EXAMINATION OF THE SUPPLY
OF OPEN SPACE AT THE RESIDENTIAL LEVEL: ADELAIDE
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ABSTRACT

A city is a place where buildings and open space fit together as a harmonious whole, each distinct to itself but both forming part of a family unit. Urban public open spaces are highly valued for their contribution to the quality of life in cities (Tenkel 1963, Burgess, Harrison, and Limb 1988, Madanipour 1999). Historically, public open spaces have been classified into 3 types, each of which address community needs in different ways; active open space, such as playgrounds and sporting fields; passive open space, such as parks and green areas; and urban buffers such as conservation areas.

The aim of this paper is to examine if the percentage of open space in older suburbs has changed over time due to residential infill development, how the supply of open space in older suburbs compares with new suburbs. The method adopted for this research was a comparative analysis of old and new suburbs selected to undertake the research.

The study found that incremental redevelopment of old suburbs through both re-subdivision and intensification of development on existing allotments has resulted in a progressive loss of open space. However the study also confirmed that the current supplies of open space across all the study areas (old and new suburbs) are relatively similar. The main difference between the open space supply in older and newer suburbs is the ownership of the land (i.e. proportion of public versus private open space). The study demonstrated that older suburbs with large allotments have experienced a significant loss of private open space – down from around 50% originally to current levels of 23-30%. The paper concludes that there is a need for a holistic approach to the provision of public and private open spaces to improve the quality of life at a residential level.

Key word: open space, residential area, infill development, quality of life
1.0 INTRODUCTION

There is an ongoing debate about the shape of cities and the optimum distribution of open space. A city is a place where buildings and open space fit together as a harmonious whole, each distinct to itself but both forming part of a family unit. The term open space is applicable to a variety of settings including green spaces consisting of vegetated land or structures, water or geographical features in an urban area, and civic spaces consisting of squares, market places and other paved and hard landscaped areas that perform a civic function. Open space can consist of both natural and manmade areas, and historically, public open spaces have met people’s needs in different ways.

Open space in residential areas can serve a multitude of purposes ranging from visual pleasure through the provision of a contrast to the built environment, passive and active recreation opportunities, stormwater detention and drainage, opportunities for community or ceremonial events, the provision of wildlife habitat, and the creation of a sense of identity. Open space is commonly regarded as a necessity within the built environment, with gardens considered vital to engendering a sense of well being (Thwaites, Helluer & Simkins 2005, Maruani and Amit-Cohen 2007), and open space providing a healthy environment with clean air and opportunities for exercise, improvement to local amenity and community building places (Freestone & Nichols 2004).

Public spaces are places in which private and common requirements appear because the public life in cities have been satisfied and also which alters by with times due to the socio-economy and culture of the people (Turel, Yigit and Altug 2007). Urban public open spaces are highly valued for their contribution to the quality of life in cites (Tenkel 1963, Burgess, Harrison, and Limb 1988, Madanipour 1999). Rapid changes in land use and occupational patterns of urban spaces in many cities
across the world have brought to the forefront the conflict between housing requirements and the preservation of green space (ZeRah 2006).

Public space contribution is often regarded as an area per population ratio issue for development authorities. In many cities the percentage of open space is declining due to rapid urbanisation and development pressures. For example in the United States the area of public open space per head of population had declined by 15% within 15 years due to in migration of the rural population into urban areas (Kline 2006). Thwaites, Helluer & Simkins (2005) argue that in the past planners have focused on the provision of large allotments, but since the 1960’s densification of urban areas has created smaller public spaces and those public spaces have been able to cater to the needs of the population.

In Australia, early land divisions typically created large allotments with each house having private open space in the form of a backyard. The percentage of private open space in these communities was relatively large, however there was little or no public open space provision. Over time, infill development has led to a decrease in private open space particularly in older suburbs, which may ultimately affect the quality of life of local residents.

The aim of this paper is to examine the percentage change of open space in older suburbs over time due to residential infill development and how it compares with new suburbs and its impact on the residential area. The method adopted for this research was a comparative analysis of old and new suburbs.

For the purposes of this research a broad definition of open space is adopted to include public land that has been set aside for use as parklands, buffer strips, and conservation reserves, as well as private land that is free from buildings, structures
and pavements, such as backyards and gardens. References to ‘infill development’ in this paper refer to both intensification of development on an existing allotment through the construction of additional structures such as sheds or home extensions, or through subdivision of a ‘traditional’ allotment and development with 2 or more new dwellings.

The paper is divided into two parts. The first part provides an overview of historical development in Adelaide, the second part of the study investigates and compares the supply of public and private open space in older and newer suburbs of Adelaide and investigates changes to the supply of open space in older areas arising from infill development.

2.0 HISTORIC DEVELOPMENT IN ADELAIDE

In order to understand the provision of open space in a city like Adelaide, it is important to understand the historic pattern of development and the legislation governing this development over time. Open space formed an important part of the initial urban landscape of Adelaide with public parklands provided in and around the City of Adelaide in 1939 under Colonel Light’s plan for Adelaide, and included:

- Wellington Square, north of the River Torrens
- Victoria Square, and four smaller squares south of the river
- Wide parklands surrounding Adelaide and North Adelaide
While the first plan for Adelaide provided a substantial amount of public open space, there was no legal mechanism for the provision of public open space at the time of land division in South Australia until 1929. Up until 1929 if a need for open space was identified, the Government had to purchase or compulsorily acquire a suitable area of land. This approach often resulted in open space not being provided at the time of development, and then subsequently having to be purchased by the government at a much higher price.

It was only with the passing of the *Town Planning Act, 1929 – 1957* that the Government could require land to be set aside as public open space at the time of land division. Under this Act the Town Planner could withhold approval to a plan of subdivision if the plan did not provide for adequate reserves. In a subdivision that created 20 or more allotments, the Town Planner normally required approximately 5% of the total area suitable for subdivision be set aside as public reserve.¹ Regulations under this Act also controlled the minimum size of housing allotments depending on whether sewerage was available, or were likely to become available to
the subdivision, within five years. Under these regulations, the minimum dimensions for an allotment of regular shape for a detached dwelling was 585m² (15 x 24m). If sewerage was not available, the minimum allotment size was increased to 696m² (15 x 30m). While some of the very early development in Adelaide (prior to 1870) included small allotment subdivisions in inner suburban areas such as Thebarton, Hindmarsh and Norwood, the bulk of land division up to the 1950’s occurred on the Adelaide plains between Grand Junction Road and O’Halloran Hill, and consisted of relatively large residential allotments and relatively little public open space.

Figure 2: Extent of urban development: 1880, 1919, 1939, 1959²

In 1967 the Government introduced the Planning and Development Act 1967 which required the provision of up to 12.5% open space at the time of land division, and/or
a financial contribution in lieu of the provision of land for open space. This open space contribution system continues largely unchanged in the current Development Act 1993, and it remains the most generous in terms of the provision of actual land at the time of subdivision of any state in Australia. Whereas early planning controls sought to prevent the creation of small allotments, more recently there has been a progressive change in market demand and planning controls, which has in turn enabled a significant reduction in the average size of housing allotments in Adelaide. The median size of newly created residential allotments in Adelaide was only 422 m² in the December quarter 2008, and ranged between 422 – 450 m² for the year to Dec 2008.³

This acceptance of smaller allotments by consumers has meant that that many of the older inner and middle ring suburbs of Adelaide are now experiencing significant infill development pressure, with older housing stock on large allotments being demolished to make way for multiple units or townhouse developments. The development of smaller allotments coupled with an increase in the average size of residential houses⁴ has resulted in an overall reduction in the supply of private open space on individual housing allotments. While infill development plays an important role in the regeneration of older areas, the provision of more diverse housing options and a reduction in the pressure on outer suburban fringe development, the cumulative effect of small-scale infill needs to be considered to ensure this form of development does not have a negative impact on the community.

3.0 IMPACT OF INFILL ON OPEN SPACE IN OLD SUBURBS

The first part of this section presents the methodology used in the study, while the second part reports on the findings and provides a comparison of the supply of public and private open space in older and newer suburbs of Adelaide.
3.1 Methodology

To investigate the supply of open space in older and newer suburbs, and in particular determine if a lack of public open space in older areas is compensated by more generous private open space on large residential allotments, four old suburbs and two new suburbs were selected. Analysis was carried out on four older Adelaide suburbs of Magill, Maylands, Unley and Seaton. These areas were selected because they were developed with regular sized allotments prior to the current 12.5% open space requirement.

![Figure 3: Study Area Locations](image)

Two more recent land divisions at Oakden and Seaford Rise were also analysed to determine what differences exist between older and newer land divisions.

In order to estimate the original supply of open space in older suburbs the approach adopted was:

- to identify original allotment sizes and the presence of any public reserves, deposited plans of the original land division was used
- to identify houses and allotments from the initial land division, current aerial photographs and valuation data was used. The supply of private open space on
each of these allotments was digitised using GIS and extrapolated over the entire land division to give an estimate of the supply of private open space originally in the land division

To estimate the current supply of open space:
- current aerial photographs, valuation and GIS data was used to identify public reserves
- private open space observed on aerial photographs was digitised in using GIS. Hard paved areas such as driveways and buildings were excluded.

Only residential land uses were included in this analysis, commercial, industrial and vacant land was excluded

3.2 Original Land Division Analysis

Analysis was conducted for the following suburbs.

Magill

In 1878, a deposited plan was lodged for the area known as ‘Murray Park’ – north of Magill Road, west of St Bernards Road (excluding the current site of the University of South Australia Magill Campus). The total area of this development site was approximately 40 ha, and resulted in the creation of 442 individual allotments, with an average area of approximately 700m². There was only one public reserve set aside in this land division (‘Botanic Reserve’) with an area of 1.3 ha, or only 3.28% of the development site. Based on analysis of aerial photography a large proportion (62%) of each housing allotment was free of built form.

Maylands

An 1877 land division created the inner city suburb of Maylands. The study area used for the following analysis is the area bounded by Clifton St, Frederick St, Magill
Road and Portrush Road. The total area of this development site was approximately 26 ha, and resulted in the creation of 132 individual allotments (excluding commercial properties fronting Magill Road), with an average allotment area of approximately 1,500 m$^2$. There were no public reserves set aside in this initial land division. Based on analysis of aerial photography a large proportion (67%) of each housing allotment was free of built form. Maylands is notable in that some of the original 1,500m$^2$ allotments were subdivided early in its development (i.e. 2 x 750m$^2$ allotments); however owing to the large size of the resultant allotments, the overall supply of open space on these allotments remained relatively unchanged.

**Unley**

The total area of the ‘New Parkside’ land division was approximately 55ha, and resulted in the creation of 544 allotments of various sizes (700 - 950m$^2$). The average allotment area was 750m$^2$. There was one large public reserve set aside in this land division (‘Unley Oval’), which comprised 6.7% of the development site. Based on analysis of aerial photography 39% of each housing allotment was free of built form. This lower supply of private open space may reflect the relative affluence of the area as the houses were observed to be larger than in the other study areas, and there appeared to be a large number of modern building extensions, entertainment areas and sheds which are likely to reflect current development activity rather than the original development of the land.

**Seaton**

The Seaton study area consisted of 122 hectares of relatively large allotments (average 740m$^2$) with minimal public open space provision (3.4% of the study area). Based on analysis of aerial photography a large proportion (50%) of each housing allotment was free of built form.
Estimated Original Open Space Supply

Initial development of these suburbs consisted of detached dwellings on individual allotments. The average private open space on each housing allotment was quite generous:

- 62% of each allotment in Magill
- 67% of each allotment in Maylands
- 39% of each allotment in Unley
- 50% of each allotment in Seaton

Figure 4: Examples of private open space on original allotments
3.3 **Current Open Space Supply**

Since their initial development, all of the studies areas have experienced a significant amount of subdivision and infill development. The type of infill is influenced by the size and configuration of the original allotment, as well as planning controls. In all cases the infill development resulted in a loss of private open space across the study areas. Allotments that had been subdivided retained only 20-26% of their total site area as private open space.

**Table 1: Average proportion of private open space on individual allotments**

<table>
<thead>
<tr>
<th>Study Area</th>
<th>Original allotment</th>
<th>After subdivision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magill</td>
<td>62%</td>
<td>26%</td>
</tr>
<tr>
<td>Maylands</td>
<td>67%</td>
<td>20%</td>
</tr>
<tr>
<td>Unley</td>
<td>39%</td>
<td>21%</td>
</tr>
<tr>
<td>Seaton</td>
<td>50%</td>
<td>22%</td>
</tr>
</tbody>
</table>
3.4 Change in public open space

While there has been significant loss of private open space since the initial development of the study areas, there has been very little additional public open space acquired over the same period of time. The total percentage of open space in each study area increased by less than 2%
Table 2: Change in public open space

<table>
<thead>
<tr>
<th>Study Area</th>
<th>Land Purchased (m²)</th>
<th>Increase in open space as % of study area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magill</td>
<td>5,685</td>
<td>1.6%</td>
</tr>
<tr>
<td>Maylands</td>
<td>3,347</td>
<td>1.3%</td>
</tr>
<tr>
<td>Unley</td>
<td>8,272</td>
<td>1.5%</td>
</tr>
<tr>
<td>Seaton</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

The graph and table below highlight that originally most of the open space in each of the study areas was held on large private allotments, with minimal public open space found within the immediate study area.

Figure 6: Estimated Original Supply of Public and Private Open Space

Over the years, all of the areas have experienced a loss of private open space through subdivision and intensification of development, however there has been very little additional public open space acquired over the same period.
Figure 7: Estimated Current Supply of Public and Private Open Space

Table 3: Comparison of Original and Current Open Space Supply

<table>
<thead>
<tr>
<th></th>
<th>Estimated Original Supply</th>
<th>Current Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public</td>
<td>Private*</td>
</tr>
<tr>
<td>Magill</td>
<td>3.4%</td>
<td>49.4%</td>
</tr>
<tr>
<td>Maylands</td>
<td>0%</td>
<td>50.1%</td>
</tr>
<tr>
<td>Unley</td>
<td>6.7%</td>
<td>28.4%</td>
</tr>
<tr>
<td>Seaton</td>
<td>3.4%</td>
<td>37.4%</td>
</tr>
</tbody>
</table>

* Figure represents percentage of the total study area, not percentage of individual allotments

3.5 Comparison of old suburbs with Recent Greenfield Land Divisions

To determine how the older areas compared to newer greenfield sites in terms of open space supply, analysis was carried out on two more recent subdivisions which were developed with the legislative requirement to provide up to 12.5% of the development site as public open space.
Oakden

The Oakden study area is a 95ha development approximately 10km north east of the CBD. It has resulted in the development of 1,288 individual allotments of varying sizes and a diversity of housing products. The average allotment size is approximately 415m².

Due to the large data set, a subset of the entire study area (94 allotments) was analysed to determine average private open space supply per allotment.
Analysis revealed that Oakden has:

- A similar supply of private open space on each allotment (23%) as infill development sites in older areas:
  - Magill infill 25%
  - Maylands infill 20%
  - Unley infill 22%
  - Seaton infill 22%

- Slightly less total open space supply (27%) than the older study areas:
  - Magill 33%
  - Maylands 32%
  - Unley 31%
  - Seaton 33%

- Public / private mix of open space is different to the older study areas, with a far greater proportion publicly owned land in Oakden:
  - Public 12.1%
  - Private 14.9%

**Seaford Rise**

The Seaford Rise study area is a 106ha development in the outer suburbs of Adelaide. It has resulted in the development of 1,143 individual allotments of varying sizes, with the average allotment being approximately 500 m², which is slightly larger than Oakden.
Due to the large data set, a subset of the entire study area (51 allotments) was analysed to determine average private open space supply per allotment.

The Willunga to Marino railway corridor (public land) dissects the study area, but this land has been excluded from the analysis.
Analysis revealed that Seaford Rise has:

- More private open space on each allotment (38%) than Oakden and than infill development in the older study areas:
  - Magill infill 25%
  - Maylands infill 20%
  - Unley infill 22%
  - Seaton 22%
  - Oakden 23%

- Total open space (35.7%) is slightly more than the older study areas:
  - Magill 33%
  - Maylands 32%
  - Unley 31%
  - Seaton 33%
  - Oakden 27%

- Public / private mix of open space is different to the older study areas, with a far greater proportion publicly owned land in Seaford Rise
  - Public 12.8%
  - Private 22.9%

4.0 CONCLUSION

While early land divisions in Adelaide typically provided the community with very little public open space (public parks), a substantial amount of private open space was provided through the development of large residential allotments. Over time, these older areas have experienced a significant loss of private open space due to infill development and have had relatively little additional public open space purchased over the same period.
In contrast, more recent greenfield land divisions such as Oakden and Seaford Rise have been developed with a generous supply of up to 12.5% public open space (public parks), but much less private open space due to the development of large houses on smaller allotments. While the total supply of open space observed in the older suburbs studied has been falling predominantly due to infill development on large allotments, the supply of open space in the more recent land divisions is likely to remain relatively stable over time as these areas:

- consist primarily of small residential allotments that are unlikely to be subject to further subdivision
- have an underlying supply of 12.5% of public open space that could only be reduced if the local government were to dispose of part of the reserve system.

![Average Open Space As A Percentage of Land Use](image)

**Figure 12: Current Open Space Supply**

This study has revealed that while the current supply of open space across all the study areas is relatively similar:
there are significant differences between the proportion of public / private open space in older and newer suburbs

the supply of private open space is progressively diminishing in the older suburbs studied due to incremental infill development of the traditional large allotments.

The increasing demand for land and the ready supply of large allotments in the older suburbs of Adelaide areas means that there is still significant scope for further subdivision and loss of private open space over time. If the current form of infill observed in older areas were to continue, the supply of private open space in these areas could be reduced to a similar level as Oakden (i.e. 14.9% of the study area). This would cause these areas to have a lower total open space supply than Oakden unless significant additional public open spaces were purchased.

Factors such as consumer demand, changes to household structure, water restrictions, the price of land and an ageing population are just some of the drivers of the ongoing redevelopment of land in inner and middle ring suburbs and the subsequent loss of private open space.

While consumer choice is an important consideration, it is equally important to identify and better understand the potential impacts of incremental development in these areas, in particular the potential public costs associated with these private landowner choices. The challenge for policy makers is how to respond to what is often a clash of imperatives between the preservation of biodiversity and vegetation, accommodating population growth, meeting consumer demands for housing variety, and the protection of existing character of suburbs. Therefore, there is the need to consider the provision of open space and infill at a residential or suburban level in a holistic way rather than block by block.
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2 Report on the Metropolitan Area of Adelaide, 1962; page 30, 31
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