Economic and Employment Study - Riverstone East Precinct

Final report

Department of 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 and Environment (DP&E) to undertake an Economic and Employment Study, which includes an assessment of retail, primary production, industry and other economic activity, for land within the Riverstone East Precinct and the Vineyard Precinct in the North West Growth Centre (NWGC).

The 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 (NWGC).
- 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 Riverstone East Precinct.

1.2   Context

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

The Riverstone East Precinct is 656 hectares in area and is located in the east-centre area of the North West Growth Centre, and is within the Blacktown City Council Local Government Area (LGA). It lies north-east in orientation, east of First Ponds Creek and west of Windsor Road.

The Precinct adjoins Alex Avenue to the south west, Area 20 to the south east, Box Hill and Box Hill Industrial to the north east and Riverstone to the west. The current land use is generally zoned General Rural under the Blacktown Local Environmental Plan 1988 with certain land at the northern end of the precinct zoned for residential purposes.

An aerial photo of the Riverstone East Precinct is provided below.

FIGURE 1. RIVERSTONE EAST PRECINCT BOUNDARY
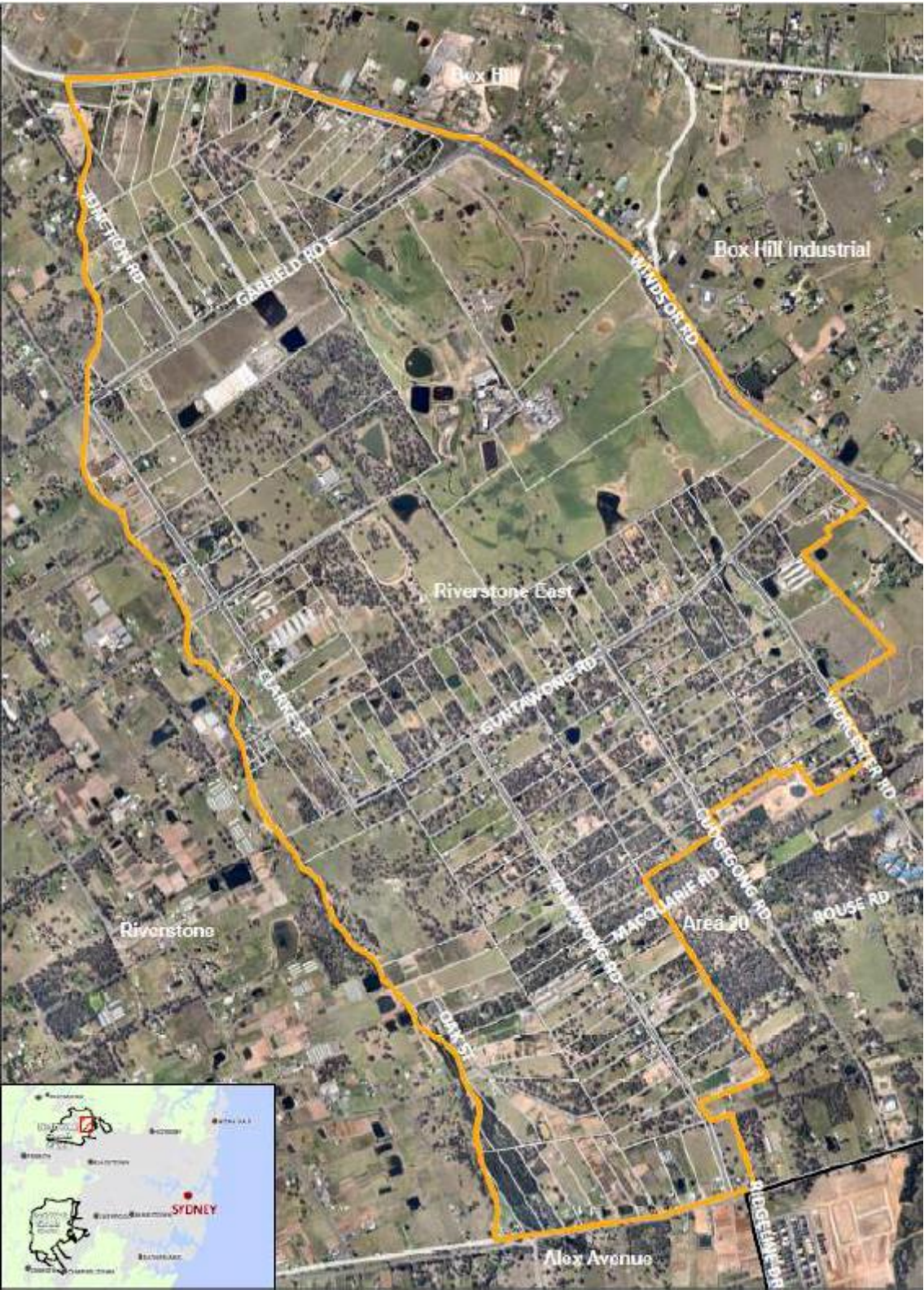
Source: Planning and Infrastructure, 2014

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
- Review of rail infrastructure
- Retail demand assessment
- Employment demand assessment
- Contribution of existing industries in precinct
- Economic viability assessment
- Preliminary recommendations (this will be updated in the draft section with draft recommendations when all the analysis has been completed).

2 REVIEW OF CURRENT AND PLANNED SUPPLY

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

2.1 Audit of current supply

The North West Growth Centre (NWGC) is located within close proximity to significant areas of existing employment lands. Located north of the Western Motorway (M4), the Great Western Highway and Westlink (M7), the NWGC has proximity and connectivity to the regional cities of Parramatta and Penrith and the centres of Blacktown and Rouse Hill.

In the audit, existing employment land supply has been identified through a review of current zoned land. This is identified in Figure 2.

Gross land areas for these precincts are indicated in the following table.

TABLE 1. EXISTING EMPLOYMENT PRECINCTS

Employment precincts	Gross land area (ha)	Total employment
Blacktown Industrial	247.4	8,960
Glendenning Industrial	207.7	4,270
Mt Druitt Industrial	3.2	1,176
Norwest Business Park	225.0	14,602
Norwest Business Park West	102.6	10,349
South Windsor	112.2	1,586
St Mary's Industrial	324.3	5,141
Vineyard	42.1	1,859
Total	**1,264.5**	**47,942**

Source: SGS Economics and Planning, 2014

Parramatta and Norwest Business Park provide the key professional employment for western Sydney. Industrial employment is mainly located within Blacktown Industrial and St Mary's Industrial precincts

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FIGURE 2. CURRENT FLOORSPACE SUPPLY

Legend

Centres
- Neighbourhood centre
- Small village
- Village
- Town centre
- Major centre
- Regional city

Boundaries
- North West Growth Centre boundary
- Business zoned land
- Industrial zoned land
- North West Rail Link

Retail centres
1. Beaumont Hills
2. Blacktown
3. Kellyville Plaza
4. Kellyville Windsor Road
5. Mt Druitt
6. Mulgrave Station
7. Penrith CBD
8. Riverstone
9. Rooty Hill
10. Rouse Hill
11. St Mary's
12. Windsor

Employment precincts
1. Blacktown Industrial
2. Glendenning Industrial
3. Mt Druitt Industrial
4. Norwest Business Park
5. Norwest BP West
6. South Windsor
7. St Mary's Industrial
8. Vineyard

Source: SGS Economics and Planning, 2014

The quantity of existing (and planned) retail floorspace surrounding the NWGC has been identified primarily through a review of the Property Council of Australia publication, the *Shopping Centre Directory*, 2010. 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 northwest of Sydney. Floorspace for these centres (excluding Parramatta) is shown in Table 2. Most of these centres have more than 10,000 square metres of total retail space, and some amount of department store retail floorspace. St Mary's and Blacktown are the largest retail centres in the area.

TABLE 2. EXISTING RETAIL FLOORSPACE

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
Kellyville - Plaza	0.6	Unknown	Unknown	Unknown	5,719
Kellyville - Windsor Road	9.2	156	365	574	1,095
Mt Druitt	355.4	13,497	44,698	45,861	104,056
Mulgrave Station	34.0	307	-	24,425	24,732
Penrith CBD	-	12,323	35,362	74,213	121,898
Riverstone	-	2,579	-	6,139	8,718
Rooty Hill	12.6	2,333	-	7,262	9,594
Rouse Hill (includes Second Ponds Creek)	57.1	10,303	15,370	38,719	64,392
St Mary's	363.3	11,358	-	138,617	149,975
Windsor	28.6	8,601	1,242	18,829	28,671
Total	**906.6**	**74,081**	**132,429**	**431,735**	**638,245**

Source: SGS Economics and Planning, 2014

2.2 Planned supply in the NWGC

Figure 3 and Figure 4 illustrate the 'planned' retail and employment floorspace for the NWGC. 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). Some industrial land supply is planned for Riverstone, Riverstone West, Box Hill and Area 20, whereas Marsden Park Industrial has significant industrial supply planned. This planned supply is detailed in Table 3 on the following page.

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

FIGURE 3. NWGC PLANNED RETAIL CENTRES
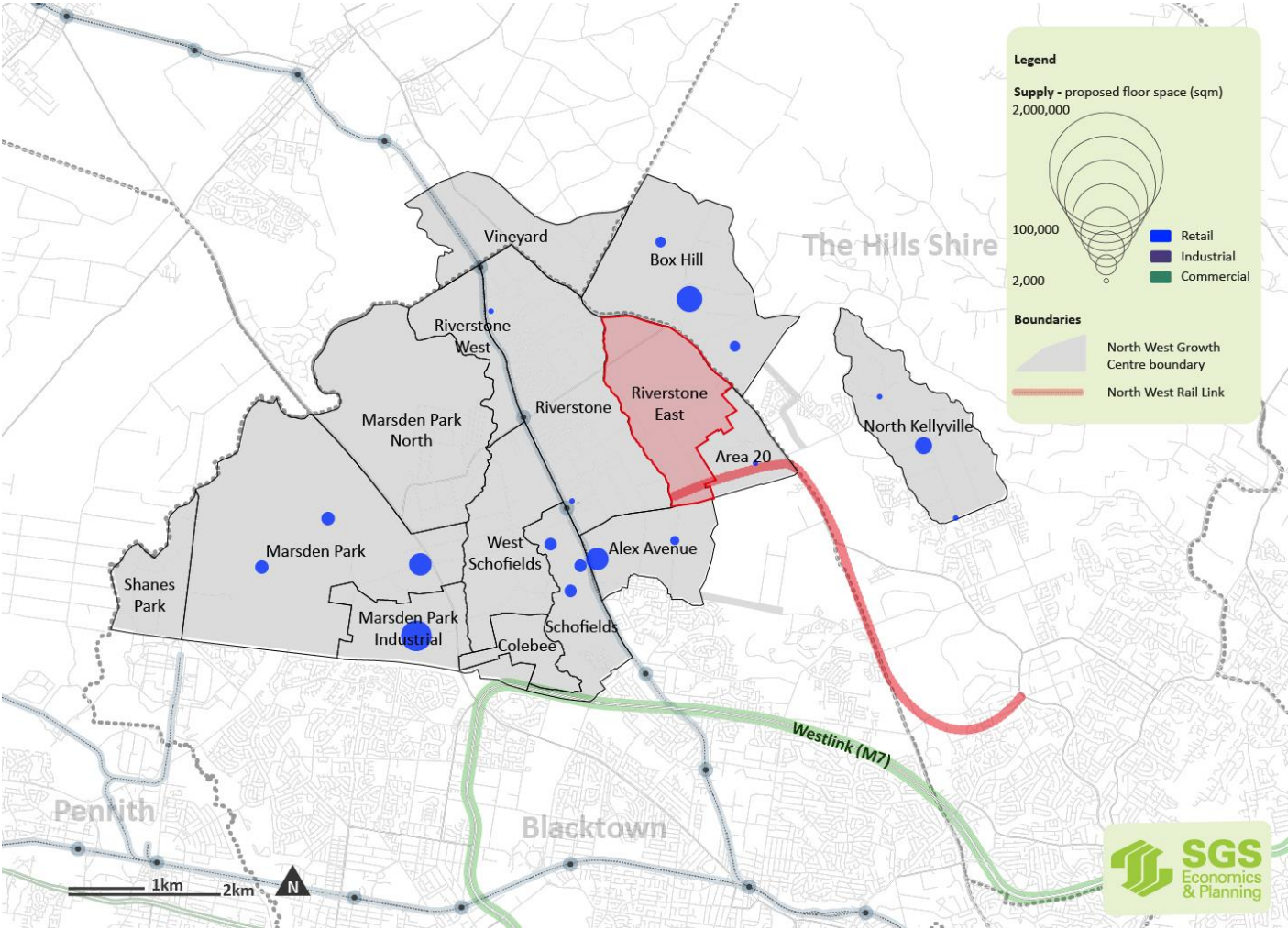
Source: SGS Economics and Planning, 2014

FIGURE 4. NWGC PLANNED OTHER EMPLOYMENT FLOORSPACE

Source: SGS Economics and Planning, 2014

TABLE 3. PLANNED SUPPLY OF RETAIL AND EMPLOYMENT FLOORSPACE FOR NWGC

Precinct	Local/town centre	Village centre	Neighbourhood centre	Other	Timing
Alex Avenue	25,000 m² retail		3-5,000 m² retail		Stage 1: 2008-2010 − Full-line supermarket (3,500m2 plus 3,000m2 speciality stores). Stage 2: 2012 -2016 − Second full-line supermarket (3,500m2 plus and Discount Department Store of 6,000m2). Stage 3: 2016-2020 − Further expansion of speciality floorspace, including mini-majors. (7,000 sq.m) − Timing to be confirmed by population growth. − The Neighbourhood centres should be established in this phase.
Area 20		12,500 m² retail and commercial		6 ha employment lands	
Box Hill and Box Hill Industrial	30,000 m²	17,000 m² (3 centres)		59.6 ha industrial land 70.7 ha business park 3.2 ha enterprise corridor	
Colebee	N/A	N/A	N/A	N/A	N/A
Marsden Park	25,000 m² retail 10,000 m² commercial	10,000 m² retail (2 centres)		3,000 m² commercial (non-prescribed)	
Marsden Park Industrial				70.6 ha Business Park 39.8 ha B5 Bulky Goods 99.3 General Industrial 107.3 Light Industrial	Take up rate of 3,000 m² of commercial p.a. and 10-15ha of industrial land p.a.
North Kellyville	15,000 m² retail		4,000 m² retail (2 centres)		
Riverstone			5,000 m²	14 ha employment lands	Same as Alex Avenue, however advice regarding number of centres and size was not adopted.
Riverstone West				250,000 m² business park floorspace 500,000 m² IN1 16 ha IN2	
Schofields		2 centres 13,600 m² and 5,600 m²	0.4 ha (1 centre)		

Source: SGS Economics and Planning, 2014

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3   REVIEW OF RAIL INFRASTRUCTURE

3.1   North West Rail Link

A review of the changes in the alignment to the North West Rail Link and the implications of the planning for the Riverstone East Precinct are discussed in this section. This is primarily related to the proposed Cudgegong Road station and stabling yards.

The current proposed alignment for the North West Rail Link (NWRL) is illustrated in Figure 5. Cudgegong Road station is located within the Area 20 Precinct which is adjacent to Riverstone East. The stabling yard for the NWRL is proposed to be located to the west of the station within the Riverstone East precinct.

FIGURE 5. NWRL ALIGNMENT
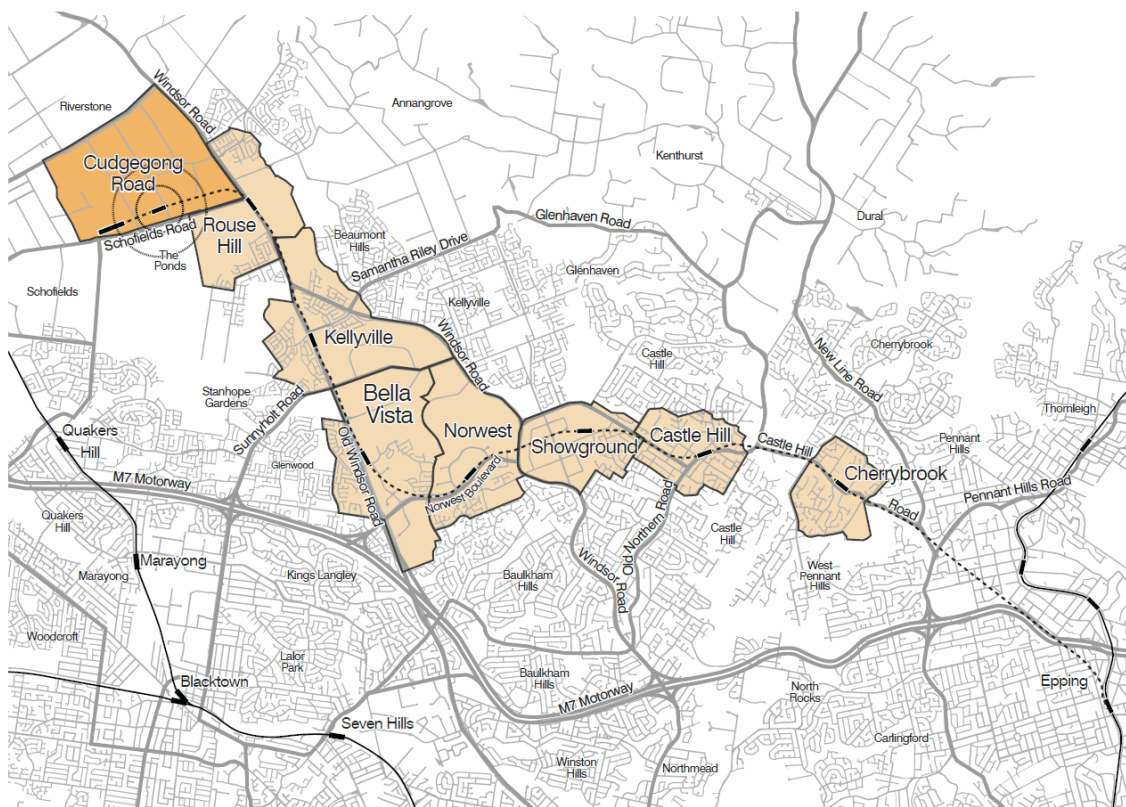
Source: Transport for NSW 2013

Under the NWRL structure plan, and the Cudgegong Road structure plan, an employment zone has been proposed in the area adjoining the NWRL stabling yard and along Schofields Road, with potential for expansion north (refer to Figure 6).

The structure plan indicates that if further expansion of the stabling yard is not required, this employment land could revert to low rise residential.

FIGURE 6. STRUCTURE PLAN FOR CUDGEGONG ROAD
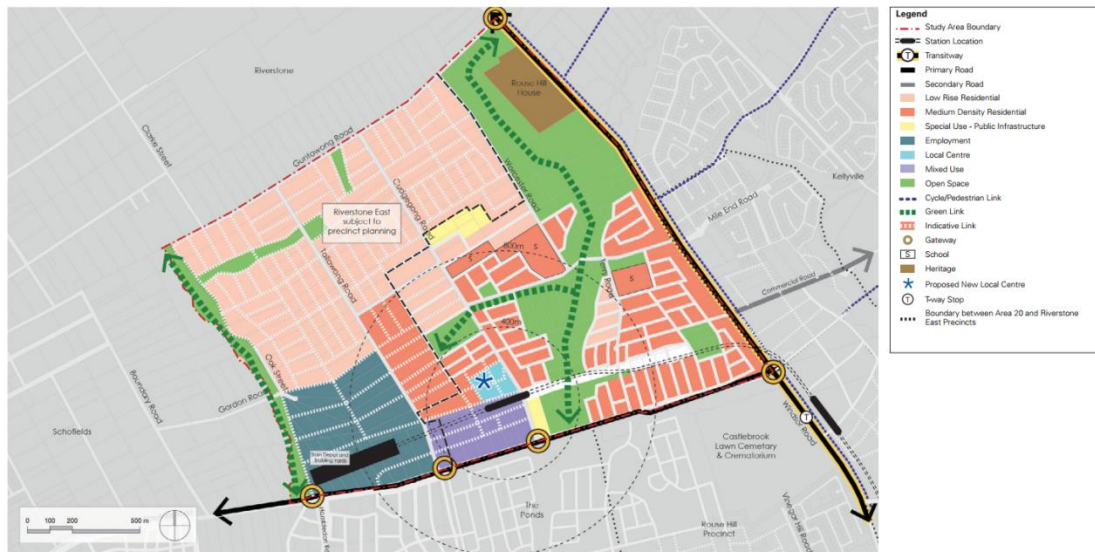
Source: Transport for NSW 2013

The objective of this employment area is 'to provide for the employment needs of a growing community and to encourage the emergence of a prominent employment area with direct access to the new rail link and station'[1].

In terms of uses, the structure plan indicates that the Precinct could accommodate light industrial uses that are 'carefully designed to integrate into the surrounding residential area' and public demand should be used to mitigate noise impacts of the stabling yard.

A demand analysis was conducted in conjunction with the structure planning process for the entire NWRL and indicates that future demand for additional employment (retail and industrial) floorspace within the precincts.

However, since the release of the structure plan, the Environmental Impact Statement (EIS) for the stabling yard (Rapid Transit Rail Facility (RTRF)) has been approved. The RTRF is larger than what was illustrated in the structure plan and is proposed to occupy 36 hectares of land.

The approved design is illustrated in Figure 6. This land is planned to be zoned to allow industrial land use. The future industrial development site located to the south of the RTRF will be available for development once construction is complete. The EIS notes that this site is suitable for employment uses.

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[1] Transport NSW (2013), Cudegong Road Structure Plan

FIGURE 7. APPROVED STABLING YARD

Source: Transport for NSW 2013

The EIS highlights that the location of the RTRF is consistent with the structure plan for the Cudgegong Road station precinct, however, the 'increased footprint will reduce the potential for other employment generating land uses' (JBA 2013). There is also potential for land use and design impacts on the development of land adjacent to this site.

The site boundary for the stabling yard is detailed in Figure 8 over the structure plan. The EIS identifies that the sites adjacent to the north and south of the RTRF should be zoned for employment uses.

FIGURE 8. RTRF SITE BOUNDARY

Source: Transport for NSW 2013

The RTRF will provide new employment opportunities for 100 employees during construction and around 300 employees during operation. The RTRF will operate 24/7 (hours) and will employ operational staff in management, administration, maintenance and cleaning positions.

JBA (2014) emphasises within the EIS that the RTRF 'is not considered to be compatible with the mixed use and residential uses anticipated and appropriate for the nature of this precinct'.

3.2 Richmond Line

In addition to the NW Rail Link alignment, the Richmond Line (now T1 line) was duplicated between 2009 and 2011. This involved the construction of a new relocated Schofields Station and duplication of the line between Quakers Hill station and Schofields. Vineyard Station (refer to Figure 9) is located within the Riverstone Precinct, immediately south of the border of the Vineyard Precinct.

FIGURE 9. SYDNEY TRAINS EXISTING NETWORK (PART)

Source: Sydney Trains, 2014

3.3 NW Rail Link extension – Cudgegong Road to Marsden Park

The Long Term Transport Master Plan (LTTMP) contains a policy directiion to preserve 19 major transport corridors across Sydney for future transport requirements. One of the corridors for protection is the North West Rail Link extension – Cudgegong Road to Marsden Park via Schofields (refer to Figure 10).

FIGURE 10. PROTECTED CORRIDORS

Legend:
- Global Sydney
- Regional city
- Major centre
- Specialised precinct
- Potential specialised precinct
- Planned major centre
- Potential major centre
- Protected corridor
- Corridor for protection
- Growth centres

1. South West Rail Link extension
2. North West Rail Link extension – Cudgegong Road to Marsden Park via Schofields
3. North West Rail Link
4. Marsden Park to Mount Druitt to Western Sydney Employment Area to Fairfield and Leppington
5. Macquarie Park to Sydney Olympic Park
6. Parramatta to Bankstown to Hurstville
7. Parramatta to Macquarie Park
8. Castlereagh Freeway
9. Bells Line of Road corridor requirements
10. Outer Sydney Orbital/M9 (including Werrington arterial)
11. F6
12. Second Harbour Crossing
13. Prospect Highway
14. F3 (M1) to M2
15. Georges River Parkway
16. WestConnex
17. Inner West Bypass and enhanced north-south links
18. Western Sydney Freight Line
19. Port Botany links

Source: Transport for NSW, 2012

TfNSW has advised that the corridor has statutory protection only in the Schofields and Marsden Park Precincts and therefore the impact on Riverstone East Precinct is uncertain. In terms of the Riverstone East Precinct, the land affected lies within the future development site to the south of the RTRF as shown below.

FIGURE 11. FUTURE RAIL EXPANSION

Source: Transport for NSW, 2014

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4 RETAIL DEMAND ASSESSMENT

The future retail/commercial land use requirements for the Riverstone East Precinct 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 existing retail offer and demand in the NWGC has also been considered to inform the size, mix and staging of prospective retail development within the precinct.

4.1 Population target

The future resident numbers in Riverstone East are based on the population target published on DP&E's website for the precinct. The web page indicates a capacity of 5300 dwellings and 15,000 residents on the 656 hectare precinct. These figures have been cross-checked against Bureau of Transport small-area population forecasts, which predict a population of 15,000 residents by 2036. According to the advice from the precinct manager (DP&E), the population target from the DP&E website has been used to assess the retail and employment demand. This will be reviewed following the current housing study being completed by SGS.

4.2 Retail expenditure projections

The retail expenditure of incoming resident population has been based on a per-capita figure derived from the national average and adjusted for the income profile of households likely to occupy the dwellings at Riverstone East. For the purpose of this assessment, the income profile of future residents has been based on ABS data for travel zones immediately surrounding the Riverstone East precinct. The assumed income profile of future households at Riverstone East is provided in the following table alongside the NSW average. On average, residents at Riverstone East are projected to have slightly lower incomes than the state as a whole, implying a lower than average per capita expenditure on retail goods and services.

TABLE 7. PROPORTION OF HOUSEHOLDS IN EACH WEEKLY INCOME BRACKET

	Low Income Range	Second Income Range	Third Income Range	Fourth Income Range	Upper Income Range
New South Wales	24%	18%	16%	21%	21%
Riverstone East (assumed)	25%	18%	15%	25%	17%

Source: SGS Economics and Planning, 2014

Next, the assumed income distribution has been applied to the ABS National Household Expenditure Survey data (by income bracket and retail type) to derive expenditure at the local level. The average expenditure at the national level is then compared to the average of the derived expenditure at a state and local level. This forms the basis for the variation in expenditure (by retail type) between NSW and the Riverstone East precinct.

The average variation in expenditure (by retail type) between NSW and the study area is then applied to the state retail forecast to derive study area-level projections. As an example of the outcome of this process, the table below shows the yearly per-capita expenditure comparison for 2036, assuming that

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the precinct is fully developed by then. The 'Total' column in Table 4 shows that each future resident at Riverstone East is estimated to spend $12,200 on retail goods and services in 2036, about $350 less than the NSW average.

TABLE 4.   PER CAPITA RETAIL EXPENDITURE, IN 2013 DOLLARS

	Supermarkets	Other Food	Dept. Stores	Clothing	Household Goods	Other Retail	Hospitality and Services	Total
NSW	$ 4,498	$ 811	$ 886	$ 2,332	$ 1,507	$ 1,769	$ 729	$ 12,532
Riverstone East (assumed)	$4,371	$788	$861	$2,266	$1,464	$1,719	$708	$12,177

Source: SGS Economics and Planning, 2014 based on ABS Retail Trade time series

These figures are then multiplied by the projected additional population in the Riverstone East Precinct to derive total expenditure. If the precinct is to be fully developed to its maximum capacity of 15,000 residents in 2036, the total retail expenditure generated by residents is projected to reach $182 million.

TABLE 5.   TOTAL RETAIL EXPENDITURE GENERATED BY ON-SITE RESIDENTS, IN 2013 DOLLARS

Supermarket & Grocery Stores	Other Food	Clothing	Household	Other Retail	Hospitality & Services	Department stores	Total
$65,566,018	$11,813,726	$12,911,365	$33,984,452	$21,964,082	$25,788,999	$10,625,679	$182,654,321

Source: SGS Economics and Planning, 2014.

4.3   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 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	Annual expenditure by precinct residents
Regional City	$28,244,677
Major Centre	$27,099,719
Town	$41,985,711
Village	$17,411,415
Small Village	$13,061,183
Neighbourhood	$12,918,651
Escaped	$41,932,965
Total	**$182,654,321**

Source: SGS, 2014

4.4 Recommended retail provision

Floorspace demand

Additional centres can only be supported in the Riverstone East Precinct area if projected floorspace demand by residents for such centres exceeds the typical centre sizes. To estimate the retail floorspace demand generated by residents at the Riverstone East Precinct, 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 (including the Western Sydney Retail Study). Comparing the projected floorspace demand to the average centre sizes suggests that there is sufficient demand to support a neighbourhood centre as part of the development, with annual turnover of $13 million and floorspace of approximately 2400 square metres.

It is also noted that this floorspace demand would not be able to support a small village centre of typically 4300 sqm. However, if the demand for neighbourhood centre is combined with demand for a small village centre, this can support a local retail centre of up to 4500 square metres..

Based on the above, it is recommended that a small village centre of that size can be supported by the future residents. This centre will service the neighbourhood shopping needs and will be more economically viable compared to a neighbourhood centre, due to its size and dual functions. The location of a small viallage centre should be to maximise the accessibility within the Riverstone East Precinct to reflect its local service function, with recognition of centres location in adjoining centres including the centre in Area 20.

All other centres, including the 'Area 20' village centre, will be positively impacted, with projected expenditure of $115 million elsewhere in the system.

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	$28,244,677	$27,099,719	$41,985,711	$17,411,415	$13,061,183	$12,918,651
Typical RTDs	B	$6,500	$5,100	$6,400	$7,100	$6,400	$5,400
Floorspace demand	C=A/B	4,352	5,264	6,598	2,439	2,053	2,400
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	Yes
Floorspace requirement		n.a.	n.a.	n.a.	n.a.	n.a.	2,400

Source: SGS estimates, 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 430,000 square metres of retail floorspace in the West and North West of Sydney, including a 140,000 square metre major centre at St Marys and a 74,000 square metre regional centre at Penrith CBD.

Section 2.2 describes the planned retail floorspace in the vicinity of the Riverstone East Precinct. Most precincts in the NWGC have some local retail planned, including a 25,000 square metre town centre with two full-line supermarkets at Alex Avenue, and another 25,000 square metre town centre at Marsden Park. A planned village centre of 12,500 square metres commercial and retail uses at the Area 20 precinct adjacent to Riverstone East is also described in the Cudgegong station structure plan.

Given this information, there will be an adequate amount of higher order retail to accommodate spill-over demand from the Riverstone East Precinct. The proposed small village centre will only service the local retail needs.

On-site retail provision

It is recommended that the on-site provision of retail floorspace comprise a small village centre with maximum retail floorspace of around 4500 square 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 the village centre of this size with at-grade parking. Hence around a 6000 square metre site area should be provided to accommodate future retail floorspace.

Staging

Since the entire dwelling yield of the precinct will not be developed in one instance, it is useful to identify the population threshold at which additional retail can be supported. Generally, a neighbourhood centre of around 2000 square metres requires a resident population of 7000 people to support it. For the proposed retail centre in the precinct, a small supermarket / grocery store of about this size (such as for example an independent/IGA) would be a catalyst for the development of the site. This should be provided once the population reaches around 7000 people (or 2500 dwellings). Following the establishment of supermarket/grocery store, it is likely that small convenience retail and some local retail service will follow in this location. While a small supermarket is viewed as a catalyst, other retail uses could also provide a catalyst for initial development.

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4.5 Expenditure outside the precinct

Expenditure from residents at Riverstone East, 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 in section 2.

Precinct residents are expected to generate $28 million of demand annually at regional city centres and $27 million in demand at major centres. Since no regional or major centre floorspace is planned on-site at the Riverstone East precinct, much of this expenditure will be captured at existing nearby centres outside the NWGC.

For example, $42 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 NWGC, 46,000 square metres of town centre floorspace has been planned, including 25,000 square metres each at Alex Avenue and Marsden Park, 30,000 square metres at Box Hill, and 15,000 square metres at North Kellyville.

$17.4 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, Rooty Hill and Riverstone. 12,500 square metres of retail and commercial floorspace is planned at Area 20, adjacent to the Riverstone East precinct. Depending on the percentage allocation of retail floorspace, this centre has the potential to capture a significant proportion of this expenditure. Other planned nearby village centres at Box Hill, Marsden Park and Schofields will also benefit.

Outside of the immediate sub-region, $41 million of expenditure is expected to 'escape' to higher order centres such as the Parramatta and Sydney CBD.

4.6 Retail demand in the North West Growth Centre

As well as assessing retail demand for the Riverstone East Precinct in particular, SGS have forecasted the aggregate retail demand in the North West Growth Centre. The process is similar to the method described in sections 4.1-4.4 above.

Population projections

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

Retail expenditure projections

An income profile for the region has been developed using ABS data for travel zones within the NWGC. In conjunction with the population projections, this has been used to estimate the total retail expenditure arising from the region. Table 8. per capita retail expenditure (NWGC)below presents the annual per capita expenditure for NWGC residents. The 'Total' column shows that each future resident at is estimated to spend $12,860 on retail goods and services in 2036, about $330 more than the NSW average.

TABLE 8. PER CAPITA RETAIL EXPENDITURE (NWGC)

	Supermarkets	Other Food	Dept. Stores	Clothing	Household Goods	Other Retail	Hospitality and Services	Total
NSW	$ 4,498	$ 811	$ 886	$ 2,332	$ 1,507	$ 1,769	$ 729	$ 12,532
NWGC (assumed)	$4,615	$832	$909	$2,392	$1,546	$1,815	$748	$12,857

Source: SGS, 2014

These figures have then been multiplied by the projected total population of the NWGC to derive total expenditure. Total retail expenditure generated by residents is expected to reach almost $2.6 billion.

TABLE 9. PROJECTED TOTAL RETAIL EXPENDITURE (NWGC)

Supermarket & Grocery Stores	Other Food	Clothing	Household	Other Retail	Hospitality & Services	Department stores	Total
$923,012,416	$166,308,953	$181,761,078	$478,419,656	$309,201,649	$363,047,304	$149,584,104	$2,571,335,161

Source: SGS, 2014

The total retail expenditure has then been apportioned between centre types based on the benchmarks provided. Results are presented in Table 10 below.

TABLE 10. DISTRIBUTION OF RETAIL EXPENDITURE BY CENTRE TYPE (NWGC)

Centre type	Annual expenditure by precinct residents
Regional City	$397,617,374
Major Centre	$381,499,107
Town	$591,058,203
Village	$245,111,008
Small Village	$183,870,152
Neighbourhood	$181,863,646
Escaped	$590,315,671
Total	**$2,571,335,161**

Source: SGS, 2014

Demand and supply analysis

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 NWGC as described in section 2. This identifies where there exists potential over or undersupply of retail floorspace by centre type.

Table 11 below compares the planned and existing supply of retail floorspace by centre type to the projected floorspace demand. 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, compared to the Western Sydney region, the NWGC will be oversupplied with large centre floorspace, but undersupplied with small village and neighbourhood centre floorspace.

TABLE 11. RETAIL FLOORSPACE DEMAND AND SUPPLY ANALYSIS

	Floorspace demand	Existing supply	Planned supply	Existing + planned	Gap?	Over/under serviced?
Regional City	58,033	138,617	0	138,617	yes	over
Major Centre	70,180	196,340	0	196,340	yes	over
Town	87,976	63,144	95,000	158,144	yes	over
Village	32,518	32,230	46,200	78,430	yes	over
Small Village	27,378	0	0	0	yes	under
Neighbourhood	32,003	1,405	13,400	14,805	yes	under

Source: SGS, 2014

5 EMPLOYMENT DEMAND ASSESSMENT

This section outlines the demand for employment floorspace associated with the future residents of the Riverstone East Precinct. 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 Riverstone East Precinct (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.

5.1 Population-driven employment

SGS have established the causal relationship between population and employment by industry at the Riverstone East 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[2]. 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[3] 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

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[2] 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.

[3] 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. The table below presents a list of 3-digit retail jobs excluded from the analysis

TABLE 12. INDUSTRY EXCLUSIONS BY 3-DIGIT ANZSIC CATEGORY

3-digit Industry
Pharmaceutical and Other Store-Based Retailing
Retail Trade, nfd
Food Retailing, nfd
Supermarket and Grocery Stores
Specialised Food Retailing
Other Store-Based Retailing, nfd
Electrical and Electronic Goods Retailing
Department Stores
Furniture, Floor Coverings, Houseware and Textile Goods Retailing
Hardware, Building and Garden Supplies Retailing
Recreational Goods Retailing

Source: SGS, 2014

Local population driven jobs by 1-digit ANZSIC

Jobs per 3-digit ANZSIC category were then 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 Health Care and Social Assistance industry generates both jobs that are likely to be located on-site, such as first aid services, and off-site, such as pathology and imaging. 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. It can be seen that Education and Training and Healthcare and Social Assistance are the most strongly population-driven industries. Based on a population of 15,000 from the Planning and Infrastructure website, SGS have also estimated the local employment arising from additional population at the potential development at Riverstone East. In total, around 1800 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 13. 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	117	117
Electricity, Gas, Water and Waste Services	0	7	6
Construction	10	157	116
Wholesale Trade	13	193	192
Retail Trade	5	75	75
Accommodation and Food Services	1	10	10
Transport, Postal and Warehousing	7	98	92
Professional, Scientific and Technical Services	2	23	23
Administrative and Support Services	6	84	64
Public Administration and Safety	4	58	57
Education and Training	25	376	352
Health Care and Social Assistance	28	417	402
Arts and Recreation Services	0	4	3
Other Services	12	180	175
TOTAL	**120**	**1800**	**1686**

Source: SGS, 2014 based on ABS data and BTS Journey to Work data

Note jobs in education and training and health care and social assistance are likely to be attributed to the provision of social infrastructure, which has been assessed in a separate study and thence have been excluded from the employment demand assessment below.

5.2 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 DP&E. Typical developments within each BLC are described in the table below. A full description of each BLC is provided in Appendix 1.

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TABLE 14. 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 Riverstone East.

BLC suitability assessment for Riverstone East Precinct

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 Riverstone East 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 Riverstone East Precinct for these employment uses:

- The precinct has major road access via Schofields Road and Windsor Road, which provides opportunities for employment uses that require reasonable access to arterial road infrastructure.
- Transport accessibility for the Riverstone East Precinct will be increased through the development of the NWRL with a station at Cudgegong Road along with existing bus corridors along Windsor Road and Schofields Road.
- The precinct will have contain a residential population of around 15,000 people which will provide opportunities for those uses requiring close proximity to populated areas and restricts the potential for activities that have impact on residential amenity, such as 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 the Riverstone East Precinct are **local light industrial and retail main street uses**. The future development area to the north of the RTRF (identified in section 3.1) provides an opportunity to accommodate employment uses because the site is subject to noise impacts and is therefore unsuitable for residential or mixed use development. There is the opportunity to consider this site as suitable for light local industrial, as it is within proximity to a resident population but also provides a buffer to separate the RTRF from the future residential area.

Retail main street uses should be restricted to the identified neighbourhood/small village centre for the Riverstone East Precinct.

In terms of the other types of population driven employment industries identified for the Riverstone East Precinct, these uses will likely be accommodated in more suitable locations in other centres or precincts within the NW Growth Centre 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 Riverstone East, 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 North West Growth Centre 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 Riverstone East can support up to 355 on-site jobs. Note this is in addition to those employed in retail, health, education and other social sectors.

TABLE 15. ON-SITE EMPLOYMENT DEMAND

1-digit industry	Retail main street	Local light industrial and urban support	Total Employment (In addition to retail jobs)
Manufacturing	0	23	23
Electricity, Gas, Water and Waste Services	0	0	0
Construction	0	47	47
Wholesale Trade	0	115	115
Retail Trade	22	0	22
Accommodation and Food Services	8	0	8
Transport, Postal and Warehousing	0	55	55
Professional, Scientific and Technical Services	3	0	3
Administrative and Support Services	10	0	10
Public Administration and Safety	9	0	9
Arts and Recreation Services	1	0	1
Other Services	35	26	61
TOTAL	**88**	**267**	**355**

Note that retail, education and training and health care and social assistance are assessed elsewhere and thus excluded from this table.
Source: SGS, 2014

5.3 Potential strategic employment uses

Future development site identified by Transport NSW

The future development site identified to the south of the RTRF is approximately 11 hectares and is situated in a strategic location with access to a major road (Schofields Road) and a future rail line (NWRL). Schofields Road is one of three mixed use employment corridors identified within the North West Growth Centre under the Structure Plan. The site is located within the 800 metre catchment of the proposed Cudgegong Road station centre, which is a local centre identified within the Area 20 precinct.

An assessment against the broad principles for suitability of employment uses, identified above, has been undertaken to identify potential employment uses for the site:

− **Office and business park** uses are suitable for a major or strategic centres. Since the site is located within a local centre, this type of employment is not considered suitable for the site.
− **Big Box Retail** (i.e. supermarkets) is more suitable for larger centres and thus is not suitable for this site.
− **Bulky goods retail** is considered potentially appropriate for the site based on the locational features of the site including arterial road access, high visibility and size of the lot to accommodate this large retail form. These uses tend to locate on the edge of centres, as is the case with this site.
− **Main street retail** is considered to be more appropriate for the centre of the local centre surrounding the station where land has been appropriately zoned.
− **Local light industry** is considered appropriate for the site as the site is located near future populated areas which have been zoned residential, has reasonable access to arterial infrastructure and is located on the edge of the local centre.
− **Light manufacturing** is less likely to be found in populated areas and requires proximity to motorway on/ off ramps and thus is not considered to be appropriate for the site which is located near future populated areas.
− **Heavy manufacturing** is best positioned away from populated areas given its impacts and thus is not considered appropriate for this site given its proximity to future residential areas.
− The site is not considered appropriate for **freight and logistics**, because it does not have direct access to motorway on/off ramps. Freight and logistics is not considered appropriate for a centre of this size and in such close proximity to residential development.

- Although the site is large enough to accommodate **urban services**, these employment uses are much better suited to sites outside of centres, with a good proximity to motorway access.
- **Special uses** is considered appropriate for the site given its proximity to a railway station and road access.
- **Short term accommodation** will gravitate towards populated areas with high visibility and accessibility and thus is also considered appropriate for the site.

Therefore, four employment uses are considered appropriate for the site based on the assessment above:

- Bulky goods retail
- Local light industry
- Special uses, and
- Short term accommodation.

However, the suitability of these sites to accommodate strategic employment uses must also consider the existing and planned supply of land for these employment uses within the nearby centres and precincts within the North West Growth Centre. A major consideration for the site is the proximity to Rouse Hill, which is a major centre, and the need to support the existing centres hierarchy identified within the *draft Sydney Metropolitan Strategy for Sydney to 2031*.

In terms of bulky goods retail, 50,000 square metres of bulky goods floorspace has been identified for the Marsden Park Industrial Precinct based on a supply and demand analysis. The site is located along Richmond Road, which is another mixed use employment corridor identified under the North West Growth Centre Structure Plan.

The catchment for this Precinct has been identified as the northern half of Blacktown LGA, which includes the Riverstone East Precinct (refer to Figure 9).

FIGURE 12.   MARSDEN PARK CATCHMENT
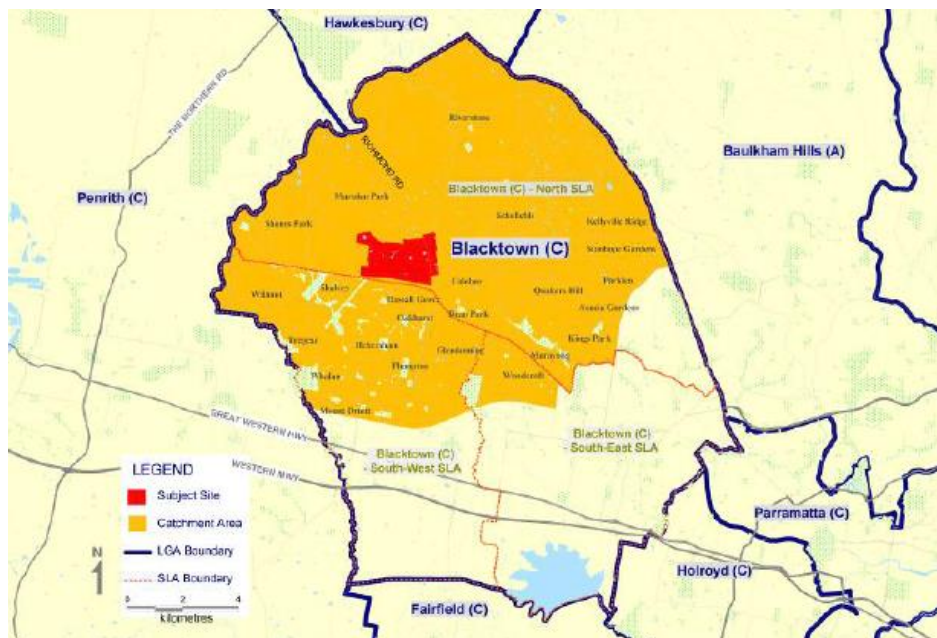
Source: Jones Lang LaSalle, 2009

Figure 13 identifies the existing supply of bulky goods within the area when the supply assessment was undertaken. A number of these sites are in closer proximity to the Riverstone East Precinct. Of particular note is the Castle Hill bulky goods precinct which contains around 100,000 square metres of bulky goods floorspace and is around eight kilometres away from the Riverstone East Precinct.

FIGURE 13.   BULKY GOODS SUPPLY NEAR MARSDEN PARK

Map Ref	Retailer / Centre	GLA (m²)	Distance From Site	Selected Major Retailers
1	Bunnings Warehouse, Bella Vista	8,200	13km	Bunnings
2	Totally Home Bella Vista	17,800	13km	Harvey Norman, Nick Scali
3	Castle Hill Homemaker Centre	12,300	15km	Bing Lee, Rays Outdoors
4	SupaCenta, Castle Hill	51,700	15km	Harvey Norman, Officeworks, Domayne, JB, Good Guys
5	Castle Hill Supacenta	4,820	15km	Clark Rubber
6	Spotlight Centre, Castle Hill	8,094	15km	Spotlight
7	Your Home Centre, Castle Hill	11,074	15km	Beaumont Tiles
8	Blacktown Megacenta	25,000	10km	Bunnings , Harvey Norman, BabyCo
9	M Centre, Minchinbury	19,345	10km	Knotts Pine, Hillsong
10	Bunnings Warehouse, Minchinbury	12,000	10km	Bunnings
11	Homebase Prospect	25,530	14km	Fantastic Furniture, Good Guys, Freedom
12	Home Central McGrath's Hill	16,500	9km	Bunnings, Harvey Norman
13	Henry Lawson Centre, Penrith	8,640	16km	Good Guys
14	Bunnings Warehouse, Penrith	8,759	16km	Bunnings
15	At Home Penrith	25,000	16km	Bing Lee, Anaconda
16	Harvey Norman Centre, Penrith	21,700	16km	Harvey Norman, Domayne
17	Bunnings Warehouse, North Penrith	12,000	14km	Bunnings

Source: Jones Lang LaSalle, 2009

Jones Lang LaSalle (2009) expect that the catchment identified above could support 194,500 square metres of bulky goods floorspace by 2026. Demand is expected to be generated by the North West Growth Centre and existing centres including Blacktown, Castle Hill, Rouse Hill and Penrith.

The analysis suggests that Richmond Road should accommodate 50 percent of the demand for bulky goods floorspace within the catchment area, however, it is not clear whether the future development site within the Riverstone East Precinct could contribute to the remaining 50 percent.

5.4   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 16. 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)	88	*30*	2,640	*0.75*	3,520
Local light industrial and urban support	267	*80*	21,360	*0.56*	38,097^

^Figures have been rounded and do not necessarily reconcile.
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 for the neighbourhood centre and employment lands, based on existing development controls for Blacktown LGA as well as an assumed average area of 30 square metres per parking space.

Based on a council parking requirement of 1 space per 22-30 square metres of retail floorspace, the neighbourhood centre (both retail floorspace and non-retail main street uses) will require 194 parking spaces which will require 5815 square metres of associated land demand. Based on a requirement of 1 space per 40 square metres for commercial and office premises, the employment lands will require 534 spaces which will require 16,020 square metres of land for parking.

5.5 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 17 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 5.6 hectares of employment floorspace and 18 hectares of land demand elsewhere in the region immediately surrounding the precinct.

TABLE 17. 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	8	50	400	0.8	530
Office	81	30	2,430	0.9	2,660
Retail - Big Box	55	100	5,500	1.7	3,173
Bulky Goods Retail	15	120	1,800	0.5	3,427
Short-term Accommodation	1	25	25	3.3	8
Dispersed Activities	35	40	1,400	0.4	3,245
Special Activities	82	70	5,740	0.5	11,405
Manufacturing - Light	97	80	7,760	0.6	12,407

Freight and Logistics	92	100	9,200	0.3	31,233
Urban Services	112	200	22,400	0.2	112,187
TOTAL	**578**		**56,655**		**180,275**

These jobs and associated floorspace/land demand should be accommodated in the other employment precincts within and in the vicinity of the NWGC. 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.

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6 CONTRIBUTION OF EXISTING INDUSTRIES

This section assesses the benefits and impacts associated with existing industries (including primary production activities), their current contribution to local employment, and relationship with the future economic activities within the Riverstone East Precinct.

To assist with the assessment, we have prepared a survey for the local business owners. These questions have been included by DP&E in a business survey, which has been mailed out to land owners and business operators to fill out. In parallel to the business survey, we have also completed the Input-output modelling to assess the direct and indirect contributions of existing industries to the local economy and the relationship with the future economic activities in the precinct.

6.1 Business survey

One survey response was received from A. J. Bush & Sons (Manufactures) Pty Ltd, a meat and poultry by-product rendering plant located at 1106 Windsor Road, Riverstone. The plant employs 95 staff and contractors, has annual turnover of $50 million, and has been operating in the area for 60 years. It requires a buffer zone including surrounding land.

One survey response was received from a chiropractor operating at 1256 Windsor Road. The chiropractor is self-employed and working from home. The business has operated in the area since 2007, with the main customer base comprised of local residents, has an annual turnover of $100,000, and has capital improvements to an estimated value of $900,000. The location requirement is on main road.

6.2 Input-output modelling

SGS utilises an input-output (IO) econometric modelling technique to convert the direct impacts of current employment on-site at the Riverstone East Precinct into indirect impacts in terms of employment, output and wealth generation at a regional level. For the purposes of this analysis, the regional economy is defined as the Blacktown City LGA.

In essence, SGS takes the inter-industry relationships (buyer-supplier transaction) that are measured by the Australian Bureau of Statistics in the National Accounts, and scales these relationships down to a state level, i.e. using available datasets and accepted mathematical techniques. The results of this scaling process are a set of regional industry specific multipliers which estimate how spending in a specific regional industry, via the assessed direct impacts (stimuli), flows through to total regional:

– Output (or income);

– Value added (or contribution to GRP); and

– Full time equivalent employment levels.

Key qualifications

Though a cost-effective and widely used technique for economic impact analysis, IO modelling has some limitations, as follows. The only feasible alternative to using IO modelling for economic impact assessments is to utilise partial or general equilibrium econometric models.

- The input output (econometric) model assumes relationships between industries are static over the forecast period. That is, productivity improvements are not factored in and historic relationships are assumed to hold.

- The input output (econometric) model derives relationships between industries using total production estimates. Consequently, the relationships are 'average', whereas the stimulus used as an input is 'marginal'. Such an approach does not account for any 'underutilised capacity' at the industry level or additional economies of scale that might ensue, as production expands from its existing base.

- As already mentioned, all of the stimuli are assumed to be 'new' economic activities for each regional economy. That is, crowding out or industry substitution effects are assumed to be negligible, meaning that key economic inputs such as labour and capital are assumed to be unconstrained, i.e. there is sufficient slack in the economy to service these stimuli without transferring significant resources from other productive uses. It also means that the activities that are promoted by the subject project do not adversely affect operations elsewhere.

Direct and indirect contributions

Jobs

Existing industries at the Riverstone East Precinct directly support 113 FTE jobs[4]. 95 of these are at the A. J. Bush and Sons meat rendering plant on Windsor Road. Most of the remaining jobs are in small-scale agricultural uses, including Vegetable Growing at local market gardens (2 jobs), Meat Product Manufacturing and other Food Product Manufacturing at the abattoir (8 jobs), and Agricultural Product Wholesaling (6 jobs).

In terms of flow-on effects, existing industries at the Riverstone East Precinct are estimated to generate a total of 300 jobs. That is, in addition to the 113 jobs on-site, 187 jobs are supported off-site elsewhere in the Blacktown LGA due to linkages with the on-site employment (for example, through supplying inputs for production, or servicing demand generated by persons employed on-site).

Output

Industries at the Riverstone East Precinct are estimated to generate about $56.7 million of annual direct output. $50 million or 88% of that is generated from Meat Product Manufacturing, while $3 million or 5% is generated from other Food Product Manufacturing. $1.6 million or 3%, is generated from Agricultural Product Wholesaling.

In terms of flow-on effects, existing industries are estimated to generate a total of $122.7 million of output (including initial direct contribution). That is, in addition to the $56.7 million generated on-site, $66 million of output is generated off-site in the Blacktown LGA due to linkages with the on-site industries (for example, through supplying inputs for production, or absorbing expenditure by persons employed on-site).

Gross Regional Product

On-site industries are estimated to generate $49 million annually in value-added to GRP, i.e. new wealth created for the regional economy. This includes $44.5 million or 91% from Meat Product Manufacturing, $1.7 million or 3.6% from other Food Product Manufacturing, and $1.5 million or 3.1% from Agricultural Product Wholesaling. This is disbursed in the form of wages, salaries and supplements, and Gross Operating Surplus for business, in the Blacktown City LGA.

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[4] Industries have been identified from a site-access map provided by the DP&I. Approximate job numbers have then been sourced from the Bureau of Transport Statistics 2011 Journey to Work dataset, and from responses to a survey of local businesses.

6.3 Relationship with future economic activities in Precinct

Based on the LGA Input-Output table, SGS have investigated potential linkages between existing and future economic activities at the Riverstone East Precinct. Future activities include retail, local light rail and other rail-related activities. There are potential links between existing agricultural uses and future on-site Retail and Wholesale Trade industries – for example, small producers might be able to sell their goods   directly to precinct residents. In general, however, the potential for inter-industry linkages is quite low, with little opportunity to integrate existing small scale primary production with future development.

The chiropractor (who responded to the business survey) will be able to continue operating the business in Riverstone East and servicing the local population when the precinct is developed. There is potential for the business to be located in the proposed neighbourhood centre.

The meat rendering plant, while a major employer in the area, may be in conflict with an increasing population at the precinct due to odour and waste impacts.

7 PRELIMINARY RECOMMENDATION

7.1 Retail

In conclusion, the retail demand assessment indicates that the on-site residents, when the Riverstone East Precinct is fully developed, can support a small village centre with retail floorspace of **around 4500 square metres GFA.** This would function to provide village as well as neighbourhood services and need to be accessible locally within the precinct. The future residents will also add $128 million retail expenditure per annum to the existing and planned retail centres in the NWGC and the surroundings.

It is recommended that a small supermarket / grocery store of 2000 square metres (such as an independent/ IGA) can act as a catalyst for the development of the retail centre, and should be provided once the population in the precinct reaches around 7000 people (or 2500 dwellings). Following the establishment of this small supermarket, the other retail uses will be attracted to the centre, in line with the rate of the residential development.

With regards to the preferred location, the centre should be located in an area which is considered accessible to the majority of the resident population of the precinct. However the proximity of this centre to planned village centre in Area 20 should be considered to ensure that the centre does not threaten the viability of these centres. In light of above, the centre can be located in the north part of the precinct.

7.2 Population driven employment

The employment demand assessment suggests that around 1800 population-driven jobs will be required to service the future population in Riverstone East, but only 1680 jobs will require additional floorspace.

The suitability assessment of the Riverstone East Precinct for various employment uses shows that the most appropriate employment uses for the Riverstone East precinct are local light industrial and other main-street employment activities within the proposed small village centre.

It is recommended the local light industrial uses to be provided within the employment area to the north of the RTRF (identified in section 3.1). This area will also act as a 'buffer' to separate the rail-related activities within the RTRF from the residential development.

In total, the local light industrial and other main-street employment activities at Riverstone East can support up to 355 on-site jobs. Note this is in addition to those employed in retail, health, education and other social sectors.

7.3 Strategic employment

In addition to the population driven jobs, the future development area to the south of the RTRF provides an opportunity to accommodate potential strategic (or 'footloose') employment. The site is approximately 11 hectares and is situated in a strategic location with access to a major road (Schofields Road) and a future rail line (NWRL). Schofields Road is one of three mixed use employment corridors identified within the North West Growth Centre under the Structure Plan.

An assessment against the broad principles for suitability of employment uses has identified the following potential employment uses for the site:

- Bulky goods retail
- Local light industry
- Special uses
- Short term accommodation

At this stage it is not recommended to define the employment land use for the 11ha, or to propose bulky good retailing. This should be considered further in the design of the rail stabling yard by Transport agencies and also the master planner for the Precinct – as this space is refined and the impacts and suitability of the land to as a mixed use corridor is resolved.

7.4 Land use requirements

The land use requirements for the small village centre and light industrial area 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 18. FLOORSPACE AND LAND REQUIREMENTS

Description	Retail		Other employment uses		Car parking		Total land requirement (sqm)
	Floorspace (sqm)	Land area (sqm)	Floorspace (sqm)	Land area (sqm)	Car spaces	Land area (sqm)	
Small village centre	4,500	6,000	2,640	3,520	275	8,238	17,758
Local light industrial			21,360	38,100	534	16,020	54,120

Source: Author, Year

According to the above, approximately 5.4 hectares of land will be required within the local light industrial area to the north of the RTRF. Within the small village centre, approximately 0.6 hectares of land will be required for retail uses and 0.35 hectares of land for non-retail uses. Together with the 0.8 hectare of car parking, around 1.7 hectares of land will be required for this centre.
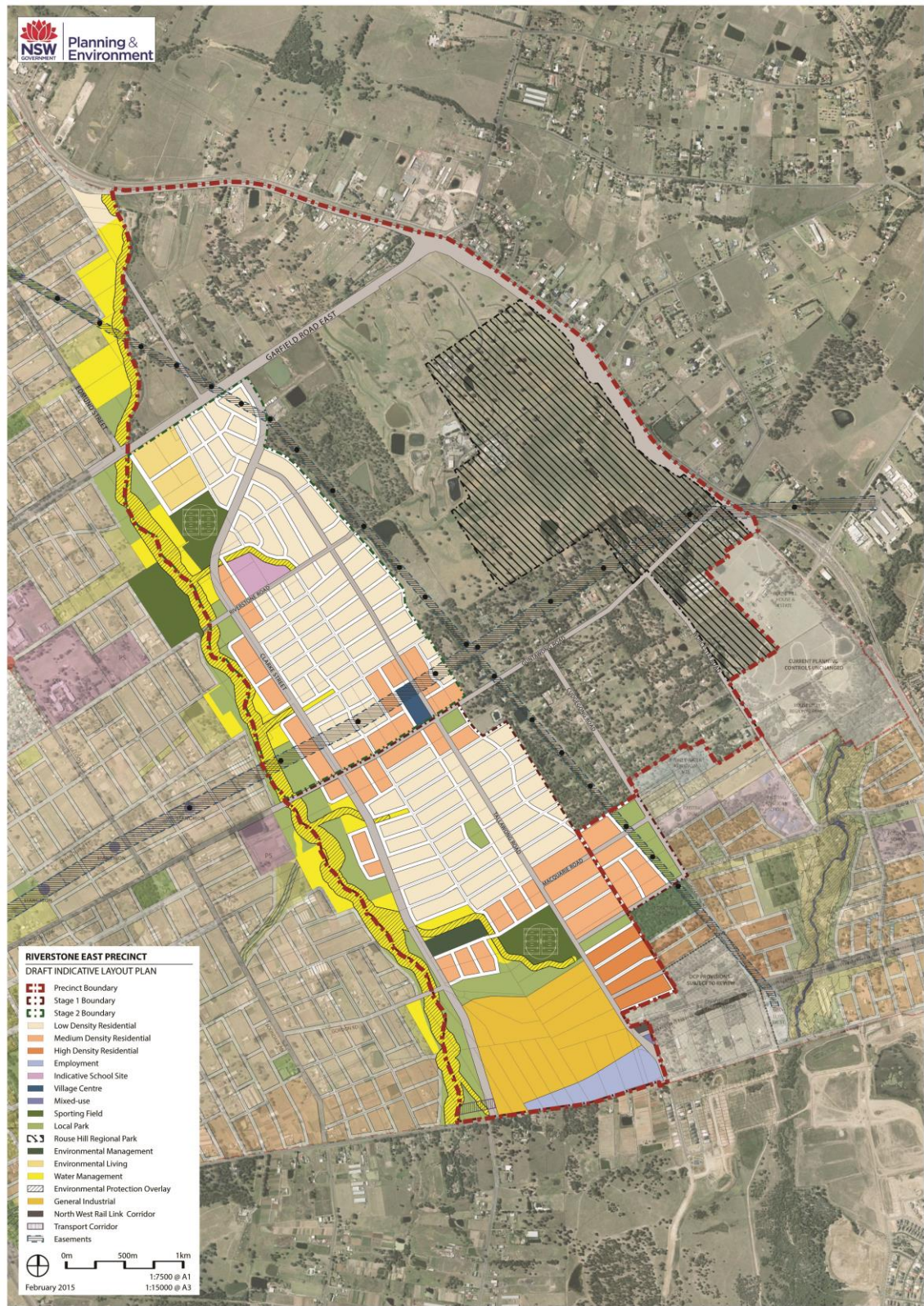
7.5 Development staging

Development of the Riverstone East precinct will be staged, with stages 1 and 2 projected to cater for approximately 3,000 new dwellings and includes a small village centre and the future development site as employment lands. The stages 1 and 2 rezoning is indicated in the Figure 14. This is expected to satisfy market demand in the area for the next 10 to 15 years.

This staging is considered to be in line with the recommendation within this report that a neighbourhood centre of around 2000 square metres be provided once the population reaches around 7000 people (or 2500 dwellings).

The rezoning of the rest of the precinct will be subject to market demand and a timeframe for the delivery of essential infrastructure to this part of the Riverstone East Precinct has not been set.

FIGURE 14.   RIVERSTONE EAST INDICATIVE LAYOUT PLAN (STAGE 1 & 2)

Source: COX, 2014

8   APPENDIX 1 – BLC DESCRIPTION

BLC	BLC Name	Types of activities	Description
AST	**Short Term Accommodation**	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
RBG	**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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