



# Open space amenities and residential land use: An Australian perspective

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## ABSTRACT

In a competitive market the individuals will bid up house prices to a level reflecting the capitalised value of the benefits that property owners perceive they receive from the presence of amenities, however there have been relatively few recent studies into the relationship between house prices and active open space. This is an important area of research as active open space helps to address some of the high profile and emerging problems in society including lack of exercise, obesity and a sedentary lifestyle. In the findings the distance to active open space was found to have a significant relationship with the level of house prices. When distance was broken down into 100 m intervals, associations differed in terms of their direction and strength. Since demand for access to active open space outweighs the demand for passive open space, the findings confirm that large-scale residential developments need the assistance of planning authorities to revise policy in response to changing community needs.

## 1. Introduction

The importance of ‘active open space’ in residential neighbourhoods can not be over-emphasised with many household residents adopting an increasingly sedentary lifestyle and now being less active in comparison to previous generations (Pawlowski et al., 2016). Reasons for this trend in society are complex and potentially include increased levels of automation in the workforce, uptake of technology at home and limited knowledge about the potential contribution of active open space to a healthier lifestyle in society. For example a study into the proximity of active space for children in 60 households in Bangladesh found that a child with access to open space was likely to have 62 min of additional time spent outdoors (Monsur et al., 2016). A study in the US concluded that higher participation in active sports was directly linked to the availability of parks, especially for female adolescents (Boone-Heinonen et al., 2010). In Australia there have been few studies conducted in this research area. An analysis undertaken in Adelaide examined the relationship between the level of physical activity and the area of suburban parks where the results confirmed varying associations between both variables depending on the type of park (Brown et al., 2014). A study in Perth conducted nearly 2000 interviews and examined larger public parks to observe the level of physical activity undertaken (Giles-Corti et al., 2005). The findings identified a relationship existed between the level of physical activity, distance to the park and the perception of the park, however the most important variable was confirmed as the level of accessibility to the park.

The role of parks and open spaces is directly linked to facilitating a

place to undertake recreational and sporting activities. In Australia the discipline of sport is an integral part of many aspects of cultural life and broader society where the widespread acceptance is also supported by internationally recognised sporting achievements (Rolls et al., 1999). At the same time, urban open public open space has been shown to be a main component of urban space and an important carrier of public life (Chen et al., 2015) with previous studies identifying direct links between local sporting clubs and the provision of open space, commonly including local sports grounds and pavilions (Metcalfe, 1993). Within this context *recreational open space* has been referred to as “space designed and used for leisure activities, such as sport or exercise” and *intermediate space* has been referred to as the “servicing of multiple residents in a more localised portion of a city, such as a district or neighbourhood” (Stanley et al., 2012, pp. 1089–90).

*Active open space* commonly refers to land dedicated for use as specified recreational space and providing venues for a range of formal sports clubs and groups to facilitate active participation in organised sports and physical activities. In contrast, *passive open space* refers to land and neighbourhood parks providing unstructured personal recreation including walking, jogging and cycling. Most importantly both land uses can be defined as *intermediate recreational open space*. It is accepted that *recreational open space* is designed and used for leisure activities such as sport or exercise, provides many positive benefits for the community (Stanley et al., 2012). However excluding leased premises, *intermediate recreational open space* is a commodity acquired with little to no real perceived market value which makes it difficult for stakeholders to provide an investment rationale (Shilbury et al., 2006).

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With reference to examining open space it is possible to quantify the strength of the association between open space and the price of nearby housing, being accepted as a method used to derive a marginal value for recreational open space (Crompton, 2001).

From a housing market perspective when externalities (e.g. close proximity of retail shops, parks) exist then it is accepted the benefits accrue primarily to households currently residing on specific sites (Australian Property Institute, 2015). However as the supply of such sites is limited then households seeking to benefit from the proximity to active open space must bid for them in the marketplace (Weigher and Zerbst, 1973). Therefore in a competitive market the level of house prices will reflect the capitalised value of the benefits that property owners perceive from the presence of amenities; in this instance the reference to ‘amenity’ refers to active open space (Crompton, 2001). In other words it is accepted the difference between different prices paid for identical houses in different locations approximates the value a community places on such recreational open space (MacLennan, 1977; Malpezzi, 2003).

One of the main drivers behind the final decision to include open space, as well as determining the most appropriate proportion, is via the legislative planning process (Reed and Sims, 2014). Within this context the spatial planning systems, such as land use planning, are primarily about the manner in which the physical resources of places are developed and utilised (Madanipour et al., 2016). Therefore the findings from this research may be productive and useful, however to be truly effective the findings need to be incorporated within the planning process to ensure they will form part of the process. Arguably many developers would prefer not to increase the amount of open space whilst decreasing the amount of vacant land they can allocate to smaller housing allotments, which in turn would alter their profit margin (Australian Property Institute, 2015; Warren et al., 2017).

From a real estate market perspective there have been relatively few recent studies into the relationship between house prices and open space. It is generally accepted the presence of intermediate recreational open space has an overall positive impact on the price of nearby houses (Correll et al., 1978; Lyon, 1972; Nicholls and Crompton, 2005). Nevertheless this relationship is more complex across typologies where passive open space usually increases the price of nearby houses more than active open space (see Hagerty et al., 1982; Lutzenhiser and Netusil, 2001; Weigher and Zerbst, 1973). For example a study in the USA found the distance from (a) housing to (b) parks and open space only influenced the perceived personal and social benefits; however in contrast the environmental and economic benefits were perceived regardless of the distance to parks and open space (Nyaupane, 2011).

Stakeholders including local government authorities which manage and regulate the growth and development of communities require information about the relative desirability of open space and the forces affecting patterns of use (Ready and Abdalla, 2003). Therefore findings from this study will assist local government authorities to determine an efficient allocation of limited funds for open space. Historically community-based assets such as open space were wholly planned, provided and managed by the local government authority for the entire life of such assets with limited consideration given to the broader contribution of the open space (Carroll et al., 2003). A further contribution from this research is to encourage identification of effective strategies where active open space can be used to address the increasingly sedentary lifestyle observed in today’s society (Pawlowski et al., 2016) with indirect links acknowledged with diabetes, obesity and mental health problems (Akpınar, 2016).

## 2. Concept of open space

The understanding of ‘open space’ varies between different stakeholders and is affected by factors including their perception and contextual use. For example a land developer may consider a parcel of low lying land as open space mainly because it can not be developed into

vacant housing lots, however the local council may seek to have saleable allotments allocated as open space. Overall the concept of ‘open space’ is relatively broad with different adaptations of open space requiring further discussion.

(a) *Urban public open space* is a main component of urban space which caters to daily public life; the amount of green space has been associated with the health of residents, relieving mental fatigue, decreasing mortality rates, reducing stress levels and promoting physical activity (Chen et al., 2015).

(b) *Neighbourhood open space (NOS)* typically refers to parks which provides destinations for people can walk to and also are ideal settings for leisure time and physical activity (Sugiyama et al., 2010). However the same study also found there were inconsistencies which were partly attributable due to different approaches used to capture the green elements of neighbourhoods. It was argued there were two types of measurements used, being (a) to focus on the overall greenness of the neighbourhood and (b) focussing on a particular neighbourhood open space. Furthermore in some urban areas there has been a trend towards higher density residential buildings and a movement away from the use of a ‘courtyard’ system. In this scenario it has been argued that green open space is essential in cities and an important influencing factor affecting livability, the quality of life and also residents’ health (Zhu et al., 2017). A lack of urban space has been confirmed as detrimental to urban life, however this has implications since the amount of open space has been decreasing at an alarming rate and becoming less accessible in rapidly urbanising countries (Khan, 2014). On the other hand, some cities have under-valued their urban space due to inappropriate recognition, poor planning or at times mismanagement (Soltanian and Mohammadi, 2015).

(c) *Green open space* has been defined as space dominated by a ‘natural’ environment and characterised by ecosystem and landscape values, in contrast to a built-up environment with more intervention in the ecosystem and landscape (Schuch et al., 2017).

Varying frameworks have been used to categorise open space using temporal and spatial characteristics in order to understand how open space contributes to the society for which it was developed (Cavanagh, 2002; Moore, 1996). Open space has been defined as “any urban ground space, regardless of public accessibility, that is not roofed by an architectural structure” (Stanley et al., 2012, p.1089). On the other hand Bernardini and Irvine (2007) argued that public and private settings should not be viewed as substitutes for each other since they served varying functions with different meanings. Therefore an alternative definition of public open space is where it encompasses all parts of natural and built environments including streets, squares and other rights of way as well as open space and parks where access to ‘public/private’ space is unrestricted (Carmona et al., 2008). To highlight the linkages between open space and physical activity refer to the framework in Fig. 1 which highlights the relationship between (a) outcomes or benefits of park usage, (b) behavioural use of the park and (c) antecedents associated with park use or non-use.

### 2.1. Divisions of open space

Earlier studies focussed on simple calculations of increased tax receipts accruing from a property’s proximity to open space (Fox, 1990) where multiple regression analysis was commonly used to examine the relationships based on a large number of property-related transactions (Rosen, 1974; Antwi, 1995). Previous research has shown that if the contribution of open space to the level of house prices could be examined, this could potentially include how large the proximity effect was and over what distance this effect could also be measured (Crompton, 2001). An earlier landmark study by Lyon (1972) used hedonic pricing methods to examine open space proximity and identified a locational advantage for proximity to open space where this advantage had been capitalised into the transaction price of nearby houses. Although the findings confirmed that open space proximity had

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