from its current 204,594 persons (June 2015, latest available ABS estimates) to reach 288,900 persons by 2031 at an annualised growth rate of 2.3%, compared with 2.0% over the past 10 year period. In comparison, Greater Sydney is projected to grow at an annualised rate of 1.9% between 2015 and 2031, having recorded an annualised 10 year growth of 1.6% between 2005 and 2015.

Figure 2. Liverpool LGA Historical Population Growth



Source: Knight Frank Research, ABS

Figure 3. Liverpool LGA Population Projections

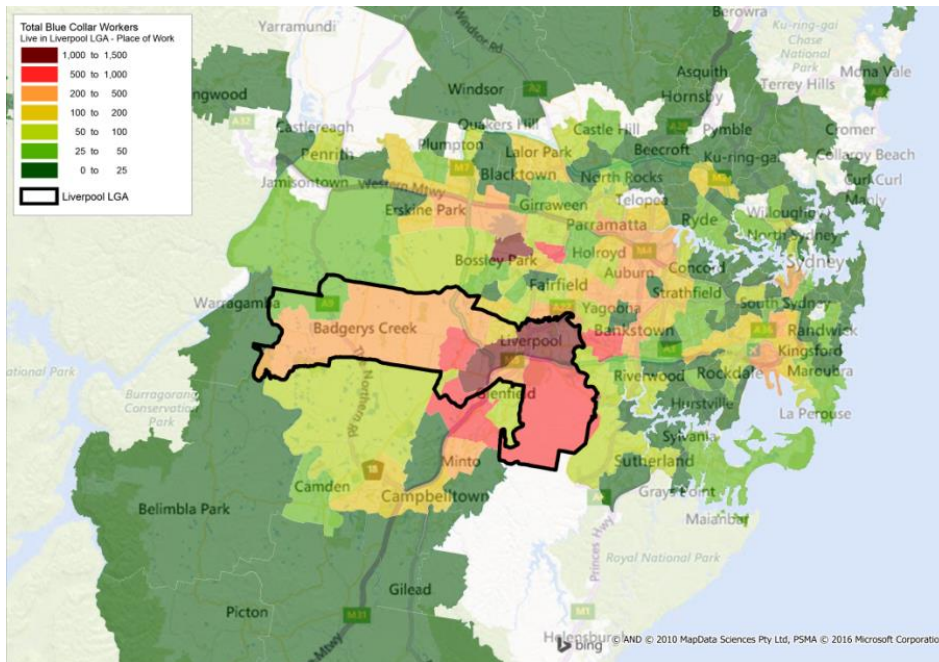


Source: Knight Frank Research, Department of Planning and Environment

Over the past few years the strong economic cycle across the NSW State and the wider Sydney Metropolitan region, underpinned by rapid growth in dwelling construction, infrastructure and the technology and financial and business services sectors, has meant that economic growth has filtered through to more regional Sydney economies.

As an example, the Liverpool LGA, recorded a 5.0% unemployment rate at December 2015 (latest available data), 2.5% lower than 18 months prior, with the number of Liverpool LGA residents employed increasing by 3,663 over the past year (see Figure 4). As the population of Liverpool LGA is forecast to grow, the need to support business and employment within the LGA will become greater, especially as the LGA is home to a large proportion of blue collar or industrial workers. Knight Frank’s analysis suggests that the majority of blue collar / industrial workers resident within the Liverpool LGA live in close proximity to their place of work (see travel to work Map 2 and Map 3).

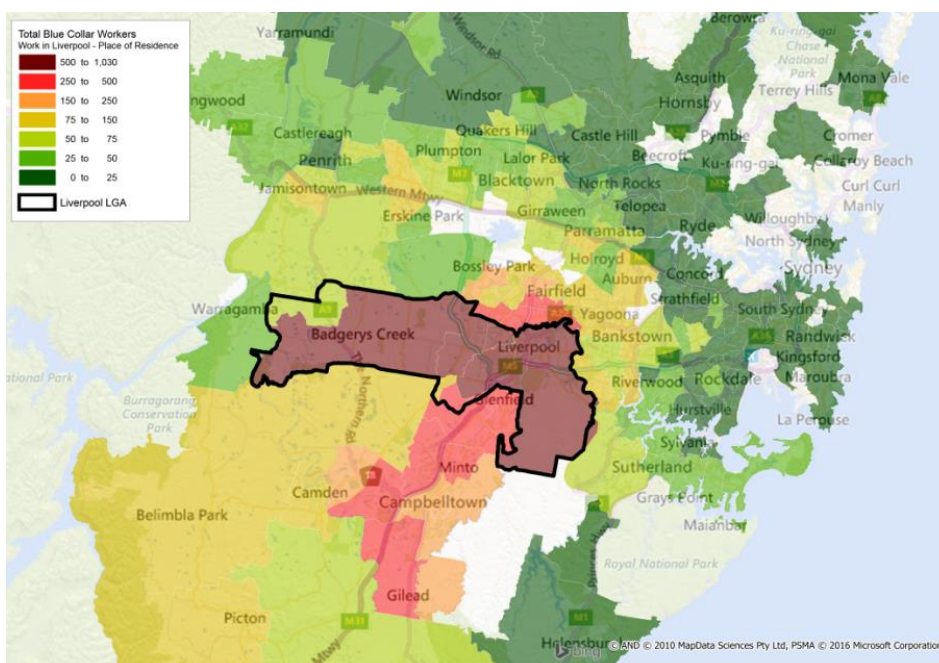
Map 2. Place of Work of Blue Collar Workers, Whose Place of Residence is in the Liverpool LGA



Source: Knight Frank Research, ABS (data at SA2 level)

The map shows the place of work of Blue Collar workers, who live in the Liverpool LGA – **the map highlights that Liverpool Blue Collar Workers tend to remain concentrated in the LGA for employment and across some areas of the immediate surrounding LGA's** – those that do travel a distance to work (from within the Liverpool LGA) are clustered in the Sydney CBD, South Sydney area and at the Sydney Airport.

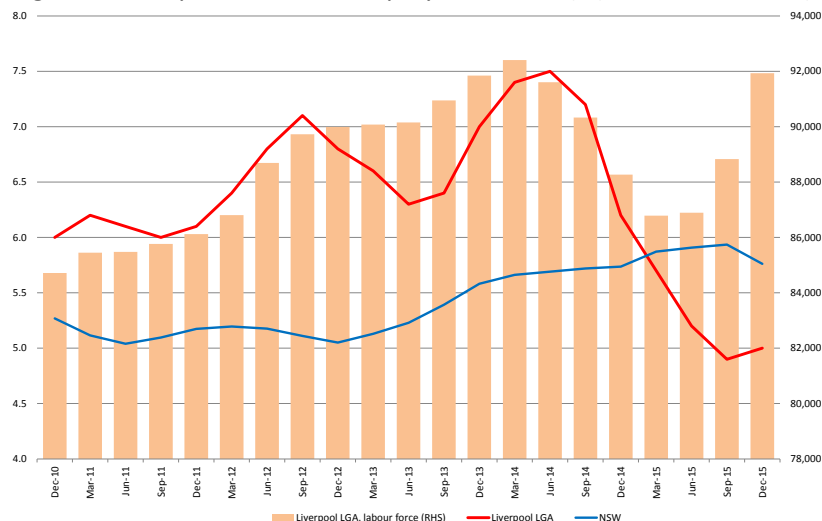
Map 3. Place of Residence of Blue Collar Workers, Who Work in the Liverpool LGA



Source: Knight Frank Research, ABS (data at SA2 level)

The map shows the place of residence of Blue Collar workers, who work in the Liverpool LGA – **the dark red colour within the Liverpool LGA highlights that a large proportion of Blue Collar workers working in the LGA live in the Liverpool LGA** – with a significant remainder of Blue Collar workers employed in the Liverpool LGA commuting from Fairfield and South of the Liverpool LGA, concentrated around the M31 motorway in Campbelltown and Camden.

Figure 4. Liverpool LGA – Unemployment Rate (%) & Labour Force (smoothed)



Source: Knight Frank Research, Department of Employment

1.1 INFRASTRUCTURE IMPROVEMENTS

Transport is critical to the efficient functioning and quality of life of Sydney and its residents. Poor or reduced accessibility can be a major constraint on the success and quality of places, their neighbourhoods and communities. Central to Western Sydney and Liverpool’s future are a number of key infrastructure projects. The provision of key road and airport infrastructure investments is providing the framework for Western Sydney, and precincts within the Liverpool LGA to become a focal point for new industrial developments over the course of the next decade. As a result, demand for industrial employment lands within close proximity to gateway infrastructure will remain high and will be a key differentiator for the Liverpool LGA compared with other competing areas of the Sydney Metropolitan region. Beyond the projects mentioned below, there is potential for further infrastructure projects which would enhance Liverpool’s strategic position within Western Sydney. Most notable of these mooted projects is the proposed extension to the Sydney Metro from Bankstown to Liverpool.

WESTERN SYDNEY AIRPORT

In April 2014, The Federal Government confirmed Badgerys Creek as the site for Western Sydney’s new airport, which is wholly located within the Liverpool LGA boundary, and 50 kilometres from the Sydney CBD. According to the Government, the decision to locate a second Sydney airport in the West reflected the growth of Western Sydney, which is expected to expand from two million to three million people over the next 20 years. The airport, which is expected to open in the mid-2020s, will initially operate from a single runway and cater for approximately five million passengers. As passenger numbers increase over the decades, so too would job opportunities both at the airport and in surrounding business districts.

The new airport will be a major generator of economic activity—providing employment opportunities closer to where people in Western Sydney live. Over 30,000 jobs could be generated directly by the airport’s operation by 2060, and indirect employment around the airport site could contribute an additional 30,000

jobs. It is anticipated that the second parallel runway would only be required after 25 years and would provide the capacity to meet growth in demand for future air travel.

To support the airport, the Government has already committed to a large number of infrastructure projects that will upgrade a number of major and local roads in the area to increase capacity and improve accessibility to the M7 and M4 motorways. In addition, the Prime Minister Malcolm Turnbull confirmed the Federal Government's commitment to constructing a high-speed Western Sydney rail link to connect the CBD to the new Airport. The rail line will not only service the new airport but will provide an additional transport link for Western Sydney, and act as an employment generator.

WESTERN SYDNEY INFRASTRUCTURE PLAN

The Australian Government is delivering on its plan to build a stronger and more prosperous Western Sydney by investing \$3.6 billion over 10 years in major infrastructure upgrades that will transform the region's economy. The Western Sydney Infrastructure Plan (WSIP) will provide better road linkages within the Western Sydney region and benefit the region's growing population, including through reducing commuting times (see Map 4).

In addition, the Western Sydney Infrastructure Plan will ensure the proposed new airport site will be supported by a quality surface transport network to ensure the efficient movements of passengers, employees and freight. A major part of this plan is the upgrade of The Northern Road from two lanes to a four-lane divided road along a 31 kilometre length. The total cost of the project is \$1,579.5 million. The Australian Government is providing \$1,228.5 million and the NSW Government is providing \$351 million towards the construction of this project. Construction commences in late 2015. The upgrade will be completed in stages, with final stage to be completed in late 2019.

Another major part of the Western Sydney Infrastructure Plan is the \$509 million upgrading of Bringelly Road. Construction of stage one of the upgrade commenced in January 2015 with construction of this stage expected to be completed late 2017. Bringelly Road will be upgraded to a minimum of four lanes between The Northern Road and Camden Valley Way.

The third major project within the Western Sydney Infrastructure Plan will involve the construction of a new four-lane motorway in the vicinity of Elizabeth Drive, providing access to the airport at Badgerys Creek and forming the main east-west connection between the M7 Motorway and The Northern Road. The new motorway will also involve a motorway interchange with the M7 Motorway.

MOOREBANK INTERMODAL TERMINAL

Moorebank had been identified as a priority location for a freight terminal since 2004. Its direct rail link to Port Botany and freight markets around Australia, and its proximity to major motorways, make it ideal for an intermodal facility. The Sydney Intermodal Terminal Alliance (SIMTA) will build and operate the intermodal freight precinct. SIMTA is a consortium consisting of the import export logistics company Qube Holdings and the rail freight operator Aurizon Holdings.

The new precinct will include an import-export (IMEX) freight terminal with eventual capacity for up to 1.05 million containers per year by 2030, and an interstate freight terminal with capacity for up to 500,000

containers a year. Stage 1 will see 250,000 containers per year through the IMEX facility. The first stage of the interstate terminal will have a similar capacity. Subsequent stages will be developed in line with demand.

The Commonwealth is expected to invest around \$370 million in the development, including funding the rail connection between the terminal and the Southern Sydney Freight Line and land preparation works. The precinct will include 850,000m² of integrated warehousing when fully developed, with the total project costing approximately \$1.87 billion over ten years. The IMEX terminal (stage 1) is expected to start operations in late 2017 and the interstate terminal in approximately 2019 and is anticipated to provide economic benefit of around \$120 million a year for the economy of south-western Sydney.

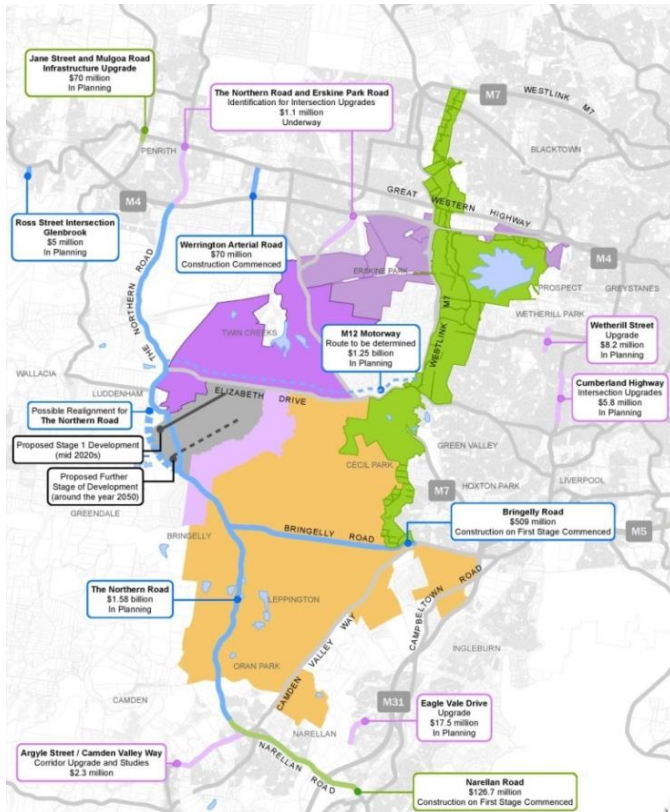
Currently, there is approximately 240,000m² of warehousing space being marketed for lease at the Moorebank IMT with anecdotal evidence from agents indicating a considerable pick-up in the level of tenant enquiry for this space. Similarly, feedback from Knight Frank agents suggest tenant enquiry has been solid in other industrial precincts in Liverpool, particularly Prestons and AMP's undeveloped Crossroads Logistics Centre at Casula given their proximity to the Moorebank IMT and the existing road networks of the M5, M7 and the Hume Highway.

Tenant enquiry for warehousing space within this precinct has been underpinned by tenants who rely on container movements to and from Port Botany. For these users, such as third party logistics (3PL) operators, by locating adjacent to an IMT (in this case within the warehousing space as part of the Moorebank IMT precinct), operational efficiencies can be achieved given their scale of operations. The motivation is that larger tenants such as 3PL groups will be able to use the adjacent warehousing space within the IMT precinct as the focal point of their operations, while using it as a base for their broader freight movements throughout Sydney and NSW. Given that these groups have tended to gravitate towards Eastern Creek in the past, the addition of these users to the area will generate a greater employment outcome for the Liverpool LGA.

PRIORITY GROWTH AREAS

Priority Growth Areas for both Sydney's South West and North West were established in 2005 by the NSW Government with the aim of creating 'attractive, sustainable new communities for up to 500,000 people by supplying land linked to key infrastructure, employment areas, parks, health and education facilities, shops, services and public transport' (NSW Government). More recently, the NSW government has announced the Western Sydney Priority Growth Area in response to Badgerys Creek becoming the location for Sydney's second airport. Both policies were aimed to provide the blueprint for development and to provide certainty to the market so that they could fast-track potential development in the area. These policies were designed to form the basis of infrastructure investment in Western Sydney.

Map 4. Western Sydney Infrastructure Plan



Source: Department of Infrastructure and Regional Development

2.0 EMPLOYMENT LANDS FOR SYDNEY

2.1 REPORT BACKGROUND – REVIEW OF ELDP 2015 REPORT

Since 2010, the NSW Government has produced the annual Employment Lands Development Program Report (ELDP Report) to monitor the supply of and demand for employment lands.

The ELDP Report contains information on:

- the current availability of undeveloped industrial lands and business parks
- where land is serviced and ready for development
- where industrial development has recently taken place
- where future industrial lands and business parks will be provided, and
- the adequacy of land stocks to meet future demand.

As reported in the 2015 EDLP Report **at January 2015 there were 13,548.2 hectares (ha) of existing zoned employment lands**, including both developed and undeveloped lands, within the Sydney Metropolitan Region. This is **an increase of 444.1 ha (3.4%) from January 2014**, resulting mainly from boundary adjustments and additional industrial sites identified through a comprehensive audit undertaken at the end of 2014 of all industrial land in the Sydney Metropolitan Region. Rezoning accounted for the remainder of total stock increase.

Of the total zoned employment lands stock, 22% or 3,029.4 ha were undeveloped at January 2015, including lands that are both serviced and not serviced. This is an increase of 170.2 ha from January 2014. The increase can be largely attributed to precinct boundary adjustments as a result of the audit.

Of the total undeveloped zoned land, 449.9 ha were serviced (water and sewer) at January 2015. This is a decrease of 13.1 ha from January 2014. The decline is mainly due to the take-up of undeveloped zoned and serviced land.

In addition to existing zoned employment lands, **there were 6,972 ha of proposed employment lands at January 2015** which were identified in planning strategies and which have yet to be rezoned. This is **an increase of 4,537 ha compared to last year**, due to the amendment of the State Environmental Planning Policy (Western Sydney Employment Area) 2009 which confirmed the new boundaries of the Western Sydney Employment Area extension.

In 2014 there were 79.2 ha of industrial zoned employment lands (IN zones) added through rezonings in the Sydney Metropolitan Region. 1.5 ha of industrial land was rezoned for other purposes in which industrial uses are not permitted, mainly residential and business zones. A further 39.6 ha were rezoned to B5 Business Development, B6 Enterprise Corridor or B7 Business Park zones which continue to permit industrial uses.

Industrial building activity increased in 2014 with \$795 million worth of approvals, compared to \$783 million in 2013. The increase in industrial approvals focused largely on the factories sector. **In 2014 there were 120.6 ha of employment lands taken up by industrial development** in the Sydney Metropolitan

Region. This compares with 190.3 ha in 2013 and 123.1 ha in 2012. Most of the take-up occurred in the West Central subregion.

Definitions (as per the ELDP 2015 Report)

'Employment Lands' is land that is zoned for industry and/or warehouse uses including manufacturing; transport and warehousing; service and repair trades and industries; integrated enterprises with a mix of administration, production, warehousing, research and development; and urban services and utilities.

'Undeveloped land' does not take into account the extent to which land is suitable for future industrial use and therefore does not simply equate to potential 'developable' land. In areas of new supply, it is often only an estimate of 'gross supply' derived from the size of the area zoned and does not subtract land that would be required for local roads, infrastructure requirements and environmental considerations. In existing urban areas, undeveloped land may be highly constrained due to subdivision into small and irregular parcels, access issues, a specialised economic function or land use conflicts. Much of the Sydney Metropolitan Region's undeveloped land is not serviced in terms of road access, water, sewer, gas or electricity connections.

'Serviced land' is land in the Sydney Metropolitan Region where a Sydney Water sewerage and potable water service may be available for connection (lead-in water and wastewater infrastructure). It is acknowledged that the servicing data does not include servicing in terms of power, roads or other infrastructure. The servicing data does not include instances where developers provide their own water and sewer services (e.g. water tanks, septic systems) or where services are provided under the Water Industry Competition Act 2006 independent of Sydney Water networks.

It is important to note the differences between developable and serviced land. Developable land does not always have to be serviced as long as the services are available, i.e. a developer can bring them in within a period of three months. Serviced land is defined as being connected to water and sewer, but generally comprises additional costs such as power and gas. Roads are generally funded via Government contributions. In addition it is important to understand the impacts of land ownership and the importance of size of land parcels to the delivery of land, as the ability for privates to actually service zoned land and compete for pre leases is very limited.

Note: For the purposes of this report Knight Frank has used the most recent data from The ELDP report. Knight Frank understands that this may not be the current situation as servicing to undeveloped and unserviced land over the course of 2015 and 2016 may have occurred.

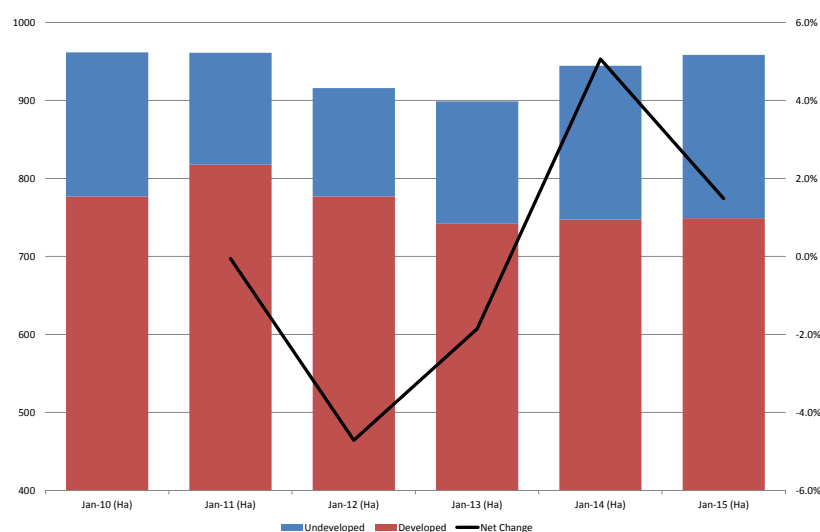
3.0 INDUSTRIAL LAND TRENDS – LIVERPOOL AND THE WIDER REGION

The migration of industrial user groups to Sydney’s outer suburbs has been an ongoing trend that is continuing to shape the location of new industrial developments. The two factors that have driven this trend are the availability of cheaper greenfield land and availability of locations at major transport hubs, both of which offer supply chain efficiencies to industrial user groups. The provision of appropriate land remains a critical issue for users and developers alike.

3.1 LAND AVAILABILITY FOR DEVELOPMENT

The residual land within the Liverpool LGA yet to be developed (209.4 ha, see Figure 5) theoretically provides sufficient land for another 14 years and beyond, based on current (an average of the last seven years) take up rates. The Liverpool LGA is home to only 6.9% of the Sydney Metropolitan region’s undeveloped and zoned industrial employment lands.

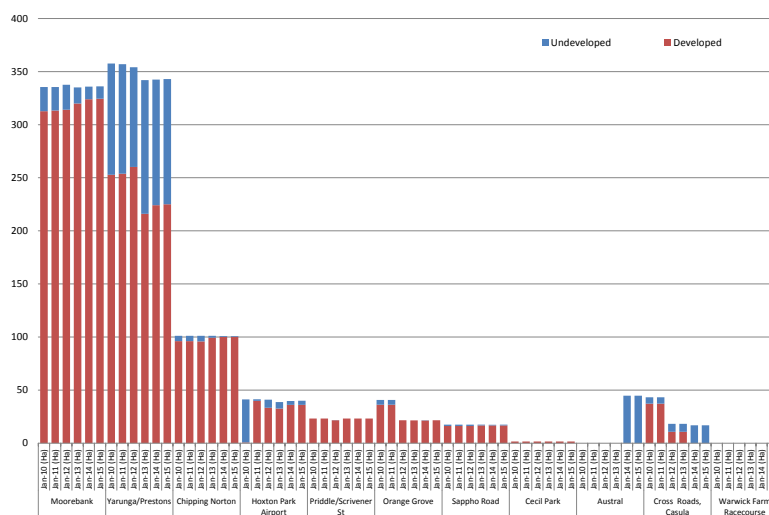
Figure 5. Liverpool LGA Zoned Land Status (Ha) – last five years



Source: Knight Frank Research, Employment Lands Development Program, Department of Planning and Environment

Over half of all undeveloped land zoned as industrial employment land in the Liverpool LGA is located in the Preston’s precinct (56.4%, or 118 ha), and a further 21.4% is located in Austral (44.8 ha), as part of the newly rezoned South West Growth Corridor (see Figure 6). An additional, 41.4 ha (19.8%) of undeveloped zoned industrial employment land is split almost evenly between Warwick Farm Racecourse, Cross Roads, Casula and Moorebank. The remaining 2.5% or 5.2 ha of Liverpool LGA’s zoned industrial employment land is located amongst Chipping Norton, Hoxton Park Airport and Sappho Road precincts.

Figure 6. Liverpool LGA Zoned Land Status (Ha) – last five years, by Precinct



Source: Knight Frank Research, Employment Lands Development Program, Department of Planning and Environment

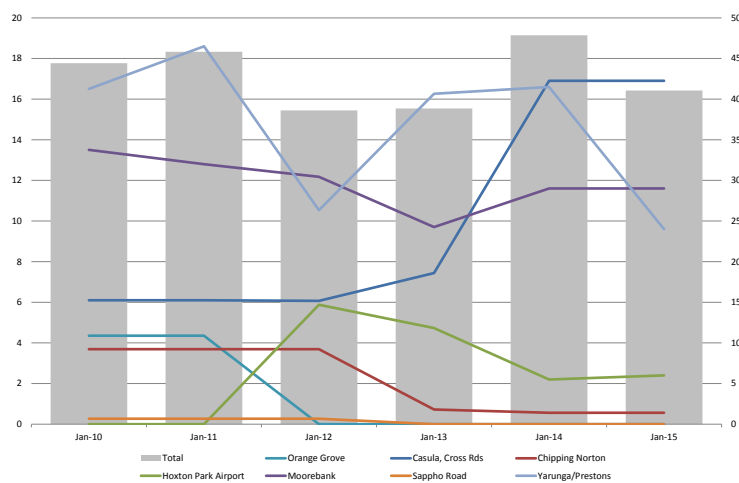
However, the availability, or lack thereof, of serviced land for immediate development within the next five years is limited to a select group of private land holders and institutional developers. **The most recent available data from NSW Planning (Employment Lands Development Program, 2015), indicated undeveloped and serviced land within the Liverpool LGA had declined to 41.1 ha** (see Figure 7). This figure represents 9.1% of all undeveloped and serviced land across the Sydney Metropolitan region. **This Liverpool LGA total represents a 7.6% fall in undeveloped and serviced land compared with 2010, and a 14.2% drop over the most recent year as land uptake has outpaced the rate of new land parcels being serviced.**

To give some context as to why this amount of serviced land implies a relative shortage of available inventory for imminent development, the average take up of land has been approximately 15 ha per annum since 2008, reflecting a possible 2.8 years of available supply (see Figure 8). Although the average take up of land has fallen to around 5.5 ha per annum over the past four years, which would reflect a possible 7.5 years of available supply. In 2010 take-up of land reached 44.4 ha, which suggests that, the current land availability could be developed in one year. Take-up refers to land that has been consumed by industrial development (i.e. vacant employment lands which have been developed). It is defined as the point at which development has commenced on a site and the site is therefore no longer available for development.

The Government is yet to formally provide a framework on how to service undeveloped land. **While institutional developers have a relatively greater capacity to fund this cost, it is a considerable impediment for smaller privates. This is providing institutional developers with the opportunity to control the market share of developments over the next two to three years**, particularly given the lead times involved in gaining appropriate zoning amendments for potential competition from land allocated for future industrial use. Larger private land holders have the potential to compete in the short term development cycle, however have shown limited urgency to progress the development of land holdings to this point in

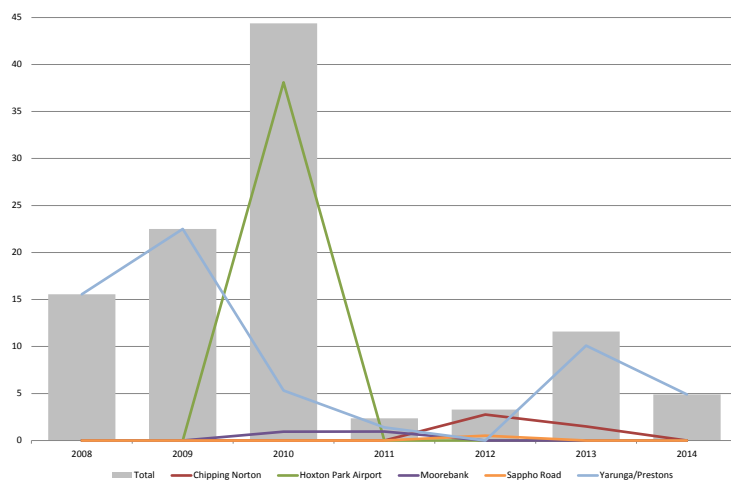
time. This has been shown by the bulk of development within the Liverpool LGA having been developed by the major institutions over the last 5-10 years.

Figure 7. Undeveloped and Serviced Land (Ha) – by Precinct, 2008-2014



Source: Knight Frank Research, Employment Lands Development Program, Department of Planning and Environment (unpublished data for Chipping Norton, Orange Grove and Sappho Road)

Figure 8. Take-up of Employment Land (Ha) – by Precinct, 2008-2014



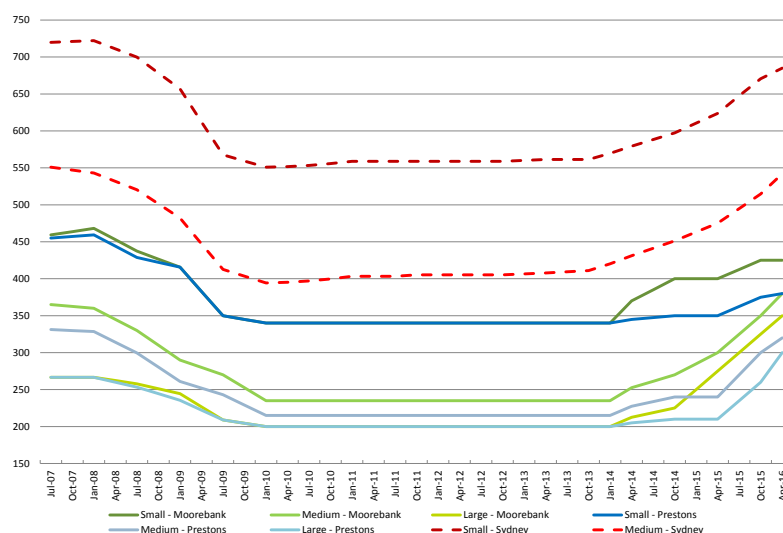
Source: Knight Frank Research, Employment Lands Development Program, Department of Planning and Environment (unpublished data for Chipping Norton, Sappho Road)* Take-up analysis only includes lots greater than 100m² and does not include existing lots which were already partially developed. The figures will therefore contain a small under estimation of total take-up.

3.2 LAND VALUES

The previous section of the report highlights the limited supply of available serviced employment lands for development across the Liverpool LGA. Evidence suggests that as a result of the slow release and servicing of land, in addition to increasing demand and speculation about rezoning to residential uses, the cost of land is being driven up, therefore making projects more expensive and decreasing affordability – which could lead to a flight of capital and jobs away from the Liverpool LGA. Although sale evidence has shown some variability in land rates (see Table 1), it is estimated that over the past 12 months, average land values across key Liverpool LGA industrial precincts, namely Moorebank and Prestons, have increased by an average of between 6% and 8.5% respectively for small sub-5,000m² parcels. However, medium sized parcels of land (1 ha to 5 ha) which are less readily available have increased by around 27% (Moorebank) and 33% (Prestons) over the same time period. Larger lands parcels, of 10 ha+, have shown increases of 27% and 43% across Moorebank and Prestons respectively in the year to April 2016 (see Figure 9).

Despite this recent growth, values still remain approximately 17% (Prestons) to 9% (Moorebank) below the last cyclical peak in late 2007/early 2008 for small land parcels. Medium sized land parcels have recovered more strongly in Moorebank (4% above previous peak) compared with Prestons, where land values remain approximately 3% below their previous peak. For larger land parcels (10 ha+) strong value growth over the past 18 months has forced values considerably above previous peak pricing, by 31% in Moorebank and by 12.5% in Prestons.

Figure 9. Liverpool LGA Industrial Land Values* – Average values serviced lots (\$/m²)



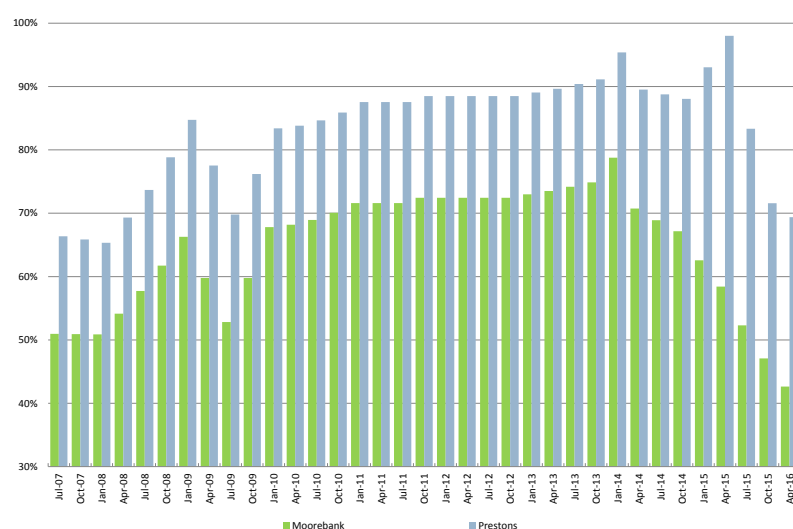
Source: Knight Frank Research

*Small = 2-5,000m², medium = 1-5 ha, large = 10 ha+

Figure 9 above shows key Liverpool industrial precinct land values and their relationship with the wider Sydney average. Compared with average Sydney land values for serviced lots, land in Liverpool has historically been priced at a considerable discount. For example, for small land parcels Sydney has averaged between 60% and 65% greater than land values across both Moorebank and Prestons since July 2007. That price differential has been greater for larger land parcels, averaging 65% greater than in Moorebank and

83% greater than in Prestons over the same time period. However, since January 2014, a combination of improved and committed infrastructure projects across Western Sydney, greater demand for larger lots and a reduction in land availability for the development of larger lots, has on the whole, seen that price differential trend downward for both Moorebank and Prestons (see Figure 10). As of April 2016, that land value difference against the Sydney average sits at between approximately 45% (Moorebank) and 70% (Prestons), thus beginning to reduce the price competitiveness of Liverpool as an industrial employment location on a relative basis.

Figure 10. Price Differential vs. Average Sydney Land Values – Medium (1-5 ha) lots (\$/m²)



Source: Knight Frank Research

The table below highlights the most recent and most relevant major land/development sales to have taken place within the Liverpool LGA. The sales highlighted are all zoned for industrial use, except where noted.

Table 1. Recent Land/Development Major Sales Activity – Liverpool LGA

Address	Price (\$ mil)	Area (m ²)	\$/m ² of area	Vendor	Purchaser	Sale Date
16 Bernara Rd, Prestons	5.60	19,800	283	Alex Chignone	Private	Feb-16
39 & 60 Culverston Av, Denham Court	6.70*	104,450	64.15	Government Property NSW	Prpic	Jan-16
140 Jedda Street, Prestons	4.024	16,290	247	Private	Mir Brothers	Nov-15
4-6 Browne Parade, Warwick Farm	4.00**	1,297	3,084	Otis Developments	West Diamond	Oct-15
34 Yarrunga Street, Prestons~	50.00	200,000	c.250	Private	Logos Property	Oct-15
402 Hoxton Park Rd, Prestons^	13.76^	44,300	311	AHG	Charter Hall (CPIF)	Aug-15
290 Kurrajong Rd, Prestons~	38.99	c.150,000	c.260	Private	Charter Hall (CPIF)	Jun-15
Coopers Paddock, Warwick Farm	17.20	115,000	150	Australia Turf Club	Stockland	Apr-15
29a Bernera Rd, Prestons#	2.70	28260	96		Shiny Path Pty Ltd	Aug-14
Parcel A, Hoxton Park Airport	45.00	408,300	110	Leighton Holdings	Mirvac Group	Jan-10

Source: Knight Frank Research

* Zones R5 large lot residential **Residential Development site – DA approved for 36 residential units ^ Subject to a 15 year pre-lease to AHG

Land development agreement ~zoned yet unserviced land – retail land value (servicing of land at \$90/sqm)

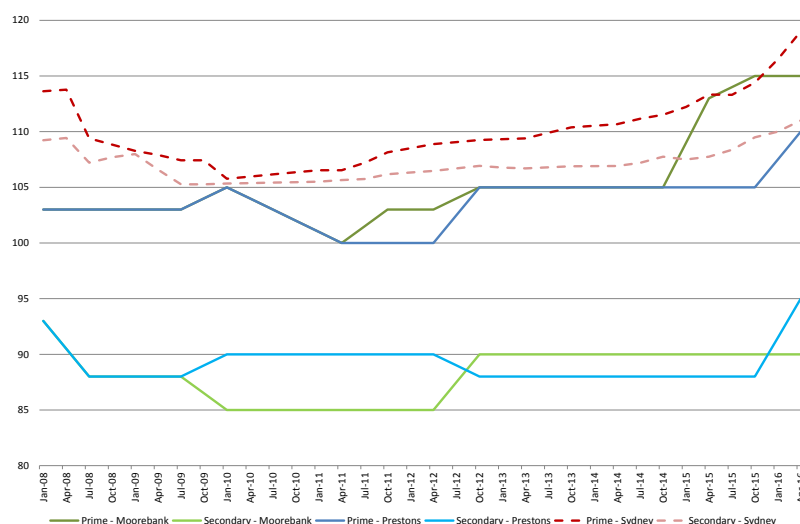
3.3 RENTAL VALUES

The NSW economy is currently experiencing favourable economic conditions underpinned by strong growth in housing investment, above average retail expenditure, elevated infrastructure investment and a jobs market that has accounted for over half of the new jobs created nationally over the past 18 months. With interest rates forecast to remain low and the dollar expected to depreciate, state economic growth is forecast to outpace the national average over the next two years. These conditions, alongside stock and land shortages are conducive for positive leasing conditions across Sydney’s industrial markets, especially across Liverpool’s Prime industrial markets.

These dynamics have resulted in prime industrial annual rental growth, across the Sydney Metropolitan Region, in the 12 months to April 2016 measuring around 5.0%, a rate more than double the average over the past five years (see Figure 11). Average secondary industrial rental growth has been less pronounced, albeit showing growth of around 3.0% over the past year.

Compared with the Sydney Metropolitan region, industrial rental values across the Moorebank precinct increased by 1.8% for prime space, but remained stable for secondary space. This annual growth in prime net face rents in Moorebank has pushed average values to now sit around \$115/m². Over a longer historic period, Prime Moorebank rents have grown by 15% over the past five years, outperforming growth of both Sydney and Prestons Prime and Secondary space. However, in contrast to annual growth in Moorebank, net face rental values have shown a greater increase across both the prime and secondary Prestons market over the 12 months to April 2016, 4.7% and 8.0% respectively. Upward pressure on net face rents across both the Moorebank and Prestons markets have resulted in rents sitting above pre GFC levels – except for Moorebank rents which are \$2/m² below previous highs.

Figure 11. Liverpool LGA Industrial Rental Values* – Net face rents (\$/m²)



Source: Knight Frank Research

*Average Precommit Net Rent (5,000-10,000 sqm D&C)

Rents charged are a derivative of land costs, labour costs and construction. With construction and labour being almost equal across geographical areas, land costs therefore have the biggest impact on final rents charged. Land across the Liverpool LGA is relatively expensive as a large proportion of the LGA's precincts are tightly held by privates. From a development perspective, the high cost of servicing this land essentially prices buyers out of the market, and pushes them to other competing geographical areas with more flexible and readily available developable land.

In addition, 70-80% of outgoings on predominantly a standard base build warehousing logistics user, is made up of council rates and land tax. Therefore the higher the land and council tax rates, the higher the outgoings. This in turn affects gross rents, which are the determining rents which tenants/occupiers consider when looking at the total cost of the lease. With leases now being an accounting practice, and being placed on balance sheet, historic ambiguity in rental increases over time, has now forced groups into requiring fixed rental increase in order to know the exact costs of a lease.

Liverpool City Council has a role to play in this equation due to its ability to fast track services, and by putting pressure on groups such as Sydney Water, to actually help assist in getting services to precincts to unlock the land. In turn, this will assist in reducing hurdle rates and make development easier and cheaper which in turn will keep gross rents competitive.

Table 2. Recent Industrial Leasing Activity – Liverpool LGA

Address	Net Rent (\$/m ²)	Area (m ²)	Term (yrs)	Tenant	Date
Pre-lease					
402 Hoxton Park Road, Prestons	N/A	17,200	15	AHG	Jun-16
290 Kurrajong Rd, Prestons	107	15,340	7	Bracknells	P/C
38-46 Bernera Rd, Prestons	258	13,917	15+5+5	Inghams	P/C
38-46 Bernera Rd, Prestons	127	8,183	10+5+5	Salmat Ltd	P/C
102 Enterprise Circuit, Prestons	128	3,330	5	ALP Products	P/C
30-50 Yarrowa St, Prestons	139	45,571	15	Mainfreight	Jan-15
Hoxton Distribution Park, Hoxton Park	Conf	90,000	25	Big W	P/C
Hoxton Distribution Park, Hoxton Park	Conf	42,000	20	Dick Smith	P/C
Existing Leases					
3 Ash Road, Prestons	131g	5,032	10	Private	Jan-16
126 Jemma Road, Prestons	125g	3,994	5	Pretty Girl Fashion Group	Dec-15
51 Heathcote Road, Moorebank	130	1,971	N/A	Evolution Traffic Controls	Jun-15
73 Alfred Rd, Chipping Norton	100	2,380		Impact Solutions	Jan-15
230 Hoxton Park Road, Hoxton Park	105	6,533	7	ARB Corporation Ltd (ARP)	Aug-14
1 Secombe Pl, Moorebank	120	5,332		Invenco Pty Ltd	Feb-14
66-68 Jemma Rd, Prestons	115	5,355	5	Western Pet Foods	Jan-14

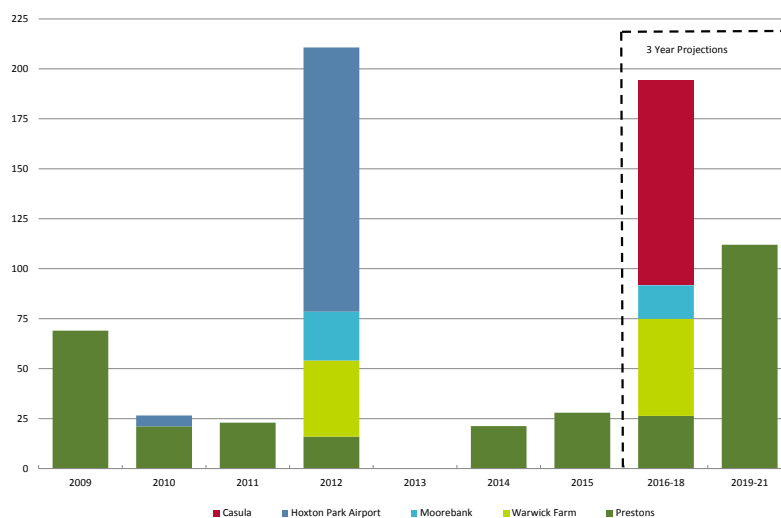
Source: Knight Frank Research

3.4 DEVELOPMENT

Since 2009 supply of new industrial employment space has been relatively benign across the Liverpool LGA, albeit for a spike in development during 2012, when approximately 132,000m² of space, 100% preleased to Woolworths Ltd, was developed by Mirvac. Following this annual development spike, the next three year period (16,400m²/annum) saw below trend industrial development activity (see Figure 12).

However, it is expected that the supply of new industrial space will again increase over the short and medium term, with approximately 194,125m² of projects already being monitored for potential development during 2016-18. This expectation is a result of the steady downward trend in vacant stock levels (5,000m²+) across the LGA, and wider region, with the bulk of this short term development phase limited to some institutional landholders and larger private land holders (see Table 3 on the following page). Over the medium term (2019-2021) we expect another 112,000m² of industrial space to be developed across the Liverpool LGA, if economic and financial market conditions remain equal.

Figure 12. Liverpool LGA Industrial Development – Annual Gross Supply ('000 m², bldgs >5,000m²)



Source: Knight Frank Research, Cordell Connect

Table 3. Liverpool LGA Industrial Development – Future Supply ('000 m², bldgs >5,000m²)

Project Title	Precinct	Est. Area (m ²)	Developer	Est. Completion
Hoxton Park Rd Warehouse & Office 402 (Lot 5) Hoxton Park Rd	Prestons	17,200	Charter Hall - Automotive Holdings Group	2016-18
AMP Crossroads Industrial Estate Casula Lot 204 Beech Rd	Casula	32,617	AMP - Spec	2016-18
Kurrajong Rd Warehouses 29 Kurrajong Rd	Casula	25,965	Charter Hall	2016-18
Governor Macquarie Dr Warehouses - Coopers Paddock 200 (Lots 41-43) Governor Macquarie Dr	Warwick Farm	48,560	Stockland	2016-18
Kurrajong Rd Warehouse 42A (Lot A) Kurrajong Rd	Prestons	9,141	Private Investor	2016-18
Crossroads Logistics Centre - Precinct C - Warehouse 3 & 4 Lot 21 Beech Rd	Casula	26,770	AMP - Casula Dev	2016-18
Crossroads Logistics Centre - Precinct C - Warehouse 5 & 6 Lot 21 Beech Rd	Casula	17,040	AMP - Casula Dev	2016-18
Heathcote Rd Industrial Complex 37 (Lot 4) Heathcote Rd	Moorebank	6,600	Consolidated Bearing Company (Properties)	2016-18
Moorebank Av Industrial Development - Mfive Industry Park 1 Moorebank Av	Moorebank	10,231	Goodman	2016-18
Prestons Industrial Estate Lot 34 Yarrunga St	Prestons	111,980	Logos Property	2019-21

Source: Knight Frank Research, Cordell Connect

4.0 DEMAND OUTLOOK

The gravitation of industrial businesses to Western Sydney is expected to continue as rising rents in inner and middle ring locations coupled with significant investment in road and infrastructure investment will motivate additional businesses to outer ring locations. This section of the report assesses the likely future demand for industrial land within the Liverpool LGA and competing areas of demand.

4.1 DRIVERS OF INDUSTRIAL LAND DEMAND

Demand for industrial land is driven by a number of factors, however they include locational preferences (proximity to key transport infrastructure or consumers etc.), population and employment growth, overall demand for goods and services and pricing. At a high level, employment growth in industry sectors which utilise industrial demand (stemming from an increase in industrial businesses and hence a need for further industrial land) are considered the key proxy for future industrial demand given the positive correlation between the two.

The industry sectors which are broadly considered to locate in industrial areas are:

- Manufacturing
- Transport and storage
- Wholesale trade
- Construction

These industries will be used to determine the future need for industrial demand in the following sections of this report.

However, arguably the key driver of demand for employment land stems from institutional demand off the back of investment mandates to grow funds under management (expand their portfolios). If institutions buy land, and have a five or ten year projection on delivery, then they have committed funds to a project, essentially building a development pipeline. Institutions are driving demand in Sydney, by developing a pipeline as to create opportunities, to form part of their tenant retention strategies. Institutions need to retain tenants coming out of older facilities, who may require additional, more efficient or purpose built space. This is different to net transitioning, i.e. selling an asset, and moving a tenant to an existing facility. Therefore, every institution requires a healthy land bank or land reserve, to ensure their portfolios have the ability to grow over time and existing tenants are retained. A good example of the above is GPT who recently paid c\$350/sqm for a six ha site in Eastern Creek, at a significant market rate. An institutions business model does not allow for a stagnant portfolio, thus competition for land is fierce, highlighted by other groups (including Frasers) being prepared to pay the same rate, to lock in land to ensure they have future strategic opportunities.

The other major demand driver for land is occupier driven demand, particularly as occupiers require bigger, newer, better designed, efficient space. An example of efficient space is when an occupier can have slow moving product stacked in sections of a warehouse where the lights remain off unless an employee is active. One other main aim when designing new facilities is reducing the labour input cost, thus reducing the amount of employees required per hectare, although not to the point of total automation.

4.2 EMPLOYMENT PROJECTIONS

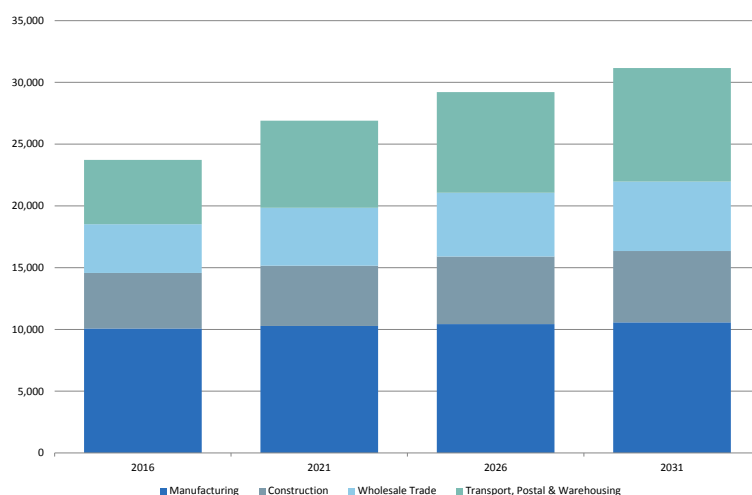
The Liverpool LGA is expected to experience significant employment growth over the next 20 years off the back of a large increase in the resident population. From an industrial employment perspective, growth is expected to be extensive.

At present, it is estimated that the industries mentioned above account for just over 23,728 jobs (2016 Knight Frank estimate), representing 31% of all jobs within the Liverpool LGA. Using Bureau of Transport Statistics (BTS) employment projections, it is anticipated that by 2031, total jobs in these industries will measure 31,160, an increase of 7,432 jobs from 2016 estimates. This represents an annual average increase of 1.7%, considerably above the Greater Sydney average of 1.1% per annum for the same period.

Given Liverpool's proximity to key road networks including the M5 and M7 motorways, Transport, Postal & Warehousing employment is anticipated to experience the largest increase in employment, increasing from 5,206 in 2016 to 9,190 by 2031. On the other hand, manufacturing employment is expected to be subdued, however remaining the largest employing industrial industry in the Liverpool LGA, increasing by 492 jobs to 10,569 jobs by 2031.

Transport, Postal & Warehousing is an emerging industry sector compared with manufacturing based industry, but one of the least labour intensive industries, and is further increasing efficiencies with technological advances in automation. As a result, demand on employment lands will be greater because those groups (Transport, Postal & Warehousing) actively seek bigger, larger, newer boxes, whereas manufactures rarely relocate due to the expensive and uneconomical cost of moving plant equipment. These groups (manufacturers) are the type of users who remain at a site for 15+ years, whereas a Transport, Postal & Warehousing operator is more likely to sign a lease for 7-10 years and then move on to the next site, if it is more efficient to do so. For example if a better racking system is designed, it may be better to offset the costs of a new racking system, and move to a new site and take the incentive offered, effectively making the move a net zero.

Figure 13. Liverpool LGA Employment Growth by Selected Industries



Source: Knight Frank Research, BTS

4.3 INDUSTRIAL LAND PROJECTIONS

The outlook for industrial land demand in the Liverpool LGA has been derived from the employment projections highlighted in section 4.2 and employment density ratios for the key industries which utilise industrial land. The employment density ratios used are:

- **Manufacturing:** 30 employees per hectare
- **Construction:** 25 employees per hectare
- **Wholesale Trade:** 25 employees per hectare
- **Transport, Postal & Warehousing:** 25 employees per hectare

The projections relate to net land demand (or allotment demand) and do not include provision for roads, reserves and buffers. High impact industry uses, and those reliant on heavy vehicle access, will require greater provision for roads, reserves and buffers than lower impact areas such as service industry precincts.

Industrial land demand indicates that future need in the Liverpool LGA from key sectors is in the order of 1,176 hectares by 2031, an increase of 427 hectares from the 749 developed hectares identified by the 2015 EDLP Report. Annual growth in demand is projected to be 25 hectares per annum between 2016 and 2021 before reducing to 18 hectares per annum over the 2021-2026 period and 15 hectares per annum over the five years to 2031.

Table 4. Industrial Employment and Land Projections

Industry	Total Employment				Emp/ha	Estimated Land Demand			
	2016	2021	2026	2031		2016	2021	2026	2031
Manufacturing	10,077	10,276	10,436	10,569	30	336	343	348	352
Construction	4,499	4,887	5,466	5,778	25	180	195	219	231
Wholesale Trade	3,946	4,680	5,159	5,623	25	158	187	206	225
Transport, Postal & Warehousing	5,206	7,060	8,154	9,190	25	208	282	326	368
Total	23,728	26,903	29,215	31,160		882	1,008	1,099	1,176
Average Annual Increase		635	462	389			25	18	15

Source: Knight Frank Research, BTS

Note: Industrial land projections are based on using the same employment density ratios over the forecast period.

The most substantial demand is anticipated to come from the Transport, Postal & Warehousing sector where 15 hectares per annum is required between 2016 and 2021 to keep pace with demand. Alternatively, limited take-up is expected to stem from the manufacturing industry.

Overlaying this against the 209.4 hectares of remaining vacant and developable land within the LGA (both serviced and not serviced), it suggests there is a significant mismatch between future supply (zoned land) and demand. It is noted that the ELDP has identified significant proposed employment land within the LGA which has the potential to add to supply over the next few decades. Proposed employment land in the LGA includes:

Table 5. Proposed Employment Land, Liverpool LGA as at January 2015

Precinct	Area (ha)
Liverpool Future Industrial	1,124.9
Kemps Creek	446.8
Rossmore	40.2
Moorebank Defence Lands	336.0
Western Sydney Employment Area Extension*	391.9
Total Liverpool Proposed Employment Land	2,339.8

Source: Knight Frank Research, Employment Lands Development Program, Department of Planning and Environment

*refers to the WSEA land located within the Liverpool LGA, a further 4,145.2 ha is located within the Penrith LGA

However, unless this land or a considerable share of it is rezoned, serviced and preserved for future industrial uses, competing areas to the North and South will capture Liverpool's industrial demand.

It is noted that the BTS employment projections do not factor the full employment impacts of the Badgerys Creek Airport given the decision on a second airport was undecided at the time of its release. Knight Frank Research estimates that employment growth will be circa 10-20% above the projections above.

4.4 WHERE IN LIVERPOOL?

In the long term, major infrastructure investment will ultimately determine the direction and magnitude of demand for industrial space in Sydney. In this case, the prospects for industrial development within the Liverpool LGA appear solid given its proximity to both existing transport infrastructure links such as the M5 and M7 and future infrastructure projects such as the WestConnex and the Moorebank Intermodal Terminal.

Overall, the impact of road and port investment is expected to stimulate industrial development in South West Sydney, particularly within Liverpool. The Moorebank Intermodal Terminal would provide an efficient solution for improved movement of container freight between Port Botany and South West Sydney. The current 'sweet spot' to the north of the Liverpool LGA around the M4 and M7 intersection will be diluted by the Moorebank IMT. The WestConnex project and widening of the M5 will also shift industrial market impetus to the south west. In addition, locations to the south of the M4 and M7 junction will become more appealing due to relative affordability.

Consequently, the centre of gravity for industrial development should continue to move away from the M4 and M7 intersection, down the M7 and to the west of the M7 i.e. between Northern Road and the M7. The widening of Northern Road as part of the Western Sydney Infrastructure Plan will be a catalyst for industrial development in the region, as it also facilitates direct access to the north west resident population market. Suitable precincts in Kemps Creek, West Hoxton and Badgerys Creek are expected to emerge.

However, with the bulk of land between Northern Road and the M7 (i.e. Kemps Creek, West Hoxton etc.) currently not zoned for industrial uses or are connected to services, these areas are likely to not be available

to industrial users until early to mid-2020s. Subsequently, it is important for Liverpool that this land is unlocked (rezoned and serviced) to capture future demand. For the Liverpool LGA, this area holds the key to capturing future industrial demand.

For the purposes of this report, and in the opinion of Knight Frank, Liverpool City Council needs to open up scalable areas of employment land with certainty on delivery in terms of augmentation and servicing. In doing so, Liverpool will be able to secure institutional buy in, which is imperative as institutions are the groups who have the capacity and the capital to actually develop and bring tenants. In Sydney, as expressed throughout this report, with the way land rates are, private developers struggle to take on projects of scale, and an institution will be reluctant to take on a project unless it has scale. For example, Frasers are currently trying to source englobo, unzoned, unserviced land; however they require at least 30 ha of contiguous area. Therefore, there is a gap in the market dynamics between when activity can and cannot occur.

In the opinion of Knight Frank, Liverpool City Council's role in the above is to provide a clear blueprint of timing and servicing to bring land online. With certainty it allows institutions to pay the type of rates that the privates are prepared to divest their land, so that they can build scale. Without the certainty an institution will not become active, nor pay the rates that privates on 5 acre lots are willing to sell for. Privates are competing on the same land, and in some parts even better land than an institution for a pre lease. However, privates remain uncompetitive to a global corporate such as DHL or TNT, due to the level of risk involved during servicing and construction, in addition to the uncertainty of processes throughout a lease.

Therefore, the Liverpool LGA is not seeing a greater increase in institutional land ownership. Without institutional land ownership the Council will be overlooked, with institutions pushed down to the South West, further North and out West towards Badgerys Creek, if they can find scale. As expressed throughout this report, scale is key for an institutional developer and the majority of development on greenfield land is for bigger, more efficient space, and requires at least 2 ha+.

In the interim, demand within the Liverpool LGA over the next decade is expected to remain focussed upon Prestons. As at January 2015, there was 118 ha of undeveloped zoned employment land within Prestons which based on historical take-up rates since 2008, equates to approximately 13.8 years' worth of supply. Beyond this, Cross Roads at Casula and Austral represents the next locations within the Liverpool LGA which can accommodate substantial growth over the next decade, however is constrained by a lack of large lots which will limit demand from larger users unless site amalgamations can occur.

It is important to note that the bulk of this land is currently not serviced with just 41.1 ha of zoned and serviced land across the Liverpool LGA.

4.5 COMPETING AREAS OUTSIDE OF LIVERPOOL

In recent years, the bulk of Sydney's industrial take-up has occurred in the Blacktown and Penrith LGAs, namely concentrated in selected precincts including Eastern Creek and Erskine Park where there is ease of access to major arterial roads and availability of undeveloped land.

Looking ahead, industrial precincts to the north of the Liverpool LGA are expected to remain buoyant, underpinned by the progression and promotion of the Western Sydney Employment Area (WSEA) which is heavily concentrated within the Penrith and Blacktown LGAs. However, land across WSEA is now tightly held, with land owners reluctant to sell unless they are deriving large profits. In the past there have been big opportunities for corporates to purchase land within the WSEA, an example of that is at Marsden Park, where corporates such as Costco, Ikea, Lindt, Dulux, Aldi bought and occupy land. The reason for locating in Marsden Park was partly due to the areas connectivity, being positioned on the M7. However, the main reason was because Marsden Park was the only real opportunity these groups had to buy land.

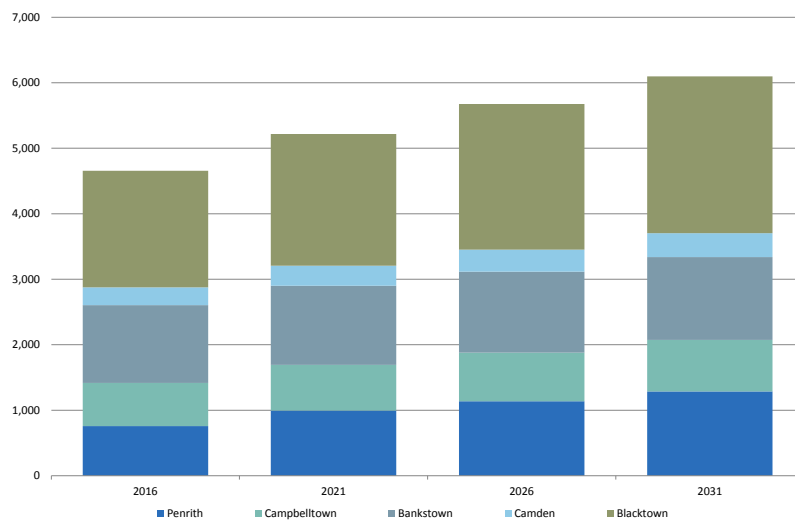
Conversely, Marsden Park is yet to secure a prelease as its price competitiveness, out of its own relative success, has become uncompetitive compared to an institutionally owned land holding. Fundamentally, the land rates Marsden Park achieved in selling to owner occupiers were essentially c\$50sqm above true market value, as an owner occupier will always pay more to secure a site. Therefore, if Marsden Park is placing their land into a feasibility at, for an example price of \$400m², and an Institution are at \$350m² then the situation becomes uncompetitive, and thus land owners have to wait, as they are hesitant to take a write-down on their land value.

The issue Liverpool City Council has is the more land that is unlocked and the more certainty that is given then institutions will become more active. However, the land rates have to be feasible and competitive otherwise private landowners will sit on land. In the opinion of Knight Frank, the Liverpool City Council cannot pick small scale isolated land pockets to rezone as expectations from land owners become too high, and leaves no other competing opportunities within the LGA. In terms of development of employment lands, this strategy would result in the LGA being left behind. In the opinion of Knight Frank, it is important for Liverpool City Council to create competitive tension in the market amongst those groups who are trying to find and secure occupiers, which can be done by rezoning larger tranches of land.

Using the same method as in Section 4.3, we are able to determine the likely level of demand for nearby LGAs over the next 15 years. Over the next fifteen years (to 2031), industrial demand in the surrounding LGAs is expected to be in the order of:

- Blacktown: 614 ha (average of 40.9 ha per annum)
- Penrith: 528 ha (average of 35.2 ha per annum)
- Campbelltown: 127 ha (average of 8.5 ha per annum)
- Camden: 94 ha (average of 6.3 ha per annum)

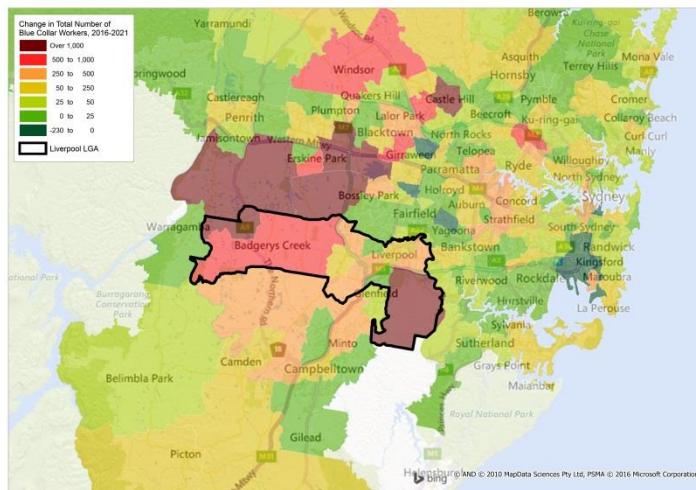
Figure 14. Industrial Demand by Competing LGAs, hectares, 2011-2031



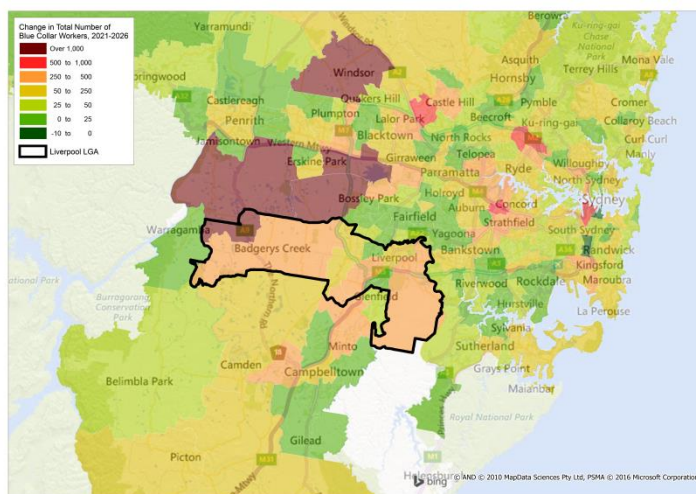
Source: Knight Frank Research, BTS

The maps on the following page highlight regions (by SA2) where employment growth in the dominant industrial industries is expected by five year intervals. Importantly, these projections are reliant on demand being met by suitable employment land. In the case where appropriate supply is not available, demand will shift elsewhere. These trends (highlighted on Map 5) indicate that land within the Liverpool LGA to the west of the M7 Motorway should be prioritised and unlocked to accommodate future demand.

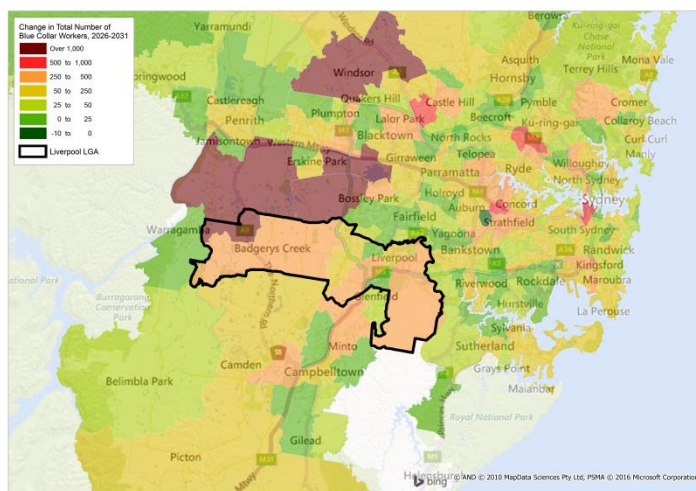
Map 5. Industrial Based Employment Gains, 2016- 2031



Between 2016 and 2021, the Horsley Park - Kemps Creek SA2 and the Mulgoa - Luddenham - Orchard Hills SA2s are expected to account for the bulk of growth. For the Liverpool LGA, the progression of the Moorebank Intermodal Terminal is expected to result in substantial land demand as industrial based employment growth is expected to exceed 1,200 jobs for the period. Elsewhere, the Badgerys Creek – Greendale SA2 region is set for solid growth while growth in Prestons is anticipated to ease from recent levels as demand shifts west of the M7 Motorway.



During the five years to 2026, employment growth in industrial industries is expected to be more concentrated in Western Sydney Employment Area, underpinned by Horsley Park - Kemps Creek, Prospect and Mulgoa - Luddenham - Orchard Hills SA2 regions. The north western area of the Liverpool LGA, surrounding Badgerys Creek is anticipated to result in substantial industrial demand while more moderate growth is anticipated elsewhere in the LGA. Notably, over the 10 years to 2026 (first two maps), a net decline in industrial based employment in South Sydney is expected as further business shift to outer west Sydney off the back of further withdrawals for alternative uses.



Similar to the previous five year period, employment in industrial industries over the 2026-2031 period is expected to remain in the area west of the M7 Motorway and south of the M4 Motorway. Industrial demand for the Liverpool LGA is expected to occur immediately south of Elizabeth Dive.

Source: Knight Frank Research, BTS

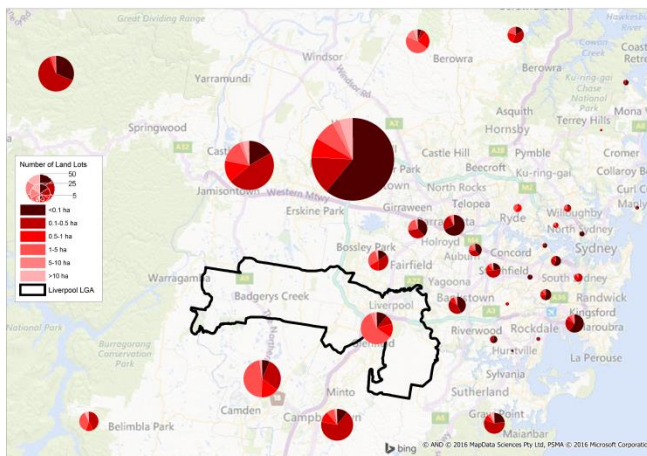
4.6 CONSTRAINTS TO FUTURE DEVELOPMENT

A lack of suitably sized lots can potentially limit industrial development. The majority of undeveloped employment land lots available for development are relatively small. Approximately 77% of all lots across the Sydney Metropolitan region are smaller than one hectare in size; a further 17.5% of all lots are between 1 and 5 ha in size (see Map 6 and Map 7).

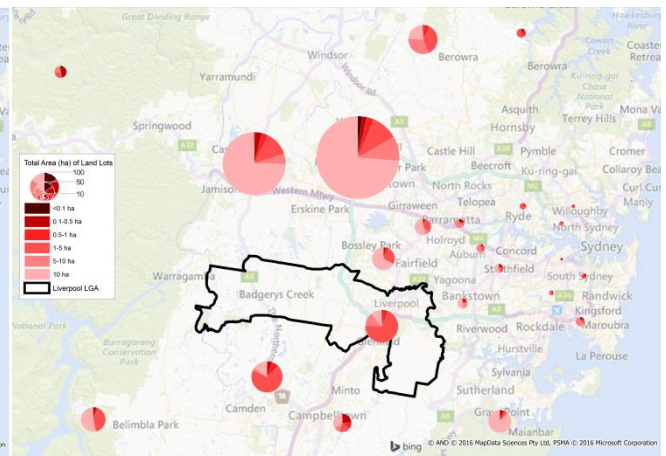
The impact from this is that development of smaller lots only appeals to certain end users or tenants. This effectively reduces the scope for market absorption and large anchor tenants, reducing the overall level of industrial construction activity. This is apparent across the Liverpool LGA, whereby the undeveloped land supply across the LGA is primarily held in parcels sized below 5 hectares, accounting for 94% of all undeveloped zoned land lots. At the same time, there are just six undeveloped zoned lots sized above 5 hectares, only two of which are sized above 10 hectares which is the ideal land parcel size to accommodate new larger users.

Map 6. Number of Undeveloped Employment Land Lots by Size, LGA

Map 7. Total Area (ha) of Undeveloped Employment Land Lots by Size, LGA



Source: Knight Frank Research, ELDP 2015, NSW Land and Property Information (data aggregated at geographic centre of LGA)



Source: Knight Frank Research, ELDP 2015, NSW Land and Property Information (data aggregated at geographic centre of LGA)

Elsewhere, Blacktown and Penrith LGAs have a greater ability to accommodate larger logistic users given the higher provision of larger lots (see Table 6 on the following page). Subsequently, in order to capture ‘big box’ demand in the Liverpool LGA, land to the west of the M7 Motorway will need to be unlocked through rezonings. Providing the framework for an easier re-zone process will assist developers and some larger users to acquire greenfield engloblo land. Similarly, servicing of engloblo land will give developers certainty on availability and timing of sites.

In the opinion of Knight Frank, Liverpool LGA has all the attributes needed to be one of the absolute prime industrial areas. The LGA has rail, roads, infrastructure, a predominantly blue collar population, ample land and has council support, the LGA now needs to tick the box to get that land unlocked. If Liverpool City Council is successful in unlocking land, then there is no reason why Liverpool LGA would not be more

successful in retaining tenants and increasing development rates than for example, Eastern Creek or Erskine Park, however, there is limited opportunity at the moment.

Liverpool LGA is competing geographically, but more importantly the LGA is competing against sophisticated institutional developers. These owners, in Sydney's case, predominantly, and effectively, already have control of the tenant from an existing facility and have the relationship. Institutions can move tenants out on to other lands that they own, and have the ability to undercut a private land holder, not on a land rate basis, but on a construction basis (due to economies of scale), which ultimately affects the feasibility. For the majority of privates, they either undercut or write-down their land to give themselves a competitive edge on a construction price, however, the hardest part for a private, is credibility, capability, delivery risk and demonstrating to a global corporate that they can complete, with limited track record.

Table 6. Undeveloped Zoned Employment Lands by Lot Size, North West & South West, 2011

	Liverpool		Blacktown		Penrith		Other Sydney	
	Lots	%	Lots	%	Lots	%	Lots	%
< 0.1 ha	11	11%	327	61%	36	17%	233	25%
0.1 - 0.5 ha	10	10%	80	15%	101	47%	379	41%
0.5 - 1 ha	14	14%	41	8%	31	14%	102	11%
1 - 5 ha	60	59%	46	9%	33	15%	171	19%
5 - 10 ha	4	4%	15	3%	5	2%	19	2%
> 10 ha	2	2%	28	5%	9	4%	18	2%
Total	101	100%	537	100%	215	100%	922	100%

Source: Knight Frank Research, Employment Lands Development Program, Department of Planning and Environment

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