

Urban parks, open space and residential property values

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Sixty second summary

Urban parks and open spaces are valuable resources. They can help improve the quality of life in urban areas, have essential environmental functions and, by increasing the attractiveness of the places in which people live and work, can have economic benefits.

They are, however, under threat. The 2001 Public Parks Assessment by the Urban Parks Forum, jointly commissioned by DTLR, Heritage Lottery Funds, English Heritage and the Countryside Agency, showed that urban parks in the UK are in serious decline.

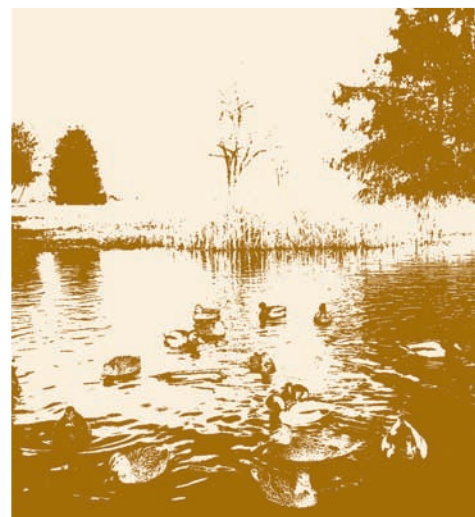
The significance of urban open spaces has been placed high on the research agenda, with many existing studies focusing on the analysis of existing literature on the economic, social, ecological and health benefits of urban open space. These links have, however, been established almost entirely on the basis of experience in countries outside of the UK.

With funding from the RICS Education Trust, Neil Dunse, formerly of the University of Aberdeen (now at Heriot Watt University), and colleagues Carolyn Dehring and Michael White, explored the effects that urban parks and open spaces have on residential property values within the UK, using Aberdeen as a case study area, measuring the effect on residential property values of proximity to the city's urban parks and amenity green spaces.

This research adds to the current debate by calculating the economic benefits and improving the understanding of the link

between accessibility to various types of urban open spaces and residential property values. It provides evidence that residents in Aberdeen do see extra value in open green spaces, which is reflected in the premium they are prepared to pay to secure a property that has this advantage. The key findings are that:

- the overall premium for a property next to a park, relative to a similar property 450 metres away, is positive across all house types. The price premium ranges between 0.44% and 19.97% depending upon house and park type
- however, while a premium is attached to flats that are in close proximity to a park, this attracts a negative premium for houses. This could be due to the potential negative attributes that are often associated with parks, particularly in the evening, such as anti-social behaviour
- city and local parks are valued most highly by occupiers of detached properties, whereas proximity to amenity green space is valued most highly by occupiers of non-detached properties
- the findings suggest that rectangular or oblong (long/narrow) parks are preferable to square or circular (short/wide) parks. A rectangular park, for example, would potentially offer greater opportunities for access – suggesting that accessibility as well as proximity is important to households.





Urban parks and open spaces are valuable resources



...there is a need for further research to be undertaken in a UK context...



Setting the scene

The quality of urban spaces was investigated by the UK's House of Commons Environment Transport and Regional Affairs Committee in 1998-1999. This inquiry reported an information deficit on urban spaces and in response, together with information from the 2000 Urban White Paper from DETR, the UK Government established the Urban Green Spaces Task Force.

More recently, the importance of urban open spaces has also been placed high on the research agenda of a number of influential organisations within the UK, including Scottish Natural Heritage and CabeSPACE.

Despite this recent progress, while there is a wealth of information available from other countries, in particular the USA, it is evident that there is a need for further research to be undertaken in a UK context. This research by Neil Dunse and colleagues was therefore conducted from a UK perspective in order to address this disparity.

But just how can the effects of urban open space on residential property values be measured?

Measuring the economic benefits of open space

From an economic perspective, the valuation of urban open space is difficult to calculate because it is a classic public good, where there is no market price. Its lack of value in monetary terms prevents urban open space from being properly evaluated in cost-benefit analyses.

Nonetheless, questions concerning the economic value of open spaces have been addressed by economists through the use of two broad methodological approaches: stated and revealed preference, and through the use of hedonic pricing models.

Stated preference relies on survey techniques to elicit individual preferences and values for environmental goods. An example of this technique is contingent valuation, whereby individuals are asked to indicate the maximum price they are willing to pay for an environmental good or benefit.

Revealed preference uses observed market choices from individuals to reveal their underlying preferences, as well as to estimate the values these individuals place on goods and services. Hedonic Pricing Models are one example of this technique.

Hedonic Pricing Models. In the context of urban open spaces, the basic concept is that a residential property is a heterogeneous good consisting of a bundle of characteristics – such as bathrooms, garages and bedrooms - each of which contributes to its sale price (including the environmental attributes of the residential bundle, such as the amount of green space available). Regressing (evaluating the relationship between one dependent variable and one or more other variables) transacted house price (the dependent variable) against this bundle of characteristics captures the value of the environmental attribute capitalized in the price of the house, and allows the private benefits of open space to be estimated.

So how have these techniques been used in the past? The researchers conducted a comprehensive literature review in order to establish what existing studies have found and how this could be applied to a study in the UK.

Literature review

Since the first application of the hedonic pricing approach to the valuation of environmental goods and services, there have been a number of studies in the USA on the effects of open space on property values. However, only a limited number of studies have been undertaken in the UK. Let's take a quick look at what they found.

And what about the US studies?

UK Studies

The researchers identified two key studies that had been undertaken in a UK context:

- 1 In 2003, the Greater London Authority (GLA) developed a hedonic model to value 'greenness' across the City of London's 760 wards. The analysis modelled the average house price and open space as the percentage of green areas in each ward with a series of socio-economic variables. The results suggested that, holding all other factors constant, higher property values exist in areas with a higher percentage of open space.
- 2 A 2005 report by CabeSPACE investigated the economic benefits of urban green spaces through the examination of a series of UK case studies. This used an appraisal approach, whereby identical hypothetical properties were appraised at three different locations within the vicinity of the park (adjacent to the park, two blocks away from the park, and several blocks away from the park).

The results show that overlooking or being close to a high quality park can have a positive affect on value. However, the range is wide – properties on the park achieved an average premium of 11.3% (standard deviation of 9.4%) and properties within close proximity achieved an average premium of 7.3% (standard deviation of 9.4%).



...the valuation of urban open space is difficult to calculate because it is a classic public good, without a market price...



US Hedonic studies

Over the past 40 years a number of US studies, adopting hedonic pricing theory, have focused on the value of open spaces and urban parks. The statistical results from these earlier studies reveal that the further a property is away from a park, the lower its selling price. However, such studies appear to reflect the underdeveloped nature of the statistical tools and research designs available at the time.

In recent years, due to three key developments, researchers have been able to refine the technique:

- 1 Hedonic analysis and the statistical tools associated with it have become increasingly sophisticated. This has allowed the range of other factors that may contribute to changes in property values to be considered.
- 2 Residential estate agents have developed electronic databases of sales transactions, including details of the structural and physical attributes of the property. These can be transposed onto electronic maps within a Geographical Information System (GIS) and spatially integrated with the location of parks.
- 3 The development of GIS enables transaction and attribute data to be mapped by individual street addresses, allowing for accurate calculation of distances between locations, such as house and park.

Neil Dunse and colleagues reviewed these more recent hedonic¹ studies with reference to four key categories:

- 1 Proximity to open space
- 2 Condition
- 3 Development potential
- 4 Economic status of the area.

¹ Bolitzer and Netusil, 2000, The Impact of Open Space on Property Values in Portland, Oregon. *Journal of Environmental Management* 59, pp 185-193.
Lutzenhiser and Netusil, 2001, The Effect of Open Space on a Home's Sale Price. *Contemporary Economic Policy* 19(3), pp 291-298.
Espey and Owusu-Edusei, 2001, Neighbourhood Parks and Residential Property Values in Greenville, South Carolina. *Journal of Agricultural and Applied Economics*, 33(3) pp 487-492.
Geoghegan, 2002, The value of open spaces in residential land use. *Land Use Policy*, 19, pp91-98.
Irwin, 2002, The Effects of Open Space on Residential Property Values. *Land Economics*, 78(4), pp 465-480.
Cheshire and Sheppard, 1998, Estimating the demand for housing, land and neighbourhood characteristics. *Oxford Bulletin of Economics and Statistics*, 60, 3, pp 357-382.

Proximity to open space

Generally, open space is an amenity and as such has a positive influence on property values. But how far does this effect reach? The researchers considered the work of Bolitzer and Netusil carried out in 2000, whereby data from Portland, Oregon, USA was analysed.

This analysis found a positive but not statistically significant effect on the sale prices of homes adjacent to (within 30 metres of) open space. At distances greater than 30 metres, and up to 450 metres, from open space, homes were found to sell for statistically greater prices than homes located over 450 metres from open space.

“...open space is an amenity and, as such, has a positive influence on property values...”

“...all forms of recreational open space had a statistically significant influence...”

Figure 1 Price Effect and Proximity to Open Space, Bolitzer & Netusil (2000)

Distance from Park (m)	% Change
Distance ≤30	Ns
Distance 31 - 120	4.09
Distance 121 - 210	2.96
Distance 211 - 300	2.28
Distance 301 - 400	2.18
Distance 401 - 450	1.51

However, it should be noted that a potential weakness of this particular study is that all types of open space were grouped into one variable. Other studies have since gone on to extend this analysis to measure the amenity effects of open spaces that provide specific uses.

In 2001 Lutzenhiser and Netusil found that all forms of recreational open space had a statistically significant influence. Of greatest significance were natural area parks – homes within 450 metres of this type of space were estimated to sell for 16.1% more than homes outside the 450 metre buffer. Other types of open space having a statistically significant influence were: golf courses (13.3%), speciality parks/facilities (8.5%) and urban parks (1.8%).

It seems that properties over 450 metres from an open space do not attract the same premiums as properties within this 450 metres buffer. Is there a prime location in terms of distance the open space? The results suggest there are relative disadvantages to being located directly next to open spaces, since the largest premiums were in the 61-120, 121-180 and 121-180 metre distance bands, respectively.

Being in close proximity to open spaces does have positive impact on property values, but this is largely dependent on the type of open space and distance from the space. But what about the condition of the open space – does this have an impact at all?

Figure 2 Price Effect and Proximity to Different Classifications of Open Space, Lutzenhiser & Netusil (2001)

Distance from Park (m)	Urban Park	Natural Park	Speciality Park
Distance ≤= 60	2.9	16.9	11.1
Distance 61 - 120	3.1	15.4	8.6
Distance 121 - 180	1.8	19.1	15.4
Distance 181 - 240	ns	16.9	8.5
Distance 241 - 300	ns	13.5	7.4
Distance 301 - 365	2.5	12.2	6.9
Distance 366 - 450	ns	15	5.8

ns – not statistically significant 10% levels

Condition of open space

The researchers next considered whether the appearance of open space can determine the level of amenity effects derived from it.

This was addressed in a 2001 report by Espey and Owusu-Edusei, whereby small and medium-sized neighbourhood parks in Greenville, South Carolina, USA were investigated. They found that the appearance of a park does influence the value of neighbouring residential properties. The parks were grouped into four categories: small and attractive, small and basic, medium and attractive, medium and basic.

It was found that small, attractive parks have a positive and statistically significant influence on neighbouring property values and medium sized, attractive parks exhibited a positive, but not statistically significant, effect. Basic parks, on the other hand, were found to have a negative and statistically significant impact on neighbouring property values.

Attractive parks appear to have a positive effect on house values, but what happens in cases where parks and open spaces have development potential, and the land use could change?

Development potential: developable vs. preserved

Neil Dunse suggests that any amenity values associated with an open space are likely to vary, depending on its development potential - permanently protected open space may be valued more highly than open space that could be developed in the future. This does seem to be the case.

A study of a suburban county of Washington DC and Baltimore, Maryland, USA by Geoghagen in 2002, indicated that permanently preserved open space increases nearby residential property values over three times more than space that has development potential.

But is proximity to open space of as high a priority to all types of households? Do those looking to buy in lower-income neighbourhoods attribute more value to open space than buyers looking in higher income neighbourhoods, for example?

Economic status of neighbourhood

The researchers suggest that, characteristically, lower income neighbourhoods often suffer from negative externalities such as, 'noise, congestion, higher crime rates, and poor performing schools' that could 'potentially counteract the amenity effects of open space'.

This issue was addressed in Portland, USA by Netusil et al in 2000, who found that the effect of open space is dependent on assessed home values within a neighbourhood. Using sales data from the area, they found no statistically significant amenity effects were attributed to open space located in neighbourhoods with low to medium value homes.

A rare UK study by Cheshire and Sheppard in 1998, estimated a demand system for housing attributes. This also found that demand for open space rises with income.

So what exactly have these previous studies taught us? What are the major points for consideration when starting an analysis of the UK?

The analysis of existing literature by Neil Dunse and colleagues identified a number of important points:

- **Open space has a statistically significant, positive impact on the sales price of neighbouring residential properties. The premiums associated with open space do however vary according to: type of park; layout of property; nature of the location; and, to some extent, the nature of the local population and value of the property involved**
- **Not all forms of open space are valued equally by households**
- **Developable open space, such as farmland and forested land, can provide amenity effects, albeit at lower levels than permanently protected open space**
- **There is a limit to how far the externalities from parks extend – in the US studies the externalities do not extend beyond a quarter of a mile, suggesting that open spaces should be regularly positioned throughout cities**
- **And finally, the economic status of a neighbourhood is a factor in the analysis of the fiscal impacts of open space protection.**

We know what is happening elsewhere, so let's now take a look at what the researchers found in their study of the UK.



...demand for open space rises with income...



The case of Aberdeen, Scotland, UK

Location North East of Scotland; Scotland's third largest city.

Population 250,000 (approx)

Urban Parks and Open Spaces The city itself contains a large number of public parks and amenity open spaces, which have been grouped into a number of categories by the City Council: City Parks; Local Parks; Amenity Green Spaces.

Neil Dunse and colleagues focused their analysis on public parks (divided into two categories: city parks and local parks) and amenity green spaces. The data they used was obtained from the Aberdeen Solicitors Property Centre (ASPC) and focused on residential sales from the City of Aberdeen between 1984 and 2002. There were a total of 53,674 observed sales over this period, which covered the three basic residential property types in the UK:

- 1 Detached housing: single-family units, typically of one or two levels.
- 2 Non-detached housing: as detached housing, but sharing a common wall with neighbouring properties.
- 3 Flats: multi-occupied buildings, normally built to a maximum of four levels.

Also included within this dataset were: property address, postal code, property geo-code, sale price, date of sale, and various structural attributes. Using GIS, the researchers also added distance and location variables to the dataset. These included:

- 1 distance from the boundary of each park and perimeter of open space.
- 2 proximity to major road networks.
- 3 proximity to school catchment areas.

To guard against mistakenly attributing price differentials to a property's proximity to parks and amenity green spaces, when the real influence comes from other location-specific variables, the researchers included other location variables in their analysis to control for this.

This control, aimed at neutralising the effect of all other location specific influences, was implemented by including: distance to the Central Business District (CBD), whether the property is located on a busy road, and the school catchment area within which the property lies.

City of Aberdeen - Classifications of open space

Amenity green spaces are landscaped areas that provide a visual amenity, or separate different buildings or land uses for environmental, visual or safety reasons.

City Parks are large parks with a number of different facilities, capable of attracting a large number of residents and visitors.

Local Parks tend to serve a smaller catchment area than city parks and have fewer facilities and/or are smaller than a city park, but can contain specific attractions.

Source: Aberdeen City Council



...permanently preserved open space increases nearby residential property values over three times more than space that could be developed in the future...



So this is how they went about the analysis, but what exactly was the outcome?

Key findings

- City and local parks are valued most highly by occupiers of detached properties, whereas proximity to amenity green space is valued most highly by occupiers of non-detached properties.
- When it comes to proximity to the park edge, while there is clearly a premium attached to flats in close vicinity to the park, a negative premium is attached to this attribute for houses, which may be due to the potential negative externalities that may surround parks, particularly in the evenings.
- By combining two variables, properties located 450 metres from park edge and properties located next to a park, the researchers discovered that the overall premium for a property next to a park, relative to a similar property 450 metres away, is positive across all house types. The price premium ranges between 0.44% and 19.97% depending upon house and park type. These findings are lower than the premiums found in the CabeSPACE study, but are in line with a number of US studies.
- Although city parks are on average more highly valued, local parks are more consistently valued across all house types.
- The findings suggest that rectangular or oblong (long/narrow) parks are preferable to square or circular (short/wide) parks. A rectangular park, for example, would potentially offer greater opportunities for access – suggesting that accessibility as well as proximity is important to households.

Conclusions

What can be learnt from this study?

The aim of this study was to improve our understanding of the economic benefits of urban open spaces, as revealed through local house prices. Using Aberdeen as a case study, it appears that its residents attach a marginal value to open green spaces – this is reflected in the premium they are prepared to pay to secure a dwelling that has this advantage.

Neil Dunse reports that 'relative to a property located 450 metres away from a park, a property located on the edge of a park could potentially attract a premium of between 0.44% and 19%'

This research has also demonstrated that types of open space are valued differently, with larger parks that have an array of facilities and amenities being more highly valued than areas of amenity green space.

Looking at the situation in more detail, it seems that different household types value accessibility differently – occupiers of flats attach a positive premium to being located on the park edge, whereas occupiers of houses tend to value this more negatively.

Overall, this study demonstrates that there are likely to be opportunities to extract higher profits if the inclusion of open space creates an environment that is attractive to purchasers.²

About the study

This study was supported by a grant from the RICS Education Trust: www.rics.org/educationtrust
The full report can be downloaded from www.rics.org/research

FiBRE written by Amy Roberts, RICS.

² It should be noted that this report is indicative but not comprehensive in its valuation of green space – green spaces have a number of attributes, each requiring a different methodology to measure it; this report only considered open space from the perspective of households; and it does not include sections of the population who do not own their own homes.

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