Economic and Employment Study for Vineyard Stage 1

Final report

NSW Planning and Environment

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Independent insight.

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1 INTRODUCTION

1.1 Brief

SGS Economics & Planning has been engaged by the Department of Planning & Environment (DP&E) to undertake an Economic and Employment Study, which includes an assessment relating to retail, primary production, industry and other economic activity for land within both the Riverstone East Precinct and the Vineyard Precinct in the North West Priority Growth Area (NWPGA).

The core objectives of the Study include:

- Provide a strategic overview of how the regional retail services within Western Sydney relate to the existing planned capacity for these services within the North West Growth Centre (NWPGA).
- Provide a strategic overview of how the regional employment activities within the vicinity of Riverstone East and Vineyard relate to local employment activities within each precinct.
- Identify viable economic and employment activities within each precinct.
- Identify retail/commercial/employment land use and floor space requirements for each precinct;
- Provide a strategic overview of the implications of the North West Rail Link on Riverstone East and Vineyard precincts including any implications for land valuations/capitalisation and demand for housing or employment uses within these precincts.
- Provide a strategic overview of the implications of the Richmond Railway Line on Vineyard Precinct and to the extent relevant, on Riverstone East Precinct.
- Provide a strategic overview of the implications of the transport corridor to Marsden Park on the two precincts including in terms of future employment and economic activities in the vicinity of the corridor.

This report is prepared for the Stage 1 release of Vineyard Precinct.

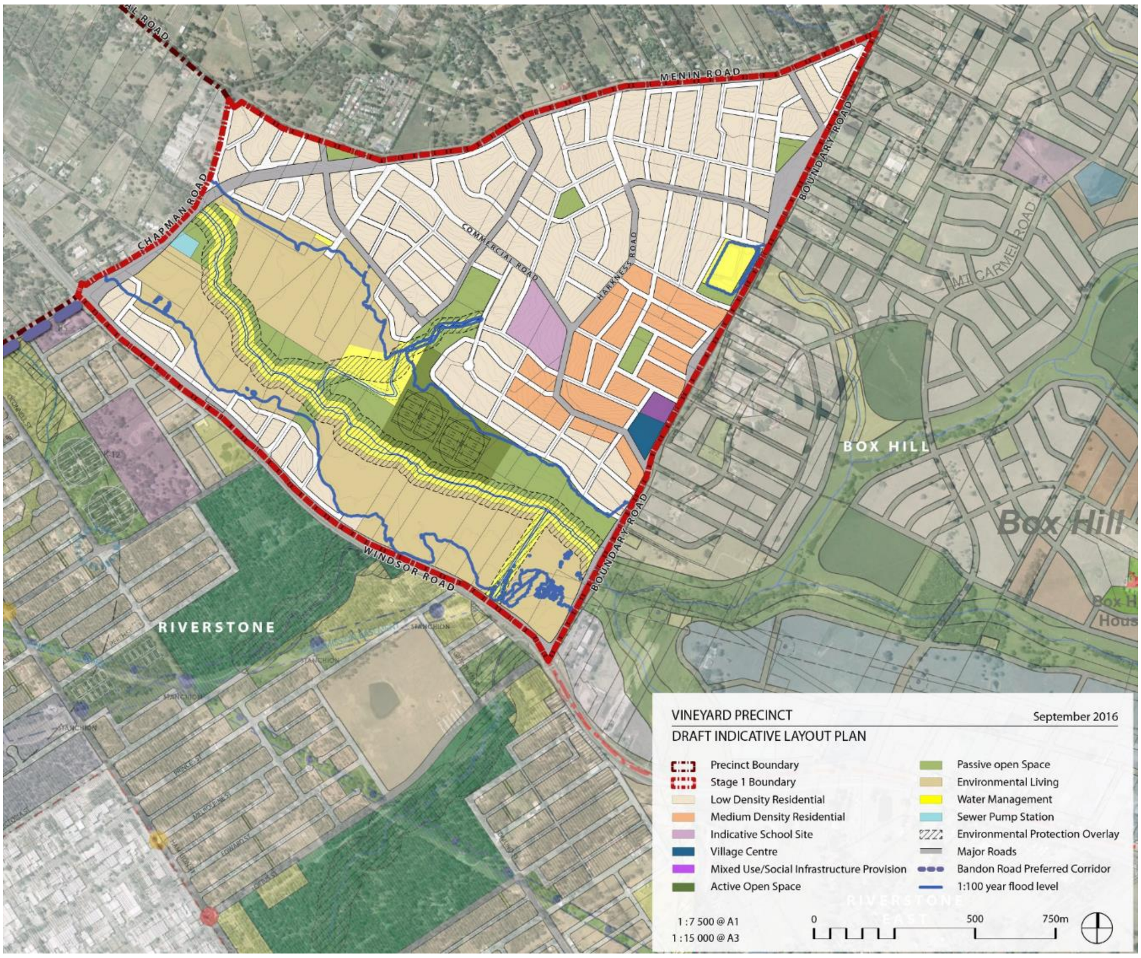
1.2 Context

Vineyard Precinct was identified for detailed precinct planning in August 2013. When the Precinct Planning is completed, the land within Vineyard will be rezoned to allow for urban development including residential and employment related development.

The Vineyard Stage 1 is 229.8 hectares in area and is located in the northern end of the North West Priority Growth Area, wholly within the Hawkesbury Local Government Area (LGA). It is immediately surrounded by Riverstone to the south, Box Hill to the south east, Chapman Road to the west and Menin Road to the north. The site is currently zoned General Rural under the Hawkesbury Local Environmental Plan.

A draft Indicative Layout Plan (ILP) of Vineyard Stage 1 is provided below.

FIGURE 1. VINEYARD STAGE 1



Source: Planning and Environment, 2016

1.3 Report structure

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

- Introduction and overview (this section)
- Review of current and planned supply
- Retail demand assessment
- Employment demand assessment
- Recommendations.

2 REVIEW OF CURRENT AND PLANNED SUPPLY

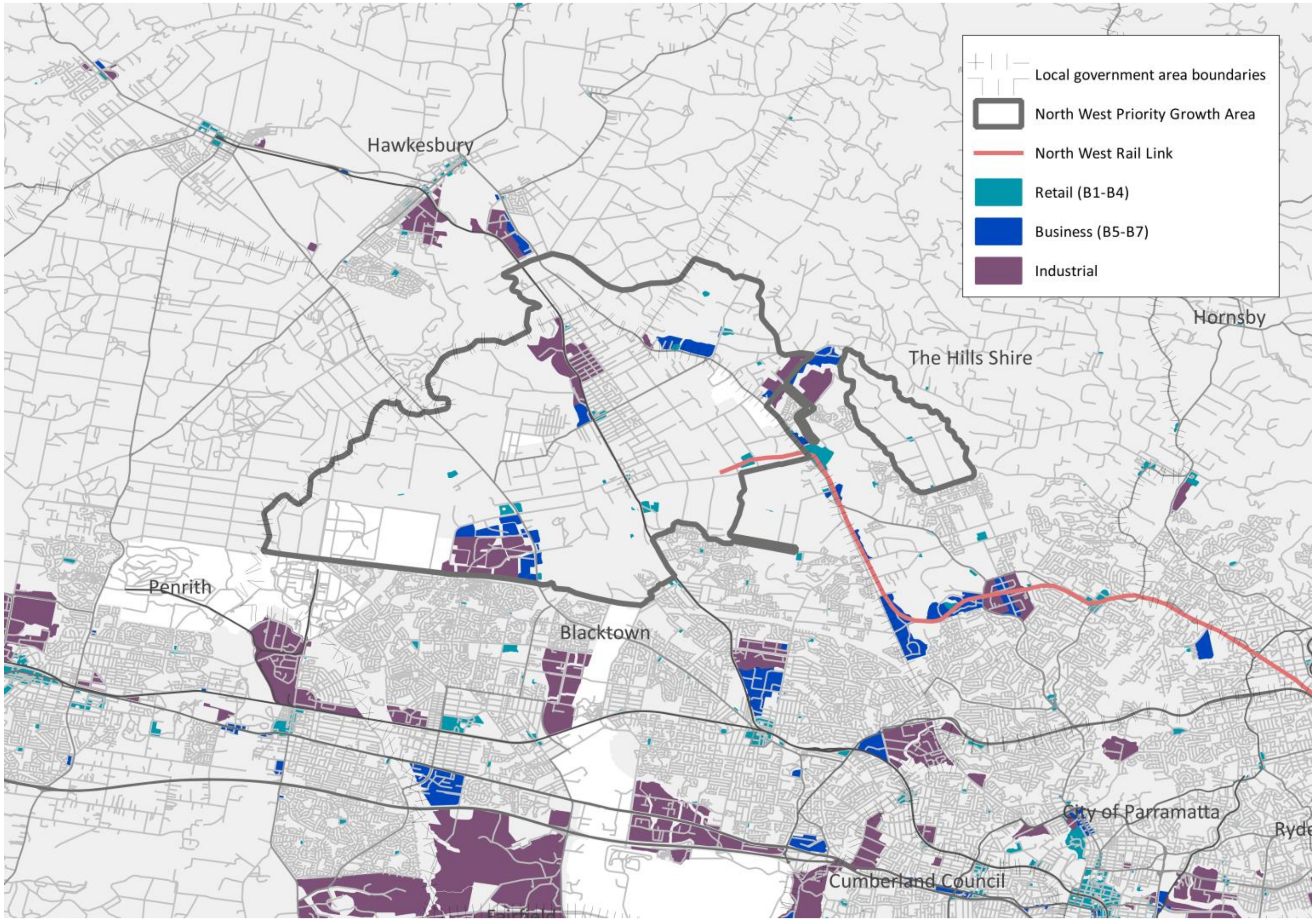
This section highlights the results from auditing current and planned retail and other employment activities within and in the vicinity of the Vineyard Precinct.

2.1 Audit of current supply

The NWPGA and its precincts sit within a large collection of existing employment lands. Located just north of the Western Motorway (M4), the Great Western Highway and Westlink (M7) the NWPGA has proximity and connectivity to the regional cities of Parramatta and Penrith. Strategic white and blue collar employment located within these centres and key employment lands strewn between the centres, are accessible within half an hour by car from the NWPGA.

Existing key employment land supply has been identified through a review of current zoned land and can be seen in Figure 2 overleaf.

FIGURE 2. CURRENT FLOORSPACE SUPPLY



Source: SGS Economics and Planning, 2016

The quantity of existing (and planned) retail floorspace surrounding the NWPGA has been identified primarily through a review of the Property Council of Australia publication, the *Shopping Centre Directory*, 2015. Gaps in this data were addressed by reviewing previous SGS employment land studies and by desktop review of reports to fill in any remaining gaps in information.

There are many retail centres located in the west and north west of Sydney. Floorspace for these centres can be seen in Table 1 below. Most of these centres have more than one hectare of total retail space, and some amount of department store retail floorspace. Outside of the regional centres of Parramatta and Penrith, Blacktown and Castle Hill are the largest retail centres in the area.

TABLE 1. EXISTING RETAIL FLOORSPACE OUTSIDE THE NORTH WEST PRIORITY GROWTH AREA

Centres	Gross land area (ha)	Supermarkets & grocery stores (sqm)	Department Stores (sqm)	Specialty stores (sqm)	Total Retail (sqm)
Beaumont Hills	1.3	417	-	831	1,248
Blacktown	44.4	12,207	35,391	76,266	123,865
Castle Hill	24.7	13,553	46,729	66,778	127,060
Kellyville - Plaza	5.7	Unknown	Unknown	Unknown	12,962
Kellyville - Windsor Road	1.6	156	365	574	1,095
Mt Druitt	355.4	13,497	44,698	45,861	104,056
Mulgrave Station	34.0	733	-	23,999	24,732
Parramatta CBD	-	28,336	56,011	200,959	285,306
Penrith CBD	-	17,929	46,441	92,200	156,571
Richmond	-	10,458	7,868	15,826	34,152
Rooty Hill	12.6	2,333	-	7,262	9,594
Rouse Hill (includes Second Ponds Creek)	57.1	10,303	15,370	52,361	78,034
St Marys	16.1	13,975	8,884	28,706	51,565
Windsor	28.6	8,601	1,242	18,829	28,671
Total	**581.5**	**132,498**	**262,999**	**630,452**	**1,038,911**

Source: SGS Economics and Planning, 2016

Some areas of the NWPGA provide a retail offering. This includes the existing Riverstone centre as well as development as part of the retail space planned through the land release in the Alex Avenue and Marsden Park Industrial Precincts.

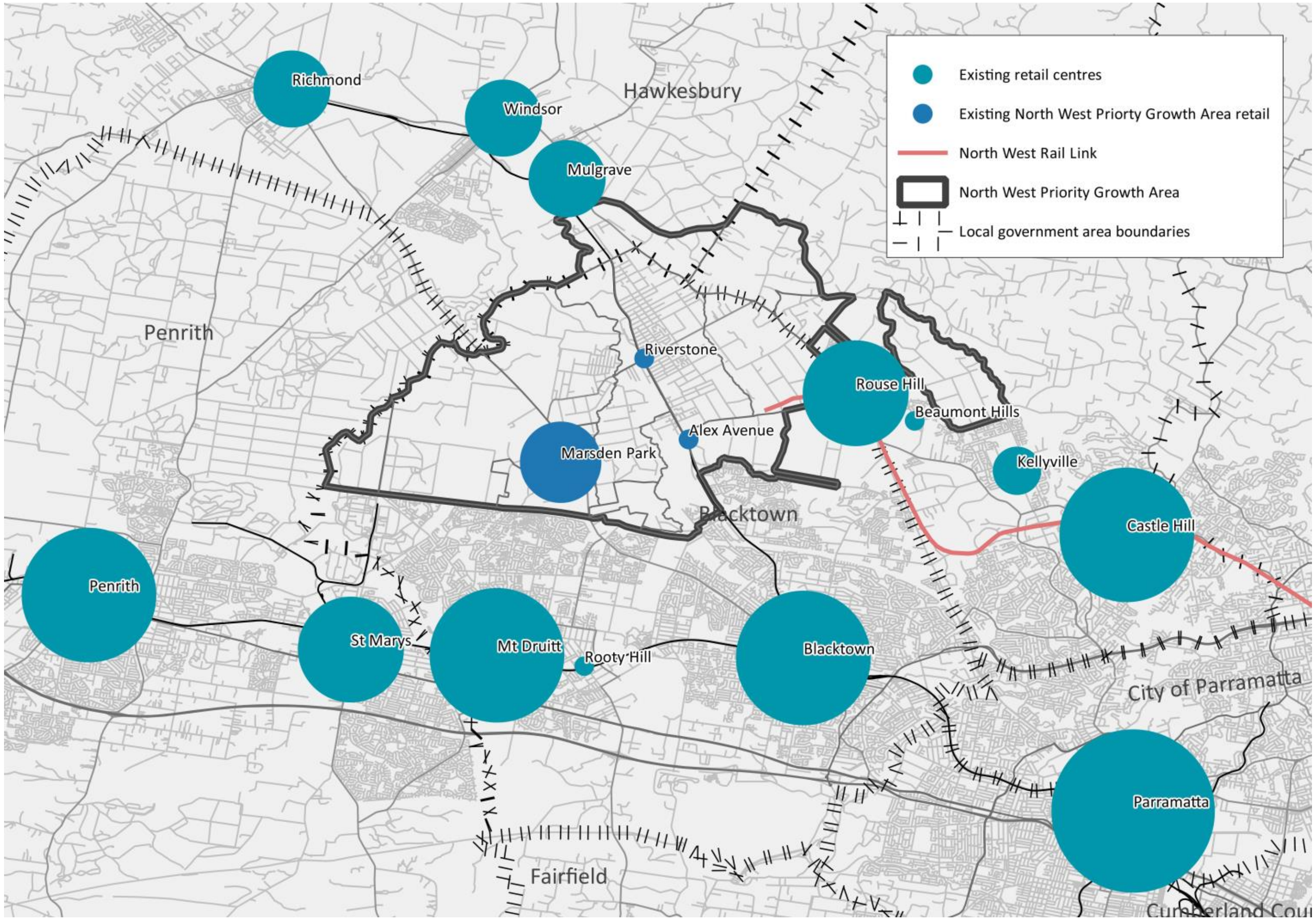
TABLE 2. EXISTING RETAIL FLOORSPACE OUTSIDE THE NORTH WEST PRIORITY GROWTH AREA

Centres	Gross land area (ha)	Supermarkets & grocery stores (sqm)	Department Stores (sqm)	Specialty stores (sqm)	Bulky Goods (sqm)	Total Retail (sqm)
Schofields/Alex Avenue	1	3,328	-	70		3,398
Riverstone	6.7	2,579	-	6,139		8,718
Marsden Park Industrial	39.8	1,000	-		74,500	75,500
Total	**47.5**	**6,907**	**-**	**6,209**	**74,500**	**87,616**

Source: SGS Economics and Planning, 2016

Existing retail floorspace within and outside of the NWPGA is shown in Figure 3 overleaf.

FIGURE 3. EXISTING RETAIL FLOORSPACE



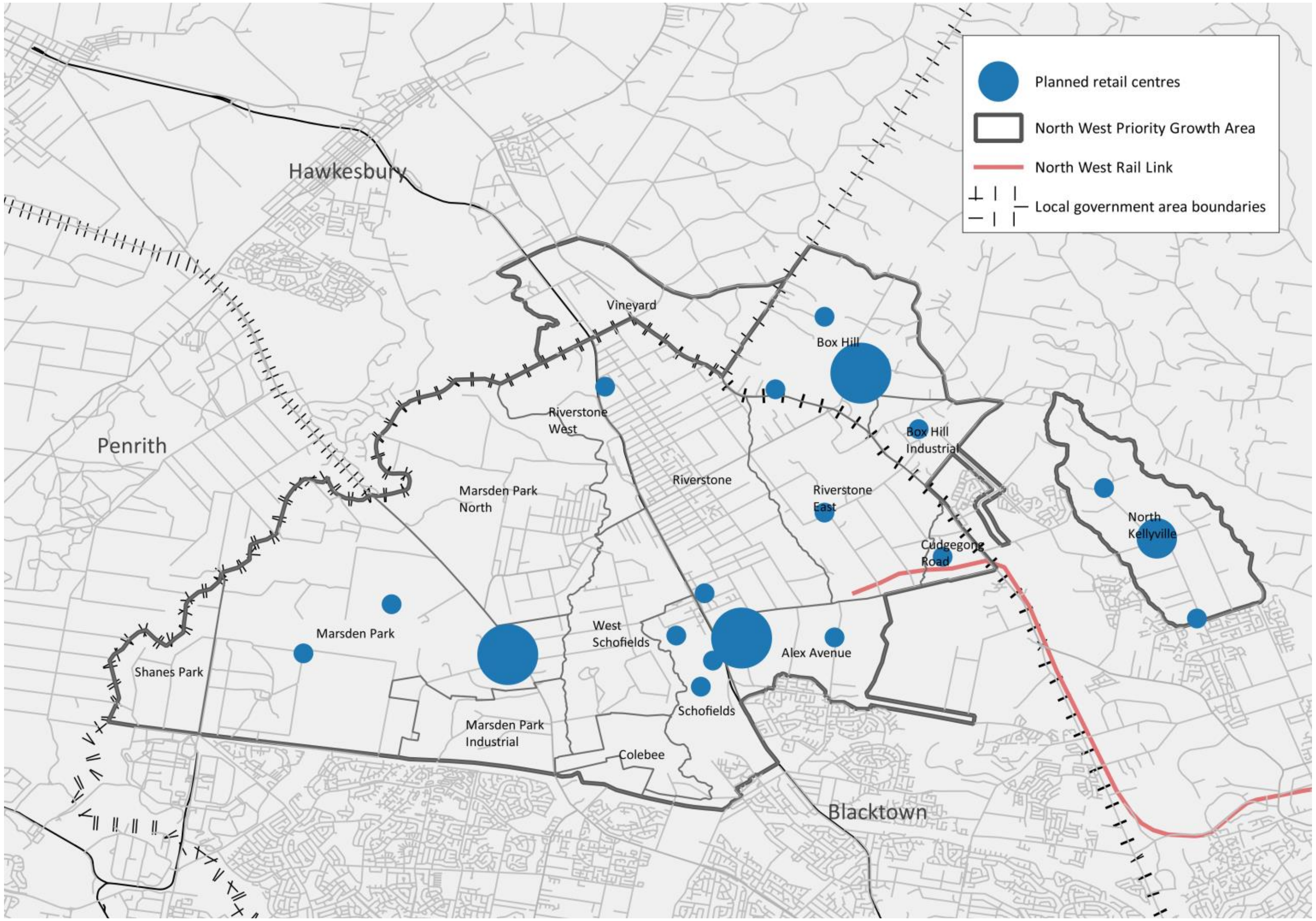
Source: SGS Economics and Planning, 2016

2.2 Planned supply in the North West Priority Growth Area

Figure 4 and Figure 5 illustrate the 'planned' retail and employment floorspace for the NWPGA. Most precincts have some neighbourhood centre retail floorspace planned. Box Hill, Riverstone West, Marsden Park and Marsden Park Industrial all have planned commercial floorspace (Enterprise Corridor or Business Park uses, which can also accommodate bulky goods retailing). Some industrial land supply is planned for Riverstone, Riverstone West and Box Hill, whereas Marsden Park Industrial has significant industrial supply planned. This planned supply is detailed in Table 3.

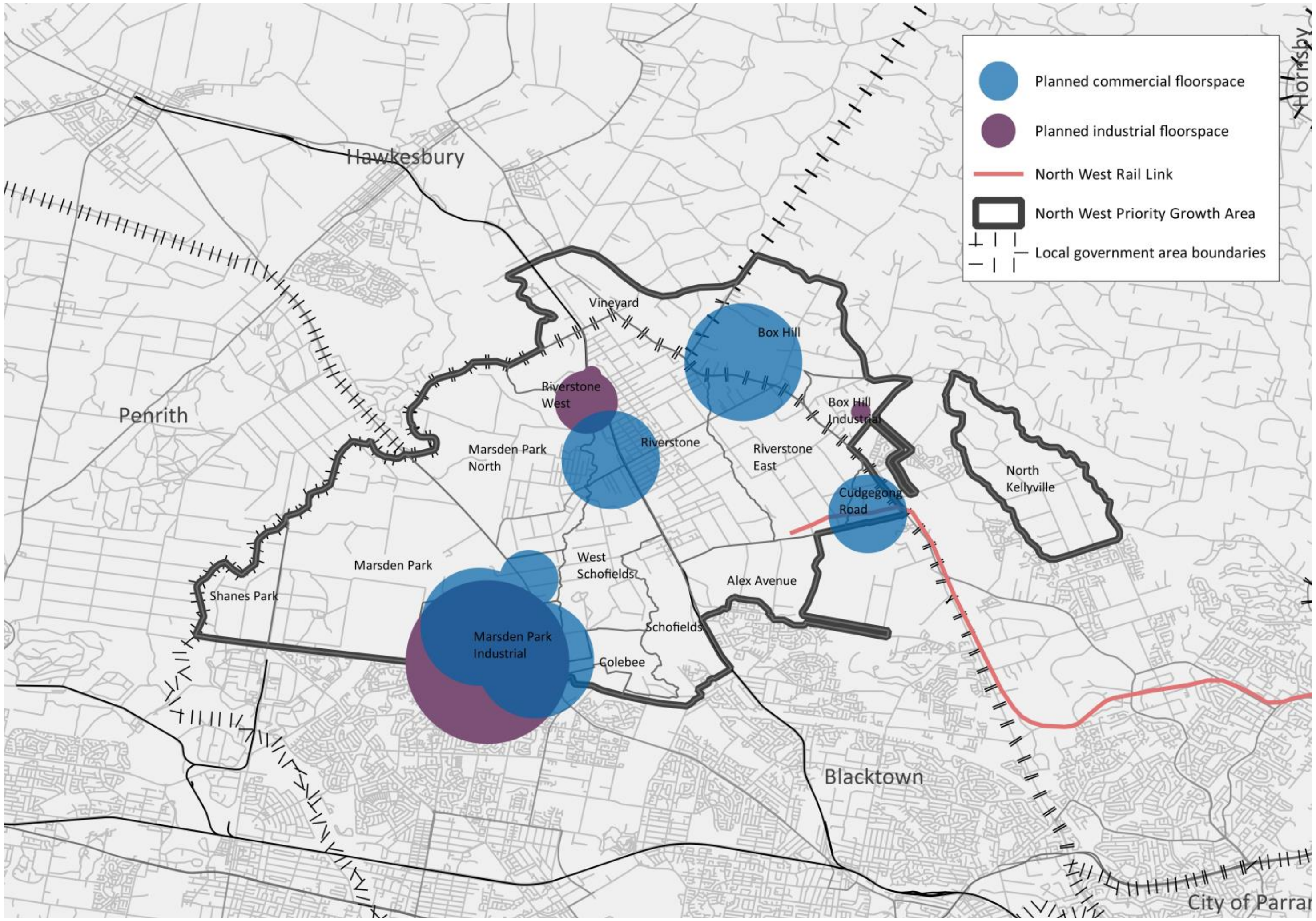
Planned supply information has been compiled from the most recent indicative precinct plans for the NWPGA precincts, in conjunction with a review of the retail and employment assessment reports and development data for each precinct where available.

FIGURE 4. NORTH WEST PRIORITY GROWTH AREA PLANNED RETAIL FLOORSPACE



Source: SGS Economics and Planning, 2016

FIGURE 5. NORTH WEST PRIORITY GROWTH AREA PLANNED EMPLOYMENT FLOORSPACE



Source: SGS Economics and Planning, 2016

TABLE 3. PLANNED SUPPLY OF RETAIL AND EMPLOYMENT FLOORSPACE FOR NORTH WEST PRIORITY GROWTH AREA

Precinct	Local/town centre	Village centre	Neighbourhood centre	Other	Current development and future staging
Alex Avenue	25,000 m^2 retail		3-5,000 m^2 retail		3,398 m^2 built – 3,328 m^2 supermarket – 70 m^2 hospitality Development approval for 4,922 m^2 – 4,200 m^2 supermarket – 722 m^2 speciality stores
Cudgegong Road (Area 20)		15,000 m^2 retail and commercial		6 ha employment lands	-
Box Hill and Box Hill Industrial	30,000 m^2	17,000 m^2 (3 centres)		59.6 ha industrial land 70.7 ha business park 3.2 ha enterprise corridor	- Development application for 15,000 m^2 of retail and 1,500 m^2 of commercial under assessment
Colebee	N/A	N/A	N/A	N/A	N/A
Marsden Park	25,000 m^2 retail 10,000 m^2 commercial	10,000 m^2 retail (2 centres)		3,000 m^2 commercial (non prescribed)	-
Marsden Park Industrial				70.6 ha Business Park 39.8 ha B5 Bulky Goods 99.3 ha General Industrial 107.3 ha Light Industrial	Take up rate of 10-15ha of industrial land p.a. 75,500 m^2 of retail floorspace built (74,500 m^2 bulky goods, 1,000 m^2 supermarket)
North Kellyville	15,000 m^2 retail		4,000 m^2 retail (2 centres)		- 10,867 m^2 of retail/commercial approved
Riverstone			5,000 m^2	14 ha employment lands	-
Riverstone West				250,000 m^2 business park floorspace 500,000 m^2 IN1 16 ha IN2	-
Schofields		2 centres 13,600 m^2 and 5,600 m^2	0.4 ha (1 centre)		-

Source: SGS Economics and Planning, 2014

3 RETAIL DEMAND ASSESSMENT

The future retail/commercial land use requirements for the Vineyard Stage 1 have been assessed. A detailed retail demand analysis has been completed by estimating total expenditure for the incoming population, distributing to different retail centre types, and converting the expenditure captured within the precinct into floorspace requirements. The projected retail demand and supply in the NWPGA has also been considered to inform the size, mix and staging of prospective retail development within the precinct.

3.1 Population projections

The projected resident population and dwelling numbers in Vineyard have been provided by the DP&E. According to the DP&E, the Stage 1 release of land in Vineyard has the ability to facilitate a maximum 2,400 dwellings, which equates to a potential population of 7,400 people by 2036, on the 229.8 hectare precinct.

3.2 Retail expenditure projections

The retail expenditure of the incoming resident population has been calculated using a multi-step approach. The first step involved identifying and locating all of the SA1s which make up the NWPGA. Following this, the identified SA1s were used to calculate an average retail expenditure profile, using MarketInfo 2011/2012 data. The rationale behind using the NWPGA as a proxy for Vineyard, was due to the fact that Vineyard is currently in rural character, thus applying the per capita spending of residents currently residing in the area to the forecasted population would not accurately reflect the potential spending patterns of future population in Vineyard Stage 1.

The following commodity categories were used for the calculation of retail expenditure:

- Food/Groceries
- Pharmaceutical goods
- Tobacco/Bottleshops
- Restaurants/Cafes/Takeaways
- Clothing/Shoes
- Personal
- Furniture/Whitegoods/Manchester
- Electronics
- Hardware/Gardening and
- Newsagent/Lotto

The MarketInfo data is at 2011/2012 prices, thus in order to bring the MarketInfo prices to 2016 dollars, a constant inflation rate of 2.5% was used. The next step was applying projected real rate of growth in retail spending to the Marketinfo estimates so that the 2036 retail expenditure can be calculated.

Table 4 below highlights the per capital expenditure profile of Vineyard Stage 1.

TABLE 4. PER CAPITA EXPENDITURE 2036 (2016 $) – VINEYARD STAGE 1

Commodity types	Per capita spending
Food/Groceries	$4,808
Pharmaceutical goods	$1,017
Tobacco/Bottleshops	$1,173
Restaurants/Cafes/Takeaway	$1,848
Clothing/Shoes	$1,322
Personal	$794
Furniture/Whitegoods/Manchester	$1,458
Electronics	$1,731
Hardware/Gardening	$856
Newsagent/Lotto	$17
Total	**$15,023**

Source: MarketInfo, SGS Economics and Planning 2016

The per capital spending from the table above is then multiplied by the projected population in Vineyard Stage 1 to derive the total retail expenditure generated by future residents when Stage 1 is fully developed. The total resident expenditure by commodity type is provided in the following table.

TABLE 5. TOTAL RESIDENT RETAIL EXPENDITURE 2036 (2016 $)

Commodity types	Total retail spending
Food/Groceries	$35,580,619
Pharmaceutical goods	$7,528,488
Tobacco/Bottleshops	$8,681,003
Restaurants/Cafes/Takeaway	$13,676,322
Clothing/Shoes	$9,781,098
Personal	$5,873,636
Furniture/Whitegoods/Manchester	$10,788,050
Electronics	$12,807,391
Hardware/Gardening	$6,331,657
Newsagent/Lotto	$124,484
Total	**$111,172,749**

Source: MarketInfo, SGS Economics and Planning 2016

3.3 Expenditure captured within the precinct

Not all of the retail expenditure from the resident population will be captured on-site. To determine the proportion of 'retained' expenditure, SGS have used previous research and floorspace audit completed for the Western Sydney Retail Study (SGS 2013 commissioned by DP&E). It has been found that in general, resident retail expenditure in areas similar to the precinct is distributed across different centre types in the following apportionment:

– Regional City: 15%
– Major Centre: 15%
– Town: 23%
– Village: 10%
– Small village: 7%
– Neighbourhood: 7%

Note that the total is less than 100 percent of residents' retail expenditure. This is because a portion of expenditure 'escapes' to bulky goods or large format retail centres and centres outside the defined system (i.e. a CBD centre). The following table shows the annual retail expenditure associated with the incoming residents and how that expenditure is likely to be allocated to each centre type within a retail hierarchy.

TABLE 6. DISTRIBUTION OF RETAIL EXPENDITURE BY CENTRE TYPE

Centre type	Residential retail expenditure
Regional City	$16,675,912
Major Centre	$16,675,912
Town	$25,569,732
Village	$11,117,275
Small Village	$7,782,092
Neighbourhood	$7,782,092
Total	**$85,603,017**

Source: SGS 2016

3.4 Recommended retail provision

Floorspace demand

Additional centres can only be supported in Vineyard Stage 1 if projected floorspace demand by residents for such centres exceeds the typical centre sizes. To estimate the retail floorspace demand generated by future residents, a set of benchmark Retail Turnover Densities (RTD) have been applied to the retail expenditure allocated to each centre type. Those RTDs represent the average trading performance of each centre type we have estimated for the Western Sydney Retail Study, and are measured in turnover per sqm Gross Leasable Area (GLA).

The projected total expenditure by precinct residents at each centre type has been assessed in the previous section. Average centre sizes are derived from a floorspace database compiled from a range of land audits completed by SGS, as well as retail and employment studies completed by SGS and other consultants as part of the Western Sydney retail study. Comparing the projected floorspace demand to the average centre sizes suggests that there is just sufficient demand to support a local neighbourhood centre of around 1500 square metres.

TABLE 7. ADDITIONAL FLOORSPACE REQUIREMENT AND TURNOVER THRESHOLDS

	Formulas	Regional City	Major Centre	Town	Village	Small Village	Neighbourhood
Allocated retail expenditure by precinct residents	A	$16,675,912	$16,675,912	$25,569,732	$11,117,275	$7,782,092	$7,782,092
Typical RTDs	B	$6,500	$5,100	$6,400	$7,100	$6,400	$5,400
Floorspace demand	C=A/B	2,566	3,270	3,995	1,566	1,216	1,441
Typical centre size	D	200,600	128,300	33,000	8,500	4,300	1,500
Enough demand to support a centre locally?	C>D?	No	No	No	No	No	Borderline

Source: SGS estimates based on RTDs from Urbis Retail Averages, 2014.

Existing/planned retail offer

Besides population, the recommended retail provision depends on the planned and existing offer available in the vicinity of the site. Section 2.1 of this report describes an extensive existing retail offer with over 1 million square metres of retail floorspace in the West and North West of Sydney, including a

51,000 square metre major centre at St Marys and a 156,500 square metre regional centre at Penrith CBD.

Section 2.2 describes the planned retail floorspace in the vicinity of the Vineyard precinct. Most precincts in the NWPGA have some retail offer planned, including a 30,000 square metre town centre at Box Hill, a 25,000 square metre town centre at Alex Avenue and another 25,000 square metre town centre at Marsden Park.

Given this information, there will be an adequate amount of higher order retail in the area surrounding Vineyard.

On-site retail provision and mix

While the level of demand from residents at Vineyard Stage 1 is not projected to exceed the threshold for an average neighbourhood centre, there is still likely to be sufficient demand for convenience retail in the precinct.

It is recommended that the on-site provision of retail floorspace comprise a neighbourhood centre with maximum floorspace of around 1500 metres. Any additional demand for retail would be distributed to the nearest centres of the appropriate typology. A floorspace ratio of 0.75:1 is considered appropriate for a neighbourhood centre of this size with at grade parking. Hence around a 2000 square metre site should be provided to accommodate future retail floorspace.

The neighbourhood centre is likely to comprise a mix of local retail shops that service the convenience shopping needs of the future residents.

Expenditure outside the precinct

Expenditure from residents at Vineyard Stage 1 which is not captured at the neighbourhood centre will 'spill over' into retail floorspace outside the precinct, generating a positive contribution to other existing and planned retail centres listed in Table 2 and Table 3 above.

Precinct residents are expected to generate $17 million of demand annually at regional city centres and $17 million in demand at major centres. Since no regional or major centre floorspace is planned on-site at the Vineyard precinct, much of this expenditure will be captured at existing nearby centres outside the NWPGA.

For example, $25 million of demand is expected to be generated annually at town centres. Some of this will be allocated to existing nearby centres at Mulgrave Station and Rouse Hill, with the remainder flowing to planned retail centres closer to the precinct. Within the NWPGA, 95,000 square metres of town centre floorspace has been planned, including 30,000 square metres at the adjacent precinct of Box Hill, 25,000 square metres each at Alex Avenue and Marsden Park, and 15,000 square metres at North Kellyville.

$11 million of demand is expected to be generated at village and small village centres. Some portion of this will flow to existing centres at Windsor and Riverstone. The planned 17,000 square metre village centre at Box Hill has the potential to benefit substantially. Other planned village centres in the NWPGA include Marsden Park, Schofields and 15,000 square metres of retail and commercial floorspace at Area 20.

Outside of the immediate sub-region, $25.6 million of expenditure is expected to 'escape' to higher order centres such as the Parramatta and Sydney CBD.

3.5 Retail demand in the North West Growth Centre

As well as assessing retail demand for the Vineyard Stage 1 in particular, SGS have forecast the aggregate retail demand in the NWPGA. The process is similar to the method described in sections above.

Population projections

Population projections for the NWPGA have been derived based on the latest available information from the NSW Government. The population of the NWPGA has been estimated at 200,000 people in 2036.

Retail expenditure projections

As mentioned in section 3.2, an expenditure profile for the NWPGA has been developed using the MarketInfo data. In conjunction with the population projections, this has been used to estimate the total retail expenditure. Table 8 below presents the projected retail expenditure generated by NWPGA residents by 2036.

TABLE 8 PROJECTED RETAIL EXPENDITURE 2036 (2016 $) - NWPGA

Commodity types	Total retail spending
Food/Groceries	$961,638,345
Pharmaceutical goods	$203,472,639
Tobacco/Bottleshops	$234,621,700
Restaurants/Cafes/Takeaway	$369,630,334
Clothing/Shoes	$264,354,011
Personal	$158,746,932
Furniture/Whitegoods/Manchester	$291,568,930
Electronics	$346,145,710
Hardware/Gardening	$171,125,871
Newsagent/Lotto	$3,364,429
Total	**$3,004,668,900**

Source: MarketInfo, SGS Economics and Planning 2016

The total retail expenditure has then been apportioned between centre types based on the benchmarks provided in section 3.4. Results are presented in Table 9 below.

TABLE 9. DISTRIBUTION OF RETAIL EXPENDITURE BY CENTRE TYPE (NWPGA)

Centre type	Annual expenditure by precinct residents
Regional City	$450,700,335
Major Centre	$450,700,335
Town	$691,073,847
Village	$300,466,890
Small Village	$210,326,823
Neighbourhood	$210,326,823
Escaped	$691,073,847
Total	**$2,313,595,053**

Source: SGS Economics and Planning 2016

Retail floorspace demand

Average RTDs have been used to convert retail expenditure estimate into floorspace demand by centre type. Floorspace demand has then been compared to the existing and planned floorspace in the NWPGA as described in section 2. This identifies where there exists potential over or undersupply of retail floorspace by centre type.

Table 10 below compares the planned and existing supply of retail floorspace to the projected floorspace demand for town, village and neighbourhood centres. A gap is considered to exist if the sum of existing and planned floorspace is at least 10% greater or less than projected demand.

Overall, the analysis indicates that projected retail demand in NWPGA is greater than the existing and planned floorspace in town, village and neighbourhood centres. When compared to the Western Sydney region, the NWPGA will be particularly undersupplied with neighbourhood centre floorspace. This finding further supports the provision of neighbourhood centre at Vineyard.

TABLE 10. RETAIL FLOORSPACE DEMAND AND SUPPLY ANALYSIS

	Floorspace demand	Existing supply	Planned supply	Existing + planned	Gap?	Over/under serviced?
Town	107,980	0	95,000	95,000	yes	under
Village & Small Village	75,183	12,114	52,200	64,314	yes	under
Neighbourhood	38,949	0	14,000	14,805	yes	under

Source: SGS Economics and Planning 2016

4 EMPLOYMENT DEMAND ASSESSMENT

This section outlines the demand for employment floorspace associated with the future residents of the Vineyard Stage 1. The population driven employment has been estimated by performing a regression analysis to identify the type of jobs that are linked to population, and applying population-driven employment ratios to the estimated incoming population.

The amount of on-site employment floorspace that is required for the Vineyard Stage 1 (and the amount that should be provided off-site) has been derived by applying a series of principles to identify the most suitable locations for particular types of employment.

4.1 Population-driven employment

SGS have established the causal relationship between population and employment by industry at the Vineyard precinct by completing a cross-sectional regression analysis. This has been used to pinpoint the types of jobs which are strongly linked to population, as well as the number of jobs in each of these categories for a given population number. Based on these findings, the population-driven employment by ANZSIC industry has been estimated for the potential development. These figures are then converted to employment land demand by Broad Land Use Categories (BLCs).

Regression

To determine the number of population-driven jobs that is supportable by the incoming population, a cross-sectional regression analysis has been performed to establish the relationship between employment and population size at a 1-digit ANZSIC level[1]. The analysis utilised the following simple linear model:

$$Jobs\ in\ industry_i = \beta_{0i} + \beta_{1i} population + \varepsilon_i$$

The data used for the regression was derived from population and place of work figures from the 2011 Census. Job and population figures were collected for all 3-digit ANZSIC categories at an SA3[2] level for the entire Sydney region. Data points where the number of jobs in a particular industry was more than 2 standard deviations away from the average were excluded from the regression. The rationale was that an abnormally high concentration of jobs in a particular region would tend to be caused by strategic rather than population-driven jobs. The inclusion of such outliers in the regression model would tend to skew the results, over-estimating the number of population-driven jobs.

Jobs in a particular industry were classified as population-driven only if the p-value associated with the regression coefficient was less than or equal to 0.05. In other words, jobs were regarded as population-driven only if there was estimated to be a less than 5% probability that the statistical relationship observed in the regression arose by chance. Including industries that did not meet this cut-off would

[1] Australian and New Zealand Standard Industrial Classification (ANZSIC) codes are provided at 4 different levels. 1-digit codes are the broadest level and there are 17 different 1-digit industry classifications.

[2] In general, the SA3s are designed to have populations between 30,000 and 130,000 persons and are often the functional areas of regional towns and cities with a population in excess of 20,000 or clusters of related suburbs around urban commercial and transport hubs within the major urban areas.

tend to overstate the true relationship between population and employment, since at a small-area level most jobs are strategic rather than population-driven.

Exclusions

Jobs in the retail industry were excluded from the regression since they have been modelled in the previous section. Jobs in education and training and health care and social assistance were also excluded since they are likely to be attributed to the provision of social infrastructure, which has been assessed in a separate study.

Local population driven jobs by 1-digit ANZSIC

Jobs per 3-digit ANZSIC category were aggregated into 1-digit ANZSIC categories. The reason for performing this step rather than regressing 1-digit industries directly was that the 1-digit categories are insufficiently fine-grained to capture population-driven jobs in industries comprising a broad range of services and functions. For example, the Transport, Postal and Warehousing industry generates both jobs that are likely to be located on-site, such as courier services, and off-site, such as warehousing services. If the regression were performed at a 1-digit level initially, it is likely that the real relationship between population and healthcare jobs would be obscured by statistical 'noise'.

The results from the regression are presented in the table below. The number of jobs per person has been scaled by 1000 for ease of interpretation. In other words, the column headed 'Jobs per 1,000 persons' indicates the number of new jobs expected to be generated in the SA3 by an additional 1,000 people on-site. Based on a population of 7400 provided by the Department of Planning and Environment, SGS have estimated the local employment arising from additional population at the potential development at Vineyard Stage 1. In total, 496 population-driven jobs are expected to locate either on-site or in proximity to the precinct. The table below lists these jobs by 1-digit ANZSIC industry category in Column 3.

Not all of these jobs will generate additional floorspace/land demand, since a proportion of jobs in each industry do not require a fixed address. For example, some workers employed in the construction industry such as builders do not require fixed office floorspace. These proportions are estimated for each industry using BTS Journey to Work data and applied to the forecasts of population-driven jobs to generate the number of jobs expected to generate employment land demand.

The final column in the table below lists these jobs by 1-digit ANZSIC industry.

TABLE 11. POPULATION-DRIVEN JOBS BY 1-DIGIT ANZSIC CATEGORY

1-digit industry	Jobs per 1000 persons	Total population-driven jobs	Jobs that demand additional floorspace
Manufacturing	8	58	58
Electricity, Gas, Water and Waste Services	0	3	3
Construction	8	78	57
Wholesale Trade	13	95	95
Retail Trade	5	37	37
Accommodation and Food Services	1	5	5
Transport, Postal and Warehousing	6	48	46
Professional, Scientific and Technical Services	2	12	11
Administrative and Support Services	4	41	32
Public Administration and Safety	4	28	28
Arts and Recreation Services	0	2	2
Other Services	12	89	86
TOTAL	**62**	**496**	**460**

Note that Retail Trade is still included on the 1-digit industry level despite the exclusions. That is because certain retail industries are not included in the retail demand modelling; for example, fuel retailing.
Source: SGS, 2016 based on ABS data and BTS Journey to Work data

4.2 Employment land demand

Floorspace reported by ANZSIC industry categories says little about operational impacts or characteristics that planning is concerned with. For this reason it is necessary to convert jobs by ANZSIC categories into floorspace by the SGS Broad Land use Categories (BLCs), which were developed in previous employment land planning investigations with the NSW Department of Planning and Environment. Typical developments within each BLC are described in the table below. A full description of each BLC is provided in Appendix 1.

TABLE 12. BLC DESCRIPTION

BLC code	BLC name	Typical development
AST	Short Term Accommodation	Hotels and Motels (not including pubs), backpacker establishments
BP	Business Park	Integrated warehouse, storage, R&D, ‘back-room’ management and administration with up to 40% office component
D	Dispersed Activity	Primary and secondary education, lower level health, social and community services, trades construction, other ‘nomads’
FL	Freight and Logistics	Warehousing and distribution activities. Includes buildings with a number of docking facilities; ‘hard stand’ areas with trucks or goods awaiting distribution; and large storage facilities
LL	Local Light	Car service and repair; joinery, construction and building supplies; and domestic storage
MH	Manufacturing Heavy	Large scale production activity. Likely to be characterised by high noise emission; emission stacks; use of heavy machinery; and frequency of large trucks
ML	Manufacturing Light	Small scale production with lower noise and emission levels than heavy manufacturing
O	Office	Office buildings that are independent (i.e. are not ancillary to another use on site) and likely to accommodate a significant number of administration staff
RB	Retail Big Box	Large shopping complexes
RBG	Retail Bulky Goods	Typically large, one-story buildings surrounded by car-parking,
RM	Retail Main Street	Main Street Retailing services.
S	Special	Tertiary level education, health, and community services
US	Urban Services	Concrete batching, waste recycling and transfer, construction and local and state government depots, sewerage, water supply, electricity construction yards

Source: SGS, 2014

However, before converting jobs into floorspace by BLC, it is necessary to assess the suitable BLCs for the Vineyard Stage 1.

BLC suitability assessment

SGS have developed a number of principles to identify the most suitable locations for particular types of employment. These broad principles can be used to determine the most suitable BLCs for the Vineyard precinct and potential locations within the precinct for these uses.

- **Office and Business Park**. Office and business park uses are heavily influenced by transport accessibility and as a result the most suitable areas are clustered around designated centres – especially those on transport nodes and with railway stations.

- **Retail.** Retail uses typically gravitate towards accessible areas. Big Box Retail (i.e. supermarkets) will tend to be found in the larger centres – usually in village centres or larger centres. Bulky goods retail is more dependent on arterial road access and high visibility but also require large lots to accommodate that retail form. As a result, these uses will tend to locate on the edge of centres, along major transport routes. Main street retail is found at all levels in the hierarchy within centres.

- **Industrial.** Local light industry is drawn towards the populated areas, will require reasonable access to arterial infrastructure and can be found on the edge of centres of all sizes in industrial areas. Light manufacturing is less likely to be found in populated areas and requires proximity to motorway on/ off ramps. Heavy manufacturing is best positioned away from populated areas given its impacts and will require motorway access and will often also require access to a rail spur. Freight and logistics is the most sensitive to motorway access and will need to be proximate to motorway on/ off ramps.

- **Other.** Urban services will tend to be outside of centres given their large land requirements, transport accessibility is important and uses are sensitive to distance from motorway access. Special uses will locate in centres at all levels in the hierarchy, road access and proximity to railway stations is important. Short term accommodation will gravitate towards populated areas with high visibility and accessibility.

In terms of the suitability of the Vineyard Stage 1 for these employment uses:

- The precinct has major road access via Windsor Road, which dissects the precinct and provides opportunities for employment uses which require reasonable access to arterial infrastructure.
- In terms of transport accessibility, Vineyard Station is located just outside of the precinct, along the border of Riverstone and Riverstone West precincts. The south of the precinct has greater railway accessibility. There are also a number of existing bus corridors along Windsor Road.
- The precinct will have contain a residential population of around 7400 people which will provide opportunities for those uses requiring close proximity to populated areas and restricts the potential for heavy manufacturing.
- The precinct does not contain any major centres which restrict the potential for office and business park type employment uses or bulky goods retail particularly because these uses should not be located out of centres.

Based on this analysis, the most appropriate employment uses for Vineyard Stage 1 are **retail main street uses**, restricted to the (potential) neighbourhood centre.

In terms of the other types of population driven employment industries, these uses will likely be accommodated in more suitable locations in other centres or precincts within the NWPGA which have capacity to accommodate these uses. At this stage, there is limited understanding of the future capacity of these centres.

ANZSIC to BLC conversion

Local population driven jobs by ANZSIC industry were then distributed to suitable BLCs for Vineyard Stage 1, based on the typical share of ANZSIC employment in each BLC. This apportionment was developed by SGS specifically for distributing population-driven jobs in the NWPGA to BLCs, through a previous employment land study commissioned by Growth Centre Commission.

The result from this distribution is shown in the table below. In total, the incoming residents at Vineyard Stage 1 can support up to 44 on-site jobs. Note this is in addition to those employed in retail, health, education and other social sectors.

TABLE 13. ON-SITE EMPLOYMENT DEMAND

1-digit industry	Retail main street
Manufacturing	0
Electricity, Gas, Water and Waste Services	0
Construction	0
Wholesale Trade	0
Retail Trade	11
Accommodation and Food Services	4
Transport, Postal and Warehousing	0
Professional, Scientific and Technical Services	2
Administrative and Support Services	5
Public Administration and Safety	4
Arts and Recreation Services	0
Other Services	17
TOTAL	**44**

Source: SGS, 2016

The list of jobs by ANZSIC category is converted into floorspace demand using the benchmark floorspace to job ratios. Finally, floorspace by BLC is converted to employment land demand using average floorspace to land ratios. All SGS benchmarks not otherwise attributed are derived from an audit of LGAs in the Sydney Greater Metropolitan Region.

4.3 Recommended on-site employment activities and land requirement

Floorspace and land requirement

The on-site employment was then converted into floorspace demand using the benchmark floorspace to job ratios. Finally, floorspace by BLC is converted to employment land demand using average floorspace ratios (FSR). These benchmark ratios were derived from land audits completed by SGS for LGAs across the Sydney Greater Metropolitan Region.

The table below presents the total floorspace and employment land demand by BLC once the precinct is fully developed.

TABLE 14. FLOORSPACE AND LAND DEMAND

Land uses	On-site jobs	Floorspace per job ratio	Floorspace demand (sqm)	FSR	Land requirement (sqm)
	A	B	C=A*B	D	C/D
Retail main street (non-retail uses)	44	*30*	1320	*0.75*	1,760

Source: SGS, 2014

Car parking requirement

Employment and retail land uses will generate demand for car parking spaces. SGS have calculated the parking lot requirement at the neighbourhood centre and employment lands, based on existing development controls from Hawkesbury Council as well as an assumed average area per parking slot of 30 square metres (including the slot itself and aisles, landscaping etc.).

Based on a council parking requirement of 1 space per 30 square metres of retail or commercial/office floorspace, the neighbourhood centre (both retail floorspace and non-retail main street uses) will require 94 parking spaces with 2820 square metres of associated land demand.

4.4 Impact on other employment precincts

Jobs identified as population-driven but not accommodated on-site are likely to locate elsewhere in the local region. These jobs will also generate employment land demand. Table 15 below presents the off-site population driven jobs as well as floorspace and land demand by BLC category. Significant floorspace and land demand will be generated for the following uses: urban services, freight and logistics, dispersed activities, special activities and local light industrial and urban support. In total, off-site population driven jobs are expected to generate over 3.8 hectares of employment floorspace and 10.6 hectares of land demand elsewhere in the region immediately surrounding the precinct.

TABLE 15. FLOORSPACE AND LAND DEMAND – OFF SITE-JOBS

Land uses	**Off-site jobs**	**Floorspace per job ratio**	**Floorspace demand (sqm)**	**FSR**	**Land requirement (sqm)**
	A	**B**	**C=A*B**	**D**	**C/D**
Business / Office Parks	4	50	200	0.8	250
Office	40	30	1,203	0.9	1,337
Retail - Big Box	27	100	2,708	1.7	1,593
Bulky Goods Retail	7	120	884	0.5	1,769
Dispersed Activities	17	40	697	0.4	1,742
Special Activities	40	70	2,821	0.5	5,641
Local light industrial and urban support	132	80	10,522	0.6	17,536
Manufacturing - Light	48	80	3,830	0.6	6,384
Freight and Logistics	45	100	4,521	0.3	15,072
Urban Services	55	200	11,024	0.2	55,119
TOTAL			**38,410**		**106,442**

Source: SGS, 2014

These jobs and associated floorspace/land demand should be accommodated in the other employment precincts within and in the vicinity of the NWPGA. For example, urban services and light manufacturing uses can locate at Marsden Park and Box Hill Industrial, whereas freight and logistics can locate at employment lands at Marsden Park, Box Hill Industrial and Alex Avenue.

5 RECOMMENDATION

5.1 Retail

In conclusion, the retail demand assessment indicates that the on-site residents, when the Vineyard Precinct is fully developed, can support a neighbourhood centre with retail floorspace of **around 1500 square metres GFA.** This would function to provide neighbourhood services and need to be accessible locally within the precinct. It is recommended that the neighbourhood centre should be located within Vineyard Stage 1 to allow local accessibility for residents.

The future residents will also add $78 million retail expenditure per annum to the existing and planned retail centres in the NWPGA and the surroundings.

5.2 Other employment activities

The employment demand assessment suggests that around 500 population-driven jobs will be required to service the future population in Vineyard, but only 460 jobs will require additional floorspace.

The suitability assessment of the Vineyard Precinct for various employment uses shows that the most appropriate employment use for the precinct is retail main street use within the proposed neighbourhood centre. In total, the non-retail employment activities in the neighbourhood centre can support 44 on-site jobs at Vineyard.

Strategic (or 'footloose') employment uses are not recommended to be located within the Vineyard Precinct.

5.3 Land use requirements

The land use requirements for the neighbourhood centre are included in the table below. We have also calculated the car parking requirement based on the car parking rates (from Council's DCPs) for retail and non-retail uses.

TABLE 16. FLOORSPACE AND LAND REQUIREMENTS

	Retail		Other employment uses		Car parking		Total land
Description	Floorspace (sqm)	Land area (sqm)	Floorspace (sqm)	Land area (sqm)	Car spaces	Land area (sqm)	requirement (sqm)
Neighbourhood centre	1,500	2,000	1,320	1,760	94	2,820	6,580

Source: SGS, 2014

Within the neighbourhood centre, approximately 2000 square metres of land will be required for retail uses and 1760 square metres of land for non-retail uses. Together with the 0.28 hectare of car parking, **around 0.66 hectares of land** will be required for the neighbourhood centre.

6 APPENDIX 1 – BLC DESCRIPTION

BLC	BLC Name	Types of activities	Description
AST	**Short Term Accommodatio n**	Hotels and Motels (not including pubs), backpacker establishments	Good accessibility and visibility. Businesses in this category tend to be in high population density areas, on close to arterial infrastructure.
BP	**Business Park**	Integrated warehouse, storage, R&D, 'back-room' management and administration with up to 40% office component	Traditional business park environments offer large land parcels and attractive site aspects. Business park locations are heavily driven by strategic positioning with respect to arterial infrastructure. For business park land uses with higher industrial components proximity to population centres is not desirable.
D	**Dispersed Activity**	Primary and secondary education, lower level health, social and community services, trades construction, other 'nomads'	Institutions are dispersed but need to be accessible and well served by public transport.
FL	**Freight and Logistics**	Warehousing and distribution activities. Includes buildings with a number of docking facilities; 'hard stand' areas with trucks or goods awaiting distribution; and large storage facilities	Warehousing and distribution is a metro level issue with activities preferably locating close to air, sea and inter-modal inland ports, or with access to the motorway system
LL	**Local Light**	Car service and repair; joinery, construction and building supplies; and domestic storage	Wide range of businesses that service other business (components, maintenance and support) and Subregional populations. Need to be accessible for population centres
MH	**Manufacturing Heavy**	Large scale production activity. Likely to be characterised by high noise emission; emission stacks; use of heavy machinery; and frequency of large trucks	Industrial areas. Heavy manufacturing is in decline in Sydney, but will continue to cluster in some locations such as Wetherill Park, Campbelltown/ Ingleburn etc. There are strong arguments for collocation in terms of raw material delivery and to concentrate externalities (though impacts on surrounding uses are generally moderate).
ML	**Manufacturing Light**	Small scale production with lower noise and emission levels than heavy manufacturing	Industrial areas but with a lower requirement for distance from population than heavy manufacturing/
O	**Office**	Office buildings that are independent (i.e. are not ancillary to another use on site) and likely to accommodate a significant number of administration staff	Typically require commercial centre locations. Need to have good accessibility for office workers.
RB	**Retail Big Box**	Large shopping complexes	Commercial centre locations. Require high visibility high traffic locations. Should be easily accessible with good public transport links
RB G	**Retail Bulky Goods**	Typically large, one-story buildings surrounded by car-parking,	Usually located out of centre and in high exposure (main road) locations.

RM	**Retail Main Street**	Main Street Retailing services.	Traditionally found in main street locations (e.g., supermarkets) and small cluster or strips of stores located next to a street or road
S	**Special**	Tertiary level education, health, and community services	Typically require strategic locations and needed in each sub-region.
US	**Urban Services**	Concrete batching, waste recycling and transfer, construction and local and state government depots, sewerage, water supply, electricity construction yards	These typically have noise dust and traffic implications and need to be isolated or buffered from other land uses. Needed in each sub-region

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