

# Aged care provision in Greater Bendigo: current provision and future requirements

Craig Toussaint and Dr John Rollo

Deakin University, Geelong, Australia

**ABSTRACT:** In the following paper, ratios which correlate aged care places with physical infrastructure requirements are developed for the regional Victorian Local Government Area of Greater Bendigo, by analysing its existing aged care facilities. These ratios are then used in conjunction with the federal government's population based measures to model scenarios of future aged care infrastructure requirements for Greater Bendigo. Strategies for the provision of additional residential aged care facilities are explored using a matrix governed by size and configuration. Variations in these two aspects are shown to affect the location options for future facilities in Greater Bendigo.

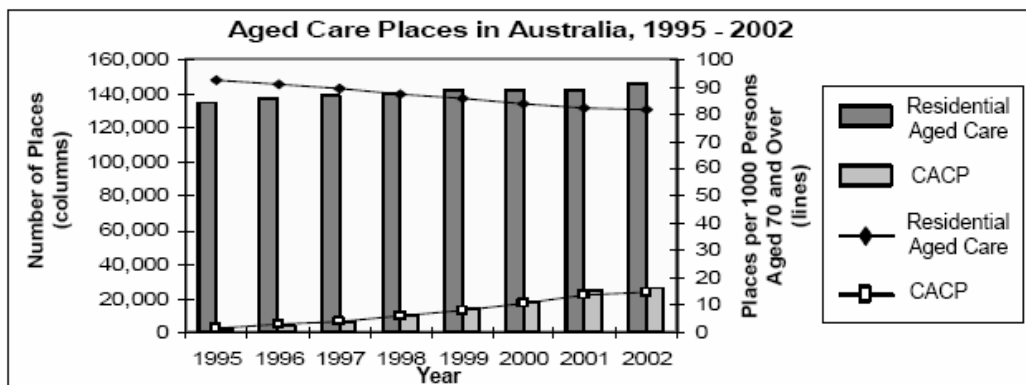
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## INTRODUCTION

The Australian federal government's Department of Health and Ageing use the ratio: places per 1000 persons aged 70 and over, to measure the provision of aged care in an area. The places included within this ratio fall into different categories of care. Aged care categories can be differentiated by the level of care provided and the type of space in which care is provided. The two main levels of aged care are high level care and low level care. Each of these main levels contain four sub-levels of care (Australian Institute of Health and Welfare 2003). The two types of space in which the different levels of care can be provided are domestic space (at-home based care) and non-domestic space (facility based care). Facility based high and low level aged care is known as *Residential Aged Care*. High level at-home based aged care is referred to as *Extended Aged Care at Home (EACH)* and low level facility based aged care is known as a *Community Aged Care Package (CACP)*.

The federal government uses a benchmark ratio to govern the overall provision of federally funded aged care. This benchmark was recently increased from 100 to 108 places per 1000 persons aged 70 and over (Australian Federal Government 2004). Although the benchmark remained constant 100 places per 1000 persons aged 70 and over since the early 1980s, the actual amount and type of aged care provided during this time changed considerably (Gibson, D., Liu, Z. and Choi, C. 1993, Gibson, D. and Liu, Z. 1994). Much of this change came as a result of the introduction of at-home care. The proportion of places allocated to at-home care within the benchmark has been steadily increasing. As a consequence, the proportion of facility based places has been steadily decreasing. This trend is shown for the period between 1995 and 2002 in Figure 1.



Source: (Australian Institute of Health and Welfare 2003)

**Figure 1:** The number of aged care places in Australia by type, and their level of provision measured per 1,000 persons aged 70 years and over, (1995-2002).

In regional Victoria in 2002, there were 94 aged care places per thousand persons aged 70 and over (Australian Institute of Health and Welfare 2003). Of these places, 78.7 were facility based residential aged care places: 47.8 high level and 30.9 low level. The remaining 15.3 places of the 94 per thousand persons aged 70 and over were at-home based aged care packages: 13.1 CACPs and 2.2 EACH<sup>1</sup> (Department of Health and Ageing 2004). In Figure 2, Greater Bendigo can be seen to have had a higher level of provision than the average for regional Victoria in 2002, for all types of aged care except for high level residential aged care. Its overall level of provision 127 places per thousand persons aged 70 and over was much higher than the overall average for regional Victoria, and it was also much higher than the federal government's benchmark of 100 places per thousand persons aged 70 and over.

Care Type		Places per 1000 Persons Aged 70 and Over	
		Regional Victoria	Greater Bendigo
Residential Aged Care Places (facility based)	High Level Care	47.8	43
	Low Level Care	30.9	52.5
	<b>Subtotal</b>	<b>78.7</b>	<b>95.5</b>
Aged Care Packages (at-home based)	High Level Care (EACH)	2.2	3.9
	Low Level Care (CACP)	13.1	27.6
	<b>Subtotal</b>	<b>15.3</b>	<b>31.5</b>
<b>Total</b>		<b>94</b>	<b>127</b>

Source: (Department of Health and Ageing 2004)

**Figure 2:** Aged care provision in Greater Bendigo in 2002, measured in relation to the average for regional Victoria.

## 1. MEASURING EXISTING RESIDENTIAL AGED CARE INFRASTRUCTURE

While the government's population based ratios and benchmarks indicate the number of aged care places required to meet the needs of a given aged population, they do not give an indication of the amount of physical infrastructure required to accommodate these places. The *Review of Pricing Arrangements in Residential Aged Care* produced by W.P. Hogan in 2004 states that 'there is no mandatory gross floor area (indoor area) per resident in the Australian Government certification requirements' (Hogan, W.P. 2004:140) for residential aged care facilities. For the calculations in the Hogan Review, an average indoor area of 45 square metres per residential aged care place was used. This was derived after an analysis of existing residential aged care facilities indicated that 'a gross floor area per resident of between 40 and 50 square metres is typical' (Hogan, W.P. 2004:140). An average site area of 90 square metres per place was subsequently estimated yielding a plot ratio of 2 square metres of site area per 1 square metre of indoor area. In this paper, indoor areas, outdoor areas and site areas have been measured for the facilities currently providing high, low, and both high and low level residential aged care in Greater Bendigo. Using these measurements, ratios of indoor area per place, indoor area-to-outdoor area, and site area per place, have been produced for each type of facility. The current provision levels in Greater Bendigo indicated by these ratios will be used as indicators to estimate future infrastructure requirements given forecast population change.

Greater Bendigo's existing residential aged care facilities and the (absolute) number of places they provide are illustrated in Figure 3, and have been grouped according to the type of care they provide. The indoor area, outdoor area and site area of each facility is also shown. These figures were used to calculate for each facility the amount of indoor area per place, the ratio of indoor area-to-outdoor area and the amount of site area per place. For example, the Barkly Private Nursing Home has 20 high level care places. With a total of 700 square metres of indoor area, it has 35 square metres of indoor area per place. It also has 700 square metres of outdoor area, which is an indoor area-to-outdoor area ratio of 1:1. With a site area then of 1,400 square metres, the Barkly Private Nursing Home has 70 square metres of site area for each of its 20 places. Averages have been calculated for the facilities of each type in Greater Bendigo. For example, for the residential aged care facilities providing high level care in Greater Bendigo (of which the Barkly Private Nursing Home is one) there is on average 43 square metres of indoor area per place. The overall totals and ratio averages are shown at the bottom of each column.

The overall average of 50 square metre of indoor area per place found for Greater Bendigo is very close to the average of 45 square metre of indoor area per place that was found in the Hogan Review. The average indoor-to-outdoor area ratio of 1:1, and the average of 90 square metres of site area per place that were found in the Hogan Review, differ significantly from the equivalent averages found for Greater Bendigo. While these land-related differences may have resulted from the greater availability of land and lower building density historically typical of a regional city such as Greater Bendigo, they nonetheless appear to indicate that Greater Bendigo has a greater level of existing infrastructure (land) than what may be taken as the average from the Hogan Review. The indoor area-to-outdoor area and the amount of site area per place found for Greater Bendigo could therefore be taken as benchmarks to be maintained, or they could be taken as indicators of the potential for expanding the indoor area of a number of facilities within their existing sites.

Type of Care Provided	Facility Name	Places	Indoor Area (m <sup>2</sup> )	Outdoor Area (m <sup>2</sup> )	Site Area (m <sup>2</sup> )	Indoor Area (m <sup>2</sup> ) per Place	Indoor Area- Outdoor Area Ratio	Site Area (m <sup>2</sup> ) per Place
High Level Care	Barkly Private Nursing Home	20	700	700	1,400	35	1:1	70
	Gleneagles Private Nursing Home	20	700	2,000	2,700	35	1:3	135
	Simpkin House	40	1,900	8,100	10,000	47	1:4	250
	Golden Oaks Nursing Home	60	2,000	9,500	11,500	33	1:5	192
	Stella Anderson Wing (A.C.C. <sup>1</sup> )	60	2,700	4,000	5,400	45	1:1	90
	Mirradong Home for the Aged	60	3,300	3,000	5,700	55	1:1	95
	<b>Totals and Ratio Averages</b>	<b>260</b>	<b>11,300</b>	<b>27,300</b>	<b>36,700</b>	<b>43</b>	<b>1:2</b>	<b>141</b>
Low Level Care	Alawara Retirement Village	35	2,300	3,200	5,200	66	1:1	149
	Carshalton House	45	2,400	9,300	11,700	53	1:4	260
	St.Lawrence Court (b)	50	2,300	13,700	16,000	46	1:6	320
	St Lawrence Court (a)	67	3,600	9,400	13,000	54	1:3	194
	Strath Haven	64	5,800	18,900	23,200	91	1:3	362
	Holdsworth Manor	90	6,000	13,000	19,000	66	1:2	211
	<b>Totals and Ratio Averages</b>	<b>351</b>	<b>22,400</b>	<b>54,500</b>	<b>88,100</b>	<b>64</b>	<b>1:3</b>	<b>250</b>
Both High and Low Level Care	Mclvor Health & Community Services	32	1,500	8,500	10,000	47	1:6	312
	Bethlehem Home for the Aged	147	6,800	35,500	40,600	46	1:5	276
	Lilley Lodge Nursing Home	43	1,500	1,700	3,200	35	1:1	74
	<b>Totals and Ratio Averages</b>	<b>222</b>	<b>9,800</b>	<b>45,700</b>	<b>53,800</b>	<b>44</b>	<b>1:5</b>	<b>242</b>
<b>Overall Totals and Ratio Averages</b>		<b>833</b>	<b>43,500</b>	<b>127,500</b>	<b>178,600</b>	<b>50</b>	<b>1:3</b>	<b>211</b>

Source (places): (Department of Health and Ageing 2004)

**Figure 3:** Greater Bendigo's residential aged care facilities: their size by place and area and their ratios.

## 2. MODELLING FUTURE INFRASTRUCTURE REQUIREMENTS

To model the future residential aged care infrastructure requirements of Greater Bendigo, the possibility that the level of residential aged care provided per aged care type might change in future from the existing provision levels (represented by the ratios) must be taken into account. As was shown earlier in Figure 1, there has been a distinct national trend of such change, as at-home based aged care places have increasingly replaced facility based aged care places. A continuation of this trend would significantly alter the amount of infrastructure required for residential aged care facilities by 2021, due to the at-home based nature of CACPs and EACH packages. Possible changes to the type of aged care provided in future can be explored through scenario modelling. Three possible scenarios of future change to aged care provision have been developed from the trends shown in Figure 1, current government policy and from government statements on future aged care provision. The scenarios are described in Figure 4.

Scenario A		
High Level Residential Aged Care	-	The current levels of aged care provision per thousand persons aged 70 and over are maintained for the different types of aged care through to 2021.
Low Level Residential Aged Care	-	
CACP	-	
EACH	-	
Scenario B		
High Level Residential Aged Care	-	Provision decreases to accommodate the increase in EACH packages while maintaining the current overall provision level.
Low Level Residential Aged Care	-	Provision decreases to accommodate the increase in CACPs while maintaining the current overall provision level.
CACP	+	Provision increases at the rate indicated by the recent federal government announcements. <sup>i</sup>
EACH	+	Provision increases at one sixth the rate of CACPs: 0.1375 packages per year. <sup>ii</sup>
Scenario C		
High Level Residential Aged Care	-	Provision decreases to accommodate the increase in EACH packages while maintaining the current overall provision level.
Low Level Residential Aged Care	-	Provision decreases to accommodate the increase in CACPs while maintaining the current overall provision level.
CACP	+	Provision increases by its past average rate of increase. <sup>iii</sup>
EACH	+	Provision increases at one sixth the rate of CACPs: 0.245 packages per year. <sup>iv</sup>

**Figure 4:** Possible scenarios of change to the provision of aged care.

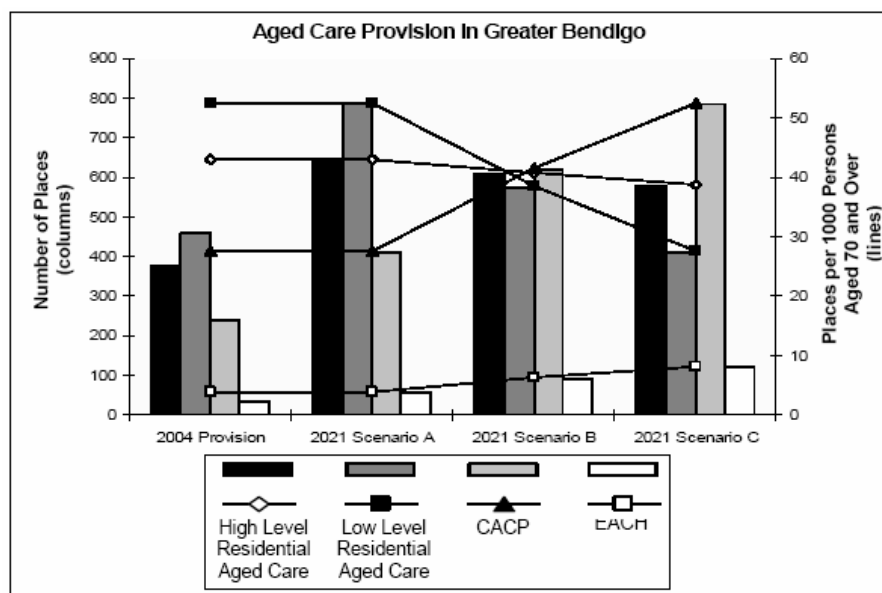
The possible implication of the three scenarios with respect to the number of aged care places required in Greater Bendigo by 2021 is shown in Figure 5. (NB, the absolute numbers of places are shown in brackets). To the left of the brackets are the numbers of places measured per thousand persons aged 70 and over. The figures in scenario A indicate that to maintain the current level of provision relative to the population aged 70 and over, the actual number of places must increase significantly. As the allocation of care is varied in scenarios B and C, the number of places in each aged care type either increases (at-home based care) or decreases (facility based care) relative to scenario A.

Care Type	Aged Care Places (shown in brackets) and Places per 1000 Persons Aged 70 and Over			
	Current (2004) Provision	Required by 2021 in Scenario A	Required by 2021 in Scenario B	Required by 2021 in Scenario C
High Level Res.	43 (375)	43 (641)	40.7 (607)	38.8 (578)
Low Level Res.	52.5 (458)	52.5 (783)	38.5 (574)	27.5 (410)
CACP	27.6 (241)	27.6 (411)	41.6 (620)	52.6 (784)
EACH	3.9 (34)	3.9 (58)	6.2 (92)	8.1 (121)
<b>Total</b>	<b>127 (1,108)</b>	<b>127 (1,893)</b>	<b>127 (1,893)</b>	<b>127 (1,893)</b>

**Figure 5:** The number of aged care places required in Greater Bendigo by 2021 under scenarios A, B and C.

Figure 6 represents in graphical form the changes that would occur to aged care provision in Greater Bendigo between 2004 and 2021 under scenarios A, B and C. In Figure 6, the absolute numbers of aged care places (that were shown in brackets in Figure 5) are represented by the columns. The number of aged care places measured per thousand persons aged 70 and over are represented by the lines.

It can be seen in Figure 6 that the increase in the proportion of EACH packages under scenarios B and C reduces the number of additional high level residential aged care places needed by 2021 from what currently exists. Furthermore the increased proportion of CACPs under scenario C results in fewer low level residential aged care places. Such scenarios would equate to significant reductions in new infrastructure requirements; but whether at-home care would adequately meet the needs of such a large proportion of the aged in need of care would require further investigation.



**Figure 6:** The number of aged care places required in Greater Bendigo by 2021 under scenarios A, B and C.

Figure 7 shows the additional residential aged care places required in Greater Bendigo by 2021 under scenarios A, B and C, (resulting from the additional number of persons forecast to be aged 70 and over in 2021<sup>2</sup>). The amount of indoor area, outdoor area and site area required to accommodate the scenarios (with respect to the existing infrastructure provision ratio averages that were calculated in Figure 3) are also shown.

Scenario	Required in Greater Bendigo by 2021				
	Additional Persons Aged 70 and over	Additional Residential Aged Care Places	Additional Indoor Area	Additional Outdoor Area	Additional Site Area
Scenario A	6,189	591	29,550	88,650	124,700
Scenario B	6,189	348	17,400	52,200	73,400
Scenario C	6,189	155	7,750	23,250	32,700

**Figure 7:** The amount of additional infrastructure required in Greater Bendigo by 2021 under scenarios A, B and C.

### 3. THE CONFIGURATION AND LOCATION OF ADDITIONAL INFRASTRUCTURE

The additional aged care places, indoor area, outdoor area and site area that are required under scenarios A, B and C may be physically configured in a number of ways. Their configuration both affects and is affected by the location options (available sites) within an area. As was mentioned earlier, the large average amount of site area per place for the facilities in Greater Bendigo (relative to average in the Hogan Review) appears to indicate the possibility that some of the additional infrastructure required may be accommodated within existing residential aged care sites. While this is a possibility, to do so would reduce the average amount of site area per place, which in effect would represent a reduction in the current level of outdoor area provision. This section of the paper will explore the configuration and location of additional infrastructure with respect to locating new facilities on new sites using the existing ratios, thereby maintaining the relative level of provision.

#### 3.1 Configuration Options

If we consider the number of places contained within each new facility, then the additional residential aged care places required in Greater Bendigo under the three scenarios shown in Figure 7 can be approximated to 600 under scenario A, 300 under scenario B and 150 under scenario C. Approximating the additional number of residential aged care places in this way allows the configuration of: number of places; indoor area; outdoor area; and site area to be systematically explored for each of the scenarios.

Progressively dividing the number of facilities yields a range of facility sizes (see Figure 8). The size of a facility can be viewed from the perspective of the number of places it contains, its indoor area, its outdoor area, or its site area. The number of new facilities into which the additional aged care requirements can be divided is dependent on the size of the facility. For example, under scenario A, if there is a desire for facilities that are 150 places in size, then four new facilities will be required to accommodate the 600 additional aged care places. Under scenario B, only 300 additional aged care places are required. These can be accommodated by two new facilities 150 places in size. Under scenario C, 150 additional aged care places are required. Only one new facility 150 places in size would be required to accommodate these additional places.<sup>3</sup>


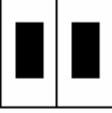

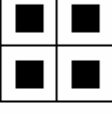


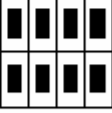


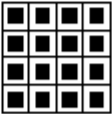


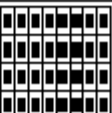
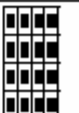

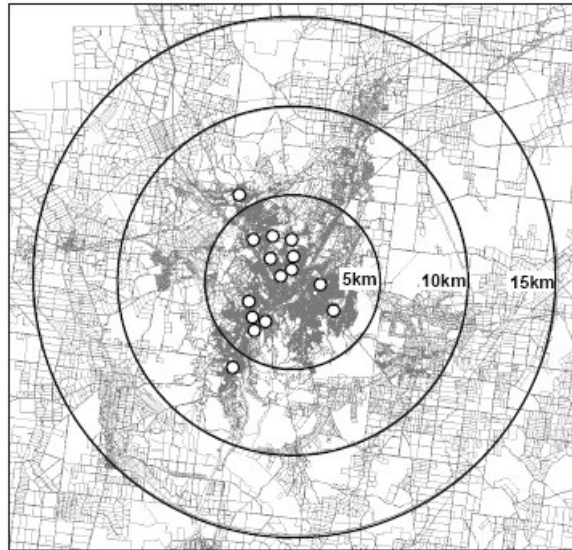
SIZE				CONFIGURATION		
Number of Places	Indoor Area	Outdoor Area	Site Area	Scenario A	Scenario B	Scenario C
600 places	30,000 sq.m	90,000 sq.m	120,000 sq.m	 x1 Facility		
300 places	15,000 sq.m	45,000 sq.m	60,000 sq.m	 x2 Facilities	 x1 Facility	
150 places	7,500 sq.m	22,500 sq.m	30,000 sq.m	 x4 Facilities	 x2 Facilities	 x1 Facility
75 places	3,750 sq.m	11,250 sq.m	15,000 sq.m	 x8 Facilities	 x4 Facilities	 x2 Facilities
37 places	1,850 sq.m	5,551 sq.m	7,500 sq.m	 x16 Facilities	 x8 Facilities	 x4 Facilities
19 places	950 sq.m	2,850 sq.m	3,750 sq.m	 x32 Facilities	 x16 Facilities	 x8 Facilities

Figure 8: Configuration options for Greater Bendigo’s required residential aged care infrastructure.

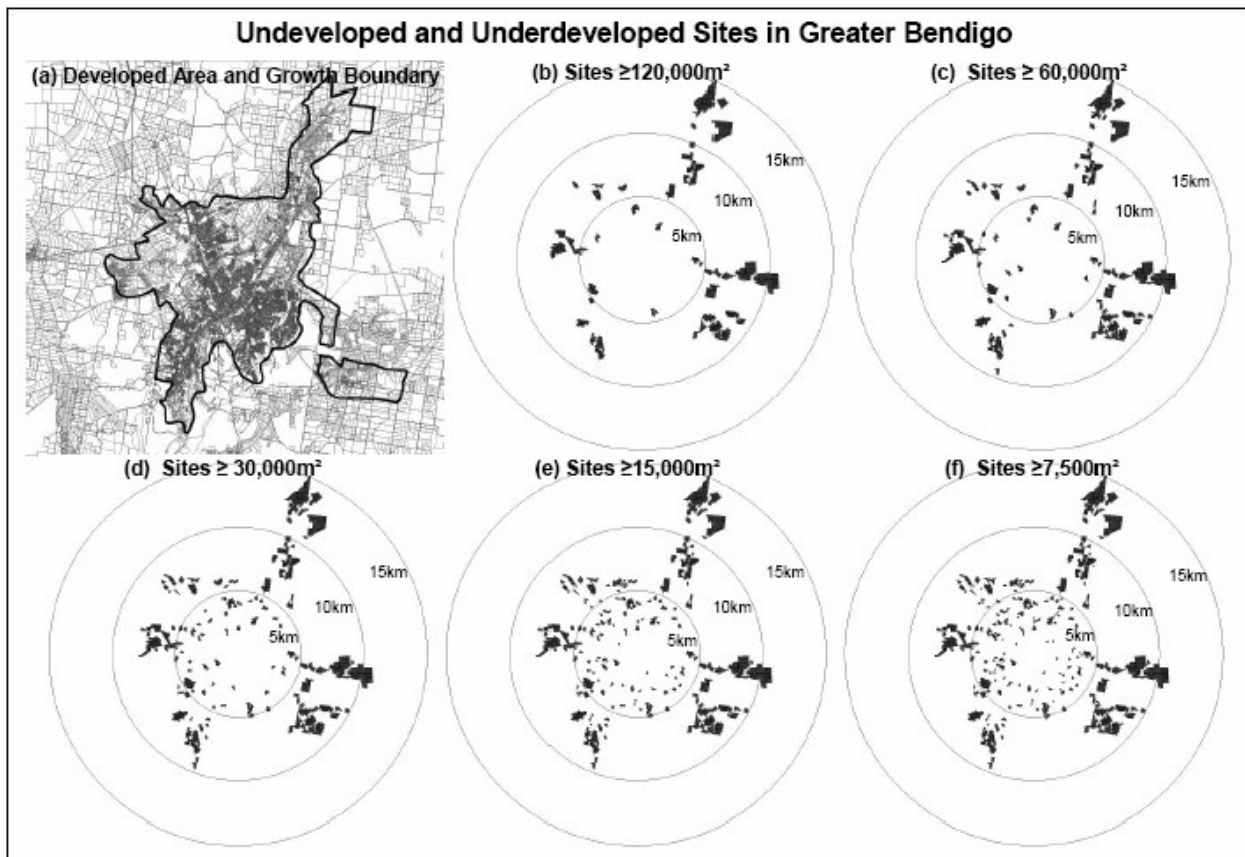
### 3.2 Location Options

Location options are dependent upon the availability of land; options for Greater Bendigo's additional residential aged care facilities are explored using sites as an indicator of physical infrastructure requirements. Figure 9 shows the locations of Greater Bendigo's existing residential aged care facilities in relation to the city centre and the developed areas. Most of the existing facilities located within a 5 kilometre radius of the city centre, (indicated by the smallest ring in Figure 9).<sup>4</sup>



**Figure 9:** The location of the existing residential aged care facilities in Greater Bendigo.

Figure 10a shows the developed areas around Greater Bendigo's city centre and the growth boundary recently set by the City of Greater Bendigo (Pollock, D. 2004). Figures 10b-f show areas of different sizes around the City of Greater Bendigo which have been identified as being either undeveloped or underdeveloped (City of Greater Bendigo 2003). These are potential sites for future residential aged care facilities.



**Figure 10a:** The developed areas around Greater Bendigo's city centre and the growth boundary recently set by the City of Greater Bendigo. **Figure 10b-f:** Undeveloped and underdeveloped sites in Greater Bendigo and their proximity to the city centre: (a) 120,000m<sup>2</sup>, (b) 60,000m<sup>2</sup>, (c) 30,000m<sup>2</sup>, (d) 15,000m<sup>2</sup> and (e) 7,500m<sup>2</sup> or greater. (Each ring increases by 5km radial increments from the city centre.)

Figure 10b shows the available sites remaining in Bendigo that would be large enough to serve as the site of a single facility containing all 600 of the new residential aged care places estimated to be required by 2021.<sup>5</sup> As can be seen, there are few sites of this size within a 5 kilometre radius of the city centre. Most of the sites of this magnitude are located between 5 and 15 km from the centre of the city, on the outer fringes of the developed area. The available sites shown in Figures 10c-f reduce in size in line with the site areas illustrated in Figure 8. As the minimum site area is reduced the number of sites can be seen to increase, particularly those located within 5km of the city centre.

#### 4. CONCLUSION

The federal government has for many years monitored change in the population aged 70 and over, in order to indicate and anticipate the changes required in the number of aged care places. The ratio of 'places per thousand persons aged 70 and over' that the federal government adopted to achieve this can also be used in conjunction with population forecasts to estimate future aged care requirements. However, while the size of future aged populations and the number of aged care places required can be estimated using this ratio, a method does not exist with which to determine the amount of physical aged care infrastructure required to accommodate future place numbers. Physically locating additional aged care places within an area requires consideration of aged care facilities: their number, indoor area, outdoor area, site area and location.

The survey of the existing residential aged care facilities in Greater Bendigo has enabled the current amounts of physical aged care infrastructure to be established. This has allowed correlations to be developed between physical aged care infrastructure, aged care places, and aged populations.

By changing one of the figures with respect to indoor area per place, indoor area-to-outdoor area, or site area per place, subsequent changes required to re-establish and maintain the original ratio can be modelled. As such, these ratios allow organisations such as local councils and aged care providers to consider and plan how future aged care needs might be met through the exploration different siting options. The amount of aged care, the type of aged care, the size of facilities, the configuration of facilities (both in terms of the number of sites and the size of the sites required), and the location of facilities (with consideration of the physical context), can all potentially act as drivers in scenario modelling.

It has been demonstrated in this paper that Greater Bendigo's current supply of undeveloped and underdeveloped sites are limited, (with certain sized sites in more limited supply in some locations than in others). If sites located close to the city centre (such as those of the existing residential aged care facilities in Greater Bendigo) are desired for new residential aged care facilities, strategies which seek to overcome site limitations may need to be explored. Such strategies may include configuring facilities in ways that require smaller site areas, reducing the current amount of outdoor area, or re-using 'brownfield' sites. The ratios, methods of scenario modelling and methods of exploring the configuration and location of facilities discussed in this paper are potential tools and methods for developing such strategies.

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<sup>1</sup> The federal government's measures of provision do not include EACH packages (presumably because of the limited number of areas into which they have currently been introduced), however, EACH packages are included in the measurements in this paper.

<sup>2</sup> Population forecasts produced by the Victorian Department of Sustainability and Environment (DSE) were used for Greater Bendigo and Warrnambool.

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<sup>3</sup> The ratio of 90 square metres of site area per aged care place derived from the Hogan Review is approximately half of the equivalent ratio found for Greater Bendigo, (208 square metres of site area per aged care place). Figure 8 can be viewed from the perspective of the 90 square metres of site area per aged care place ratio by moving all of the figures listed under 'site area' up one row. For example, a facility containing 600 places would require a site area approximately 65,000 square metres in size, rather than a site area 130,000 square metres in size.

<sup>4</sup> There is one other residential aged care facility located in Greater Bendigo that is not shown in Figure 9. This facility is located in the outlying town of Heathcote which is approximately 40km from the Bendigo city centre.

<sup>5</sup> Adjoining sites have been combined in Figure 10b-f.