Greater Macarthur Investigation Area

Economic and Employment Analysis

Department of Planning and Environment

September 2015

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EXECUTIVE SUMMARY

SGS Economics and Planning have been commissioned by the Department of Planning and Environment (DP&E) to evaluate and define potential major retail / commercial centres within the Greater Macarthur Investigation Area (GMIA). A retail and employment forecast was completed for a potential future population at 2036 and to determine total capacity if all suitable land was built-out. The forecast demand was then allocated within the GMIA based on the most suitable areas to accommodate employment and retail demand. The potential for increasing employment accessibility to local residents was also discussed. The key findings of the report are summarised below.

Population forecast

The total capacity figure was derived from research completed by the masterplanner, based on an Urban Capable Footprint (UCF) that discounts absolute constraints such as environmentally sensitive land and using an occupancy rate of 2.8 people per dwelling. The 2036 vision number for 2036 assumes a population estimated at approximately 97,000 based on the completion of private proposals. The total capacity number is not a time-bound figure.

Retail forecast

In total, it is estimated that approximately 524,000 square metres of retail floorspace would be required to accommodate the retail expenditure in GMIA if all land suitable for urban development was released. Of that floorspace, approximately 97,000 square metres (about 20 per cent) are likely to be accommodated by the surrounding retail offer (outside GMIA). The rest of the 427,000 square metres (80 per cent) of retained floorspace will be distributed across four main centre types in the following order:

- around 135,000 square metres floorspace for strategic centres (approximately one centre)
- over 100,000 square metres for town centres (approximately three to four centres)
- almost 100,00 square metres for villages (approximately 11 centres)
- approximately 91,000 square metres for large format retail

This translates to a total of 17 to 18 centres across GMIA with a strong strategic emphasis in the South (Wilton Junction strategic centre and its anchoring large format retail precinct). Given the proximity of the Campbelltown-Macarthur Regional city, it is likely that no regional centre will be required to service local residents in the medium to long term as residents tend to gravitate towards the existing establishment in the neighbouring region. A southward focused large format retail precinct is also proposed to optimise accessibility to bulky goods services (considering the Campbelltown-Macarthur and Narellan large format retail precinct is near the northern end of GMIA).

In terms of access to daily shopping needs, residents in the GMIA are likely to require a higher number of local villages to service the potential population (up to 85% retained expenditure). The centres should be located strategically across GMIA to ensure equal supply of services and to all residents and to ensure viability and sustainability of the centres.

Other employment forecast

The SGS employment forecasts alter the spatial distribution and industry composition (structural change) of BTS (2014) projected jobs at the GMA level due to modelled population growth at the GMIA. However, it is assumed that there are no net additions to the GMA labour market. As a result, the BTS control totals remain unchanged.

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Using BTS employment forecasts as a starting point, it is estimated that employment in the GMIA would be around 17,000 by 2036. This estimate is largely based on the *SGS Population-Driven Employment projection model* and is linked to the projected population increase for the GMIA. If all opportunities for development were pursued, the total employment is expected to be around 30,000 jobs. It is anticipated that the majority of employment increase would be population servicing industries such as retail, food services and education.

Employment land demand

The employment forecast has been converted from ANZSIC categories into broad 'Categories of Land Use' (CLU), to better reflect the required built form and urban amenities required to perform the employment activity. The retail floorspace figures were converted into land demand by using benchmark FSRs. The other employment forecast was converted from jobs to land by using jobs density benchmarks. If all opportunities for development were pursued, there is forecast demand for approximately 317 hectares of employment land in the following categories:

- Strategic centre retail and office: 16 hectares
- Other office and retail: 41 hectares
- Large format retail: 31 hectares
- Local industry: 80 hectares
- Subregional industry: 59 hectares
- Footloose: 48 hectares
- Dispersed: 44 hectares

Land suitability and employment allocation

When viewing the outputs of the CLU suitability mapping (see the Appendix), it is apparent that there are several areas of consistent suitability across each of the CLUs. The land to the west and east of the Picton Road - Hume Motorway junction is highly suitable for most of the CLU types, especially the industrial and large format industries. This is due to the high connectivity with road infrastructure, the existing large lot structure and the separation from existing population. Maldon and North Douglas Park Industrial (around Moreton Park Road) have been identified as a prime candidates to accommodate the Strategic Industry and Footloose demand for the GMIA due to existing industrial clusters, access to rail and the Hume Highway.

Wilton Junction has been identified as a suitable location for the strategic centre identified for the GMIA. This location also has been identified as opportune for some of the Large Format Retail demand along Picton heading south out of the identified centre precinct boundary.

The suitability apparent across most of the CLUs to the north of the GMIA boundary, is driven by the existing population and social and transport infrastructure in the suburbs to the north and north east. Gilead Industrial has been identified as the primary catchment for significant employment growth in the north of the GMIA. The distribution of centres as identified by the masterplanner has greater emphasis, compared to the suitability mapping, in determining the centre hierarchy and distribution of centre based activities. Four town centres were identified at Gilead, South Appin, Menangle Park and North Douglas Park.

FIGURE 1. POTENTIAL EMPLOYMENT LAND ALLOCATION
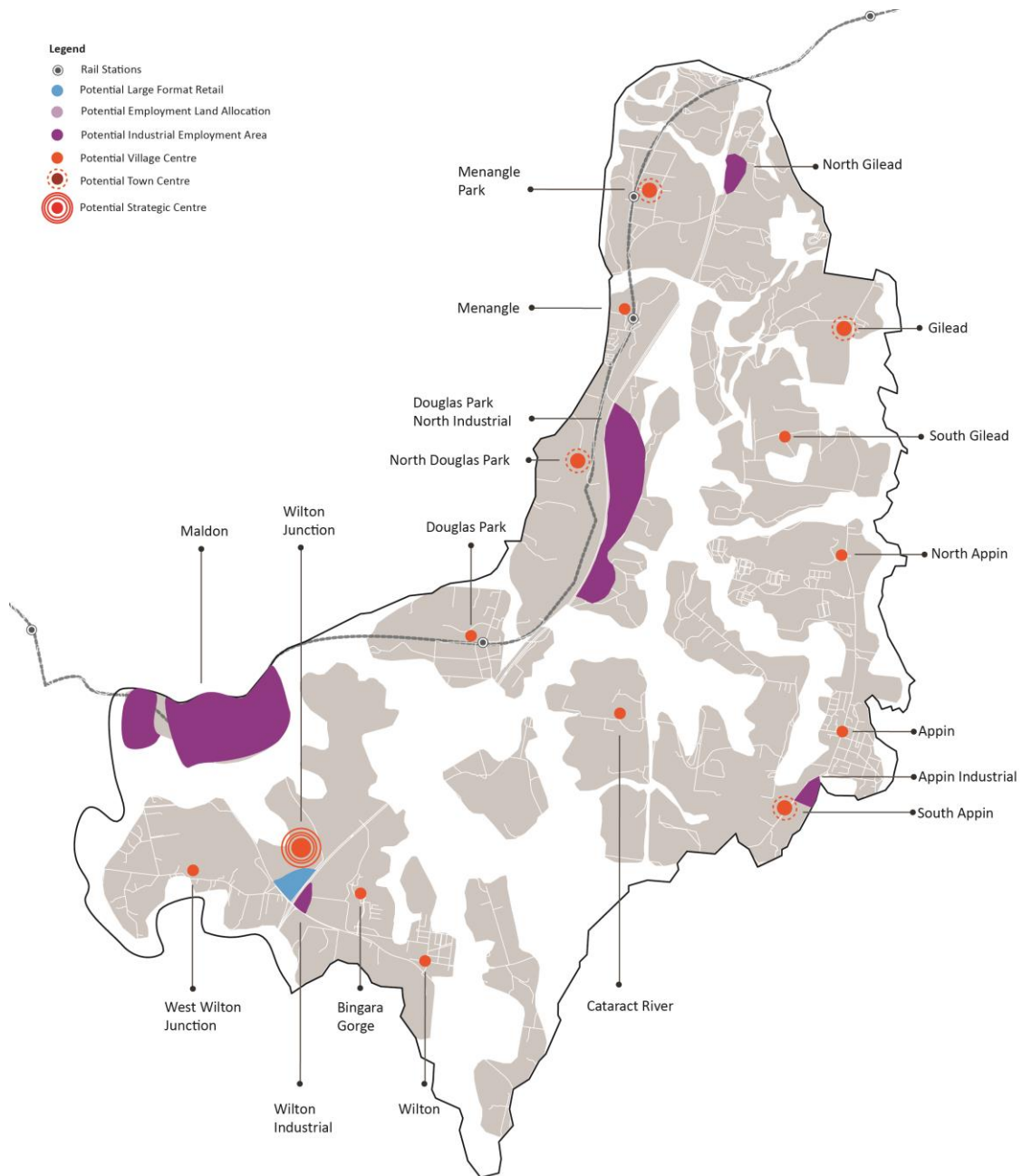
Source: SGS Economics and Planning, 2015.

Staging and sequencing

Table 19 (overleaf) shows the indicative staging for development in Menangle Park, Mount Gilead and Wilton Junction. Again, population driven employment should be expected to occur broadly in-line with population growth and strategic employment likely lagging population driven employment.

As the major industries within the GMIA are population-driven, it is expected that the staging of employment growth will be broadly in line with population growth. Given substantial infrastructure costs and environmental constraints, only Menangle Park, Mount Gilead and Wilton Junction have been considered for staging up to 2036..

Population growth was assumed to be linear up to 2036 and the amount of employment development in supporting centres is expected to ramp up as the population base in each area becomes mature. Once a critical mass of population serving activities are located in centre, then strategic employment will likely follow. It is expected that industrial employment in Maldon will ramp up over time and that the North Douglas Park Industrial precinct will come online somewhere between 2021 and 2026. The rate of development at both of these precincts will depend on owner intentions, infrastructure provision, the broader subregional and regional industrial lands market and feasibility.

TABLE 1. STAGING OF POTENTIAL EMPLOYMENT PRECINCTS

Precinct / centre	2016 - 2021	2021 - 2026	2026 - 2031	2031 - 2036	Total capacity (beyond 2036)	Total
Appin	-	-	-	-	1.1	1.1
Appin Industrial	-	-	-	-	4.3	4.3
Bingara Gorge	0.9	0.6	0.5	0.3	-	2.3
Cataract River	-	-	-	-	2.5	2.5
Douglas Park	-	-	-	-	1.6	1.6
Douglas Park North Industrial	-	-	-	-	98.5	98.5
Gilead	1.1	2.7	3.3	3.8	-	10.9
Maldon	3.8	11.4	15.2	19.0	26.6	76.1
Menangle	-	-	-	-	1.5	1.5
Menangle Park	1.2	2.9	3.5	4.1	-	11.8
North Gilead	-	-	2.8	2.3	4.2	9.2
North Appin	-	-	-	-	2	2
North Douglas Park	-	-	-	-	8.5	8.5
South Appin	-	-	-	-	21.1	21.1
South Gilead	-	0.5	0.7	0.8	-	1.9
West Wilton Junction	-	0.5	0.7	0.8	-	1.9
Wilton Industrial	0.6	0.6	1.3	1.7	-	4.3
Wilton	0.2	0.3	0.2	0	-	0.7
Wilton Junction	3.2	3.9	6.5	8.6	34.6	56.8

Source: SGS Economics and Planning, 2014. Note: Numbers are rounded.

Appropriate development infrastructure would need to be implemented to support strategic employment opportunities.

It is important that early centre development should be directed to those centres higher in the hierarchy identified as town or strategic centres at Menangle Park, Gilead and Wilton Junction ensure they are able to gain momentum, achieve critical mass and reach maturity. Once employment development is established at these higher order centres, then lower order village centres should be allowed to occur. Industrial development should be supported where proposed and employment development at Maldon and to the east of the Hume Highway at Moreton Park Road, should be encouraged early.

The approved longwall mining operations could affect sequencing of potential employment lands proposed to the north and south of Picton Road and any potential expansion of the existing employment lands at Maldon. There may also be some short-medium term effects in the Menangle area.

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Centre and employment development principles

Often the development rate and sequence becomes spatially uneven, with particular parts of the precinct developing at a greater rate or amount than others. A list of centre and employment development principles have been outlined to provide guidance on future centre and employment, should development not proceed as expected. These criteria should be adhered to if variations from the master plan are ever contemplated (Table 2).

TABLE 2. CENTRE AND OTHER EMPLOYMENT LANDS DEVELOPMENT PRINCIPLES

Centre development principles	Employment development principles
− prominent location and accessibility − access to and integration with public transport, or the infrastructure capacity to support future public transport − access to the broadest possible catchment, without undermining the viability of existing centres − good pedestrian access − good road access for employees, customers and suppliers and, where necessary, capacity to provide new road infrastructure − close proximity to local labour markets with the skills required by business − high quality urban design with opportunities to integrate with surrounding land uses − potential to increase the amenity of the local area − capacity to contribute to environmental outcomes − environmental constraints, such as flooding − impact on the supply of the existing land use such as residential land (including impacts on housing supply and affordability) or industrial lands	Strategic principles − of strategic significance, preferably in an endorsed higher level planning strategy Clustering / land use principles − supporting existing enterprise(s) − contiguous to other industrial activities − well located to contribute to an existing or emerging industry cluster − currently or potentially form part of a supply chain or located close to next stage industries (e.g. areas producing goods to retail or distribution centres) Site level physical /ownership characteristics − under single ownership or offer significantly large land for employment uses − unconstrained in terms of vehicle access and exit − sufficiently large with potential for on-site expansion of existing businesses and with space for adequate parking and turning space for industrial vehicles − buffered from surrounding residential development − unconstrained by environmental factors such as ANEF, floodprone, heritage/conservation, contamination, flooding which make other uses undesirable Operational principles − well located in relation to freight hubs (such as intermodal terminals, ports, airports) and other important road and/or rail networks − well located to service an existing or growing population − currently or planned to be serviced by adequate power and water supplies − located close to or potential to support the economic role of a nearby centre − offering potential for 24-hour operations − located away from other uses to cater for dust sensitive and potentially toxic or hazardous industries

Source: DP&I, 2009; DP&I 2012.

While the changing needs of industry need to be recognised, a centres based approach to planning is crucial to future sustainability and planning authorities need to 'hold the line' in relation to this approach.

Job to working resident ratio for the GMIA

Action 2.4.2 discusses the importance of 'access to employment, noting that around 69 percent of residents in Sydney's north west and south west travel outside their Local Government Area to work, - adding considerably to their weekly expenses' (DP&E, 2014).

Research found that the job to working resident ratio for Wollondilly LGA was around 44 percent and the South-West subregion job to working resident ratio was 0.7. Instead, the related concept of job to working resident ratio for the GMIA was found to be 0.38:1, based on the employment analysis and

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assumed working population. This ratio is lower than the current 0.44:1 for Wollondilly LGA and compares relatively poorly to the ratios for Camden, Campbelltown and Wingecarribee, which are 0.57:1, 0.62:1 and 0.83:1, respectively.

The current job to working resident objective from Wollondilly Shire Council (1 full time job per dwelling) is very high at around 0.88:1. It is greater than the South West subregion job to working resident ratio of 0.7 and is almost twice as high as the current job to resident ratio for Wollondilly (0.44:1).

In determining an appropriate jobs to resident target for the GMIA, the current Wollondilly LGA ratio of 0.44 jobs to resident workers should be a minimum with a target of 0.6 jobs to resident workers, similar to the Campbelltown LGA. Campbelltown contains a 'regional city' of Campbelltown-Macarthur and established industrial precincts in Minto and Ingleburn. Based on the total capacity employment numbers there would need to be at least a 15 percent increase in employment above the current forecast to meet the minimum jobs to resident ratio and close to a 60 percent increase in local employment to reach the target rate of 60 percent jobs to local resident ratio – around 46,200 jobs. While the below job numbers refer to the total capacity, the 'minimum' and 'target' job to working resident ratios should be considered for the 2036 vision.

TABLE 3. MINIMUM AND TARGET JOB TO RESIDENT RATIOS AT TOTAL CAPACITY

	Total capacity jobs	Job to working resident ratio
Current	29,591	38%
Minimum	*33,908*	44%
Target	*46,238*	60%

Source: ABS Census, 2011; BTS, 2014; SGS Economics and Planning calculations, 2015.

Increasing local employment access

Given the context and lessons provided above, a framework for developing and diversifying the economic opportunities for the GMIA should consider the key elements:

1) Optimising 'population driven' jobs
2) Capturing 'strategic' jobs
3) Private sector collaboration
4) Economic development roles – Develop substantial 'hard' and 'soft' infrastructure development effort to build local capacity
5) Planning for liveability

In considering the key elements for employment development, SGS has provided the following checklist for the GMIA:

− **Connectivity:** access to businesses and labour and executive housing, expanded public transport, preferably rail connections to knowledge centres.
− **Amenity:** create a quality public domain and retail amenity. A large enclosed shopping centre surrounded by swathes of at-grade parking would not be a desirable built-form outcome for the GMIA. Rouse Hill Shopping Centre in the North-West is an exemplar for suburban shopping centre development, with an urban traditional centre feel. Such a centre, with traditional main streets could be emulated at Wilton Junction (as well as the smaller-scale town centres) to help attract and retain a high share of population-driven employment and potentially some strategic industries. The centre could be well integrated with a rail station and with medium rise residential development.
− **Capacity:** the centres and employment areas would need to be 'future-proofed' with room to grow by ensuring they aren't hemmed. For the potential strategic centre at Wilton Junction, this will required a careful balancing act between employment and residential uses.
− **Conditions to compete** such as the availability of large lots for footloose industrial development, but also encouraging an urban grain for centres, as well as sufficient / appropriate car parking.

‒ **Recognition and support** from the metropolitan or State Government will be critical. A focussed effort in policy, planning, funding, will be key but also public investment in education and health facilities, such as major high schools or further education or a hospital.

The development of future jobs in the GMIA will require a strong and ongoing economic development 'push'. Again, this will require significant infrastructure intervention, such as both transport and education and health facilities, to build local capacity. Commitment from developers will be key to driving employment growth and should focus on developer contributions or 'works-in-kind' (without adversely affecting feasibility of development).

It is important to keep in mind that successful employment precincts are more likely to emerge over the long term. Notwithstanding, there will be limits to the extent to which the GMIA can attract strategic jobs, given its remote location on Sydney's urban fringe. To improve employment opportunities and overcome the social and economic costs of low employment access for potential GMIA residents, improving access to jobs outside of the region via transport interventions will be critical.

Given the expected population of a total capacity scenario at the GMIA would be significant, electrification of the Southern rail line and extension across to a Wilton Junction strategic centre should be contemplated for the long-term (beyond 2036). In this context there are a number of specific initiatives which are relevant and would improve access to employment opportunities for GMIA residents:
‒ Enhanced integrated land use and transport planning
‒ Electrification of the Southern Rail line and extension:
  ‒ to Douglas Park and possibly to Picton
  ‒ A Macarthur branch line (Southern Rail Link), either;
    ‒ South of Macarthur Station to Wilton Junction via Appin west of Campbelltown Golf club and east of the Hume Highway, or
    ‒ South of Douglas Park to Wilton Junction via the Maldon-Dombarton freight rail corridor. The proposed freight corridor passes directly through the identified Wilton Junction Strategic Centre and provides an attractive lower cost option.
‒ Bus Rapid Transit (BRT) from Wilton Junction and Appin to Campbelltown Station (or beyond). BRT would have a much higher capital cost than standard bus services, but lower than rail (although the operational costs are higher than rail). BRT functions more like a train than the current Sydney buses operation, with dedicated and separated lanes, widely spaced stops (ideally around 400 metres) and large stations that reduce delays associated with traditional buses payment upon boarding
‒ General bus lines throughout the GMIA and to existing centres in Wollondilly.

1   INTRODUCTION

1.1 Project introduction

The NSW Government's latest metropolitan plan, *A Plan for Growing Sydney*, indicates support for Priority Growth Areas, which are aimed at prioritising dwelling and employment opportunities in key areas to encourage a sustainable urban structure and cost effective infrastructure delivery.

Action 2.4.2 from *A Plan for Growing Sydney* requires the State Government to 'develop a framework for the identification of new Growth Centres'. The framework will consider and address the cumulative impacts of individual developments. The aim of this framework is to improve the management of future land release to ensure efficient infrastructure delivery and create communities that have access to public transport, shops, services and employment opportunities. The framework will also 'stimulate competition to keep downward pressure on prices and help prevent speculative investment and land-banking'. To achieve these aims, Action 2.4.2 indicates that that the framework will consider:

- the sustainability of Sydney's agricultural and resource sectors
- the cost of delivering roads, transport and services infrastructure
- the costs to communities of higher transport and infrastructure costs, reduced social outcomes and poorer access to economic opportunities and services
- the compatibility of development with adjacent land uses; and
- access to employment, noting that around 69 per cent of residents in Sydney's north west and south west travel outside their Local Government Area to work, adding considerably to their weekly expenses (DP&E, 2014).

As part of Action 2.4.2 the State Government will identify potential locations for new greenfield development giving particular attention to investigating the potential for greenfield development in the Greater Macarthur region to the south and south west of Campbelltown – Macarthur centres (Figure 2).

FIGURE 2. GREATER MACARTHUR INVESTIGATION AREA

Source: DP&E, 2014.

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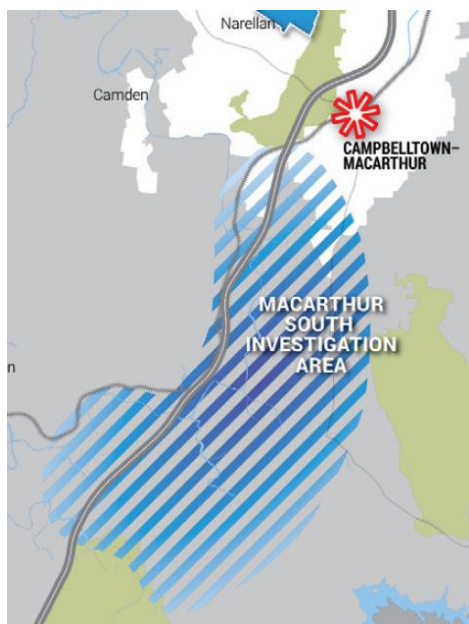
In preparing a framework for the identification of new Growth Centres and Priority Growth Areas the Government will consider a range of issues, including:
- the value of land for drinking water supply, agriculture, environmental management, resources, tourism and other purposes;
- constraints to development, including environmental constraints and natural hazards
- private sector interest in developing particular land;
- proximity of land to current and planned locations of employment;
- the cost of infrastructure provision including roads, water, sewerage, public transport, schools and health facilities; and
- the economic and social cost to communities of having relatively poor access to employment and services (DP&E, 2014).

Greater Macarthur Investigation Area's (GMIA) geography and terrain pose some challenges in identifying a strong future 'urban structure'. Elements which will influence the structure that can be identified include:

- a major arterial north-south road corridor (Hume Highway) to the west of the major identified development areas main settlement areas
- a minor arterial generally north-south corridor (Appin Road) in the eastern section of the GMIA
- a rail line on the far west of the GMIA, which tracks the minor arterial road corridor Menangle Road
- small established residential settlements at Wilton, Appin, Douglass Park and Menangle
- settlement areas to the north of the GMIA
- environmentally constrained land associated with river gorges and rural areas throughout the study area.

1.2 Project background

This investigation is examining the possibility of developing new urban communities in Greater Macarthur and if development is found to be desirable, when this development should be scheduled to occur. The Government will be guided by its statutory responsibility to assess how new urban areas would impact the natural environment, agricultural and mining activities. A key consideration will be the likely positive and negative impacts for existing communities in the area.

The investigations will then focus on how any new potential communities would access jobs, services and amenities, including what the costs of infrastructure would be and how it would be funded. The government recognises that there is already strong private sector interest in the GMIA and will therefore consider existing private proposals for housing and employment opportunities in the Appin & West Appin, Wilton Junction, South Campbelltown, Menangle Park, Mount Gilead and Menangle areas.

Current state of play

There are a number of residential proposals in the GMIA, which are in different stages of the development pipeline. There are two broad study areas where private developer interests have 'options' including the West Appin Study Area and the Wilton Junction Study Area. There are a number of Post-Gateway planning proposals for residential development including at Menangle Park, Station Street – Menangle, Mount Gilead, and Macquariedale Road, Appin.

There are also Pre-Gateway proposals for residential development including Moreton Park Road - Menangle Employment Lands (non-residential), South Campbelltown and Brooks Point Road.

Known private proposals are also located at Appin East and in an area referred to as Mt Gilead Balance lands. DP&E has received representations from proponents in these areas but they are both yet to have a formal planning proposal.

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1.3   Scope of work

Based on the brief, the overarching objective of the project is to determine whether the GMIA is suitable as a new growth centre by measuring its performance against threshold issues. If considered suitable, then a growth framework will be developed to manage the cumulative impacts of development, ensure efficient infrastructure delivery, ecological sustainability and social equity and access to economic opportunities.

In particular, the more specific requirements for the economic and employment analysis are:

−   Evaluate and define potential major retail / commercial centres within the GMIA working with the DP&E Structure Planner.
−   For a minimum of two potential structure plan scenarios:
    −   Identify the employment and related floorspace (in retail, industrial and other forms) associated with potential future populations in the GMIA.
    −   Identify the share of these jobs and floorspace that would be accommodated within the GMIA (and spatially, in which centres and employment land precincts).
    −   Evaluate the potential of each structure plan scenario for employment self-containment.
    −   Inform transport, services and infrastructure planning by ensuring that outputs in relation to future jobs are reconciled to BTS travel zones, and consistent with metropolitan control totals.
−   Evaluate, whether from a government or whole of community perspective, the costs and benefits of developing the GMIA and informing recommendations for a government decision on a way forward.

In relation to the final dot point, SGS is completing a separate Cost-Benefit Analysis (CBA) for this project. The ultimate objective of the CBA will be to provide an assessment of the broad welfare impacts that result in moving from the base case (i.e. business as usual) development scenario to an alternative development scenario (i.e. GMIA as a new growth centre), when taking an integrated perspective across economic, social and environmental considerations.

1.4   Report contents

The study has been structured in this report to include the following sections.

−   Introduction and overview (this section).
−   Section 2 provides an overview of the future retail demand analysis for the GMIA, including the amount type and broad location of retail uses.
−   Section 3 outlines the forecast for non-retail uses in the GMIA considering both population-driven employment and strategic employment.
−   Section 4 reveals the methodology undertaken to model an 'optimal distribution' of future employment lands across the GMIA. The outputs from Section 2 and 3 are distilled and allocated across the GMIA.
−   Section 5 discusses the potential development staging and sequencing of employment precincts and centres in the GMIA, as well as a list of centre and employment development principles to provide guidance on future centre and employment.
−   Section 6 identifies the current job to working resident ratio of the GMIA and proposes a target ratio. Principles for increasing local employment are then discussed focussing on the creation of local jobs as well as the importance of linking local residents to job rich areas elsewhere is Sydney.
−   Section 7 provides a summary of the main findings of the report.

2 RETAIL DEMAND ANALYSIS

Overview

This section provides an overview of the future retail land use requirements for the GMIA. A detailed retail demand analysis has been completed by estimating total retail expenditure for the incoming population, distributing to different retail centre types, and converting the expenditure captured within the precincts into floorspace requirements. The existing retail offering and typical share of escape expenditure by centre type has also been considered in the modelling to determine an appropriate retail hierarchy for the GMIA.

2.1 Summary of inputs and process

A number of data inputs and assumptions are used to derive the total retail floorspace. Figure 3 illustrates the steps taken estimate the total supportable floorspace by centre type. The light shaded green blocks in the figure indicate modelling inputs including data referenced from industry standard resources and previous studies. The pink blocks indicate key outputs that drive the final results of this modelling exercise.

FIGURE 3. RETAIL FLOORSPACE DEMAND MODELLING PROCESS
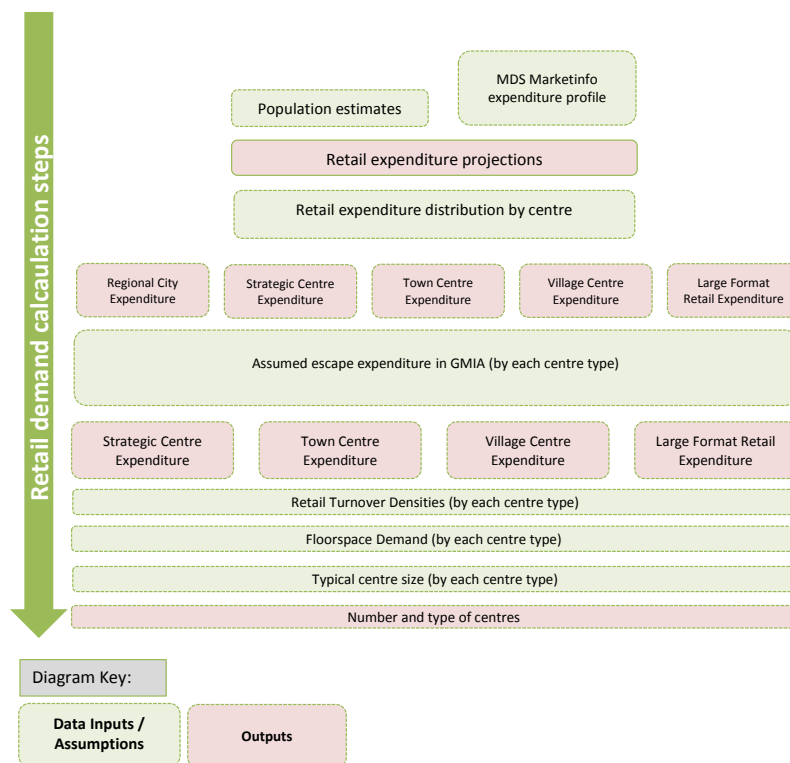
Source: SGS Economics and Planning, 2015.

2.2 Population forecast

SGS has completed two retail forecast scenarios for the GMIA – using a total capacity figure and a 2036 vision figure both estimated and tested at 2036. The total capacity figure assumes a population of approximately 190,000. The total capacity figure was derived from research completed by the masterplanner, based on an Urban Capable Footprint (UCF) that discounts absolute constraints such as environmentally sensitive land and using an occupancy rate of 2.8 people per dwelling. The 2036 vision assumes a population estimated at approximately 97,000. The total capacity number is not a time-bound figure. The projected population by 2036 under each scenario is outlined in Table 4.

TABLE 4. POPULATION FORECASTS FOR THE GMIA (AT 2036)

	GMIA 2036 vision	GMIA total capacity
GMIA	97,403	190,315

Source: BTS, 2012; AEC, 2015; Urbis, 2015.

2.3 Retail expenditure projections

The per-capita expenditure estimates across 10 commodity categories used in this analysis are sourced from the Marketinfo expenditure data supplied by the MDS Market Data Systems. The Marketinfo data provides small area household expenditure estimates at the Statistical Area Level 1 (SA1) geography and has become the industry standard for retail analysis. The SA1 has been designed for use in the Census of Population and Housing as the smallest unit for the processing and release of Census data. MDS adopts this geography to generate small area expenditure estimates using a micro-simulation technique. This technique adjusts the ABS Household Expenditure Survey (HES) unit record file to effectively provide a synthetic HES expenditure profile for every SA1 in Australia, according to a range of socio-economic factors from 2011 Census.

However, since the Marketinfo estimates for the GMIA have been based on the socio-economic characteristics of the area as of 2011, they may not reflect the expenditure profile of the future population. To account for this, a proxy per capita expenditure estimate has been derived based on a recently developed area nearby. For the purpose of this study, the recently developed Englorie Park area to the south of Campbelltown-Macarthur centre has been chosen as the proxy area. The population in this area increased rapidly between 2006 and 2011 as new dwellings were added to the area. On average, residents in the proxy area currently spend approximately $13,000 on retail goods per annum. This proxy expenditure profile is then combined with ABS retail trade data to forecast inflation adjusted expenditure per capita at a small area level for the GMIA. The per capita forecasts also draw on broad retail industry trends.

Online Retailing

Using research from the Productivity Commission (2011) and other industry information, the proportion of online retail escape expenditure by commodity type has been estimated.

Figure 4 (overleaf) shows the estimated online retail share by commodity group. Where possible, percentages for individual commodity groups have been sourced from the Productivity Commission. Perishable commodities are assumed to lose a negligible share of turnover to online retailing. For other non-perishable commodities, the overall online share of retail sales has been applied. It has been assumed that all online retailing expenditure is sourced from outside the GMIA catchment area.

FIGURE 4. ONLINE RETAIL SHARES BY COMMODITY GROUP
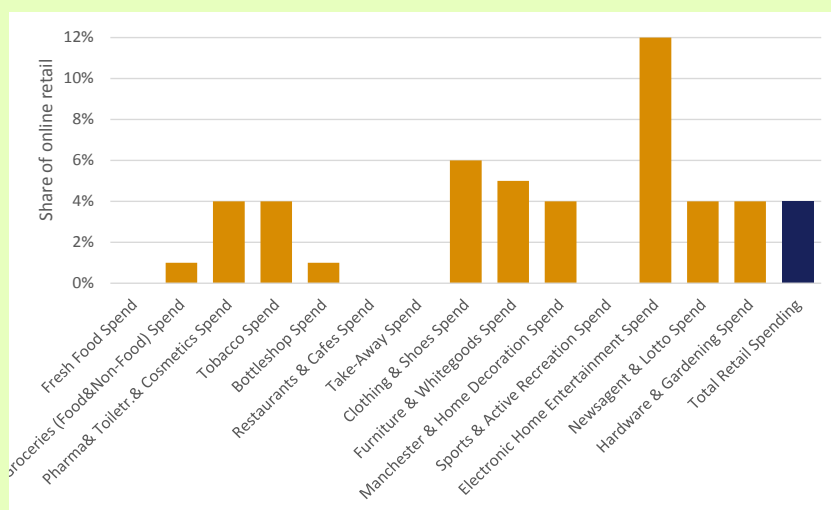
Source: Productivity Commission, 2011.

The forecast population is then applied to the expenditure forecasts (excluding online spending) to derive total available resident retail expenditure for the 2036 vision and total capacity scenarios for the GMIA.

Table 5 below shows the total retail spending in 2036 by commodity type under both scenarios. It shows that the total retail expenditure generated by residents is projected to reach $3.4 billion per annum when the GMIA realises its maximum capacity of 190,000 residents. Under the 2036 vision scenario, the total resident retail expenditure is expected to reach almost $1.8 billion per annum by 2036.

TABLE 5. TOTAL RETAIL EXPENDITURE GENERATED BY ON-SITE RESIDENTS IN 2036 (PER PERSON PER ANNUM)

	GMIA base case (BTS 2036)	GMIA 2036 vision	GMIA total capacity
Total Population	18,901 residents	97,403 residents	190,315 residents
Commodity	Spending by commodity ($)	Spending by commodity based on proxy area ($)	Spending by commodity based on proxy area ($)
Food/Groceries	$108,173,637	$568,750,032	$1,111,276,473
Pharmaceutical goods	$19,052,425	$103,460,214	$202,150,146
Tobacco/Bottleshops	$29,687,336	$133,552,058	$260,946,376
Restaurants/Cafes/Takeaway	$36,289,908	$221,584,172	$432,951,672
Clothing/Shoes	$25,902,209	$157,509,550	$307,756,742
Personal	$16,554,735	$108,243,721	$211,496,605
Furniture/Whitegoods/Manchester	$28,446,767	$166,792,040	$325,893,730
Electronics	$31,274,794	$185,965,089	$363,355,809
Hardware/Gardening	$18,106,637	$105,469,736	$206,076,535
Newsagent/Lotto	$2,867,502	$15,716,172	$30,707,712
Total	$316,355,950	$1,767,042,782	$3,452,611,799
Per Capita spending at 2036	**$16,738**	**$18,142**	**$18,142**

Source: SGS Economics and Planning calculations based per capita retail spend from Marketinfo 2014, 2015

2.4 Retail floorspace demand

Distribution of retail expenditure by centre type

To identify an appropriate retail hierarchy within the GMIA, the retail expenditure from the future resident population is distributed to a range of centre types, based on their typical market shares ascertained from previous research and floorspace audit completed for the Western Sydney Retail Study (SGS 2013, commissioned by the DP&E). It is has been found that in general, retail expenditure in areas similar to the GMIA is distributed in the following apportionment:

- Regional City: 15%
- Strategic Centre: 24%
- Town: 23%
- Village: 24%
- Large format retail: 14%

It should be noted that 14% expenditure at Large Format Retail centres is lower than the industry standard (approximately 20%) reported by the Bulky Goods Retailers Association for New South Wales. This acknowledges that fact that a portion of spending is directed towards traditional centres through sales of furniture, appliances, hardware, homeware and sporting/camping goods (rather than solely at bulky goods precincts). Overall, the distribution of retail spending at centres applies to both the 2036 vision and total capacity scenarios.

Table 6 shows how the resident retail expenditure is likely to be allocated to each centre type, for both scenarios, within a retail hierarchy, using the apportionment above.

TABLE 6. DISTRIBUTION OF RETAIL EXPENDITURE BY CENTRE TYPE

		GMIA 2036 vision	GMIA total capacity
Total Population		97,403 residents	190,315 residents
Retail centres	**Spending at retail centres (%)**	**Spending at retail centres ($)**	**Spending at retail centres ($)**
Regional City	15%	$265,056,417	$517,891,770
Strategic Centre	24%	$424,090,268	$828,626,832
Town	23%	$406,419,840	$794,100,714
Village	24%	$424,090,268	$828,626,832
Large Format Retail	14%	$247,385,990	$483,365,652
		$1,767,042,782	$3,452,611,799

Source: SGS Economic and Planning estimates, 2015.

Escape expenditure

The retail demand assessment accounts for the existing and planned provision of centres and allows for 'escaped' expenditure i.e. expenditure that 'escapes' to centres outside the defined system, for example to regional cities and large format retail centres. The GMIA in particular is likely to experience significant expenditure leakage as residents tend to gravitate towards the established shopping centres in the neighbouring Campbelltown-Macarthur regional city. Significant leakage in large format retail expenditure is also predicted due to the adjacent large format retail precinct in Campbelltown and Casula in Liverpool.

SGS have analysed the retail offer around the GMIA and the broader South West to derive a set of escape expenditure assumptions. These assumptions are expressed as percentages of total expenditure for both the 2036 vision and total capacity scenarios, assuming the surrounding retail offer remains unchanged over time.

Regional City

Located 7 minutes north of Menangle Park is the Campbelltown-Macarthur Regional Centre which includes Campbelltown Mall, Macarthur Square, Large Format Retail stores and extensive strip retail along Queen Street with approximately 160,000 square metres of floorspace. It is assumed that these shops will be able to attract the majority of 'Regional City' spending from the GMIA and the broader South West due to its proximity to population and retail variety. An escape expenditure of 100% is therefore assumed for the GMIA in recognising the role of Campbelltown-Macarthur as a Regional City.

Large Format Retail

Towards the north of GMIA, there is approximately 125,000 square metres of Large Format Retail floorspace in Campbelltown, 46,000 square metres in Camden (Hill PDA, 2011). There is also approximately 6,000 square metres large format retail floorspace in Picton in Wollondilly, towards the South West of the GMIA. This adds up to a total of 180,000 square metres of large format retail floorspace across these three LGAs.

Of these, major competition in Campbelltown and Narellan centres covers approximately 85,000 square metres of large format retail floorspace. An additional 50,000 square metres is identified further north in Casula in Liverpool. Given that both large format retail precincts are within a 30 minute drive from Menangle Park (north of the GMIA), it is assumed that some of large format retail spending will be accommodated outside the catchment rather than within the catchment.

This assumption has been sense-checked with expenditure figures derived using large format retail per capita floorspace benchmarks and retail turnover density (RTD) benchmarks. Industry reports recommend that the NSW per capita floorspace benchmark for large format retail (bulky goods) is approximately 0.5 square metre per capita. This benchmark has also been consistently used across retail studies in the South West and broader Western Sydney area.

This means that the floorspace demand for GMIA is approximately 90,000 square metres and 300,000 square metres respectively for the 2036 vision and total capacity scenarios. These figures are then converted into dollar values (representing expenditure) by multiplying floorspace by an average benchmark RTD of $3,600. This benchmark RTD represent the average trading performance for large format retail based on the Western Sydney Retail Study, sense-checked with Urbis RTDs of floorspace. The final expenditure for large format retail in the GMIA is estimated to be approximately $0.3 billion dollars and $1.1 billion dollars for each scenario.

This equates to approximately 20 to 25 percent of the derived expenditure (seen in Table 6). SGS notes that the reversed engineering of escape expenditures based on per capita floorspace benchmarks should only be used test whether the floorspace demand is within the range of the modelled demand to decide whether general assumptions are reasonable. However, it should not be used exclusively to derive floorspace demand as the per capita thresholds are highly volatile and may vary depending on region and catchment definition.

Other centres

No additional escape expenditure is assumed for Strategic, Town and Village centres.

Overall assumptions of escape expenditure

The overall assumed escape expenditure for the GMIA is shown below.

- Regional City: 100% (for example to Campbelltown-Macarthur Regional City)
- Strategic Centre: 0%
- Town: 0%
- Village: 0%
- Large Format Retail: 25%

Retained expenditure

The escape expenditure assumptions above are then applied to the allocated retail expenditure by centre type (as shown in Table 5) to derive the remaining retail expenditure by centre type within the GMIA. As shown in Table 7 around $1.4 billion retail expenditure is expected to be retained in the GMIA under the 2036 vision and $2.8 billion expenditure retained under the total capacity scenario.

TABLE 7. RETAINED EXPENDITURE BY CENTRE TYPE

			GMIA 2036 vision	GMIA total capacity
Total Population			97,403 residents	190,315 residents
Centre type	**Escape expenditure (%)**	**Retained expenditure (%)**	**Retained expenditure ($)**	**Retained expenditure ($)**
Regional City	100%	0%	$0	$0
Strategic Centre	0%	100%	$424,090,268	$828,626,832
Town	0%	100%	$406,419,840	$794,100,714
Village	0%	100%	$424,090,268	$828,626,832
Large format retail	25%	75%	$185,539,492	$362,524,239
Total			**$1,440,139,867**	**$2,813,878,616**

Source: SGS Economics and Planning, 2015.

Floorspace demand by centre type

To estimate the retail floorspace demand generated by residents of the GMIA, a set of benchmark Retail Turnover Densities (RTD) have been applied to the retained retail expenditure for each centre type. Those RTDs represent the average trading performance of each centre type estimated for the Western Sydney Retail Study, cross checked with Urbis RTDs, and are measured in turnover per square metre of Gross Leasable Area (GLA).

A real growth rate of 0.84% per annum is then applied to the benchmark RTDs to derive the typical RTDs at 2036 (see Table 8). This growth rate is based on the increase in retail floorspace and inflation-adjusted turnover in Australia from 1991/1992 to 2005/06.

A centre threshold assessment is then used to determine whether additional centres can be supported in the GMIA. This involves first deriving an average centre size[1] from a floorspace database compiled from a range of land audit, retail and employment studies completed by SGS (including the Western Sydney Retail Study). The projected floorspace demand for each centre type is then divided by the typical centre size to determine the number of supportable centres within the GMIA. This calculation is illustrated in Table 8.

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[1] The typical centre size was used to inform the modelling, but size can vary within centre type categories. For example, three large town centres or four smaller town centres could absorb the same amount of floorspace demand.

The assessment finds that there is sufficient demand to support one to two town centres at 2036 and three centres if GMIA was developed up to total capacity. A minimum 10 villages of approximately 9,000 square metres can be supported by residents in the total capacity scenario and at least five at 2036. The data suggests there is just enough demand for one strategic centre under the total capacity scenario. Under the total capacity scenario, its size could reach 140,000 square metres, whereas the strategic centre may function more like a large town centre at 2036.

The data suggests that future population demand is likely to support at least two bulky goods centre with a size of up to 40,000 square metres under the total capacity scenario or around 48,000 square metres at 2036. This is approximately the size of Casula large format retail precinct in Liverpool at present. SGS notes that the number of centres proposed here may vary depending on a number of factors including future centre performance and the achievable centre size based on land availability and suitability. Additional floorspace requirements and respective turnover thresholds are shown in Table 8 below and further recommendations are outlined in Section 4.4 of this report.

In total, at 2036 the GMIA is expected support around nine centres while the total capacity scenario is likely to support around 17 centres.

TABLE 8. ADDITIONAL FLOORSPACE REQUIREMENT AND TURNOVER THRESHOLDS

Centres	Typical RTDs ($ per square metre)	Typical centre size (sqm)	GMIA 2036 vision (97,403 residents)			GMIA total capacity (190,315 residents)		
			Retained expenditure ($)	Supportable floorspace within GMIA (sqm)	Number of supportable centres based on demand	Retained expenditure ($)	Supportable floorspace within GMIA (sqm)	Number of supportable centres based on demand
	A	B	C1	D1 = C1/A	D1/B	C2	D1 = C2/A	D2/B
Regional City	$7,813	200,000	$0	-	-	$0	-	-
Strategic Centre	$6,130	150,000	$424,090,268	69,178	0.5	$828,626,832	135,166	0.9
Town	$7,693	35,000	$406,419,840	52,829	1.5	$794,100,714	103,222	2.9
Village	$8,535	9,000	$424,090,268	49,691	5.5	$828,626,832	97,091	10.8
Large Format Retail	$3,606	40,000	$185,539,492	46,774	1.2	$362,524,239	91,390	2.3
			$1,440,139,867	218,471	8.7	$2,813,878,616	426,869	16.9

Source: SGS Economics and Planning estimates, 2015.

Retail hierarchy

Based on the UCF, SGS worked with the masterplanner to identify a preliminary series of centres within the GMIA. It is recommended that Wilton Junction be developed as the Strategic Centre in the GMIA to service the southern catchment and potentially connect to the Southern rail line in the future. A town centre could be located at South Appin to service the large urban footprint in and around the Appin and South Appin area. There is limited room for growth in the existing Appin centre and it is bounded by significant biodiversity areas. Menangle Park would also be an appropriate site as a town centre, servicing the majority of population in the northern-western precinct, while a town centre could be located in the north east around Gilead. Douglas Park is also well-located to host a new or expanded centre.

In terms of villages, the existing centres at Bingara Gorge and Wilton could remain as small villages supporting the local population due to proximity to larger retail areas. Under total capacity scenario, village centres with an approximate centre size of between 5 – 10,000 square metres could be developed and function as villages that service the local residents' daily shopping needs. Due to the topographical constraints of the GMIA, the location of villages should be to maximise accessibility for local residents to ensure economic viability and reflect their local service function.

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Large format retail (bulky goods)

Suitability mapping (see the Appendix) of the area identifies Wilton Junction as a prime candidate for a future large format retail (bulky goods) precinct. Earlier analysis shows there is sufficient demand to support up to approximately 90,000 square metres of large format retail floorspace in the GMIA. This floorspace is approximately the same size as Campbelltown and the adjacent Narellan large format retail precincts combined.

From a strategic land use perspective, large format retail should be located in or adjacent to centres to support the existing retail hierarchy, support multi-purpose trips and minimise trip generation. When it is not realistic for large format outlets to be in centres, they should be located edge of centre or in dedicated clusters. This adds to customer choice and can improve the 'pulling power' of these businesses. As such, having defined large format retail precincts benefits both businesses and customers.

The delivery of stock and the collection of bulky goods by customers requires sites with good road access. Main road locations provide both access and exposure. Sites with exposure to high traffic volumes are desired by large format retailers because they enable business promotion and locations on major arterial roads are preferred. Wilton Junction is suitable given these criteria, particularly if signage is located along the Hume Highway.

In some locations across the Sydney region, large format retailing has encroached into industrial areas. This has significant implications. Large format retailing within industrial precincts has the potential to place upward pressure on rents, potentially forcing industrial land uses to relocate. Additionally, industrial land users often prefer to be located in an area which has an 'industrial image', and for some it is important maintain a sense of 'address' for existing businesses in industrial areas. Further, increased traffic volumes stemming from large format customers might affect access to and from industrial operations in the same area. The location of retailers in out-of-centre locations has the potential to undermine nearby centres.

2.5   Summary

In total, it is estimated that approximately 524,000 square metres of retail floorspace is required to accommodate the retail expenditure in the GMIA at total capacity. Of that floorspace, approximately 97,000 square metres (about 20 per cent) are likely to be accommodated by the neighbouring retail offer (outside GMIA). The rest of the 427,000 square metres (80 per cent) of retained floorspace will be distributed across four main centre types in the following order:
−   around 135,000 square metres floorspace for strategic centres (approximately one centre) at total capacity and 69,000 square metres at 2036 (no strategic centre)
−   over 100,000 square metres for town centres (approximately three to four centres) at total capacity and 53,000 square metres at 2036 (approximately one to two centres)
−   almost 100,00 square metres for villages (approximately 11 centres) at total capacity and 50,000 square metres at 2036 (approximately 6 centres)
−   approximately 91,000 square metres for large format retail at total capacity and 47,000 square metres at 2036

In total, at 2036 and including bulky goods retail the GMIA is expected support around nine centres while the total capacity scenario is likely to support around 17 centres with a strong strategic emphasis in the South (Wilton Junction strategic centre and its anchoring large format retail precinct).

The assessment finds that there is sufficient demand to support one to two town centres at 2036 and three centres if GMIA was developed up to total capacity. A minimum 10 villages of approximately 9,000 square metres can be supported by residents in the total capacity scenario and at least five at 2036. The data suggests there is just enough demand for one strategic centre under the total capacity scenario. Under the total capacity scenario, its size could reach 140,000 square metres, whereas the strategic centre may function more like a large town centre at 2036.

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Given the proximity of the Campbelltown-Macarthur Regional city, it is likely that no regional centre will be required to service local residents in the medium to long term as residents tend to gravitate towards the existing establishment in the neighbouring region. A southward focused large format retail precinct is also proposed to optimise accessibility to bulky goods services (considering the Campbelltown-Macarthur and Narellan large format retail precinct is near the northern end of GMIA).

In terms of access to daily shopping needs, residents in the GMIA are likely to require a higher number of local villages to service the potential population of 190,000 (up to 85% retained expenditure). The centres should be located strategically across GMIA to ensure equal supply of services and to all residents and to ensure viability and sustainability of the centres.

3 OTHER EMPLOYMENT ANALYSIS

Overview

This section outlines the forecast for non-retail uses in the GMIA. The approach considers the size of the incoming population and then determines the local industries that would service this population. Top-down strategic drivers of employment are also considered and the GMIA's relative desirability to attract a share of anticipated growth in the broader Sydney Metropolitan Region and South West Sydney.

3.1 Scenarios

For the GMIA two scenarios have been assessed: a base case scenario (based on the BTS forecast) and a project case scenario (which models large scale residential development at the GMIA). Implicit in this project case forecast is the assumption that substantial growth in the GMIA results in a reduction in growth in the SWGC, as well as other areas in Sydney, in line with broader net migration patterns in Western Sydney.

This chapter discusses the modelling approach, SGS forecasting method, and results of the modelling for the project case only. SGS employment forecasts, are also compared with the latest BTS (December 2014) forecasts.

3.2 Modelling approach and assumptions

In broad terms, the SGS employment forecasts **alter the spatial distribution** and **industry composition** (structural change) of BTS (2014) projected jobs at the GMIA and the SWGC, due to modelled population growth at the GMIA. However, it has been assumed there are **no net additions to the GMA labour market**. As a result, the BTS control totals for GMA (which includes the Sydney Greater Capital City Statistical Area, and the Illawarra and Hunter regions) remain unchanged.

Also, there is no 'structural change' at the GMA-level in the *project case*. This is because the GMIA simply absorbs population driven jobs from other locations in the GMA.

It should be noted that the SGS forecasts utilise the BTS (2014) projections as a starting point. This implies that the BTS underlying assumptions regarding spatial distribution, and industry trends are taken as given.

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The total capacity scenario for the UCF for the GMIA is assumed to be approximately 190,000 persons (based on an occupancy rate of 2.8 people per household). This estimate was derived from the UCF, but is subject to further refinement based on input from technical studies. The forecast population at 2036 is expected to be 97,000. Figure 5 displays the BTS base case forecast, the SGS projection, and total capacity scenario.

FIGURE 5. GMIA PROJECTED POPULATION
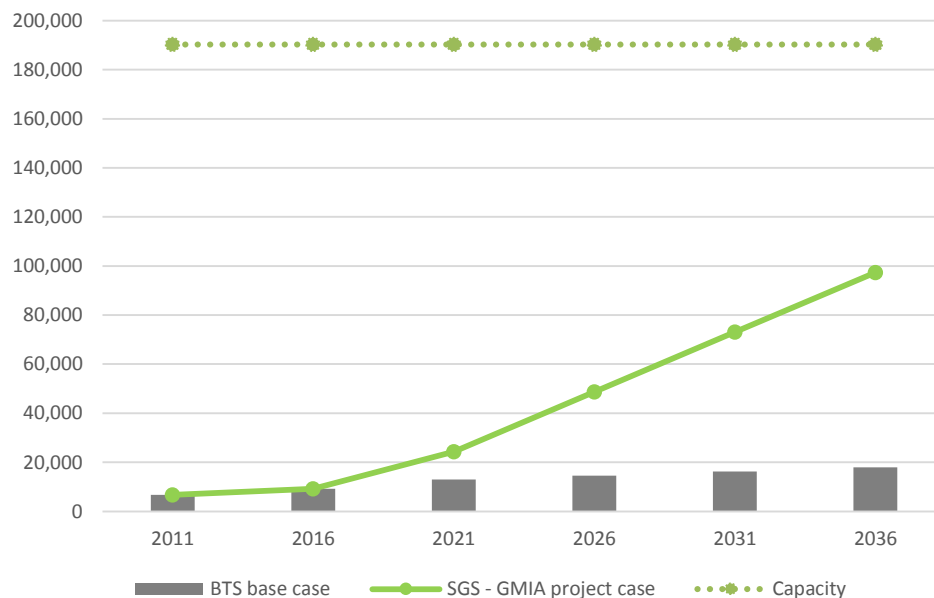
Source: SGS Economics and Planning, 2015 calculations, using BTS, 2014, and capacity total capacity data provided by DP&E.

Estimating population-driven and strategic employment

Using the SGS econometric model of population-driven employment, the BTS base case forecast for the GMIA has been disaggregated into population-driven and strategic employment. It is expected that a large majority of employment in the GMIA would be population-servicing employment. Therefore to estimate the increase in population-driven employment associated with the increased population, the increase in population growth at the GMIA has been proportionally applied to the SGS estimate of the underlying population-driven employment in the BTS base case forecast.

Retail jobs (retail trade and accommodation and food services industries) for the GMIA are extrapolated from the floorspace estimates using the SGS retail model. Based on the projected future GMIA population, floorspace is able to be estimated, and the implied number of jobs that would locate in the GMIA. The social infrastructure industries (i.e. education, health and arts) are also estimated using the SGS Population-Driven Employment projection model.

In addition, there is also a small leakage of SWGC strategic jobs (around two percent) from the SWGC to the GMIA. For industries that are not captured by the *SGS Population-Driven Employment projection model* (Finance, Real Estate, and Professional Services), but are likely to locate in the GMIA, it is assumed that a small proportion of SWGC's strategic employment in three industries relocate to the GMIA, based on estimated relationships in the *SGS Population-Driven Employment projection model*. The movement of these strategic jobs from the SWGC to the GMIA is intended to reflect the growing population and the strategic economic base in the GMIA[2].

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[2] Given the over-arching assumption of a closed-system labour market, there is no net increase to GMA employment associated with the GMIA. Instead, the source of population and employment is assumed to be mostly redistributions from the GMA, particularly future residents of the SWGC.

3.3   Modelling results

Greater Macarthur Investigation Area (GMIA)

Figure 6 shows the BTS base case, and SGS employment projection for the GMIA. The employment projection is linked to the population forecast. As such, a large majority of the employment above the BTS base case is due to population-driven employment.

FIGURE 6. GMIA FORECASTS
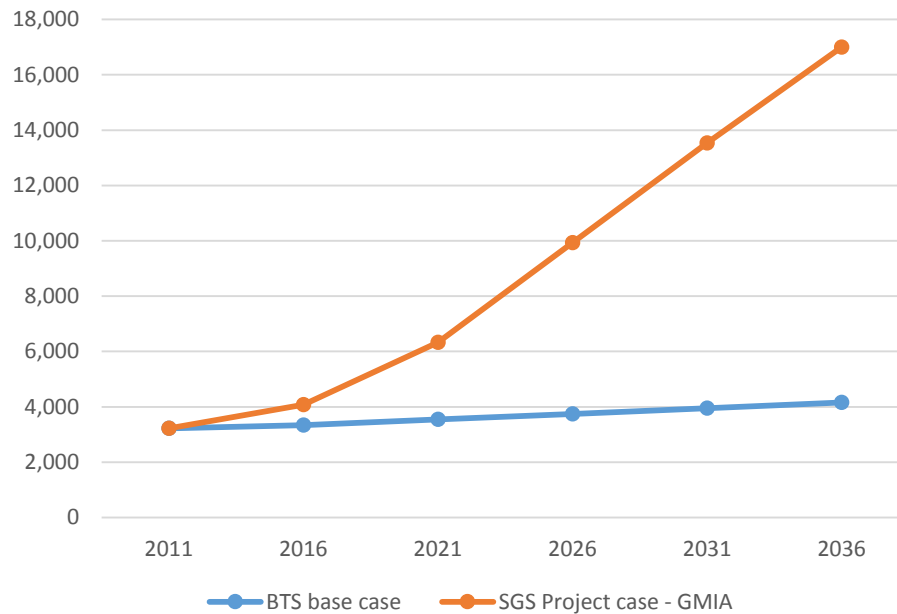
Source: BTS, 2014; SGS Economics and Planning, 2015.

Table 9 (overleaf) shows the industry composition of employment for the BTS base case, SGS projections for the GMIA at 2036, and implied employment at the population capacity maximum of around 190,000. The forecast is for approximately 30,000 jobs at total capacity and approximately 17,000 jobs by 2036 (2036 vision), which is around 13,000 jobs above the BTS forecast at 2036. At total capacity, the total employment is expected to be around 30,000 jobs.

The industry composition projected by BTS is altered because the increase in population is associated with an increase in population-servicing employment and some strategic employment. Accordingly, population-driven industries are anticipated, such as retail trade, food services and education to dominate the local economy of the GMIA. These jobs 'move' with population from other areas in the GMA, which suggests that there will be no structural change across the GMA.

TABLE 9. INDUSTRY FORECASTS – GMIA AT 2036, AND AT POPULATION CAPACITY

	GMIA					
	BTS base case		SGS (up to 2036)		Total capacity	
Agriculture, Forestry and Fishing	127	3%	148	1%	153	1%
Mining	1,169	28%	1,169	7%	1,205	4%
Manufacturing	480	12%	1,101	6%	1,827	6%
Electricity, Gas, Water and Waste Services	123	3%	163	1%	212	1%
Construction	452	11%	1,288	8%	2,277	8%
Wholesale Trade	44	1%	242	1%	450	2%
Retail Trade	155	4%	3,765	22%	7,120	24%
Accommodation and Food Services	116	3%	2,848	17%	5,511	19%
Transport, Postal and Warehousing	195	5%	723	4%	1,331	4%
Information Media and Telecommunications	0	0%	20	0%	21	0%
Financial and Insurance Services	5	0%	118	1%	121	0%
Rental, Hiring and Real Estate Services	35	1%	150	1%	155	1%
Professional, Scientific and Technical Services	209	5%	842	5%	1,042	4%
Administrative and Support Services	65	2%	356	2%	666	2%
Public Administration and Safety	208	5%	519	3%	879	3%
Education and Training	322	8%	1,750	10%	3,292	11%
Health Care and Social Assistance	175	4%	951	6%	1,866	6%
Arts and Recreation Services	80	2%	113	1%	139	0%
Other Services	118	3%	640	4%	1,231	4%
Unclassified	86	2%	91	1%	93	0%
TOTAL	**4,161**	**100%**	**16,998**	**100%**	**29,591**	**100%**

Source: BTS, 2014; and SGS Economics and Planning, 2015.
Notes: Projected mining employment is as per BTS forecast, and only takes into account staging of mining operations inherent in the information available to the BTS when the forecast was produced.

3.4   Summary

The SGS employment forecasts alter the spatial distribution and industry composition (structural change) of BTS (2014) projected jobs at the GMA level due to modelled population growth at the GMIA. However, it is assumed that there are no net additions to the GMA labour market. As a result, the BTS control totals remain unchanged.

Using BTS employment forecasts as a starting point, it is estimated that employment in the GMIA would be around 17,000 by 2036. This estimate is largely based on the *SGS Population-Driven Employment projection model* and is linked to the projected population increase for the GMIA. At total capacity (based on the UCF estimate for of 190,000 persons), the total employment is expected to be around 30,000 jobs. It is anticipated that the majority of employment increase would be population servicing industries such as retail, food services and education.

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4 LAND AND FLOORSPACE REQUIREMENTS

Overview

This section outlines the methodology undertaken to model an 'optimal distribution' of future employment lands across the GMIA. The aim of this was to simulate where employment growth would ideally locate across a growing GMIA landscape. The outputs from Section 2 and Section 3 of this report have been combined to forecast the employment demand under a total capacity scenario.

4.1 Introduction

The primary assumption within this section is that land supply within the GMIA is fundamentally unconstrained policy agendas and ownership issues. This creates a platform for considering a UCF rather than an urban suitable footprint.

The process required many inputs, though, it can be broken down into three main sections: employment land demand, employment land supply and employment land allocation (Figure 7 overleaf). The following segments outline the method used, including inputs and assumptions as well as analysis and findings.

FIGURE 7. LAND DEMAND, LAND SUPPLY AND LAND ALLOCATION FLOW CHART
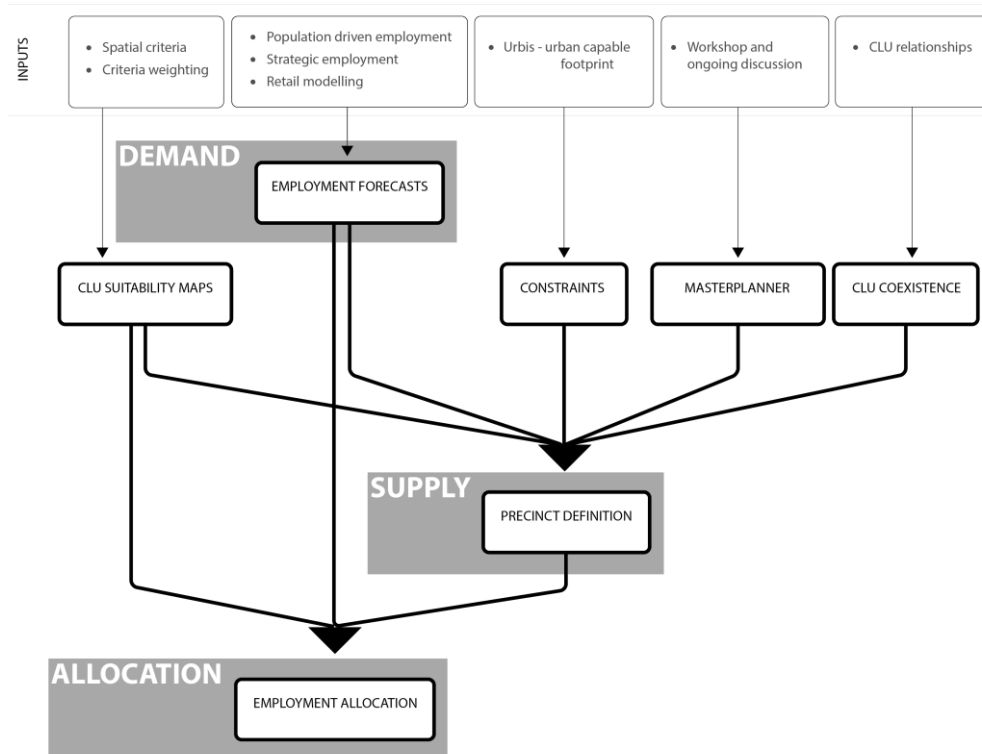
Source: SGS Economics and Planning, 2015. Note: CLU = Categories of Land Use.

4.2 Employment land demand

To this point in the report, employment has been considered in terms of jobs by industry (ANZSICs). These industry definitions offer a description of the business category of employment, but do not directly relate to built-form and land use. For example, when looking at the employment numbers within the industry of *Agriculture, Forestry and Fishing* the total job number includes jobs located on a farm or plantation while also including jobs within an office in management of that farm or plantation. One job could be in a rural setting, the other within an office block in the city, however, both are included in the *Agriculture, Forestry and Fishing* total ANZSIC job number. To this end, ANZSIC industries are converted to Categories of Land Use (CLU) that better consider the function of the land required to accommodate employment demand (CLUs are explained overleaf and a detailed description is provided in the Appendix).

Agriculture, Forestry and Fishing and *Mining* employment have been removed from the analysis at this point under the assumption that with an urban capable supply of land, existing mining and agricultural companies will continue to operate, but will not require additional floorspace within the precinct in the future.

Construction jobs have been discounted to account for non-floorspace driven employment. This adjustment considers the nature of the construction industry, where approximately 56 percent of employment is project based and does not require static floorspace to operate. These jobs are on construction sites and have been removed from the calculation of floorspace demand for the *Construction* industry.

Jobs by ANZSIC to CLU

ANZSIC job numbers have been translated into seven SGS derived classifications called 'Category of Land Use' (CLU). This translation was conducted to better consider the function of the land required to accommodate employment demand. The following is a list of the CLUs adopted throughout this section of the modelling and report. A detailed description of CLUs, spatial criteria and weightings is provided in the Appendix.

- **Strategic centre retail and office (SCRO)**: Located in identified major centres, SCRO takes the form of multi-level, mixed-use buildings with ground floor retail, high public transport accessibility and is often centred on a train station or major bus route interchange. SCRO requires an urban setting.
- **Other office and retail (OOR):** Retail and commercial cluster servicing a local population. OOR is generally ground floor retail with office or shop-top residential above with on street parking or small carpark adjacent. OOR has good public transport connections and is often located proximate to civic buildings (town halls, libraries and so on). Examples: Town centres, corner shops, local shop cluster.
- **Large format retail (LFR):** Large, warehouse-style retail buildings typically surrounded by or including a large amount of car parking. Situated on commercial centre periphery or in independent clusters.
- **Local industry (LI):** Clustered in industrial areas, LI services a local area. This CLU is typically small industrial lot sizes, workshop buildings with some possible office function. LI requires a large degree of functional hardstand for service delivery and operational space. Can be nearby surrounding residential and commercial community. Example: Car repairs; joinery and building supplies.
- **Subregional industry (SI):** SI is found clustered in large industrial areas and its role is to service a broad catchment. It is characterised by larger lot sizes and often large warehouse buildings are common. SI requires a large degree of functional hardstand for service delivery and operational space. SI requires physical separation from residential development and often has a low degree of public transport accessibility due to its remoteness. The SI CLU requires high levels of car and truck access, close proximity to arterial roads and motorway on/off ramps and possible access to freight rail. Example: Subregional warehousing, freight & logistics (such as food distribution).
- **Footloose (F):** Footloose has little customer relation to its surrounding area as its primary function is to service a metropolitan or larger area. This CLU has larger lot sizes and often with large warehouse

buildings are common. Similar to SI, the Footloose CLU requires a large degree of functional hardstand for service delivery and operational space and requires physical separation from residential development. As per SI, Footloose needs high levels of car and truck access, close proximity to arterial roads and motorway on/off ramps and possible access to freight rail Example: Manufacturing, major freight and logistics (such as DHL), regional distribution facilities.

– **Dispersed (D):** Industries that do not fit into local, subregional or footloose categories. Dispersed uses are not tied to industrial precincts and vary in size, location (hence being dispersed), and often role.

Demand for employment land

The spatial requirements of jobs vary between industries and CLUs. In centre office jobs will require less floorspace, and in turn less gross land area per job, when compared to freight and logistics employment, which requires warehousing and storage space as well as hardstand areas for trucking and machinery operations. Using employment density ratios and floorspace ratios, a forecast was produced for the study area by Categories of Land Use. Table 10 shows the ratios used to determine the amount of gross land area (LA) the GMIA will require to accommodate forecast employment growth. The 'LA per job' column was calculated by dividing the job density (floorspace/job) by the FSR (floorspace/LA). The figures used have been derived from previous employment lands studies undertaken by SGS and cross-checked against results from other employment lands reports.

TABLE 10. GROSS LAND AREA RATIO PER JOB RATIO

CLU	Job density	FSR		LA per job	LA per job
	FS sqm/Job	FS sqm/LA sqm		sqm/job	Ha/job
Strategic centre retail and office	30	1		30	**0.003**
Other office and retail	35	0.75		47	**0.005**
Large format retail	70	0.3		233	**0.023**
Local industry	100	0.3		333	**0.033**
Subregional industry	140	0.3		467	**0.047**
Footloose	150	0.3		500	**0.050**

Source: SGS Economics and Planning; 2015, Syne Marmion & Co., 2008. Note: the FSRs used are low and include an allowance for internal roads.

4.3   Employment land supply

Considering the supply of land to meet this demand, SGS has defined employment precincts by looking at five influencing factors;

– Input 1: the suitability of land for each CLU
– Input 2: the development constraints on land within the GMIA
– Input 3: work carried out in previous sections or by the masterplanner on the requirements of centres within the GMIA
– Input 4: the ability of CLUs to coexist and function within a potential precinct
– Input 5: the amount of land required to accommodate the forecast employment

Each of these inputs had influence over the precinct definition process.

FIGURE 8. LAND SUPPLY INPUTS
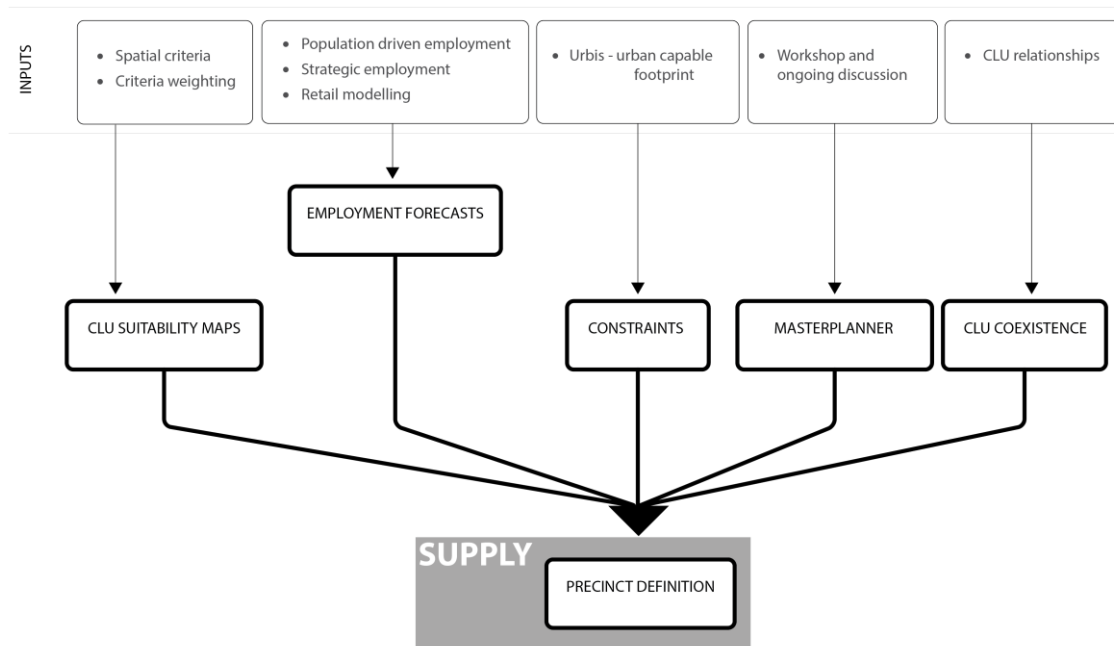
Source: SGS Economics and Planning, 2015.

Input 1: CLU suitability analysis

The suitability for CLUs to locate in an area has been determined by the proximity to key spatial criteria. For example, freight and logistics hubs operating at a Subregional Industry level require high accessibility to motorway on and off ramps and arterial roads in order to operate efficiently. Subregional Industry also does not want to be located close by residential areas as noise and other pollutants can lead to land use conflicts.

SGS has considered the spatial requirements of each CLU and created a list of 16 spatial criteria that impact the spatial suitability for CLUs to locate. Each criterion will influence the suitability of each CLU to differing extents and therefore the criteria for each CLU has a unique weighting. An example can be seen in Table 11 overleaf.

The proximity of land within the GMIA boundary to each suitability criterion measured at a fine grain (sub-cadastral level). This calculation measures the distance along the existing road network from an origin point to the closest criteria point. Typically the closer an origin point is to the destination point (the criterion, for example a train station) the more favourable it is considered. Each individual origin point has distance values calculated for each spatial criterion. These are then brought together using the weightings as a multiplier to calculate a final score or index for the origin point for an individual CLU. This individual score represents the origin point's relative suitability for that CLU. Each origin point has a unique CLU suitability score.

The results of this suitability assessment for each CLU, along with the full list of spatial criteria and their related weighting can be seen in the Appendix. The suitability analysis was used as a starting point for the allocation and was completed based on the existing and known future infrastructure within the GMIA. Once specialist studies were completed, such as the transport study on future road and public transport connections, the outputs of these were qualitatively sense-checked against the suitability assessment. Where there were changes to important spatial criteria from other specialist studies, such as new major roadways or public transport stations, then the allocation of employment was updated to incorporate such changes.

TABLE 11. ATTRIBUTE RANKING: STRATEGIC CENTRES RETAIL AND OFFICE

Attribute	Score/ranking	Justification
Rail Station	100	Access to rail stations is critical in the location of strategic centres to ensure highest levels of accessibility, encouraging multi-purpose trips whilst reducing need for cars
Shopping Centre	100	Critical as it forms the core of a strategic centre
Population density	100	Critical as a strategic centre is supporting infrastructure for residential population and requires population in order to thrive
Arterial roads	60	Access to centres from surrounding areas is important but not critical
TAFEs & Colleges	56	Desirable to cluster activities including TAFEs & colleges as they may provide ancillary services or be part of a centre
Universities	56	Desirable to cluster activities including Universities as they may provide ancillary services or be part of a centre
Motorway on/off Ramps	50	Access to centres from surrounding areas is important but not critical given availability of public transport alternatives
Lot size	30	Lot size has an influence on the development of centres, but is not essential due to range of use types in such centres and ability for centres to develop multiple shopfronts, or amalgamate smaller lots for larger development
All Retail	30	Location near local retail providers is not essential due to the CLU offering the same facilities at a broader level
Hospital	30	Hospitals have some influence on the location of centres as they may provide ancillary services supporting a hospital. A large working population is also likely to require access to hospital services
Secondary Schools	25	Desirable to cluster activities with this CLU including schools but not critical
Preschools	20	Pre-schools may have some relevance to people employed in centres who require pre-school services
Aged Care	20	Proximity to aged care assists those in it by reducing distances to travel for major services
Primary Schools	15	Desirable to cluster activities with this CLU including schools but not critical
RE1 open space	0	Proximity to public open space does not influence the location of strategic centres due to their need to be surrounded by density

Source: SGS Economics and Planning, 2015.

Input 2: Development constraints

Constrained land boundaries were adopted from the analysis conducted by the masterplanner, using technical consultant inputs, creating an 'urban capable' footprint. For the UCF, all lands are considered as potential supply for employment lands unless they have been identified as constrained.

Input 3: Existing work

Following the completion of the centres based retail analysis in Section 2, it was identified that the GMIA has the capacity for 14 retail centres. A preliminary series of retail centres was identified for the GMIA by the masterplanner.

The centre location and hierarchy from these previous stages of work have formed the basis for the definition of centre-based employment precincts. Centre based CLUs, Strategic Centre Retail and Office, Other Office and Retail and Dispersed have been apportioned according to the hierarchy of the centres; although Dispersed, which includes health and education uses can operate both inside and outside of centres.

Input 4: CLU coexistence

As each CLU requires different amenities from its surroundings, it follows that some CLUs do not operate successfully or effectively in close proximity to each other, while others benefit from proximity. These coexistence relationships can be seen in Figure 9. This figure shows a series of positive/negative relationships between the CLUs as well as whether these relationships are encouraged/absolute or rather in a less strict nature, allowable/undesirable. These CLU coexistence relationships have been used to determine the nature of the identified employment precincts.

FIGURE 9. CLU COEXISTENCE

Source: SGS Economics and Planning, 2015.

Input 5: Demand quantity

The total land area by CLU has been used as an input to precinct definition to identify the size of potential precincts. Land area is expressed in hectares. Having identified the demand amount by CLU, the most suitable areas by CLU and the nature of potential coexistence within precincts, the size of each precinct is assessed to ensure total demand would have sufficient supply considering constrained lands.

Precinct definition method

Each of the five inputs have been brought together to identify future employment precincts and their roles in accommodating the GMIA's future employment. CLUs can be split into two categories: in-centre activities and out-of-centre activities. Despite some industries (such as Light Industrial and Large Format Retail) wanting to locate on the fringe of centres to access the immediate population base, Dispersed is the only CLU that operates both inside and outside of centres.

In-centre employment is defined as all employment within CLUs; namely Strategic Centre Retail and Office, Other Office and Retail and Dispersed. Precincts identified to absorb this demand are determined primarily using the centre hierarchy created by the masterplanner and refined by SGS, as well as a desktop review of existing urban form constraints at these proposed locations.

Out-of-centre employment is defined as Light Industrial, Subregional Industry and Footloose. The definition of precincts to accommodate employment in these CLUs is primarily driven by the suitability

analysis and development constraints. When looking at the suitability mapping outputs, it is evident that some CLUs are suitable across the same areas. This is due to similarities in their operational requirements and hence similarities in their criteria weightings. Using the CLU coexistence framework, it was possible to identify precincts and what CLUs they could accommodate.

Large Format Retail is primarily considered edge-of-centre or out-of-centre in dedicated precincts. It has been found that 68 percent will be allocated to the edge of the proposed Wilton Junction Strategic Centre. The area identified to accommodate this Large Format Retail demand is on the eastern fringe of Wilton Junction's boundary, and has been considered as part of the Wilton Junction precinct.

Table 12 outlines the resultant proportional split for CLU allocation to employment precincts.

TABLE 12. APPORTIONMENT OF CLU TO POTENTIAL EMPLOYMENT PRECINCTS

Precinct	D	F	LFR	LI	OOR	SCRO	SI
Appin	1.53%	0.00%	0.00%	0.00%	1.00%	0.00%	0.00%
Appin Industrial	0.00%	0.00%	0.00%	5.44%	0.00%	0.00%	0.00%
Bingara Gorge	1.53%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%
Cataract River	1.92%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%
Douglas Park	0.00%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%
Douglas Park North Industrial	0.00%	61.15%	0.00%	45.00%	0.00%	0.00%	57.11%
Gilead	10.93%	0.00%	0.00%	0.00%	15.00%	0.00%	0.00%
Maldon	0.00%	38.85%	0.00%	38.68%	4.00%	0.00%	42.89%
Menangle	0.58%	0.00%	0.00%	0.00%	3.00%	0.00%	0.00%
Menangle Park	13.04%	0.00%	0.00%	0.00%	15.00%	0.00%	0.00%
North Appin	0.75%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%
North Douglas Park	5.56%	0.00%	0.00%	0.00%	15.00%	0.00%	0.00%
North Gilead	0.00%	0.00%	16.13%	5.44%	0.00%	0.00%	0.00%
South Appin	17.26%	0.00%	15.25%	0.00%	22.00%	0.00%	0.00%
South Gilead	0.58%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%
West Wilton Junction	0.58%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%
Wilton Industrial	0.00%	0.00%	0.00%	5.44%	0.00%	0.00%	0.00%
Wilton	0.75%	0.00%	0.00%	0.00%	1.00%	0.00%	0.00%
Wilton Junction	45.00%	0.00%	68.62%	0.00%	0.00%	100.00%	0.00%

Source: SGS Economics and Planning, 2015.

4.4   Employment land allocation

To simulate the distribution of employment at total capacity, the employment growth (demand) has been allocated to the identified employment precincts (supply), under the assumption that the demand is allocated to the most suitable land in increments of one hectare (Table 13). Timing of demand has been modelled based on the BTS demand forecasts at five yearly increments. This is subject to refinement based on input from the housing consultant. The main assumptions for the employment land allocation process are:

− Timing of employment demand at a GMIA aggregate level follows BTS forecasts, in five yearly intervals
− Precincts have a defined allocation amount by CLU
− Demand is allocated by CLU one at a time, to most suitable available land until capacity of precinct is reached or demand by CLU is exhausted for that period

FIGURE 10.   LAND ALLOCATION INPUTS
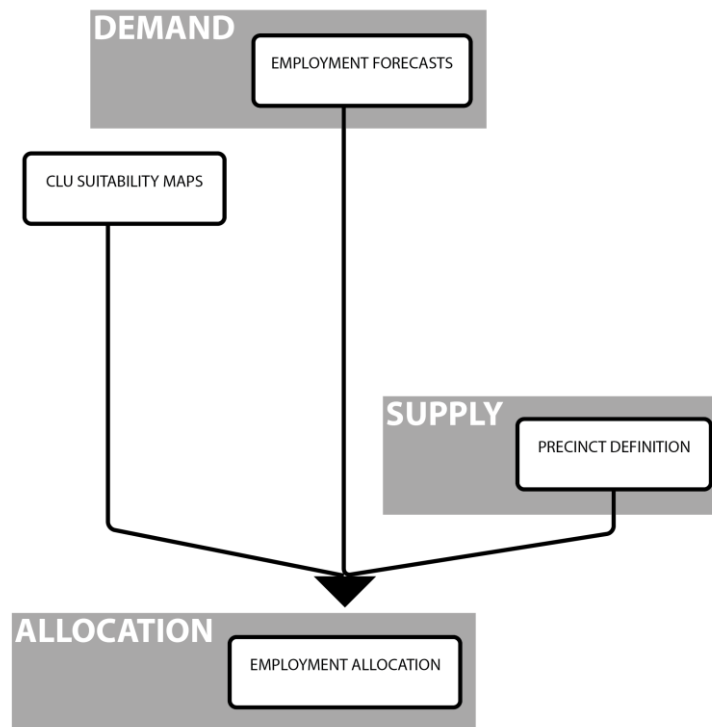
Source: SGS Economics and Planning, 2015.

The allocation model exhausts a single CLU's demand before moving to the next precinct in the following order: Footloose, Subregional Industry, Light Industrial, Strategic Centre Retail and Office, Large Format Retail, Other Office and Retail and finally Dispersed. As the distribution of employment is already defined during the precinct definition process, allocating each CLU singularly does not limit the possibility of CLU coexistence within precincts.

Table 13 and Figure 11 (overleaf) display the allocation of demand across the GMIA. A total of approximately 317 hectares of employment land has been allocated across 15 centres and four industrial precincts. The results show that Wilton Junction Strategic Centre is expected to accommodate around 16 hectares of Strategic Centre Retail and Office, 20 hectares of Large Format Retail and 20 hectares of Dispersed (which would include health and education uses[3]). The Douglas Park North Industrial precinct is expected to accommodate approximately 99 hectares of employment uses.

TABLE 13. LAND ALLOCATION BY CLU BY POTENTIAL PRECINCT

Precinct	D	F	LFR	LI	OOR	SCRO	SI	Total
Appin	0.7	-	-	-	0.4	-	-	1.1
Appin Industrial	-	-	-	4.3	-	-	-	4.3
Bingara Gorge	0.7	-	-	-	1.6	-	-	2.3
Cataract River	0.8	-	-	-	1.6	-	-	2.5
Douglas Park	-	-	-	-	1.6	-	-	1.6
Douglas Park North Industrial	-	29.1	-	35.8	-	-	33.6	98.5
Gilead	4.8	-	-	-	6.1	-	-	10.9
Maldon	-	18.5	-	30.8	1.6	-	25.2	76.1
Menangle	0.3	-	-	-	1.2	-	-	1.5
Menangle Park	5.7	-	-	-	6.1	-	-	11.8
North Appin	0.3	-	-	-	1.6	-	-	2.0
North Douglas Park	2.4	-	-	-	6.1	-	-	8.5
North Gilead	-	-	4.9	4.3	-	-	-	9.2
South Appin	7.5	-	4.6	-	9.0	-	-	21.1
South Gilead	0.3	-	-	-	1.6	-	-	1.9
West Wilton Junction	0.3	-	-	-	1.6	-	-	1.9
Wilton Industrial	-	-	-	4.3	-	-	-	4.3
Wilton	0.3	-	-	-	0.4	-	-	0.7
Wilton Junction	19.6	-	20.9	-	-	16.3	-	56.8
Total	**43.5**	**47.6**	**30.5**	**79.6**	**40.7**	**16.3**	**58.7**	**316.9**

Source: SGS Economics and Planning, 2015. Note: numbers are rounded

[3] Dispersed uses have been allocated to centres, but many dispersed uses such as health and education can operate outside of centres.

FIGURE 11.   POTENTIAL EMPLOYMENT LAND ALLOCATION
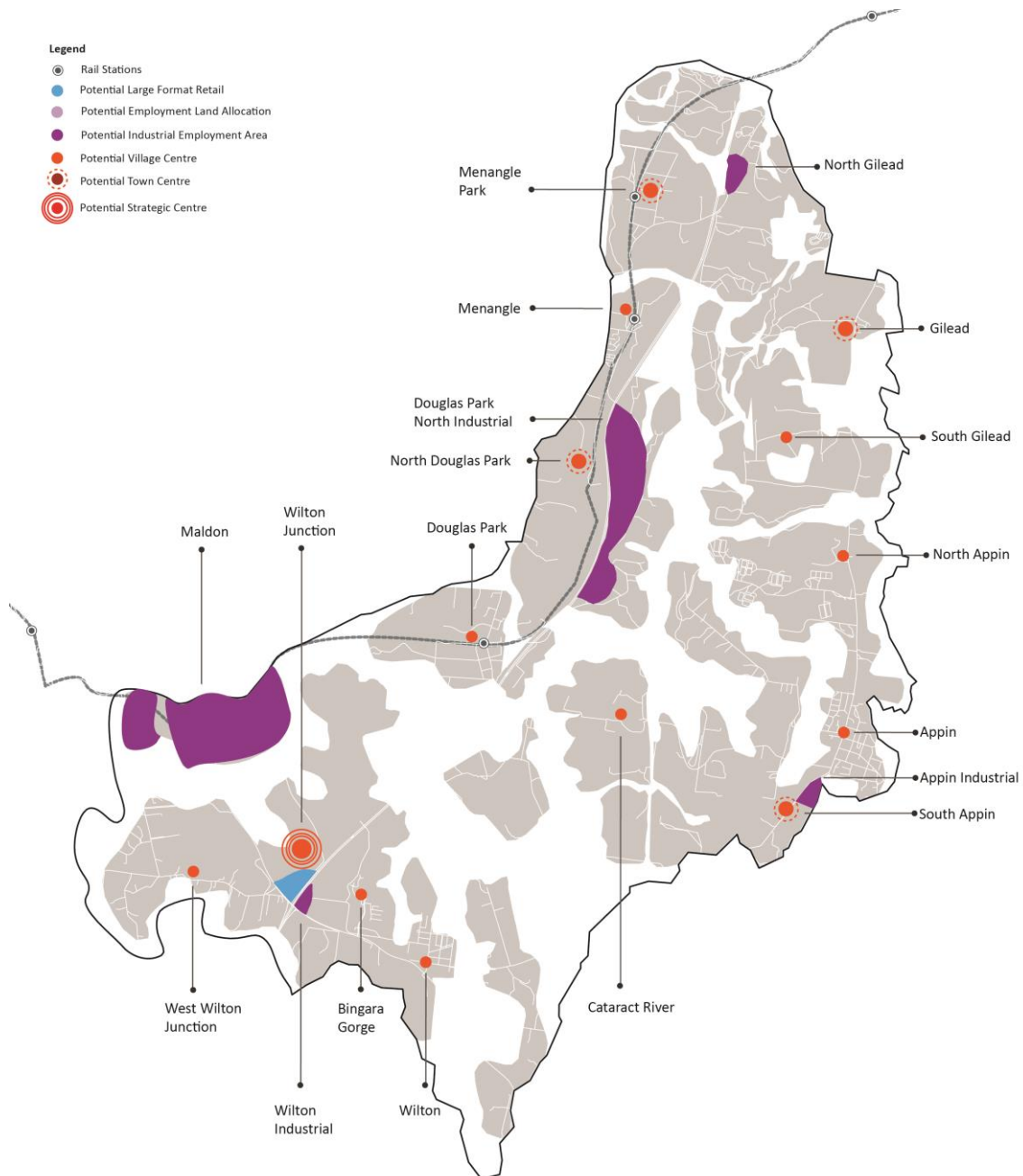
Source: SGS Economics and Planning, 2015. Note: Size of employment precincts are indicative only.

The employment land (hectares), gross floorspace (hectares) and associated jobs by CLU for each precinct shown in Figure 11 is shown in Table 14.

TABLE 14. EMPLOYMENT LAND (HA), FLOORSPACE(HA) AND JOBS FOR POTENTIAL GMIA CENTRES

Precinct	Dispersed			Footloose			Large Format Retail			Light Industry			Other Office and Retail			Strategic Centre Retail and Office			Subregional Industry			Total		
	Land	Floorspace	Jobs	Land	Floorspace	Jobs	Land	Floorspace	Jobs	Land	Floorspace	Jobs	Land	Floorspace	Jobs	Land	Floorspace	Jobs	Land	Floorspace	Jobs	Land	Floorspace	Jobs
Appin	0.7	0.3	59	-	-	-	-	-	-	-	-	-	0.4	0.3	100	-	-	-	-	-	-	1.1	0.6	160
Appin Industrial	-	-	-	-	-	-	-	-	-	4.3	1.3	130	-	-	-	-	-	-	-	-	-	4.3	1.3	130
Bingara Gorge	0.7	0.3	59	-	-	-	-	-	-	-	-	-	1.6	1.2	402	-	-	-	-	-	-	2.3	1.5	461
Cataract River	0.8	0.3	74	-	-	-	-	-	-	-	-	-	1.6	1.2	402	-	-	-	-	-	-	2.5	1.6	476
Douglas Park	-	-	-	-	-	-	-	-	-	-	-	-	1.6	1.2	402	-	-	-	-	-	-	1.6	1.2	402
Douglas Park North Industrial	-	-	-	29.1	8.7	582	-	-	-	35.8	10.8	1,075	-	-	-	-	-	-	33.6	10.1	719	98.5	29.5	2,376
Gilead	4.8	1.9	423	-	-	-	-	-	-	-	-	-	6.1	4.6	1,506	-	-	-	-	-	-	10.9	6.5	1,929
Maldon	-	-	-	18.5	5.5	370	-	-	-	30.8	9.2	924	1.6	1.2	402	-	-	-	25.2	7.6	540	76.1	23.6	2,235
Menangle	0.3	0.1	22	-	-	-	-	-	-	-	-	-	1.2	0.9	301	-	-	-	-	-	-	1.5	1.0	323
Menangle Park	5.7	2.3	504	-	-	-	-	-	-	-	-	-	6.1	4.6	1,506	-	-	-	-	-	-	11.8	6.9	2,010
North Appin	0.3	0.1	29	-	-	-	-	-	-	-	-	-	1.6	1.2	402	-	-	-	-	-	-	2.0	1.4	431
North Douglas Park	2.4	1.0	215	-	-	-	-	-	-	-	-	-	6.1	4.6	1,506	-	-	-	-	-	-	8.5	5.5	1,721
North Gilead	-	-	-	-	-	-	4.9	1.5	227	4.3	1.3	130	-	-	-	-	-	-	-	-	-	9.2	2.8	357
South Appin	7.5	3.0	668	-	-	-	4.6	1.4	214	-	-	-	9.0	6.7	2,208	-	-	-	-	-	-	21.1	11.1	3,091
South Gilead	0.3	0.1	22	-	-	-	-	-	-	-	-	-	1.6	1.2	402	-	-	-	-	-	-	1.9	1.3	424
West Wilton Junction	0.3	0.1	22	-	-	-	-	-	-	-	-	-	1.6	1.2	402	-	-	-	-	-	-	1.9	1.3	424
Wilton Industrial	-	-	-	-	-	-	-	-	-	4.3	1.3	130	-	-	-	-	-	-	-	-	-	4.3	1.3	130
Wilton	0.3	0.1	29	-	-	-	-	-	-	-	-	-	0.4	0.3	100	-	-	-	-	-	-	0.7	0.4	129
Wilton Junction	19.6	7.8	1,741	-	-	-	20.9	6.3	965	-	-	-	-	-	-	16.3	16.3	4,684	-	-	-	56.8	30.4	7,390
Total	43.5	17.4	3,869	47.6	14.3	951	30.5	9.1	1,406	79.6	23.9	2,389	40.7	30.5	10,038	16.3	16.3	4,684	58.7	17.6	1,259	316.9	129.2	24,596

Source: SGS Economics and Planning, 2015. Note: These are *additional* jobs at total capacity (above the existing 1,800 jobs) and have completely discounted agriculture and mining jobs and partially discounted construction jobs which do not require floorspace.

Role and function of centres

Table 15 shows the suggested role and function of the various retail and employment precincts and provides context for the selection of these various locations within the GMIA.

TABLE 15. POTENTIAL ROLE AND FUNCTION OF PRECINCTS

Precinct	Role and function
Appin	Appin is proposed to continue its role as a small village centre. Given surrounding uses and fragmented ownership, it has not been identified for expansion.
Appin Industrial	Appin Industrial is proposed to continue and expand its role as a local service industrial site.
Bingara Gorge	Bingara Gorge is expected to continue its role as a local village centre.
Cataract River	Cataract River has been identified as a small village centre servicing the local catchment.
Douglas Park	Douglas Park has been identified to continue and expand its role as a village centre.
Douglas Park North Industrial	Douglas Park North Industrial has been identified as the largest industrial precinct for the GMIA. Its location is favourable with access to the Hume Highway (assuming on/off ramps are constructed) and it is likely that the Outer Sydney Orbital may connect with the Hume Highway nearby.
Gilead	Gilead has been identified a town centre servicing the northern residential development catchment.
Maldon	Maldon has been identified to continue its heavy industrial role and expand to meet future Subregional Industrial and Footloose development.
Menangle	Menangle has been identified as a small village centre servicing the local catchment.
Menangle Park	Menangle Park has been identified as a town centre servicing the northern residential catchment to the west of the Hume Highway.
North Appin	North Appin has been identified as a small village centre servicing the local catchment.
North Douglas Park	Douglas Park North has been identified as a future potential town centre or large village centre.
North Gilead	North Gilead has been identified as a future industrial precinct to service the northern residential catchment.
South Appin	South Appin is proposed to be a large town centre servicing the southern residential catchment.
South Gilead	South Gilead has been identified as a small village centre servicing the local catchment.
West Wilton Junction	West Wilton Junction has been identified as a small village centre servicing the local catchment.
Wilton Industrial	Wilton Industrial area has already been identified as a future local service industrial precinct. It is anticipated that the precinct will continue this role.
Wilton	Wilton is expected to service its role as a small village centre. Given surrounding uses and fragmented ownership, it has not been identified for expansion.
Wilton Junction	Wilton Junction has been identified the strategic centre in the GMIA. It is accessible to the southern population catchment of the GMIA, as well as to the residential populations to the south in Wollondilly, and could be linked to a future rail electrification extension across to Maldon.

Source: SGS Economics and Planning, 2015.

The potential zones that could be used to support the role and function of the various retail and employment centres have been considered. Table 16 shows the likely zones which may be most appropriate to support the different CLUs. It should be noted that Dispersed floorspace may also be present in residential zones as home businesses and industries.

TABLE 16. EXAMPLE ZONES BY CLU

CLU	Example zones
D	B1, B2, B4, B5, B6
F	IN1, IN3
LFR	B2, B3, B4, B5, B6, B7, IN2
LI	IN1, IN2
OOR	B1, B2, B4,
SCRO	B1, B2, B4, B5, B6, B7
SI	IN1, IN3

Source: SGS Economics and Planning, 2015.

These example zones have been applied to each of the retail and employment centres in Table 17. These zones are indicative and actual land zoning may include one, all or a mixture of the example zones.

TABLE 17. EXAMPLE ZONES BY CENTRE AND CLU

Precinct	D	F	LFR	LI	OOR	SCRO	SI
Appin	B1, B2, B4, B5, B6				B1, B2, B4,		
Appin Industrial				IN1, IN2			
Bingara Gorge	B1, B2, B4, B5, B6				B1, B2, B4,		
Cataract River	B1, B2, B4, B5, B6				B1, B2, B4,		
Douglas Park					B1, B2, B4,		
Douglas Park North Industrial		IN1, IN3		IN1, IN2			IN1, IN3
Gilead	B1, B2, B4, B5, B6				B1, B2, B4,		
Maldon		IN1, IN3		IN1, IN2	B1, B2, B4,		IN1, IN3
Menangle	B1, B2, B4, B5, B6				B1, B2, B4,		
Menangle Park	B1, B2, B4, B5, B6				B1, B2, B4,		
North Appin	B1, B2, B4, B5, B6				B1, B2, B4,		
North Douglas Park	B1, B2, B4, B5, B6				B1, B2, B4,		
North Gilead			B2, B3, B4, B5, B6, B7, IN2	IN1, IN2			
South Appin	B1, B2, B4, B5, B6		B2, B3, B4, B5, B6, B7, IN2		B1, B2, B4,		
South Gilead	B1, B2, B4, B5, B6				B1, B2, B4,		
West Wilton Junction	B1, B2, B4, B5, B6				B1, B2, B4,		
Wilton Industrial				IN1, IN2			
Wilton	B1, B2, B4, B5, B6				B1, B2, B4,		
Wilton Junction	B1, B2, B4, B5, B6		B2, B3, B4, B5, B6, B7, IN2			B1, B2, B4, B5, B6, B7	

Source: SGS Economics and Planning, 2015.

4.5 Summary

Employment land demand

The emphasis of this modelling was to test the distribution, apportionment and location of employment land demand across the GMIA under a total capacity scenario. The employment forecast has been converted from ANZSIC categories into Categories of Land Use (CLU), to better reflect the required built form and urban amenities required to perform the employment activity. Demand for employment land was derived by using the both the inputs from Section 2 and Section 3. The retail floorspace figures were converted into land demand by using benchmark FSRs. The other employment forecast was converted from jobs to land by using jobs density benchmarks. The *Agriculture, Forestry and Fishing* and *Mining* industries were discounted as these jobs are not likely to be associated with floorspace in the GMIA. Under a total capacity scenario there is forecast demand for approximately 317 hectares of employment land in the following categories:

– Strategic centre retail and office: 16 hectares
– Other office and retail: 41 hectares
– Large format retail: 31 hectares
– Local industry: 80 hectares
– Subregional industry: 59 hectares
– Footloose: 48 hectares
– Dispersed: 44 hectares

Land suitability and employment allocation

When viewing the outputs of the CLU suitability mapping (see the Appendix), it is apparent that there are several areas of consistent suitability across each of the CLUs. The land to the west and east of the Picton Road - Hume Motorway junction is highly suitable for most of the CLU types, especially the industrial and large format industries. This is due to the high connectivity with road infrastructure, the existing large lot structure and the separation from existing population. Maldon and North Douglas Park Industrial (around Moreton Park Road) have been identified as a prime candidates to accommodate the Strategic Industry and Footloose demand for the GMIA due to existing industrial clusters, access to rail and the Hume Highway.

Wilton Junction has been identified as a suitable location for the strategic centre identified for the GMIA. This location also has been identified as opportune for some of the Large Format Retail demand along Picton heading south out of the identified centre precinct boundary.

The suitability apparent across most of the CLUs to the north of the GMIA boundary, is driven by the existing population and social and transport infrastructure in the suburbs to the north and north east. Gilead Industrial has been identified as the primary catchment for significant employment growth in the north of the GMIA. The distribution of centres as identified by the masterplanner has greater emphasis, compared to the suitability mapping, in determining the centre hierarchy and distribution of centre based activities. Four town centres were identified at Gilead, South Appin, Menangle Park and North Douglas Park.

It should be noted that the staging and sequencing of development can affect and alter the identified allocation of employment land in the GMIA. This is discussed in future detail in the following section.

5 DEVELOPMENT STAGING AND SEQUENCING

Overview

This section discusses the potential development staging and sequencing of employment precincts and centres in the GMIA, as well as a discussion on how continued mining operations might affect staging and sequencing. A list of centre and employment development principles are also outlined to provide guidance on future centre and employment, should development not proceed as expected.

5.1 Staging

Given that the major industries within the GMIA are population-driven, it is expected that much of the employment growth will grow broadly in line with population growth. Although, this does not necessarily imply that there will be a linear increase of floorspace each year – development often occurs in 'fits and starts', based on commercial property developer imperatives.

Strategic employment development is not linked to population growth and theoretically could occur at any stage, depending on the broader strategic employment lands market. If appropriate development infrastructure was implemented, then strategic development would likely accelerate.

Government intervention, in the form of early public transport would be important to attract early jobs and create employment momentum. Similarly, providing large catalytic social infrastructure would provide an employment stimulus.

Given substantial infrastructure costs and environmental constraints, only Menangle Park, Mount Gilead and Wilton Junction have been considered for staging up to 2036. Table 18 shows the indicative staging for development in Menangle Park, Mount Gilead and Wilton Junction and other employment centres shown in Figure 11. Again, population driven employment should be expected to occur broadly in-line with population growth and strategic employment could occur at any stage, as long as the relevant infrastructure is in place, as it is not directly related to local population growth. The population growth rate has been based on the housing and infrastructure studies. Population growth was assumed to be linear up to 2036 and the amount of employment development in supporting centres is expected to ramp up as the population base in each area becomes mature. Employment development will follow a circular and cumulative causation, whereby employment development will feed off established employment and increase in size over time. Once a critical mass of population serving activities are located in centre, then strategic employment will likely follow.

It is expected that industrial employment in Maldon will ramp up over time and that the North Douglas Park Industrial precinct will come online somewhere between 2021 and 2026. The rate of development at both of these precincts will depend on owner intentions, infrastructure provision, the broader subregional and regional industrial lands market and feasibility.

While there will be an imperative to ensure that the proposed employment lands and the strategic centre at Wilton Junction does not adversely compete with existing employment lands and centres in

established areas, this will be tempered by the need to stimulate local employment development. Notwithstanding, any employment development in the GMIA should be in centres and designated employment lands.

TABLE 18. STAGING OF POTENTIAL EMPLOYMENT PRECINCTS

Precinct / centre	2016 - 2021	2021 - 2026	2026 - 2031	2031 - 2036	Total capacity (beyond 2036)	Total
Appin	-	-	-	-	1.1	1.1
Appin Industrial	-	-	-	-	4.3	4.3
Bingara Gorge	0.9	0.6	0.5	0.3	-	2.3
Cataract River	-	-	-	-	2.5	2.5
Douglas Park	-	-	-	-	1.6	1.6
Douglas Park North Industrial	-	-	-	-	98.5	98.5
Gilead	1.1	2.7	3.3	3.8	-	10.9
Maldon	3.8	11.4	15.2	19.0	26.6	76.1
Menangle	-	-	-	-	1.5	1.5
Menangle Park	1.2	2.9	3.5	4.1	-	11.8
North Gilead	-	-	2.8	2.3	4.2	9.2
North Appin	-	-	-	-	2	2
North Douglas Park	-	-	-	-	8.5	8.5
South Appin	-	-	-	-	21.1	21.1
South Gilead	-	0.5	0.7	0.8	-	1.9
West Wilton Junction	-	0.5	0.7	0.8	-	1.9
Wilton Industrial	0.6	0.6	1.3	1.7	-	4.3
Wilton	0.2	0.3	0.2	0	-	0.7
Wilton Junction	3.2	3.9	6.5	8.6	34.6	56.8

Source: SGS Economics and Planning, 2014. Note: Numbers are rounded.

5.2 Sequencing

As aforementioned, the sequencing of the GMIA will be focussed on Menangle Park, Mount Gilead and Wilton up to 2036.

Within precincts the sequencing will again be led by residential development. As the local population increases it is likely that demand for smaller centres or convenience retail and services will transpire first. While this employment floorspace could form the part of any of the proposed village centres, it is important that early centre development should be directed to those centres higher in the hierarchy identified as town or strategic centres at Menangle Park, Gilead and Wilton Junction. The development of these centres as the 'first cab off the rank' will ensure that they have a foothold in the market and are able to gain momentum, achieve critical mass and reach maturity (path dependence leads to positive feedbacks or 'circular and cumulative causation', which creates positive clustering and the associated beneficial agglomeration economy effects). Once employment development is established at these higher order centres, then lower order village centres should be allowed to occur.

Industrial development should be supported where proposed and employment development at Maldon and to the east of the Hume Highway at Moreton Park Road, should be encouraged early.

Employment land that has been identified as being encumbered will need to ensure pathway steps are satisfied prior to urban development occurring.

5.3   Impact of mining uses on staging and sequencing

The timing sequence of the urban capable footprint may by influenced by approved long wall coal mining. The operation of the approved Bulli Seam Operations longwall coal mine is currently planned to occur in stages up to 2041. Figure 12 shows where mining has been complete, is approved to occur over the short, medium and long term. The approved longwall mining operations could affect sequencing of potential employment lands proposed to the north and south of Picton Road and any potential expansion of the existing employment lands at Maldon. If so, demand for industrial land in this area may spill over to the identified North Douglas Park Industrial precinct. There may also be some short-medium term effects in the Menangle area.

As mentioned above, population-driven employment will broadly grow in-line with residential development. If there are no major residential development fronts on the western side of the Hume Highway below Menangle, then no new centres would develop in these locations.

The approved mining could significantly affect the proposed employment lands around Wilton Junction. This area is currently identified for the Wilton Junction Strategic Centre, with supporting large format retail. If these areas off the Hume Highway do not develop for some time, as well as any proposed expansion of the existing Maldon employment lands being potentially restricted, this may have implications for the future jobs to working resident ratio. Therefore, it will be important for local residents to have improved access jobs via good transport links to existing employment areas in the Sydney GMA.

FIGURE 12.   COMPLETED AND APPROVED LONG-WALL MINING
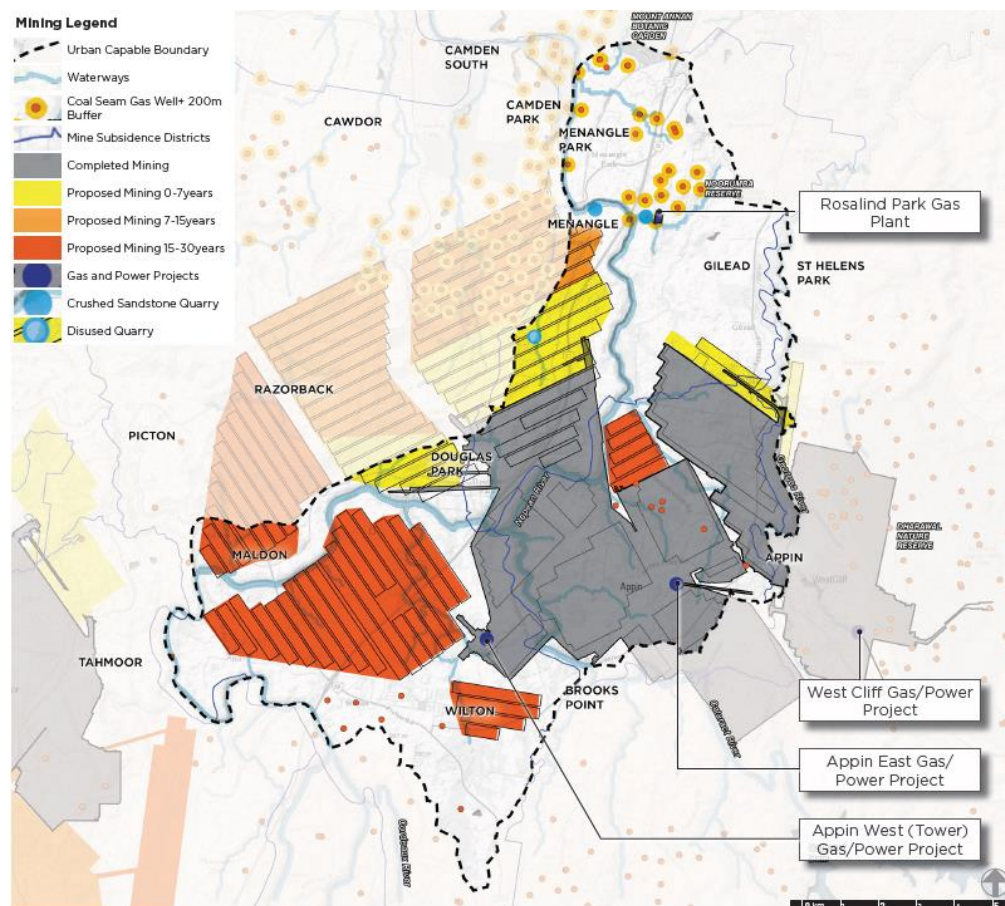
Source: Urbis, 2015.

5.4   Employment development principles

So far this report provides important spatial guidance for the amount, type and location of employment centres and precincts in the GMIA. The recommendations are based on a long term view (2050 and beyond) total capacity development of the GMIA. However, the development rate and development sequence can become spatially uneven, with particular parts of the GMIA developing at a greater rate or amount than others.

As a corollary, there is often pressure from developers to create centres or employment lands in locations that have not been masterplanned for employment. Similarly, there may be pressure to avoid providing employment lands in favour of higher value residential development. At the same time, it is critical to recognise that planning for employment precincts is a long-term exercise. Therefore, cyclical factors or short-term residential development imperatives should not be allowed to cloud 'the bigger picture' of structured, masterplanned precincts. Nevertheless planning cannot anticipate all circumstances and hence needs to be responsive to adapt to unforeseen circumstances. Aside from the spatial recommendations identified in this report, a series of principles that should be adhered to if variations from the master plan are ever contemplated are provided below.

Notwithstanding the above, the medium to long-term potential of the industrial area around Moreton Park Road (identified in this report as 'Douglas Park North Industrial') as a location for future footloose and subregional industry hub and Wilton Junction as a strategic centre must be emphasised. For example, the Hume Highway offers the opportunity as a freight breakage point for southern derived materials heading south to Sydney. It is important that the relevant planning authorities 'hold the line' in relation to this area. Freight hubs and new major centres in Sydney and Melbourne, and elsewhere around the world have long lead times from conception to delivery, spanning decades in some instances. The delivery depends on innovations and changes in approaches to distribution, land price pressures and on transport investments. In the next 20 to 30 years current and future identified employment lands in Sydney will be filling. In 30 years' time the Outer Sydney Orbital, bypassing Sydney to the west and linking to the GMIA in the south, may have developed and could likely connect with the Hume Highway nearby the proposed Douglas Park North Industrial. If footloose industrial areas are fragmented and allowed for minor subdivision and if the identified strategic centre is constrained or diminished for residential development then a major opportunity will have been lost. More particularly, any future development at the potential Wilton Junction strategic centre should be designed in a way that allows for easy expansion. This is an opportunity for the planning authorities – both Local and State Governments – to take a long term perspective.

Centre-development principles

If variations are sought to relocate the proposed potential centres, then the following criteria for assessing the suitability of new centre locations should be followed:

−   prominent location and accessibility
−   access to and integration with public transport, or the infrastructure capacity to support future public transport
−   access to the broadest possible catchment, without undermining the viability of existing centres
−   good pedestrian access
−   good road access for employees, customers and suppliers and, where necessary, capacity to provide new road infrastructure
−   close proximity to local labour markets with the skills required by business
−   high quality urban design with opportunities to integrate with surrounding land uses
−   potential to increase the amenity of the local area
−   capacity to contribute to environmental outcomes
−   environmental constraints, such as flooding

– impact on the supply of the existing land use such as residential land (including impacts on housing supply and affordability) or industrial lands (DP&I, 2009).

There is a tension between:

– a centres based approach to planning, which seeks to concentrate higher order employment related activity in particular to realise the strategic benefits of clustering and trip minimisation, with some restrictions on out-of-centre commercial and retail development, and
– a more laissez faire approach allowing new forms of enterprise and commercial development in non-centre locations, often taking advantage on lower land values, to encourage employment growth.

While the changing needs of industry need to be recognised, a centres based approach to planning is crucial to future sustainability and planning authorities need to 'hold the line' in relation to this approach. Planning needs to effectively balance competing pressures to achieve multiple objectives - for sustainability, social cohesion and economic development.

In the short term, adaptability can be improved by minimising labour market friction through reduced congestion. Looking further ahead, the urban structure should keep options open for various types of future economic activity. This means avoiding dependency on a singular transport mode.

Promoting an adaptive urban structure should not be read as creating flexibility through adoption of a more laissez-faire, ad hoc and reactive planning process. Rather, the overarching metropolitan structure – in terms of transport corridors and employment nodes – needs to be resilient and robust so that it can cope efficiently with different economic futures. At any point in time, the structure of the GMIA must keep options open in terms of employment development opportunities. Reactive planning decisions – for example, in approving 'out of centre' development can bring short term investment gains but close off future opportunities for compelling agglomeration economies.

Other employment precinct development principles

The NSW DP&E (formerly DP&I) developed a comprehensive checklist for considering the rezoning of industrial precincts to non-industrial uses. These considerations are equally valid as principles for assessing the development of new employment precincts. If employment development is proposed that is inconsistent with any future masterplan for the GMIA, then the following checklist should apply. The identified employment precinct should be:

– Strategic principles
  – of strategic significance, preferably in an endorsed higher level planning strategy
– Clustering / land use principles
  – supporting existing enterprise(s)
  – contiguous to other industrial activities
  – well located to contribute to an existing or emerging industry cluster
  – currently or potentially form part of a supply chain or located close to next stage industries (e.g. areas producing goods to retail or distribution centres)
– Site level physical /ownership characteristics
  – under single ownership or offer significantly large land for employment uses
  – unconstrained in terms of vehicle access and exit
  – sufficiently large with potential for on-site expansion of existing businesses and with space for adequate parking and turning space for industrial vehicles
  – buffered from surrounding residential development
  – unconstrained by environmental factors such as ANEF, floodprone, heritage/conservation, contamination, flooding which make other uses undesirable
– Operational principles

SGS Economics & Planning

- well located in relation to freight hubs (such as intermodal terminals, ports, airports) and other important road and/or rail networks
- well located to service an existing or growing population
- currently or planned to be serviced by adequate power and water supplies
- located close to or potential to support the economic role of a nearby centre
- offering potential for 24-hour operations
- located away from other uses to cater for dust sensitive and potentially toxic or hazardous industries (DP&I, 2011).

5.5   Private proposals for employment lands

There are a number of private proposals for employment lands and centres throughout the GMIA that SGS has reviewed as a part of this study. The analysis of these proposals and comparison with SGS recommendations are outlined below.

Employment lands in and around Wilton Junction

A report completed by MacroPlan (2014) on behalf of a group of landowners in Wilton Junction identifies a range of employment uses straddling the Hume Highway on/off ramps, with a major town centre identified to the north of the Picton Road and west of Hume Highway and neighbourhood centres located to the south-east of Wilton, at Bingara Gorge (existing) and to the north of their proposed town centre near the Nepean River natural boundary (Figure 13).

FIGURE 13.   WILTON JUNCTION PROPONENTS IDENTIFIED EMPLOYMENT LANDS
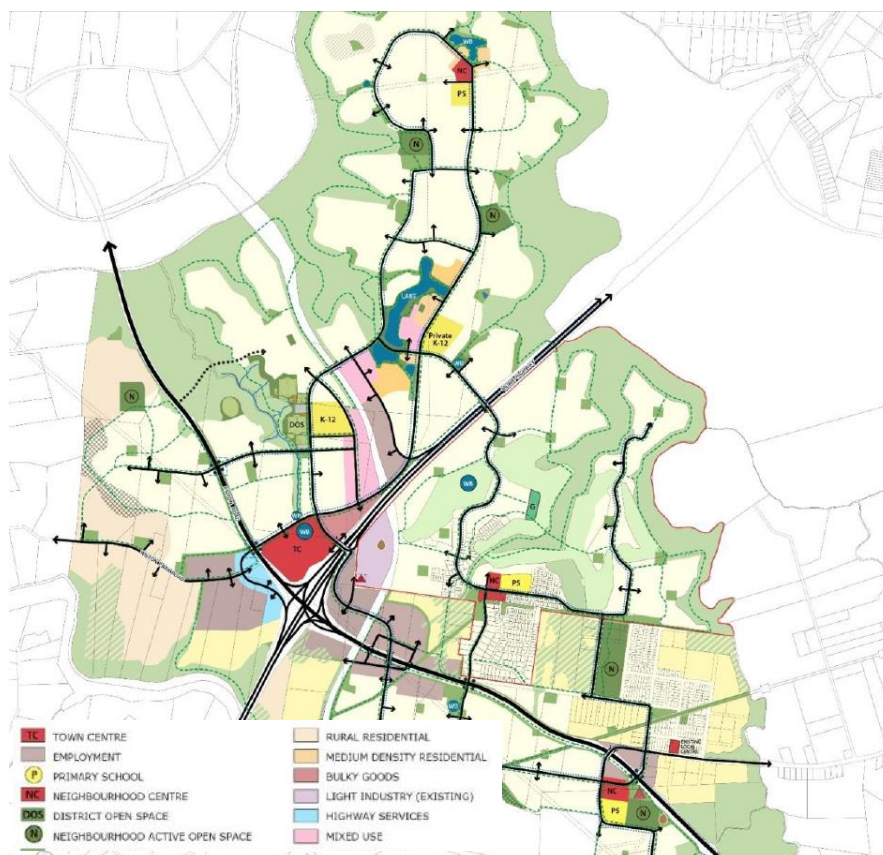
Source: MacroPlan, 2014.

The location of the town centre largely aligns with this report's recommendation for a strategic centre servicing the GMIA; although this report recommends that the strategic centre be slightly further to the north to adjoin a potential rail line extension, with large format retail to the south along Picton Road.

SGS does not allocate all of the demand for smaller village (or neighbourhood) centres in this report. The location of these centres is more flexible than for larger centres and SGS has no in-principle objection to the location of the proposed neighbourhood centres if they are consistent with the centre development principles outlined in this report.

Mount Gilead Proponent Proposal

A planning proposal for residential development at Mount Gilead was lodged to the Campbelltown City Council in January 2015. The proposal does not identify any employment lands or centres within the site, which contrasts with the SGS recommendation for a town centre site to the north of this development. The town centre identified in this report is anticipated to serve the northern population catchment of the GMIA to the east of the Hume Highway. Therefore a town centre site should be located either within or nearby the boundary of the Mount Gilead Planning Proposal.

FIGURE 14.   MOUNT GILEAD PLANNING PROPOSAL

Source: Cox Richardson, 2014.

Menangle Park

SGS completed the Menangle Park Employment Lands and Retail Study for Landcom in 2007. The report described three development scenarios with a suggested centre floorspace of up to 23,000 square metres. This is consistent with this report, which identifies the development of a town centre at Menangle Park.

5.6   Summary

Staging and sequencing

Table 19 (overleaf) shows the indicative staging for development in Menangle Park, Mount Gilead and Wilton Junction. Again, population driven employment should be expected to occur broadly in-line with population growth and strategic employment likely lagging population driven employment.

As the major industries within the GMIA are population-driven, it is expected that the staging of employment growth will be broadly in line with population growth. Given substantial infrastructure costs and environmental constraints, only Menangle Park, Mount Gilead and Wilton Junction have been considered for staging up to 2036.

Population growth was assumed to be linear up to 2036 and the amount of employment development in supporting centres is expected to ramp up as the population base in each area becomes mature. Once a critical mass of population serving activities are located in centre, then strategic employment will likely follow. It is expected that industrial employment in Maldon will ramp up over time and that the North Douglas Park Industrial precinct will come online somewhere between 2021 and 2026. The rate of development at both of these precincts will depend on owner intentions, infrastructure provision, the broader subregional and regional industrial lands market and feasibility.

TABLE 19. STAGING OF EMPLOYMENT POTENTIAL PRECINCTS

Precinct / centre	2016 - 2021	2021 - 2026	2026 - 2031	2031 - 2036	Total capacity (beyond 2036)	Total
Appin	-	-	-	-	1.1	1.1
Appin Industrial	-	-	-	-	4.3	4.3
Bingara Gorge	0.9	0.6	0.5	0.3	-	2.3
Cataract River	-	-	-	-	2.5	2.5
Douglas Park	-	-	-	-	1.6	1.6
Douglas Park North Industrial	-	-	-	-	98.5	98.5
Gilead	1.1	2.7	3.3	3.8	-	10.9
Maldon	3.8	11.4	15.2	19.0	26.6	76.1
Menangle	-	-	-	-	1.5	1.5
Menangle Park	1.2	2.9	3.5	4.1	-	11.8
North Gilead	-	-	2.8	2.3	4.2	9.2
North Appin	-	-	-	-	2.0	2.0
North Douglas Park	-	-	-	-	8.5	8.5
South Appin	-	-	-	-	21.1	21.1
South Gilead	-	0.5	0.7	0.8	-	1.9
West Wilton Junction	-	0.5	0.7	0.8	-	1.9
Wilton Industrial	0.6	0.6	1.3	1.7	-	4.3
Wilton	0.2	0.3	0.2	0.0	-	0.7
Wilton Junction	3.2	3.9	6.5	8.6	34.6	56.8

Source: SGS Economics and Planning, 2015. Note: numbers are rounded.

If appropriate development infrastructure was implemented, for areas such as highway on/off ramps lanes, for instance at the large planned industrial area at Moreton Park Road, then strategic development would likely accelerate. Likewise, provision of public transport and/or large catalytic social infrastructure, would provide an employment stimulus and create employment momentum.

It is important that early centre development should be directed to those centres higher in the hierarchy identified as town or strategic centres at Menangle Park, Gilead and Wilton Junction ensure they are able to gain momentum, achieve critical mass and reach maturity. Once employment development is established at these higher order centres, then lower order village centres should be allowed to occur. Industrial development should be supported where proposed and employment development at Maldon and to the east of the Hume Highway at Moreton Park Road, should be encouraged early.

The approved longwall mining operations could affect sequencing of potential employment lands proposed to the north and south of Picton Road and any potential expansion of the existing employment lands at Maldon. There may also be some short-medium term effects in the Menangle area.

Centre and employment development principles

Often the development rate and sequence becomes spatially uneven, with particular parts of the precinct developing at a greater rate or amount than others. A list of centre and employment development principles have been outlined in this report, based on previous DP&E principles, to provide guidance on future centre and employment, should development not proceed as expected. These criteria should be adhered to if variations from the master plan are ever contemplated (Table 20).

TABLE 20. CENTRE AND OTHER EMPLOYMENT LANDS DEVELOPMENT PRINCIPLES

Centre development principles	Employment development principles
− prominent location and accessibility − access to and integration with public transport, or the infrastructure capacity to support future public transport − access to the broadest possible catchment, without undermining the viability of existing centres − good pedestrian access − good road access for employees, customers and suppliers and, where necessary, capacity to provide new road infrastructure − close proximity to local labour markets with the skills required by business − high quality urban design with opportunities to integrate with surrounding land uses − potential to increase the amenity of the local area − capacity to contribute to environmental outcomes − environmental constraints, such as flooding − impact on the supply of the existing land use such as residential land (including impacts on housing supply and affordability) or industrial lands	Strategic principles − of strategic significance, preferably in an endorsed higher level planning strategy Clustering / land use principles − supporting existing enterprise(s) − contiguous to other industrial activities − well located to contribute to an existing or emerging industry cluster − currently or potentially form part of a supply chain or located close to next stage industries (e.g. areas producing goods to retail or distribution centres) Site level physical /ownership characteristics − under single ownership or offer significantly large land for employment uses − unconstrained in terms of vehicle access and exit − sufficiently large with potential for on-site expansion of existing businesses and with space for adequate parking and turning space for industrial vehicles − buffered from surrounding residential development − unconstrained by environmental factors such as ANEF, floodprone, heritage/conservation, contamination, flooding which make other uses undesirable Operational principles − well located in relation to freight hubs (such as intermodal terminals, ports, airports) and other important road and/or rail networks − well located to service an existing or growing population − currently or planned to be serviced by adequate power and water supplies − located close to or potential to support the economic role of a nearby centre − offering potential for 24-hour operations − located away from other uses to cater for dust sensitive and potentially toxic or hazardous industries

Source: DP&I, 2009; DP&I 2012.

While the changing needs of industry need to be recognised, a centres based approach to planning is crucial to future sustainability and planning authorities need to 'hold the line' in relation to this approach.

Private proposals for employment lands

There are a number of existing private proposals for employment land and centres at Wilton Junction, West Appin, Mount Gilead and Menangle Park. For the most part, the centres and employment lands identified within these proposals are consistent with the recommendations outlined in this report. Any future proposals or variations of the existing proposals should be assessed against the locations and principles in this report.

6   EMPLOYMENT ACCESSIBILITY

Overview

This section provides an overview of the current job to working resident ratio of the GMIA. The concept of self-containment and job to working residents ratios are explained, with reference to case studies. A suitable job to working resident ratio is derived using research and compared to the future GMIA job to working resident ratio. Principles for increasing local employment are then discussed focussing on the creation of local jobs as well as the importance of linking local residents to job rich areas elsewhere is Sydney. This section does not provide specific economic development actions or initiatives.

6.1   Self-containment and job to working resident ratio

One of the key questions identified in the brief was to 'evaluate the potential of each structure plan scenario for employment self-containment'. Action 2.4.2 discusses the importance of 'access to employment, noting that around 69 percent of residents in Sydney's north west and south west travel outside their Local Government Area to work, adding considerably to their weekly expenses' (DP&E, 2014). Only the total capacity scenario has been assessed for a job to working resident ratio given that the staging of most jobs will occur sequentially with population (and therefore the ratio would be expected to stay relatively constant with different population scenarios).

While there are no published NSW Government self-containment or job to working resident targets for the area, Wollondilly Shire Council's (WSC) current expectation for Wilton Junction and West Appin is for one full time job per new dwelling. The Wollondilly EDS recognises that employment self-containment in Wollondilly is low due to its relative isolation and poor public transport, with most resident workers experiencing significant travel times. The EDS states that a key objective is to significantly increase employment self-containment by 2031. The EDS states that *"Wollondilly will be in a better position to attain its social and environmental goals if it strengthens its local economy in ways that reduce long commuting distances by car and provides more local employment opportunities for residents, with a particular interest in young people in Wollondilly"* (Strategic Economics, 2007).

Self-containment and job to working resident ratio
Self-containment can be defined as the percentage of employed local residents who are employed within the local boundary, such as an LGA (or other applicable region). For the GMIA the employment self-containment rate refers to the proportion of the local resident workforce that would also work within the GMIA. A similar and perhaps more pertinent concept is a job to working resident ratio, which refers to the number of jobs in an area as a ratio of the number of working local residents in that same area. The job to working resident ratio represents a likely upper limit for employment self-containment.

Employment self-containment is a sound planning concept to improve greater accessibility to jobs and reduce the externalities of commuting longer distances. Nevertheless, it is a concept that can be limited by the realities of economic geography that determine suitability and viability of land for different uses. For example, some areas are more 'strategically located' than others, with better integration into the urban network, greater infrastructure, access to 'thick' labour markets, consumer markets and supply-

chains. While housing markets and labour markets can and do overlap, decisions about working and living locations often contrast, with people choosing to live and work in different areas.

The Metropolitan Plan (DP&I, 2010) suggests that 'Western Sydney has moderate levels of employment self-containment (West Central 43 percent, South West 45 percent and North West 50 percent)'. The Metropolitan Plan then goes on to suggest that 'the South West subregion has a relatively low ratio of 0.7 jobs per working resident; its modest self-containment level also indicates most of its residents work outside the subregion' (DP&I 2010: 148).

SGS has previously completed work assessing the self-containment rates of LGAs throughout Sydney (Figure 15). The self-containment rate for Wollondilly was found to be around 34 percent. The research also assessed the self-containment rate of the South-West subregion and found it to be around 50 percent. The research also found that the City of Sydney has a very high number of jobs compared to the number of resident workers. As a result, its self-containment rate is high (a high proportion of the resident workforce also have jobs in the City of Sydney). This situation is mirrored somewhat (albeit in a less extreme way) in the LGAs with Regional Cities (Campbelltown, Liverpool, Penrith), Major Centres (e.g. Blacktown) or specialised centres as these are also employment destinations. All other things being equal, areas close to major employment centres that have a low number of local jobs, such as inner city suburbs, typically have low self-containment rates while areas further away from major employment centres and with a higher number of local jobs, such as rural towns, have higher self-containment rates. Figure 15 demonstrates this point. Generally, those LGAs with the highest self-containment rates are further away from the major employment areas or contain a significant number of jobs, such as the City of Sydney.

At the same time, suburban locations without major employment destinations will tend to have much lower self-containment rates as the resident workforce commutes to employment destinations elsewhere. Given the GMIA's isolated location on the furthermost fringe of the Sydney basin, it is expected that its self-containment level will be limited. In this instance, a better measure for the GMIA is the job per working resident ratio. This ratio makes no assumption about people's journey to work patterns, but nevertheless provides an important measure for employment self-containment opportunities. A final qualification for both self-containment and job to working resident ratios are that they are sensitive to geographical size. All other things being equal, the ratio will be higher for larger areas than for smaller areas, as larger areas are more self-contained than smaller areas.

FIGURE 15.   SELF-CONTAINMENT RATES ACROSS SYDNEY GMR

Source: SGS Economics and Planning, 2012.

6.2   Job to working resident ratio for the GMIA

The total capacity employment forecast for the GMIA is approximately 30,000 jobs. The assumed number of residents for this forecast is approximately 190,000. Assuming a working age cohort and labour force participation rate of 65 percent each, as well as an unemployment rate of four percent, the total number of working residents is approximately 77,000. The job to working resident ratio for the GMIA is therefore approximately 0.38 or 38 percent. As a comparison, this is slightly below the current job to working resident ratio for Wollondilly LGA is at 0.44 or 44 percent (9,400 local jobs to 22,200 people in the workforce).

As mentioned above, the WSC requires a target of one full time job per new dwelling. Assuming a person per dwelling rate of 2.8, a working age and labour force participation rate of 65 percent each and unemployment rate of four percent, this equates to one full time job per 1.18 working residents or a jobs to working resident ratio of 0.88 or 88 percent. This current requirement from WSC is very high, being greater than the South West subregion job to working resident ratio of 0.7. At the same time, this rate is twice as high as the current job to resident ratio for Wollondilly, which is 44 percent (Table 21). This suggests that the current WSC target is 'aspirational' given that larger geographies, such as subregions, will tend to have higher self-containment than LGAs. Comparatively, the job to resident ratios of Camden, Campbelltown and Wingecarribee are higher than Wollondilly at 57, 62 and 83 percent, respectively. This suggests that there is already likely to be a higher number of local residents commuting out of the Wollondilly LGA than surrounding LGAs. Camden and Campbelltown are moderately 'employment rich' areas with established centres and industrial areas, while Wingecarribee is a regional LGA that is relatively self-contained, given its distance to Sydney.

In determining an appropriate jobs to resident target for the GMIA, the Wollondilly LGA ratio of 0.44 jobs to resident workers should be a minimum with a target of 0.6 jobs to resident workers, similar to the Campbelltown LGA. Campbelltown contains a 'regional city' of Campbelltown-Macarthur and established industrial precincts in Minto and Ingleburn.

TABLE 21. JOB TO RESIDENT RATIOS

Area	Local jobs	Labour force	Employed residents	Job per working resident
Camden	16,507	29,967	28,761	57%
Campbelltown	40,480	70,235	65,052	62%
Wollondilly	9,362	22,230	21,295	44%
Wingecarribee	15,919	20,108	19,257	83%
GMIA – total capacity	29,591	80,275	77,064	38%

Source: ABS Census, 2011; BTS, 2014; SGS Economics and Planning calculations, 2015.

Table 22 reveals that based on the total capacity employment numbers there needs to be at least a 15 percent increase in employment above the current forecast to meet the minimum jobs to resident ratio and close to a 60 percent increase in local employment to reach the target rate of 60 percent jobs to local resident ratio – around 46,200 jobs. While the below job numbers refer to the total capacity, the 'minimum' and 'target' job to working resident ratios should be considered for the 2036 vision.

TABLE 22. MINIMUM AND TARGET JOB TO RESIDENT RATIOS

	Total capacity jobs	Job to working resident ratio
Current forecast	29,591	38%
Minimum	*33,908*	44%
Target	*46,238*	60%

Source: ABS Census, 2011; BTS, 2014; SGS Economics and Planning calculations, 2015.

6.3 Increasing local employment access

There are broadly three ways to ameliorate a job to working residents mismatch, or improve 'effective job density'. These are to:

- Increase the number of jobs in and around 'people rich' suburbs
- Increase the number of residents in and around 'employment rich' areas, and
- Improve the connections between people and jobs.

This subsection will discuss the first factor. There are a number of elements that are important to increasing suburban employment. The constraints with attracting jobs to suburban areas and some best practice research and principles are outlined below. However, it is outside of the scope of this report to consider specific economic development actions for the GMIA. The role of facilitating, funding and stimulating employment – either local, state government or the private sector – will form part of future work for the GMIA if it is considered a suitable future growth centre.

Proponent studies for the GMIA

Previous studies have been completed for developers in the GMIA outlining ways to improve employment prospects for the precinct. The recommendations from these reports are outlined below.

Wilton Junction High Level Employment Strategy (2012)

Connor Holmes completed the 'Wilton Junction High Level Employment Strategy' for a private developer in the Wilton Junction area, which suggested a number of employment principles and objectives for Wilton Junction. The report identified three avenues for future employment growth: local population-driven employment, the surrounding community catchment and passing trade on Hume Highway and Picton Road. The suggested principles were:

- Provision of affordable and suitable land
- Facilitation of new business set up through financial incentives
- Relocation of State Government divisions and offices
- Target marketing of businesses and industries with horizontal and vertical growth opportunities
- Incubate start-up businesses through incentives
- Attracting suitable complementary support businesses

Wilton Junction – Preliminary Employment Strategy (2012)

Elton Consulting prepared the *Wilton Junction – Preliminary Employment Strategy* in 2012 for the Wilton Junction Land Owners Group. The strategy discussed the opportunity for attracting both strategic and population-driven employment. The strategy suggested that approximately 6,000 of an estimated 11,800 jobs would likely locate in a new Wilton Junction centre, in the form of retail, commercial, community, recreation and education services.

The strategy outlined 'principles' to facilitate the employment development, including:

- Utilise central, prominent and visible locations for employment and town centre uses to ensure strong exposure and access;
- Maximise the capture of passing trade from the Hume Highway to maximise employment opportunities and capture escape expenditure;
- Integrate and co-locate employment activities within the town centre;
- Create a high amenity outcome to attract and retain footloose businesses;
- Promote Wilton Junction as a catalyst and platform to capture employment opportunities and to reverse the under-represented south west commercial/office market; and

– Establish a balanced employment base for the region which attracts investment and expenditure for the benefit of the whole Shire.

Wilton Junction Economic Development & Employment Strategy (2014)

MacroPlan Dimasi were commissioned by the Wilton Junction Land Owners Group to complete a 'Wilton Junction Economic Development & Employment Strategy' to inform the employment needs of the Wilton Junction new township. A summary of their employment strategies are indicated in Table 23.

TABLE 23. MACROPLAN EMPLOYMENT DEVELOPMENT STRATEGIES

Economic Development Issue	Actions
A Competitive Industry Environment	– Preparation of a Business Prospectus – focusing on Wilton's gateway credentials and its comparative advantages. – Development of 'postcode' and location specific strategies and a 'best of both worlds' awareness campaign. – Creation of the Wilton Junction Economic Technical Working Group
Facilitating Industry Growth	– Early consideration and delivery of employment land. A logical sequencing is to provide for development around the proposed town centre and near to the juncture of Picton Road and the Hume Highway. – Timely delivery of retail land to address the shopping needs of the new township residents. – Sequential delivery of supportive retail (bulky goods etc.) and other employment land (e.g. schools and health services). – Continued roll-out and early access to the National Broadband Network (NBN) service and development of digital enterprise awareness amongst the Wilton Junction township, e.g. via a specific digital enterprise capacity program.
Sector-specific Approaches & Target Industries	– **Health Sector** - formation of business partnerships with the South Western Sydney Local Health District; the region's private hospitals and care providers; as well as specific aged care and home care providers, preferably early in the residential precinct development cycle. – Business partnerships with health equipment manufacturers and distributors. – **Education Sector** – establish business partnerships with private schools, TAFEs and potentially involving industry training partnerships and/or enterprise partnerships with nearby facilities at UWS Campbelltown and the University of Wollongong. – Educational focus on local industry needs and trades sector e.g. work with NSW Transport to implement its Master Plan objective to maintain the state's freight workforce through initiatives that attract and retain skilled workers in the industry. – Work with the Bureau of Freight Statistics to streamline freight data collection and strategic analysis, e.g. by liaising with freight industries to ensure their needs are understood and accommodated and that the necessary industry skills are developed, or through applied research in freight management. · – **Construction Sector** – identification of candidate construction supply companies eager to locate at Wilton Junction to take advantage of its proximity to broader development fronts at the South West Growth Centre and in Wollongong. – Work with specific supply industries to understand their training needs and partner with education providers to create Wilton as a place of trade learning. – **Transport, Postal and Warehousing** – maximise the broader appreciation of Wilton Junction's natural advantages in terms of it connectedness to Sydney, Wollongong and other regions. – Ensure the allocation of suitable land and simultaneous marketing to attract those businesses which have the potential to benefit from a southern Sydney regional location. – Identification and targeting of specific logistics businesses. – **Tourism and Recreation** – work with Council toward the review and implementation of its Tourism Business Plan. – Align current objectives to Destination NSW's agenda to double the state's overnight visitor expenditure by 2020 in order that regional funding may be obtained. – Develop local tourism partnership between Council and respective businesses – and seek regional development funding from the Federal Government. – **Agribusiness** - supporting primary production in a research, training or trading capacity. Tap into the presence of research institutions to encourage Wollondilly as a centre for innovation in the agricultural industry and/or for food production and manufacturing. – Identify existing agribusinesses in Sydney's south-west that will be impacted by encroaching urban development to pursue their relocation to Wollondilly e.g. Inghams Enterprises, Flora International, NuFlora International and Andreasens Green.

Economic Development Issue	Actions
Catalytic Employment Projects	− Pursue specific catalytic employment projects for Wilton Junction, such as: − District medical & allied health services − The relocation of Council's administrative centre − State Distribution facilities (e.g. Myer at Somersby) − A data centre
Infrastructure Delivery	− The identification and pursuit of such investment ought to be a priority position taken by Wollondilly Council and supporting businesses.
Regional Partnerships and Business Support	− A survey of new and existing local businesses to ascertain the main issues facing business growth. − The establishment of a local Economic Development Partnership (EDP) that provides a platform for key stakeholders to co-ordinate economic development initiatives. The EDP could include representatives from the public, private and voluntary sectors. − The creation of Employment and Skills Centre, as a focal point for the delivery of employment advice and training services in partnership with local schools and TAFE colleges. Such a facility could be incorporated into the early provision of retail and other space as part of the Wilton Junction town centre. − Making start-up business space available – either by utilising existing community buildings or by drawing on resources from private businesses or state agencies to establish a new incubator space within or adjacent to the Wilton Junction town centre.

Source: MacroPlan Dimasi, 2014.

Principles for attracting jobs to outer urban growth areas

SGS has completed studies and published research on the principles for attracting jobs to outer urban growth areas. The learnings from previous research has been used to inform this subsection.

To improve employment opportunities for potential GMIA residents, increasing local jobs and improved access to jobs outside of the region are both important. In its efforts to provide policymakers with solutions to improving job opportunities in outer growth areas, the World Bank recommends avoiding the forced relocation of jobs to outer areas, as doing so reduces the overall productivity of economic activity (World Bank, 2009). Rather, it promotes two basic strategies. First, encouraging metropolitan-wide mobility through improved transport connections, linking the labour force better with jobs, and linking businesses better with customers, suppliers and other businesses. And second, ensuring universal access levels across the metropolis to services such as health and education, which better enable economic participation by community members irrespective of their location (SGS, 2015).

Harnessing private sector leadership is crucial. Government, be it local, state or federal cannot 'drive' regional development. Private enterprise is the principal driver of regional prosperity and for this reason it must be embraced as a partner in the determination of regional priorities and strategies for economic prosperity. True collaboration is essential for success. To effectively engage the private sector in steering the regional economy down the desired development path, institutional collaboration is required between the three tiers of government, as well as with research and education institutions. Otherwise the actions needed to support private sector initiatives are uncoordinated and often unworkable. A multifaceted approach is required, starting with existing strengths and capabilities and building outwards. In this way, governments can influence the multifaceted pre-conditions for a competitive environment. Government should ensure that an understanding of the region's strengths, weaknesses and capacities is shared widely. In the case of the GMIA study area, its economic strengths are its access to the Hume Highway corridor and the freight and logistics opportunities associated with this corridor. The primary weakness of the GMIA is its relative isolation on the urban fringe. Given this understanding, development efforts need to focus on building on existing strengths and leveraging existing local capabilities – not aiming to attract or develop industries 'from scratch' or by subsidising uncompetitive operations that do not provide a broader public benefit.

When combined with the World Bank's policy prescriptions above, this multifaceted approach should be directed by an understanding of three types of jobs. Firstly, jobs which are CBD-tied and which will not

move to the growth areas (about one quarter of all jobs). Secondly, jobs which are population-driven, and which should naturally come to growth areas, all things being equal (about half of all jobs). Lastly, strategic jobs which can be won by the growth areas if their local strengths and capabilities are relevant, nurtured and communicated well to decision makers (about one quarter of all jobs).

While a proportion of jobs are tied to a given population (population-driven), they still may not necessarily locate in the study area and instead may 'escape' or be attracted to nearby established centres and employment areas such as Campbelltown-Macarthur and industrial areas clustered to the north. Creating high quality and well-connected employment areas and centres in the study area will be important to retaining and attracting local population-driven employment. Furthermore, the local strengths and capabilities of the study area – good highway access and no conflict with established residential areas, will need to be supported. If these are undermined, then attracting strategic and subregional industrial jobs will be difficult.

Successful suburban employment hubs

When moving from a 'regional' level to a specific location, additional lessons can be learnt from successful suburban employment hubs that have developed across the world. Case studies previously investigated by SGS to help develop strategies for places like Tonsley (southern Adelaide) and East Werribee (Southwest Melbourne) have revealed that successful suburban employment hubs have been strategically located within growth corridors and on greenfield sites in single ownership. Outside of these beneficial circumstances, the case studies also revealed the following success factors:

– **Public transport infrastructure.** Public transport played a significant role in consolidating each hub's position within its corridor rail and/or bus interchanges linking the precinct with the broader metropolitan network were a key feature.
– **Coordinated infrastructure commitment & planning.** Early commitment to delivering this public transport and other key items of infrastructure in an integrated manner was evident, as was the coordination between government agencies and the private sector.
– **Planning vision, governance and mechanisms.** The visions guiding the suburban employment hubs are similar, in that they all feature:
  – mixed use development forms
  – significant residential development either within or directly adjacent to the employment hub themselves
  – dense development, usually of a minimum of three storeys, particularly around the public transport nodes
  – integrated development in that the services and facilities required by a residential community (e.g. parklands, entertainment, dining, public transport, etc.) are provided on site; and
  – the provision of a high amenity, pedestrian friendly environment.
  Importantly, the vision was matched with cooperative planning 'governance' arrangements and mechanisms that catered for development flexibility whilst ensuring the vision was maintained.
– **Government facilities** (such as hospitals, universities, government offices and service centres) are common features across the case studies both as key anchor tenants and enabling infrastructure items.
– **Superior ICT infrastructure** features regularly in terms of both the quality and price of telecommunications services to employment and residential sites alike.
– **Marketing/ investment recruitment campaigns.** Each of the hubs has strong branding and marketing campaigns which highlight government commitment to the site, its planning vision and strategic location, amongst other things.

Applying the lessons to the GMIA

Given the context and lessons provided above, a framework for developing and diversifying the economic opportunities for the GMIA should consider:

1) Optimising population-driven jobs – Ensuring that the GMIA are ready to accommodate jobs that service population growth (e.g. construction, retail, education, etc.) is essential and is least difficult to achieve.

2) Knowing your product/market to capture strategic jobs – Stakeholders need to collectively understand what competitive advantages that the GMIA has, and how this needs to be communicated/ targeted towards strategic industries. Statistical identification of these jobs is one thing: effectively communicating the right messages to private sector decision makers is another.

3) Truly collaborating – The private sector undoubtedly drives job creation/ industry diversification. Only by truly engaging with the private sector can the public sector truly develop a path for employment creation. Sometimes this means giving private sector leaders the power to drive development efforts. It also means encouraging growth area businesses to work together, which is not an easy task, but is often made easier when bidding for a mutually beneficial opportunity.

4) Economic development roles - It is not the public sector's role to 'pick winners'. The public sector needs to build the region's capacity to respond to economic opportunity, by taking a multifaceted approach, but not by risking public funds on commercial ventures. Substantial 'hard' and 'soft' infrastructure development effort is required to build local capacity.

5) Planning for liveability – Growth area communities need to be attractive places. Too often major investors (public and private) ignore the contributions that their projects can make to urban liveability. Often the cost is not greater, it just takes an outward looking project philosophy.

At a more 'micro' level the main factors influencing the location of employment-generating activity in the Sydney Metropolitan Area are:

– the price (cost) of space
– proximity and accessibility to markets
– proximity and accessibility to suppliers
– access to appropriately qualified and skilled labour supply
– the availability of parking
– sufficient space for the efficient layout of facilities
– flexibility for expansion or contraction
– adequate zoning flexibility to cater for future expansion or diversification
– quality of the local environment, and
– the availability of local services and facilities to meet the needs of the labour force.

In considering the central elements for employment development, SGS has provided the following checklist for the GMIA:

– **Connectivity:** access to businesses and labour and executive housing, expanded public transport, preferably rail connections to established employment centres.
– **Amenity:** create a quality public domain and retail amenity. A large enclosed shopping centre surrounded by swathes of at-grade parking would not be a desirable built-form outcome for the GMIA. Rouse Hill Shopping Centre in the North-West is an exemplar for suburban shopping centre development, with an urban traditional centre feel. Such a centre, with traditional main streets could be emulated at Wilton Junction (as well as the smaller-scale town centres) to help attract and retain a high share of population-driven employment and potentially some strategic industries. The centre could be well integrated with a rail station and with medium rise residential development.

- **Capacity:** the centres and employment areas would need to be 'future-proofed' with room to grow by ensuring they aren't hemmed in by residential. For the potential strategic centre at Wilton Junction, this will required a careful balancing act between employment and residential uses.
- **Conditions to compete** such as the availability of large lots for footloose industrial development, but also encouraging an urban grain for centres, as well as and sufficient / appropriate car parking.
- **Recognition and support** from the metropolitan or State Government will be critical. A focussed effort in policy, planning, funding, will be vital but also public investment in education and health facilities.

This last point is critical. One of the easiest ways to stimulate job growth in outer suburban areas is to implement large catalyst developments such as schools, hospitals and tertiary education facilities. Catalytic development can assist in establishing centres and attract other industries that collocate.

Wollondilly Shire Council could contemplate moving its Council administration building to Wilton Junction strategic centre to be closer to the major population mass of the LGA, in a similar way to Camden Council's move to Oran Park centre from Camden centre.

Wollondilly Shire Council has indicated that it would like to see the development of a local university in the GMIA. The UWS and TAFE have campuses located just off the Hume Highway on Narellan Road, near Campbelltown. These are currently accessible from the GMIA, being between a 15 and 20 minute drive from Wilton Junction. The relatively close location of these institutions would make it difficult for a university in the GMIA to compete. Nevertheless, in searching for a way to develop a tertiary education/university campus at Wilton Junction, consideration would need to be given to how to develop a credible concept that is convincing to a range of parties: an accredited higher education institution, government funding and accreditation agencies, private sector investors, financial institutions, industry, and importantly, prospective researchers, teachers and students.

A hospital is another major employer that could be contemplated as a catalyst development for the GMIA. This would need to complement the regional Campbelltown Hospital and would be a longer term prospect.

Implementation

The development of future jobs in the GMIA will require a strong and ongoing economic development 'push'. As discussed, governments do not 'drive' economic development, but can lay the foundations for successful economic development. Again, this will require significant infrastructure intervention, such as both transport and education and health facilities, to build local capacity. Land requirements for major infrastructure, such as future public transit stations and major health or education sites would need to be identified early on and quarantined where possible.

Commitment from developers will be decisive in driving employment growth. This should extend beyond compliance with a job to working resident (or dwelling) ratio to a more meaningful commitment; it is easy to commit to providing jobs and then seek future amendments in the distant future once jobs have not come to fruition. Commitments could focus on developer contributions or 'work-in-kind' towards getting employment precincts 'development ready' with infrastructure or buildings.

Growth rate of jobs

Success often is only evident in the long term – employment development will come from maturity. Economic development interventions are not always successful in the immediate time horizon. Initial levels of employment will likely be quite low, but over time as the precinct matures then the number of local jobs should increase. Previously completed research for Melbourne demonstrates this point, with residential growth occurring at a much higher rate than employment growth in outer suburban areas between 2001 and 2011 (Figure 16 & Figure 17). Not surprisingly, given the multiplicity of factors
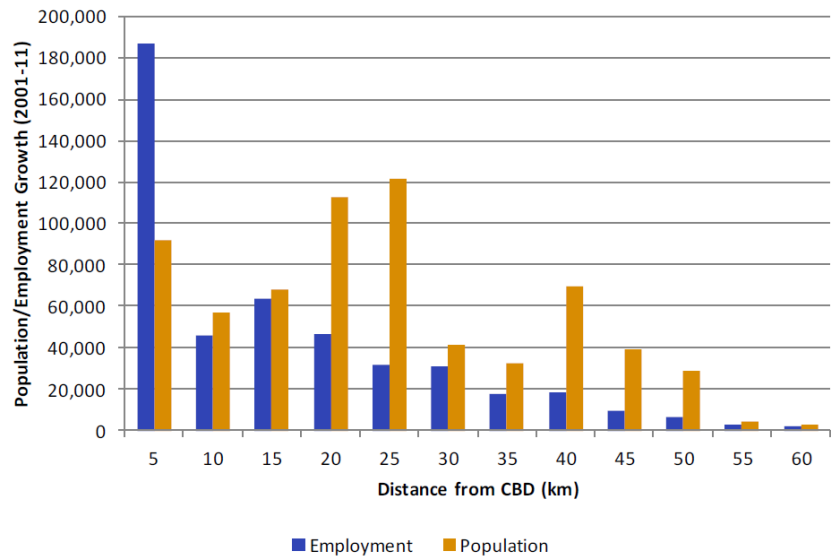
affecting regional competitiveness, success requires a long-term commitment, ongoing monitoring and refinement of initiatives.

FIGURE 16.   POPULATION AND EMPLOYMENT GROWTH, MELBOURNE, 2001-11
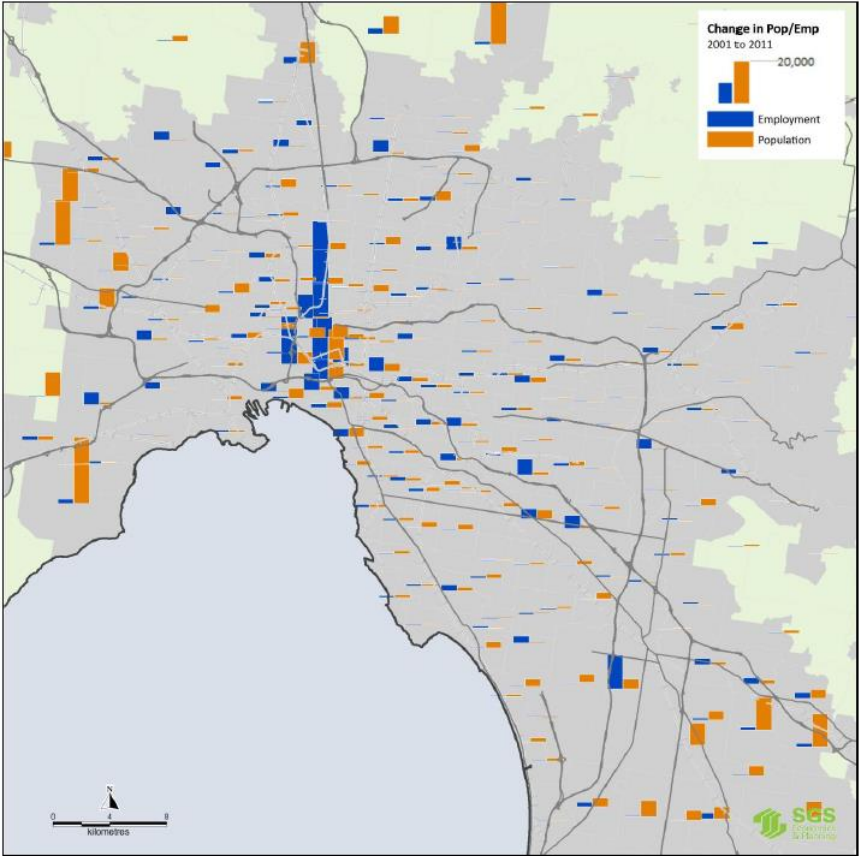
Source: SGS Economics and Planning, 2013.

FIGURE 17.   POPULATION AND EMPLOYMENT GROWTH, MELBOURNE, 2001-11

Source: SGS Economics and Planning, 2013.

6.4   Improved transport options

To this point, Section 6 has focussed on increasing the number of jobs in the GMIA boundaries. Importantly, the focus should not only be on the quantum of jobs, but the diversity and quality of jobs that GMIA residents have access to. While there are ways to achieve this, there will be limits to the extent to which the GMIA can realistically attract strategic and footloose jobs, given its remote location on Sydney's urban fringe.

Directing employment growth is generally a more challenging task than directing population, with business viability heavily impacted by location choices. Different jobs are more or less flexible in their location choices. With fixed jobs, one of the most obvious characteristics of 'fixedness' is the need for physical proximity to a particular location because the job directly involves the making, mending, cleaning, or moving of physical goods or the delivery of real personal services to people. Jobs that follow population do so because they must be easily accessible to the surrounding resident population.

By contrast a footloose business is one that is not tied down by particular locating factors and can move more freely based on its individual requirements. They are not required to be in close proximity to their customers and so are not tied down to any specific location. As a result they will make a location decision based on a range of variable factors including access to a wide and deep pool of skilled labour, accessibility to global gateways, quality of office space, prestige, etc. The highly productive firms in the finance and insurance, professional, technical and scientific services, and information media and telecommunications sectors have a high degree of mobility, and will make locational choices that maximise their competitive advantage.

Attracting these kinds of footloose firms and sectors to the GMIA, while a worthy longer-term objective, is unrealistic in the short and medium term. The GMIA cannot be expected to compete with the locational advantages presented in Sydney's CBD and inner areas, where decades of significant public and private infrastructure spending, business and administration clustering, and supportive planning has further reinforced the competitive advantage of these locations.

While it may be unrealistic, and indeed be a less productive outcome for the city as a whole to have these types of jobs locating in the GMIA, the residents of the GMIA should be able to access these jobs within a reasonable commute.

In striving to provide the residents of the GMIA with a range of employment options, improving the connections between people and jobs is an effective way of increasing 'Effective Job Density' (EJD) and, while not improving the job to resident workers mismatch, is likely to effectively address some of the core issues that underpin it – namely economic efficiency and socio-economic equality.

Poor access to transport options is a major drag on the productivity of the whole economy as it reduces the capacity to match workers with jobs, and also limits the capacity of businesses to interact effectively and thereby benefit from agglomeration economies. This not only inhibits economic growth, but presents major equity issues. Limiting transport options 'locks in' some of the more disadvantaged parts of Sydney to automobile dependence (which is a high cost option for many households) and in doing so, limits the range of jobs and industries they can potentially access. A range of transport options is also an effective way to address social costs associated with isolation.

With this in mind, promoting the economic development of outer urban growth areas in Australia should start by providing quality transport connections between growth areas and the capital city CBDs and regional employment hubs. These centres accommodate a wider range of employment options and are well connected into the public transport network.

The relevant employment areas for the GMIA include the regional cities of Campbelltown-Macarthur and Liverpool as well future development of Broader WSEA. Improving links between these areas and the GMIA will be pivotal to improving employment outcomes for the GMIA.

Roads

Any development of the GMIA would necessarily involve augmenting the existing road network and creating new access roads. This may involve duplicating or triplicating the major arterial roads and highway. However, while these road investments may be effective in moving people in and out of the GMIA, there are likely to be congestion issues further 'downstream' in the road system. There are significant limits to investing in roads and tollways to address the congestion, connectivity and productivity issues. Strategic investments in new roads and tollways is appropriate if truly addressing an accessibility problem but just enhancing road capacity inevitably induces more traffic, thereby not 'solving' the congestion issue, but rather 'locking in' auto dependence. Parallel 'demand management', such as congestion pricing, as well as public transport investment, which will have a major pay off in terms of enhancing access, need to be part of a comprehensive approach to transport investment.

Public transport

The economic and social benefits of providing public transport connections to GMIA are explored below.

Economic productivity benefits

One consequence of higher accessibility comes in the form of increased labour productivity and agglomeration benefits, which arise when the barriers to firm interaction, such as travel times, are reduced. These agglomeration benefits include firms having access to a larger pool of clients/employees as well as technical spillovers resulting from stronger supply chain linkages and greater firm interaction.

SGS has developed a measure of accessibility within a specified geographical region known as 'Effective Job Density'. This measure essentially discounts every job within an area by the time taken to gain access to that job. Therefore, it provides a very detailed understanding of the relative level of employment opportunities (and associated services) available across an area. SGS has modelled the EJD of Greater Sydney and Figure 18 displays the availability of jobs across the metro area. It shows that the study area is in the lowest decile for 'Effective Job Density'; meaning that residents have the poorest access to the available jobs across Greater Sydney.

FIGURE 18.   SYDNEY'S CURRENT EJD
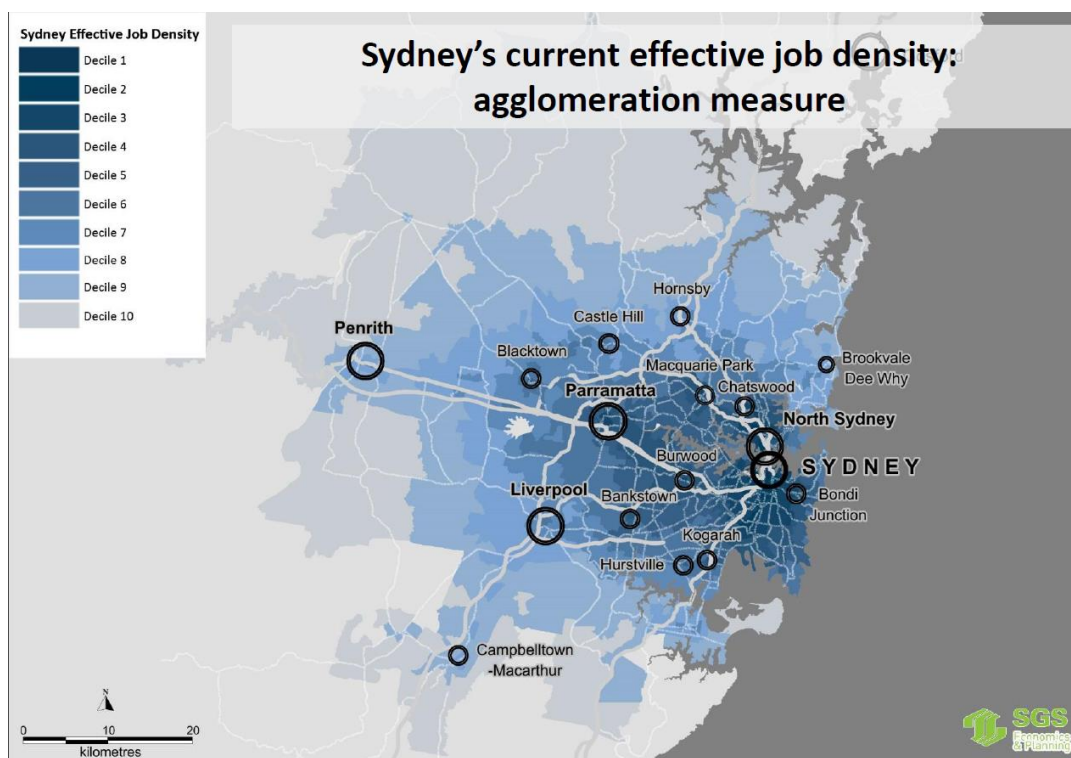
Source: SGS Economics and Planning, 2014.

The more accessible a location (defined as the quantum of economic or social activities that can be reached using the transport system), the larger the effective size of the local geographic market, which promotes economic activity between firms and fosters higher levels of local area competition.

The benefits that arise from locating in a denser economy include:

— **Economics of scale and scope**: with a larger customer base businesses are able to develop efficiencies through operating at a large scale. This also enables firms to focus the scope of their expertise in a particular field, gaining improved efficiencies through specialisation.
— **Deep and diverse pool of clients/employers/employees**: A competitive marketplace presents people and firms with a multitude of potential options. This frees them from reliance on a single (or limited) client or employer base. This enables firms to better align their specific skills.
— **Technological spillovers**: With multiple businesses located together there will be a higher level of technological and knowledge spillovers and transfers, which will help bolster innovation. This transfer occurs both directly - through stronger supply chain linkages and connections between local firms - and indirectly - when skilled labour moves between firms and transfers knowledge as well as through incidental exchanges.

Consequently improved accessibility has the potential to create new business and trading opportunities, and increased competition, which result in higher profitability for firms that are able to adapt to the new market conditions. While this increased competition is detrimental to the interests of some firms, which are unable to adapt or afford higher rents in highly accessible locations, the positive impacts have been shown to completely overshadow the negative impacts (SGS, 2014).

Improved accessibility also helps to improve the quality of labour inputs available by increasing the stock of human capital (the value of knowledge and experience in the labour force). This benefit is afforded to workers and stems from their improved ability to match their skills with available job opportunities, and to move easily from job to job, thereby expanding their set of experiences.
Improving accessibility via public transport services should be central to planning the GMIA. While public transport, such as rail, can have a high upfront cost it can significantly reduce private transportation costs and provide wider social benefits. Efficient public transport services can prove the best way of overcoming the 'tyranny of distance' and diminishing 'space via time' to address access to higher value jobs from urban fringe areas.

The effective returns on increased investment in public transport are significant. In this context there are a number of specific initiatives which are relevant and should be considered for the GMIA:
— Enhanced integrated land use and transport planning
— Electrification of the Southern Rail line and extension:
  — to Douglas Park and possibly to Picton
  — A Macarthur branch line (Southern Rail Link), either;
    — South of Macarthur Station to Wilton Junction via Appin west of Campbelltown Golf Club and east of the Hume Highway, or
    — South of Douglas Park to Wilton Junction via the Maldon-Dombarton freight rail corridor. The proposed freight corridor passes directly through the identified Wilton Junction Strategic Centre and provides an attractive lower cost option.
— Bus Rapid Transit (BRT) from Wilton Junction and Appin to Campbelltown Station (or beyond). BRT would have a much higher capital cost than standard bus services, but lower than rail (although the operational costs are higher than rail). BRT functions more like a train than the current Sydney buses operation, with dedicated and separated lanes, widely spaced stops (ideally around 400 metres) and large stations that reduce delays associated with traditional buses payment upon boarding
— General bus lines throughout the GMIA and to existing centres in Wollondilly

If these rail corridors are not committed then corridor reservation should be considered. Figure 19 displays the Maldon-Dombarton rail link corridor and demonstrates how it runs near the Wilton Junction

Strategic Centre proposed in this report. Figure 20 shows that the Nepean River bridge crossing ramps have already been constructed. It also displays the proximity to the existing rail line, east of Maldon.

FIGURE 19.   MALDON-DOMBARTON RAIL CORRIDOR – STUDY AREA

Source: Nearmap, 2014.

FIGURE 20.   MALDON-DOMBARTON RAIL CORRIDOR – NEPEAN RIVER CROSSING RAMPS

Source: Nearmap, 2014.

The $2 Billion, 11.4 kilometre South West Rail Link (SWRL) included: two new stations at Leppington and Edmondson Park, a major upgrade of Glenfield station, commuter car parks at each station and new train stabling facilities. Comparatively, a 6 kilometre Southern Rail Link via the Maldon-Dombarton freight rail corridor, using the existing train stabling at Macathur Station, with one new station and one major bridge would cost significantly less than the SWRL. Based on the comparative costs outlined above for the SWRL, a separate passenger rail link could cost approximately $800 million, and could be cheaper if shared with freight and/or built as a single line[4].

Given the capital expenditure associated with the South West and North West Rail Link, and the comparable population sizes, the electrification of the Southern Line and extension to Wilton Junction centre would be 'low hanging fruit' that could transform the employment access opportunities for the GMIA residents both through the associated jobs with a future station at Wilton Junction centre and the increase in employment access via a rail link (an increase in 'effective job density'). Given that the GMIA is more isolated from job rich areas than the South West and North West Growth Centres, such a proposal would go a long way to mitigating the 'economic and social cost to communities of having relatively poor access to employment and services' and would confer much greater environmental benefits than car dependence.

Positive land use effects

A major outcome of changed accessibility arrangements are the land use impacts that would emerge. The development potential of land parcels (that enjoy improved accessibility arrangements) rises, and this is often directly incorporated into land value increments. As time goes on land owners and developers act on this value and convert affected land into more compelling development mixes and intensities, and in doing so incrementally reshape the metropolis. Land uses that crave superior access are attracted and their relocation often intensifies development along the transport corridor, thereby reducing dispersed development. Providing rail services at Wilton Junction would generate higher land values in and around the potential strategic centre, stimulating higher density residential development and attracting a better level of local services and amenity. In turn, these improved accessibility arrangements can have significant effects on economic productivity, social inclusion and environmental sustainability (SGS, 2014).

Social inclusion

Greater access and mobility can address social exclusion, thereby contributing to higher levels of social cohesion and engagement and reducing the social costs of relatively poor access to employment and services. Often improved accessibility can act to alleviate disadvantage, and research has suggested that this can lead to improved engagement with employment and education opportunities, which in turn contributes to improved health and criminal justice outcomes.

Perhaps most significantly, a new public transport network significantly bolsters the employment and service access opportunities available to those who cannot drive. Not only does this enhance social equity, it also helps to build solidarity with previously disengaged and/or disadvantaged community members (SGS, 2014).

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[4] While the cost of completing the Maldon-Dombarton rail link has been estimated at around $600 million, the cost of providing a new station and electrification would be major cost contributors for passenger rail extension to Wilton Junction.

Expansion of Campbelltown-Macarthur Regional City

A significant expansion of the Campbelltown-Macarthur Regional City could provide local employment and services for the GMIA residents. This option could be contemplated as a compromise between a significant economic development push for local jobs within the GMIA and substantial public transport investment linking the GMIA to other areas of Sydney. This development scenario would see Campbelltown-Macarthur play a role similar to Liverpool's current role in the south-west subregion. The expansion would involve greater local and strategic office development, a larger and more diverse retail role and larger social infrastructure facilities such as a more established TAFE and university presence and a larger hospital.

6.5   Summary

Job to working resident ratio for the GMIA

Action 2.4.2 in the *Plan for Growing Sydney* discusses the importance of 'access to employment, noting that around 69 percent of residents in Sydney's north west and south west travel outside their Local Government Area to work, adding considerably to their weekly expenses' (DP&E, 2014).

Research found that the job to working resident ratio for Wollondilly LGA was around 44 percent and the South-West subregion job to working resident ratio was 0.7. Instead, the related concept of job to working resident ratio for the GMIA was found to be 0.38:1, based on the employment analysis and assumed working population. This ratio is lower than the current 0.44:1 for Wollondilly LGA and compares relatively poorly to the ratios for Camden, Campbelltown and Wingecarribee, which are 0.57:1, 0.62:1 and 0.83:1, respectively.

The current job to working resident objective from Wollondilly Shire Council (1 full time job per dwelling) is very high at around 0.88:1. It is greater than the South West subregion job to working resident ratio of 0.7 and is almost twice as high as the current job to resident ratio for Wollondilly (0.44:1).

In determining an appropriate jobs to resident target for the GMIA, the current Wollondilly LGA ratio of 0.44 jobs to resident workers should be a minimum with a target of 0.6 jobs to resident workers, similar to the Campbelltown LGA. Campbelltown contains a 'regional city' of Campbelltown-Macarthur and established industrial precincts in Minto and Ingleburn. Based on the total capacity employment numbers there would need to be at least a 15 percent increase in employment above the current forecast to meet the minimum jobs to resident ratio and close to a 60 percent increase in local employment to reach the target rate of 60 percent jobs to local resident ratio – around 46,200 jobs. While the below job numbers refer to the total capacity, the 'minimum' and 'target' job to working resident ratios should be considered for the 2036 vision.

Increasing local employment access

Given the context and lessons provided above, a framework for developing and diversifying the economic opportunities for the GMIA should consider the key elements:

1) Optimising population-driven jobs
2) Capturing strategic jobs
3) Private sector collaboration
4) Economic development roles – Develop substantial 'hard' and 'soft' infrastructure development effort to build local capacity
5) Planning for liveability

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In considering the key elements for employment development, SGS has provided the following checklist for the GMIA:

- **Connectivity:** access to businesses and labour and executive housing, expanded public transport, preferably rail connections to knowledge centres.
- **Amenity:** create a quality public domain and retail amenity. A large enclosed shopping centre surrounded by swathes of at-grade parking would not be a desirable built-form outcome for the GMIA. Rouse Hill Shopping Centre in the North-West is an exemplar for suburban shopping centre development, with an urban traditional centre feel. Such a centre, with traditional main streets could be emulated at Wilton Junction (as well as the smaller-scale town centres) to help attract and retain a high share of population-driven employment and potentially some strategic industries. The centre could be well integrated with a rail station and with medium rise residential development.
- **Capacity:** the centres and employment areas would need to be 'future-proofed' with room to grow by ensuring they aren't hemmed. For the potential strategic centre at Wilton Junction, this will required a careful balancing act between employment and residential uses.
- **Conditions to compete** such as the availability of large lots for footloose industrial development, but also encouraging an urban grain for centres, as well as sufficient/appropriate car parking.
- **Recognition and support** from the metropolitan or State Government will be critical. A focussed effort in policy, planning, funding, will be key but also public investment in education and health facilities.

The development of future jobs in the GMIA will require a strong and ongoing economic development 'push'. Again, this will require significant infrastructure intervention, such as both transport and education and health facilities, to build local capacity. Commitment from developers will be key to driving employment growth and should focus on developer contributions or 'works-in-kind'.

It is important to keep in mind that successful employment precincts are only evident in the long term. Notwithstanding, there will be limits to the extent to which the GMIA can attract strategic jobs, given its remote location on Sydney's urban fringe. To improve employment opportunities and overcome the social and economic costs of low employment access for potential GMIA residents, improving access to jobs outside of the region via transport interventions will be critical.

Given the comparable size resident size of a total capacity scenario at the GMIA to the SWGC and NWGC, the Government has shown in the past that it can and will provide heavy rail, with significant investment for both of the existing growth centres. Comparably, electrification of the Southern rail line and extension across to a Wilton Junction strategic centre represents a lower cost and greater potential return on investment than both the North West and South West Rail Link.

A significant expansion of the Campbelltown-Macarthur Regional City could be contemplated as a compromise between a significant economic development push for local jobs within the GMIA and substantial public transport investment linking the GMIA to other areas of Sydney.

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GLOSSARY

ANZSIC – Australian New Zealand Standard Industry Classification
CLU – Category of Land Use
DP&E – Department of Planning and Environment
GMIA – Greater Macarthur Investigation Area
GMA – Greater Metropolitan Area
LGA – Local Government Area
SWGC – South West Growth Centre
TfNSW – Transport for New South Wales
USF – Urban Suitable Footprint
UCF – Urban Capable Footprint
WSA – Western Sydney Airport
WSC – Wollondilly Shire Council

Categories of Land Use

SCRO – Strategic centre retail and office
OOR – Other office and retail
LFR – Large format retail
LI – Local industry
SI – Subregional industry
F – Footloose
D – Dispersed

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Greater Macarthur Investigation Area - APPENDIX

Draft Economic and Employment Analysis

Department of Planning and Environment

August 2015

Independent insight.

SGS Economics & Planning | Independent insight.

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1   SUITABILITY ANALYSIS OUTPUTS

1.1   Overview

Suitability Analysis is a modelling process to assist with subregional strategic planning decisions. The process identifies the most suitable location for different employment categories of land use (CLUs) within a region, by assessing the spatial distribution of infrastructure and physical characteristics of an area. For each CLU relevant attributes can be aggregated in a 'heat' map which shows the (nominal) 'best' locations for that CLU.

Not all attributes have equal value to a CLU. Weighting is applied to these attributes (CLUs) to determine their relative importance.

Weighting each attribute is a subjective process, and has been refined by SGS over many projects which utilised the suitability assessment tool. There may be debate amongst stakeholders as to what they feel should be weighted more heavily. Policy aspiration must be kept separate from the review of the weightings – they are intended to reflect an attribute's value to land use, not political ambition. Weightings can be debated, however, ultimately only **one** collective set of weighted attributes for the subregions will be agreed. There will not be different weightings for each study area.

CATEGORY OF LAND USE (CLU)

Strategic centre retail and office (SCRO)
Located in identified major centres, SCRO takes the form of multi-level, mixed-use buildings with ground floor retail, high public transport accessibility and is often centred around a train station or major bus route interchange. SCRO requires an urban setting.
Examples: Parramatta Regional City or Castle Hill Major Centre.

Other office and retail (OOR)
Retail and commercial cluster servicing a local population. OOR is generally ground floor retail with office or shop-top residential above with on street parking or small carpark adjacent. OOR has good public transport connections and is often located proximate to civic buildings (town halls, libraries etc.).
Examples: Town centres, corner shops, local shop cluster.

Large format retail (LFR)
Large, warehouse-style retail buildings typically surrounded by or including a large amount of car parking. Situated on commercial centre periphery or in independent clusters.
Examples: Harvey Norman, Bunnings, Ikea and Direct Factory Outlets.

Local industry (LI)
Clustered in industrial areas, LI services a local area. This CLU is typically small industrial lot sizes, workshop buildings with some possible office function. LI requires a large degree of functional hardstand for service delivery and operational space. Can be nearby surrounding residential and commercial community.
Example: Car repairs; joinery and building supplies.

Subregional industry (SI)
SI is found clustered in large industrial areas and its role is to service a broad catchment. It is characterised by larger lot sizes and large warehouse buildings are common. SI requires a large degree of functional hardstand for service delivery and operational space. SI requires physical separation from residential development and often has a low degree of public transport accessibility due to its remoteness. The SI CLU requires high levels of car and truck access, close proximity to arterial roads and motorway on/off ramps and possible access to freight rail.
Example: Subregional warehousing, freight & logistics (such as food distribution), subregional Australia Post distribution hubs.

Footloose (F)
Footloose has little customer relation to its surrounding area as its primary function is to service a metropolitan or larger area. This CLU has larger lot sizes and large warehouse buildings are common. Similar to SI, the Footloose CLU requires a large degree of functional hardstand for service delivery and operational space and requires physical separation from residential development. High car and truck access, close proximity to arterial roads and motorway on/off ramps. As per SI, Footloose needs high levels of car and truck access, close proximity to arterial roads and motorway on/off ramps and possible access to freight rail.
Example: Manufacturing, major freight and logistics (such as DHL), regional distribution facilities.
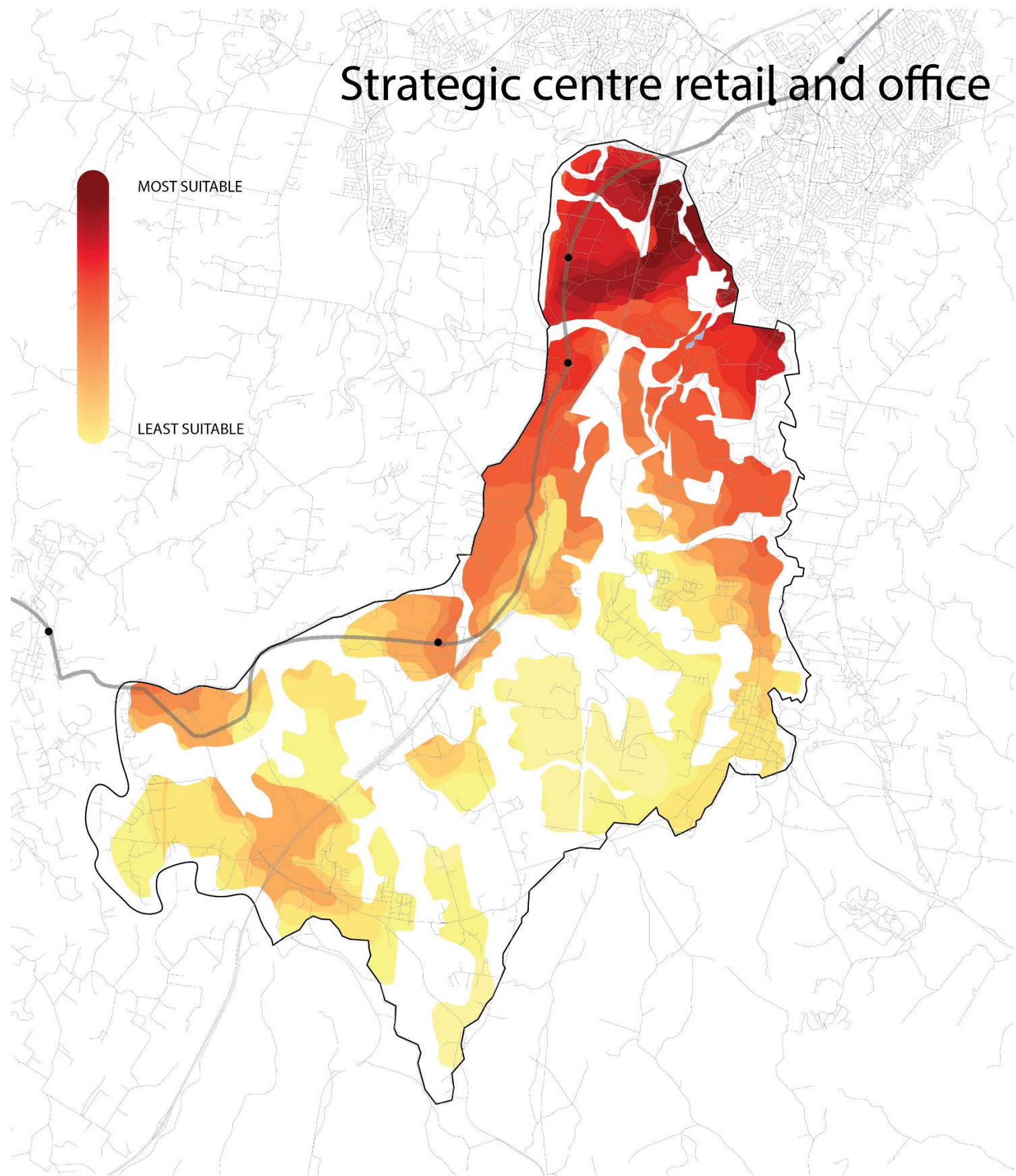
Dispersed (D)
Industries that do not fit into local, subregional or footloose categories. Dispersed uses are not tied to industrial precincts and vary in size, location (hence being dispersed), and role.
Example: Major health and education institutions, churches, petrol stations, dentists, community groups, whilst also including some heavier industries such as mining and agriculture.

1.2   CLU maps

The following maps show the primary outputs of the suitability analysis for the CLUs. These outputs should be considered in context of the primary report.
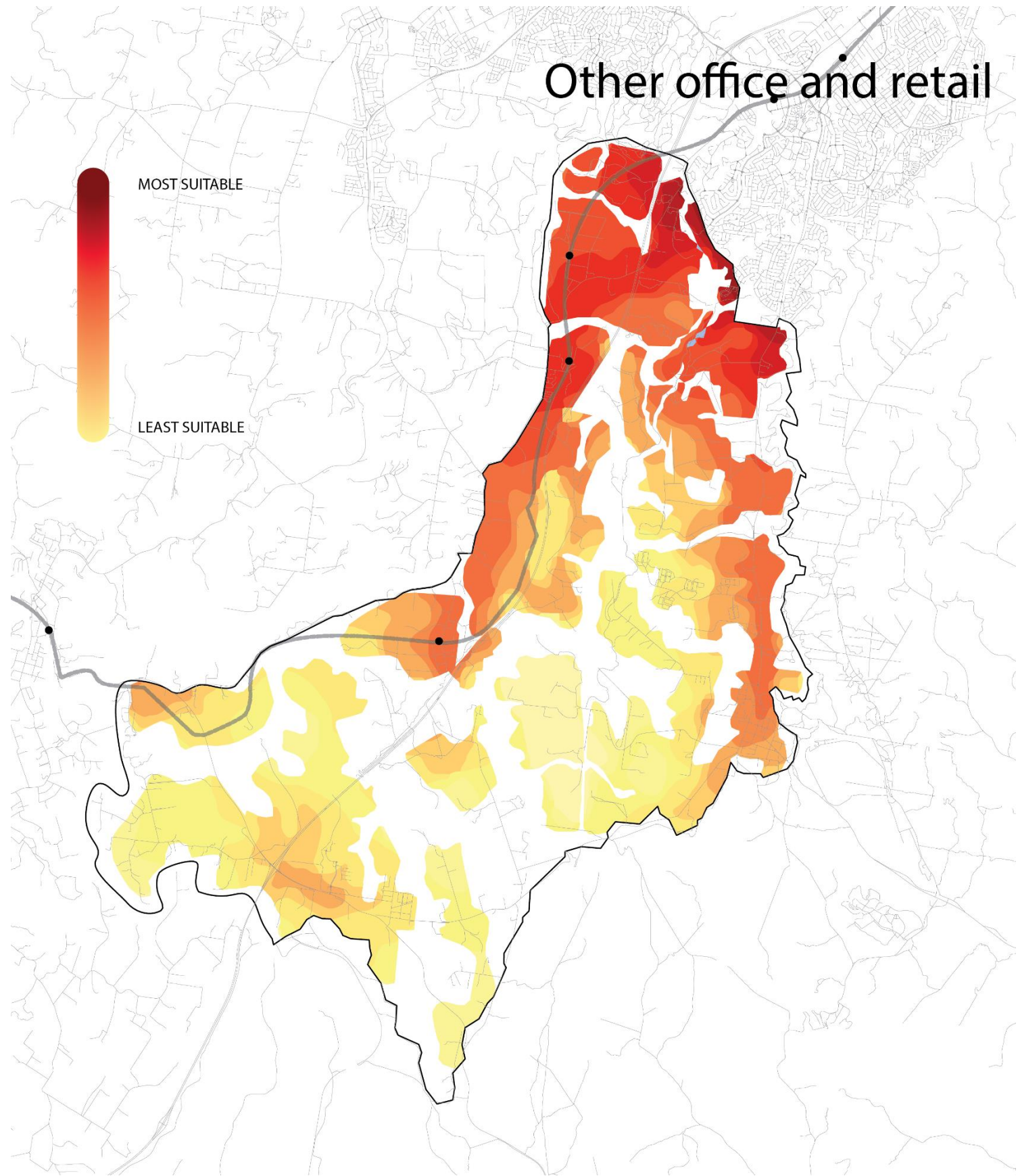
Strategic centres and office

Strategic centre retail and office

MOST SUITABLE

LEAST SUITABLE

ATTRIBUTE RANKING: STRATEGIC CENTRES RETAIL AND OFFICE

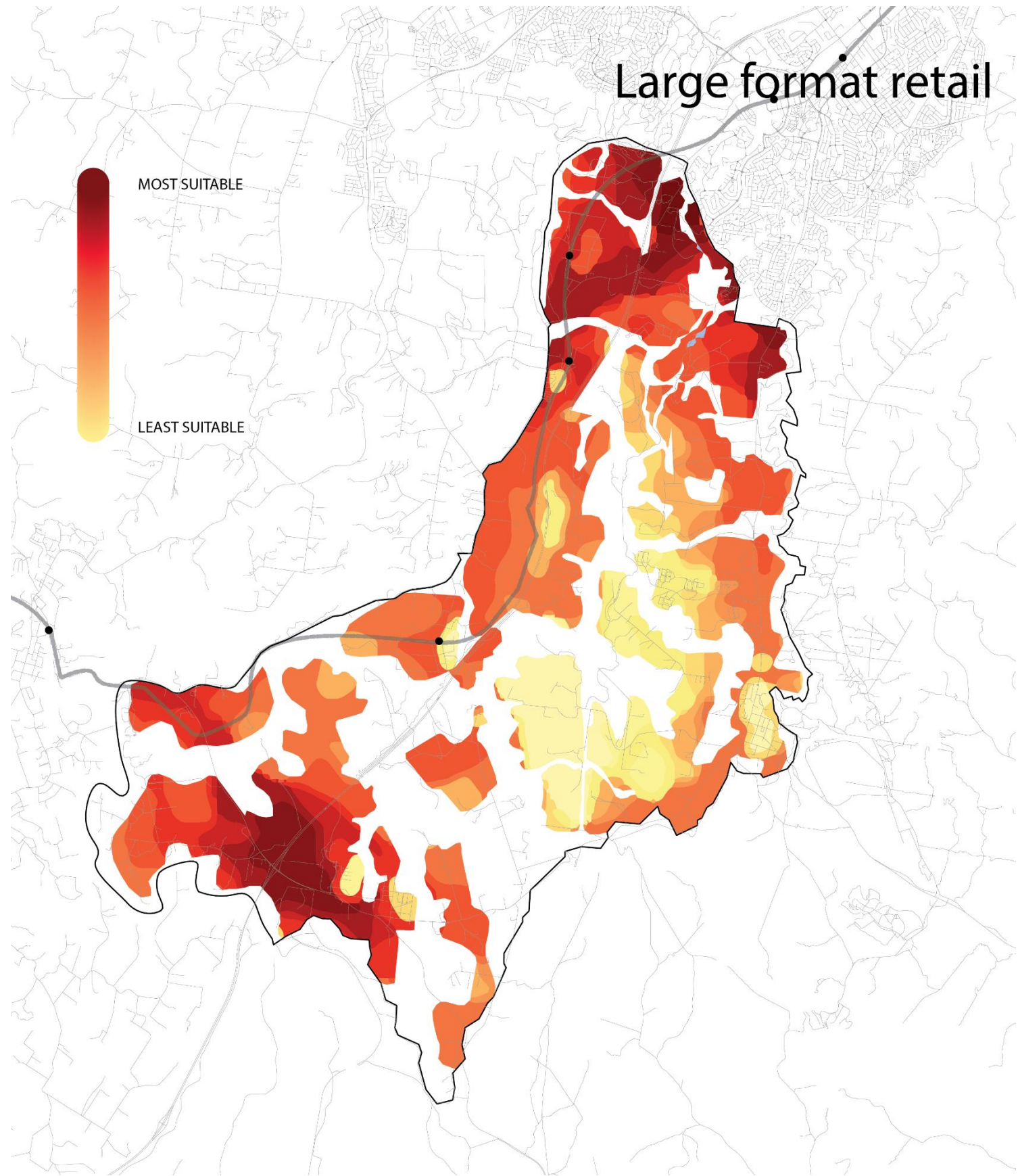| Attribute	Score/ranking	Justification
Rail Station	100	Access to rail stations is critical in the location of strategic centres to ensure highest levels of accessibility, encouraging multi-purpose trips whilst reducing need for cars
Shopping Centre	100	Critical as it forms the core of a strategic centre
Population density	100	Critical as a strategic centre is supporting infrastructure for residential population and requires population in order to thrive
Arterial roads	60	Access to centres from surrounding areas is important but not critical
TAFEs & Colleges	56	Desirable to cluster activities including TAFEs & colleges as they may provide ancillary services or be part of a centre
Universities	56	Desirable to cluster activities including Universities as they may provide ancillary services or be part of a centre
Motorway on/off Ramps	50	Access to centres from surrounding areas is important but not critical given availability of public transport alternatives
Lot size	30	Lot size has an influence on the development of centres, but is not essential due to range of use types in such centres and ability for centres to develop multiple shopfronts, or amalgamate smaller lots for larger development
All Retail	30	Location near local retail providers is not essential due to the CLU offering the same facilities at a broader level
Hospital	30	Hospitals have some influence on the location of centres as they may provide ancillary services supporting a hospital. A large working population is also likely to require access to hospital services
Secondary Schools	25	Desirable to cluster activities with this CLU including schools but not critical
PreSchools	20	Pre-schools may have some relevance to people employed in centres who require pre-school services
AgedCare	20	Proximity to aged care assists those in it by reducing distances to travel for major services
Primary Schools	15	Desirable to cluster activities with this CLU including schools but not critical
RE1 open space	0	Proximity to public open space does not influence the location of strategic centres due to their need to be surrounded by density

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Other office and retail

Other office and retail

MOST SUITABLE

LEAST SUITABLE

ATTRIBUTE RANKING: OTHER OFFICE AND RETAIL

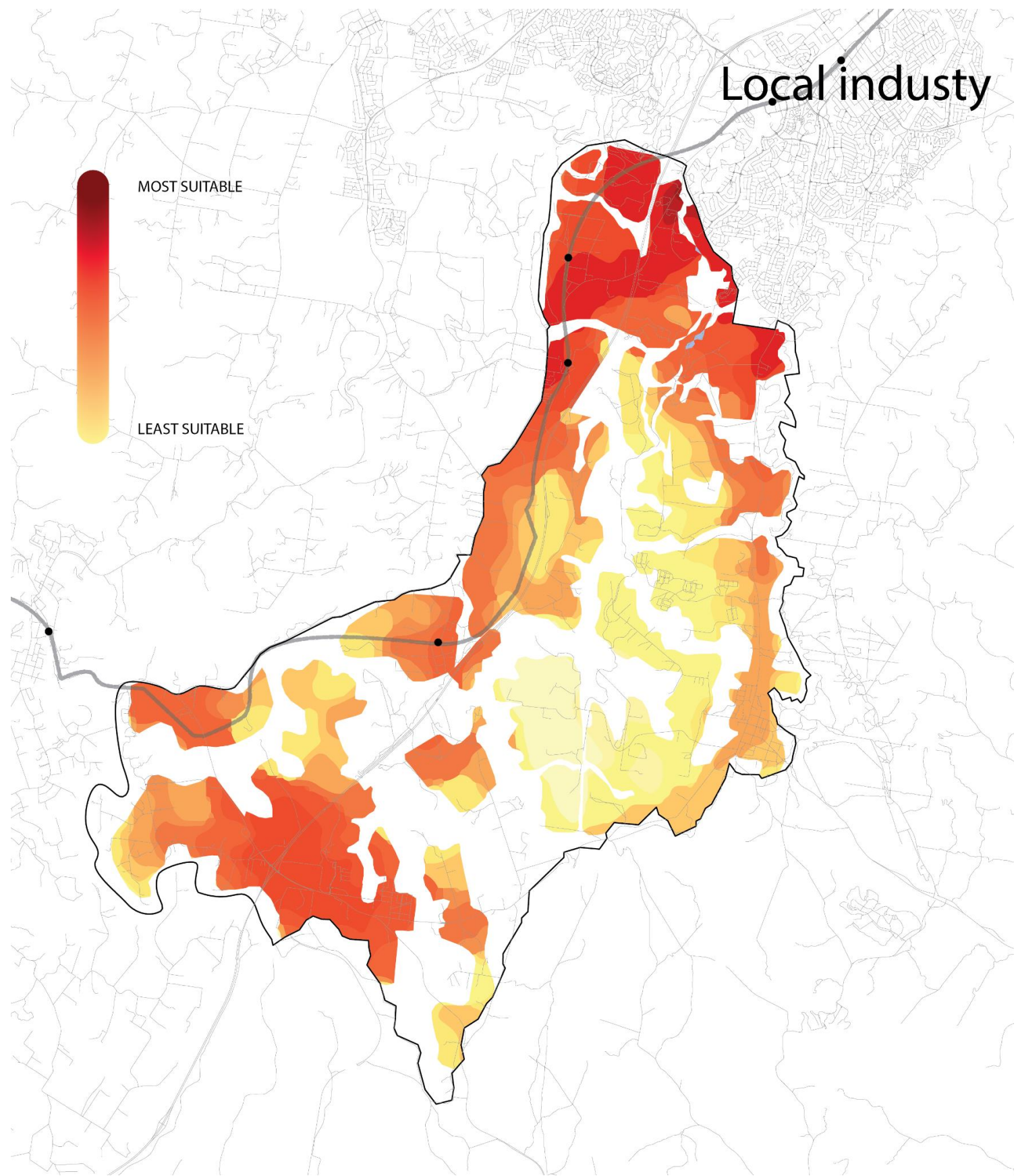| Attribute	Score/ranking	Justification
All Retail	90	Development of a non-strategic centre will be driven by retail offering and so it is important to be located where existing retail is found
Population density	90	Other office and retail centres are the commercial and social centre of local communities. Population density is very important in supporting this use.
Rail Station	72	Access to rail stations is important as many non-strategic centres cluster around important transport infrastructure and growth in locations with transport is preferred
Shopping Centre	72	Other centres may provide supporting services to a larger centre, in particular with other office locating near centres but not in them due to issue such as rent costs
AgedCare	72	Proximity to aged care assists those in it by reducing distances to travel for major services. Focusing around local clusters of shops and employment will assist in ageing in place
PreSchools	64	Desirable to create clusters of activity, surveillance and safety.
Arterial roads	63	Access to centres from surrounding areas is important
RE1 open space	60	As a social centre, access to public open space is important as it often forms part of local centre amenity
Hospital	56	Hospitals have some influence on the location of centres as they may provide ancillary services supporting a hospital. A large working population is also likely to require access to hospital services
Primary Schools	56	Focus on community facilities & social infrastructure in and around centres. Desirable to create clusters of activity, surveillance and safety.
Motorway on/off Ramps	45	Access to non-strategic centres from surrounding areas is important but not critical
Secondary Schools	40	Focus on community facilities & social infrastructure in and around centres. Desirable to create clusters of activity, surveillance and safety.
TAFEs & Colleges	40	TAFES and Colleges have some influence on the location of other office and retail as they may provide ancillary services or be part of the centre
Universities	40	Universities have some influence on the location of other office and retail as they may provide ancillary services or be part of the centre
Lot size	10	Minor importance. The smaller nature of non-strategic centre retail requires fewer large lots and works within the confines of existing business zoned areas

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Large format retail

Large format retail

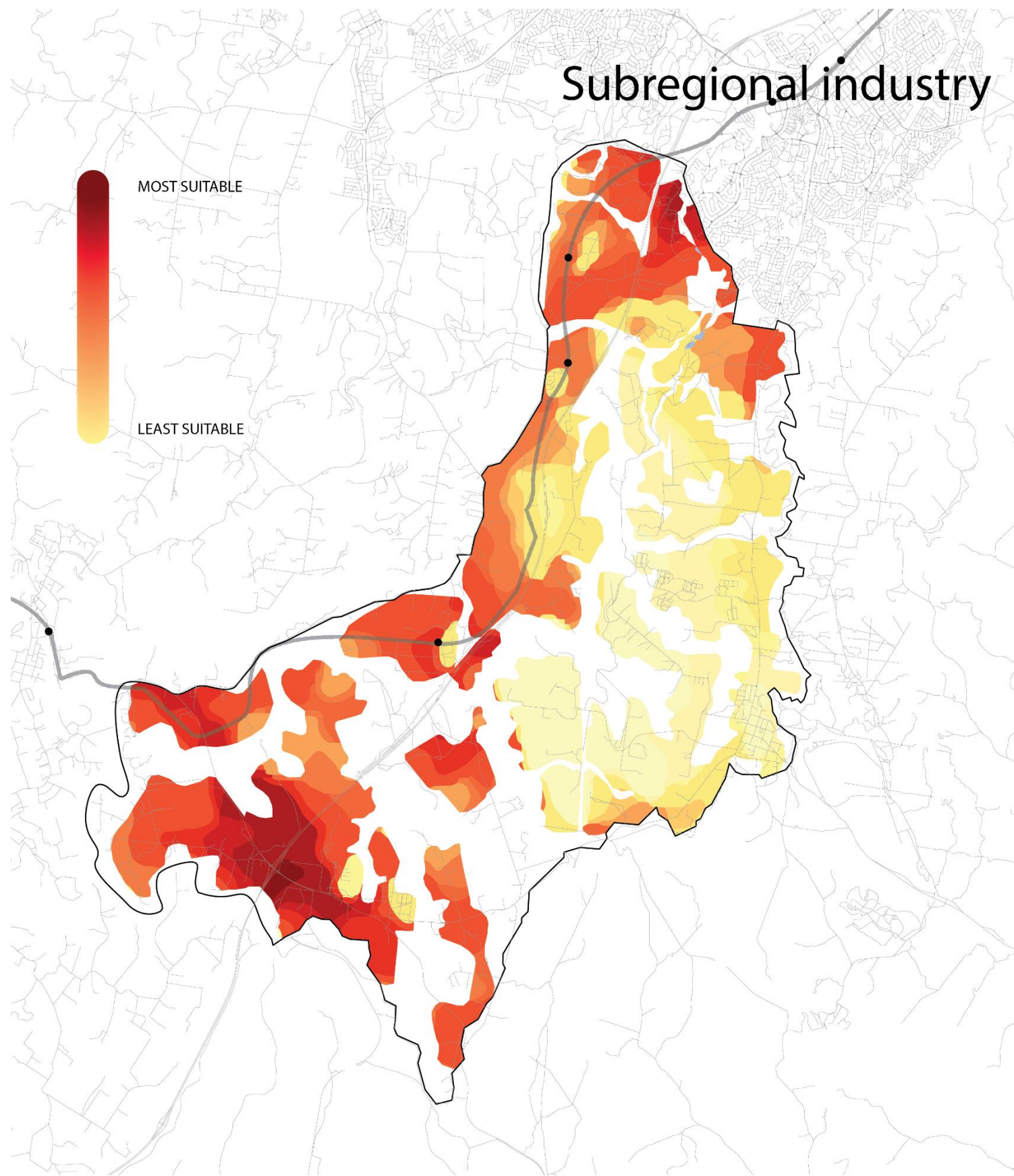| Attribute	Score/ranking	Justification
Arterial roads	100	Large format retail is heavily reliant upon driving as a means of customers taking away their purchased goods. Access to arterial roads for traffic management and access is critical
Lot size	100	Lot size is a critical factor in locating LFR. Large building footprints and carpark requirements require large lot sizes. Minimum lot size of 4000 sqm with an ideal of 10000 sqm utilised (this excludes areas with 'averages' of less than 4000 sqm, rates areas with average greater than 10000 sqm highest and 'ranks' areas with averages between 4000 and 10000sqm).
Motorway on/off Ramps	80	Large format retail is heavily reliant upon driving as a means of customers taking away their purchased goods. Access to motorways is important for delivery of goods
Population density	80	As a retail offering, proximity to population is very important for LFR to provide a strong and regular customer base
Shopping Centre	60	LFR can serve an ancillary service to other retail as shoppers use both retail offerings. This increases nearer strategic shopping centres. Encourages multi-purpose trip making.
All Retail	45	LFR can serve an ancillary service to other retail as shoppers use both retail offerings. Encourages multi-purpose trip making.
Rail Station	30	Access to public transport is desirable, but majority of customers will be car based. Rail transport may benefit some and provide a means of transport for employees
RE1 open space	10	Open space has very little impact on the suitability of LFR, although it can act as a buffer between the box nature of LFR and surrounding residential land uses
PreSchools	0	No bearing on the location of LFR due to its reason for use by customers being highly specific to its offering
Hospital	0	No bearing on the location of LFR due to its reason for use by customers being highly specific to its offering
Secondary Schools	0	No bearing on the location of LFR due to its reason for use by customers being highly specific to its offering
Primary Schools	0	No bearing on the location of LFR due to its reason for use by customers being highly specific to its offering
TAFEs & Colleges	0	No bearing on the location of LFR due to its reason for use by customers being highly specific to its offering
Universities	0	No bearing on the location of LFR due to its reason for use by customers being highly specific to its offering
AgedCare	0	No bearing on the location of LFR due to its reason for use by customers being highly specific to its offering

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Local industry

Local industy

MOST SUITABLE

LEAST SUITABLE

ATTRIBUTE RANKING: LOCAL INDUSTRY

Attribute	Score/ranking	Justification
Population density	80	Light industry is heavily population-driven and needs proximity to population to provide services to its customer base
Motorway on/off Ramps	72	Very important for customers and service supply access
Arterial roads	63	An important attribute for access to and by customers as well as accessibility for larger vehicles and supplies
Rail Station	36	Some value for employees accessing places of work and some customers, but not significant
All Retail	36	Value in being located near to other places for customers visit for services. For instance access to local shops while car is serviced
Shopping Centre	24	Access to shopping centres of some value for exposure to customers
RE1 open space	20	Open space can act as a buffer between any noise issues or use conflicts it may have with immediately surrounding residential land uses
TAFEs & Colleges	15	Proximity to TAFEs and colleges can support local industry to some extent through providing apprentices worker access
Universities	12	Proximity to universities can support local industry to some extent through providing apprentices worker access
Lot size	10	Some degree of importance, but does not necessarily require large lot sizes for operation
Hospital	6	Very little influence
AgedCare	6	Very little influence
PreSchools	3	Very little influence
Secondary Schools	3	Very little influence
Primary Schools	3	Very little influence

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Subregional industry

Subregional industry

MOST SUITABLE

LEAST SUITABLE

ATTRIBUTE RANKING: SUBREGIONAL INDUSTRY

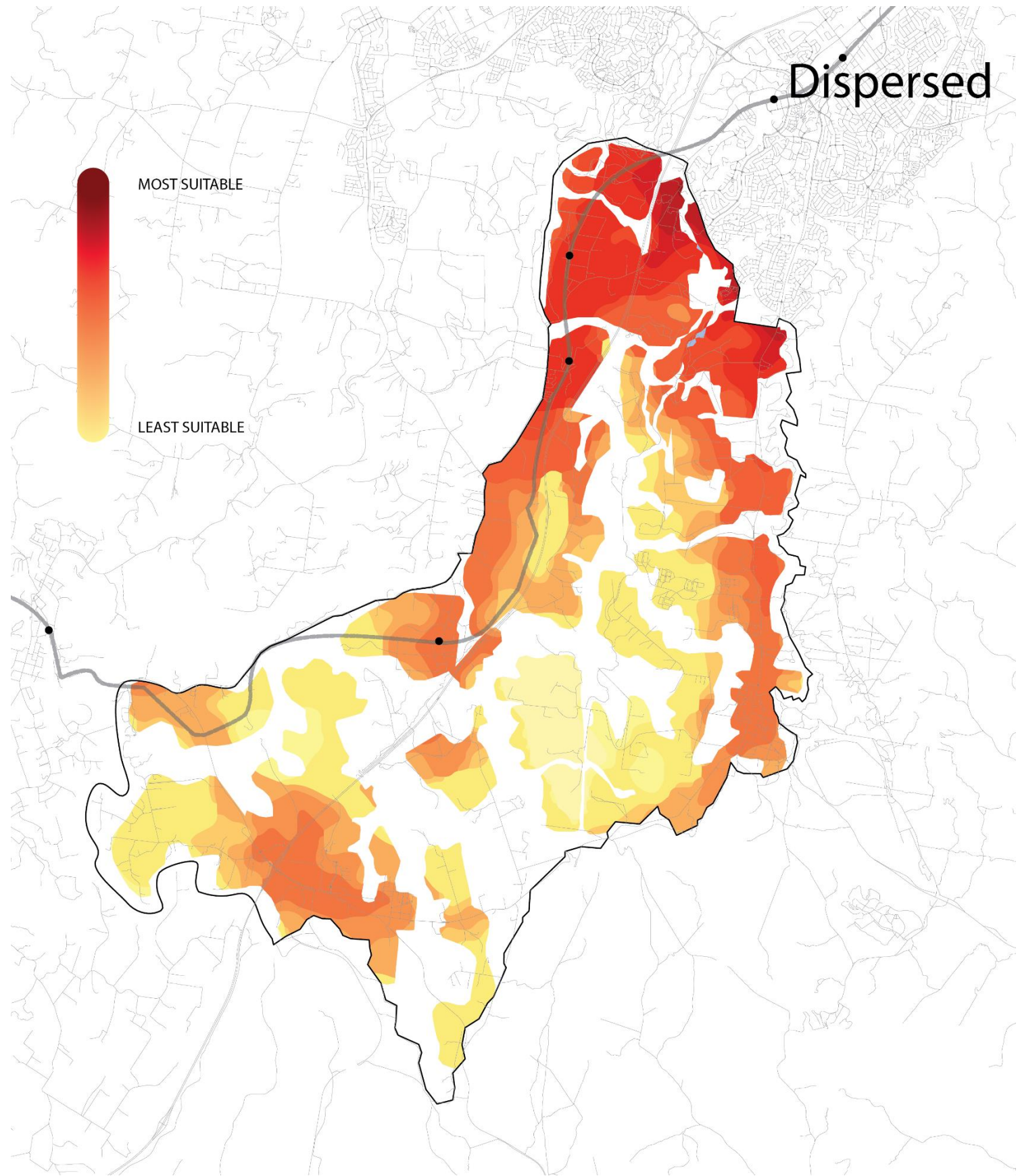| Attribute	Score/ranking	Justification
Arterial roads	90	Access for goods by road is extremely important to subregional industry
Motorway on/off Ramps	80	Access for goods by road is extremely important to subregional industry
Lot size	50	Important for subregional industry due to building type and function, although not all industry require large format plots. Minimum 2000 and ideal of 12000 sqm.
Rail Station	20	Some value for employees accessing places of work and some customers, although the nature of subregional industry locations would make access from stations difficult
RE1 open space	20	Open space can form a buffer between industrial uses and others, including residential and environmental
All Retail	10	Access required for employee amenity
Shopping Centre	10	Access required for employee amenity
TAFEs & Colleges	10	Proximity to TAFEs and colleges can support local industry to some extent through providing apprentices worker access
PreSchools	0	No influence on determining industrial suitability
Hospital	0	No influence on determining industrial suitability
Secondary Schools	0	No influence on determining industrial suitability
Primary Schools	0	No influence on determining industrial suitability
Universities	0	No influence on determining industrial suitability
AgedCare	0	No influence on determining industrial suitability
Population density	-40	Distance from population is preferred due to potential land use conflicts with uses such as residential

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Footloose industry
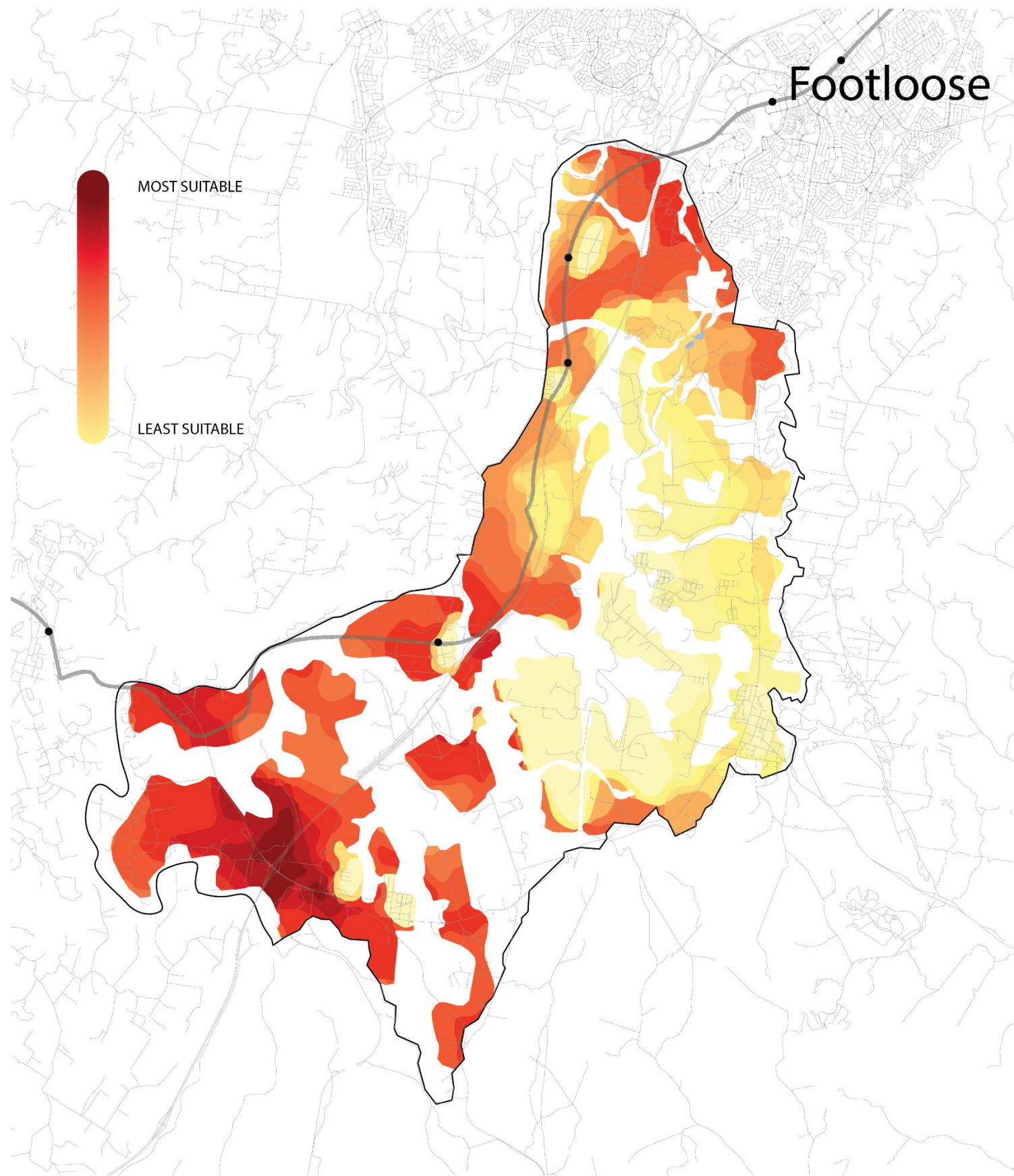
ATTRIBUTE RANKING: FOOTLOOSE INDUSTRY

Attribute	Score/ranking	Justification
Arterial roads	100	Access for goods by road is critical to subregional industry
Lot size	100	Important for subregional industry due to building type and function, although not all industry require large format plots
Motorway on/off Ramps	90	Access for goods by road is extremely important to subregional industry
RE1 open space	20	Open space can form a buffer between industrial uses and others, including residential and environmental
Rail Station	10	Some value for employees accessing places of work and some customers, although the nature of subregional industry locations would make access from stations difficult
TAFEs & Colleges	10	Proximity to TAFEs and colleges can support local industry to some extent through providing apprentices worker access
All Retail	5	Access required for employee amenity
Shopping Centre	5	Access required for employee amenity
PreSchools	0	No influence on determining industrial suitability
Hospital	0	No influence on determining industrial suitability
Secondary Schools	0	No influence on determining industrial suitability
Primary Schools	0	No influence on determining industrial suitability
Universities	0	No influence on determining industrial suitability
AgedCare	0	No influence on determining industrial suitability
Population density	-70	Distance from population is preferred due to potential land use conflicts with uses such as residential

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Dispersed Uses

ATTRIBUTE RANKING: DISPERSED

Attribute	Score/ranking	Justification
Population density	90	Heavily population-driven and requires a high degree of population density to form its customer base
Arterial roads	70	An important attribute for access due to the dispersed nature of the CLU
All Retail	42	Value in being located near to other retail areas to capture local customers.
Rail Station	40	Some value, although dispersed uses are scattered throughout an area
Motorway on/off Ramps	40	Serve a local function so motorway access is of less influence
PreSchools	40	Some
RE1 open space	30	Open space can be accessed by users of dispersed services for recreation (for example schools and community groups)
Shopping Centre	28	Access to shopping centres of some value for exposure to customers
TAFEs & Colleges	25	Proximity to TAFEs and colleges can support local industry to some extent through providing ancillary services for workers and students
Lot size	20	Some degree of importance, but does not require large lot sizes for operation
Universities	20	Proximity to universities can support local industry to some extent through providing ancillary services for workers and students
AgedCare	10	Community facilities may be used by aged care residents
Hospital	5	Very little influence
Secondary Schools	0	Although this includes schools, they are not an influence on the location of other dispersed uses
Primary Schools	0	Although this includes schools, they are not an influence on the location of other dispersed uses

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