

The impact of Landscape Quality on Land Values and Development/investment Decisions

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Introduction

This paper discusses some of the results of a 3 year European project examining the link between Landscape Quality (hereafter LQ) improvements and economic investment decisions. The Interreg IIIB project focused on whether third party expenditure to improve the LQ of regeneration sites could attract private sector investment to these areas. Could such sites, located in an ex-mining areas of NW Europe, be made more attractive to potential developers and investors by improving their LQ? This paper first considers how varying the LQ of Brownfield development sites in the UK and Belgium affect land values and secondly explores the role and importance of LQ in the decision making processes of key actors in the property investment process.

The issue of whether LQ has an impact on the value of Brownfield development land took a quantitative approach and involved the development of a new methodology. This methodology is based around the use of visual images which compare improved and unimproved variations (pairs) of Brownfield sites deemed suitable for business park style office development. UK valuers were asked to value the Brownfield site and its 'greened' equivalent. The site pairs were identical apart from variations in the LQ. The results of the valuations were then compared to establish whether the value of the 'greened' version of the site was higher than its brown equivalent. If it proved to be the case we could conclude that the quality of the landscape had a positive impact on land values which, in turn, reflects increased demand for such sites. The qualitative part of the research attempted to determine the role and relative importance of LQ within the decision-making processes of investors, developers and occupiers. We were also able to compare the results of the land value study with the views of the developers and investors to determine whether valuers were correctly eliciting the views of the key market actors.

Defining Landscape Quality

Defining Landscape Quality (LQ) is a separate paper in itself, but for the purposes of this paper we can split LQ into two parts. First, the quality of the immediate setting of a site and second, the quality of the wider area within which the site is located. The immediate setting of a site consists of its access, entrance, boundary, surrounding sites and road corridor; so largely what can be seen from the site itself. The quality of these elements, in terms of both appearance and function, determines the overall perception of immediate setting quality. The wider area is defined by the local amenities, general open space, road network and the approach to the site. Again the quality of the individual elements determines the overall quality of the wider area. This framework of elements that shape LQ were carefully incorporated into the design of the images used within the methodologies designed for the research. These images reflected the overall quality of the landscape by varying its individual components. For a more detailed discussion of LQ see www.environment-investment.com/research.

Landscape Quality and Land Values

There has been no previous attempt in the UK to quantify the impact of landscape improvements on land value. There has been much written about how the quality of the physical environment increases values and investment performance (for example CABE 2001, 2002, 2005) but there has been little, if any, empirical evidence to support these claims. Previous research has used hedonic techniques to analyse the impact of environmental features on property values, as opposed to the overall quality of the landscape, but not specifically the value of land (for a review see Henneberry *et al.*, 2005, references included). The methodology adopted for this research addresses this gap but also develops a unique method combining valuation theory and computerised visualisation.

The research adopted computer modified site images and descriptive text to provide valuers with a set of hypothetical 'particulars' describing development sites. Using pairs of sites based on an original, brownfield site with its modified 'greened' equivalent, the methodology compares the value of the brown site with the greened site. All factors, with the exception of LQ, remain constant, allowing the direct impact of LQ on land value to be identified.

The decision was made to concentrate on development for B1 office use. It was considered that if LQ was to have an impact on development values, then the impact would be most pronounced on office development sites. Office developments focus more on the needs of occupiers rather than customers, unlike retail for example. Providing a high quality working environment for office staff is considered more important than in retail and industrial developments. Research for the scoping study of this project found LQ to be an important element in attracting and retaining staff on business park sites (see Henneberry *et al* 2005).

The theoretical impact of LQ can be explained through a simple residual valuation exercise. Table 1 describes the results of a simple analysis of the potential impact of LQ on land values adopting certain assumptions (tested as part of the research). Land values act as the stimulus for development as they reflect potential profits for both the owner of the land and the developer, who needs to make sufficient profit to compensate for the risks of development.

Improving the LQ of a potential development site with planning permission for business park use may have an impact on land values. The scale of the effect depends upon the impact that the improvements have on the demand for space from occupiers and the perception of the return potential from the investment side. If the impact is positive and occupiers are prepared

to pay more for the office space then development becomes more profitable. If investors perceive that occupiers will be prepared to pay more rent for the space and the quality of the space will attract high quality tenants, then this reduces the risk of the development and enhances its potential for rental and capital growth.

Table 1 illustrates the potential impact of LQ on land values. Using a simplified residual model for a 5ha office development on a business park and making certain necessary assumptions relating to construction periods, finance and so on, it is possible to describe the impact on land values of a number of development scenarios. In scenario a) the rents and yields for the development are derived from comparables for business park space with normal levels of LQ, minimal landscaping and no improvements to the site surroundings. In this case the land value is negative at -£745,000. The development of the proposed scheme would clearly not proceed in these circumstances. In scenario b) substantial environmental improvements are undertaken on the site and its surroundings by the developer. As a result the cost of the development increases by 10% but these improvements mean that occupiers would be willing to pay rents 10% above the standard business park development in scenario. We also assume here that potential investors recognise the impact of LQ on attracting good tenants and reducing investment risk. As a result investment yields are reduced by 10%. The impact is to increase the land value by £500,000 from scenario a) but it is still not enough to make the land value positive. In scenario c) the landscape improvements to the site and its surroundings have been undertaken and funded by a third party so removing the extra costs of providing the high quality landscape previously shouldered by the developer. We still assume a beneficial 10% impact on rents and yields. Now the land value becomes positive and development is profitable. If a third party funds landscape improvement this could stimulate investment.

Table 1: The potential impact of LQ on land values

Scenario	Inputs	Land Value
a) Brownfield site with no environmental improvements	Market driven rents and yields	-£745,711
b) Landscape improvements reflected in occupier demand and investor sentiment	As above but with a 10% reduction in yield to reflect investor perceptions	-£220,114
c) Landscape improvements already completed by a third party. Rents and yields reflect occupier demand and investor sentiment	LQ already improved and have a 10% impact on rents and yields	£340,003

Of course, this analysis makes unsubstantiated assumptions about the impacts of LQ on rents and yields. This research relies on professional valuers to quantify these assumptions through assessments of the land values of hypothetical development sites.

Methodology

An on-line survey was developed using a set of images and accompanying text to describe the development site to respondents in the form of a set of hypothetical development ‘particulars’. Following careful piloting, the ‘particulars’ included all the relevant information required by a valuer to produce a land value including the location, planning issues, ground conditions, transport links etc. The images substituted for an actual visit to the site and provided the main differentiation between the brown site and its ‘greened’ equivalent. Images provided an overhead view of the site (see Figure 1) as well as a ground level view from the centre of the site and from the entrance. In order to isolate the impact of improving the LQ of the site, the

only difference between the pairs of sites was the actual quality of the immediate setting presented in the images. All other value relevant factors were held constant. The hypothetical sites were placed in actual locations in order to permit valuers to use actual comparable evidence and market knowledge of the area.

Two pairs of sites were developed with a brown and green version of each, these are shown in Appendix 1. Valuers were asked during the on-line survey to value two sites; one site from pair 1 and one site from pair 2, selected at random. At no point did valuers value the brown and green version of the same site. The respondents were not aware of the purpose of the survey until its completion in order not to introduce bias to the responses. Two locations were chosen for the sites. First, Yorkshire and Humberside and second, the South East. Valuers selected their appropriate region at the beginning of the survey. Choosing two regions with very different demand characteristics allowed an evaluation of whether LQ was viewed with varying levels of importance in the two regions. The survey was also replicated in Belgium in two provinces, the province of Liege and the province of Walloon Brabant.

The results of the valuations for the brown versions of the site were compared to their green equivalents in order to determine the impact of LQ. A minimum level of response was necessary to ensure the statistical reliability of the survey, determined to be 25 valuations of each pair in each region. The survey assumed that the valuers would be able to produce reliable valuations based on the information provided allowing accurate comparisons within site pairs. The respondents were asked to provide a minimum and maximum estimate of the land value per hectare for each site valued. It was felt that it would be easier for respondents to provide a range of values, rather than a single value; and that this might be more likely to reveal any affect of greening. Respondents also had an opportunity to make additional, open ended comments at the valuation stage.

At the end of the survey some demographic and attitudinal data were elicited from the respondents. This allowed us to gauge whether the personal characteristics of respondents - such as commercial role, level of experience and so on - affected their assessment of the impact of greening on land values.

Impact of Landscape Quality on Land Values - Results

Quantitative Results

Out of over 3,000 property professionals contacted through various methods, a total of 99 valuations were obtained, spread over the four sites. This total consisted of 40 'pairs' of valuations, each produced by a single respondent; and 19 single valuations. This was a disappointing, if not unsurprising, response rate. Table 2 describes the valuations.

Table 2: Responses

Version of Site	South East		Yorkshire and Humberside		Total
	Site 1	Site 2	Site 1	Site 2	
Green	9	15	12	14	50
Brown	11	11	14	13	49
Total	20	26	26	27	99

The valuations were split evenly between the green and brown versions of the site. There were slightly more valuations for the Yorkshire and Humberside sites. With the exception of site 1 in the South East, the target number of valuations (25) was achieved for each site version.

The respondents in the South East had an average of 13 years experience. The equivalent figure for Yorkshire and Humberside was 16 years. Most respondents were employed in medium to large organisations in the South East and medium-sized organisations in Yorkshire and Humberside. The vast majority of respondents were male.

The main aim of the research was to quantify the impact of LQ on land values. A comparison of the valuations for the green and brown versions of each site in each region (see Table 3) shows there was no clear (or statistically significant) relationship between LQ and land value.

Table 3: Land Values (rounded) per hectare

South East	Green	Brown	Difference
Site 1	£2,000,000	£1,800,000	13%
Site 2	£1,800,000	£1,950,000	-9%

Y&H	Green	Brown	Difference
Site 1	£540,250	£544,750	-1%
Site 2	£442,500	£421,700	5%

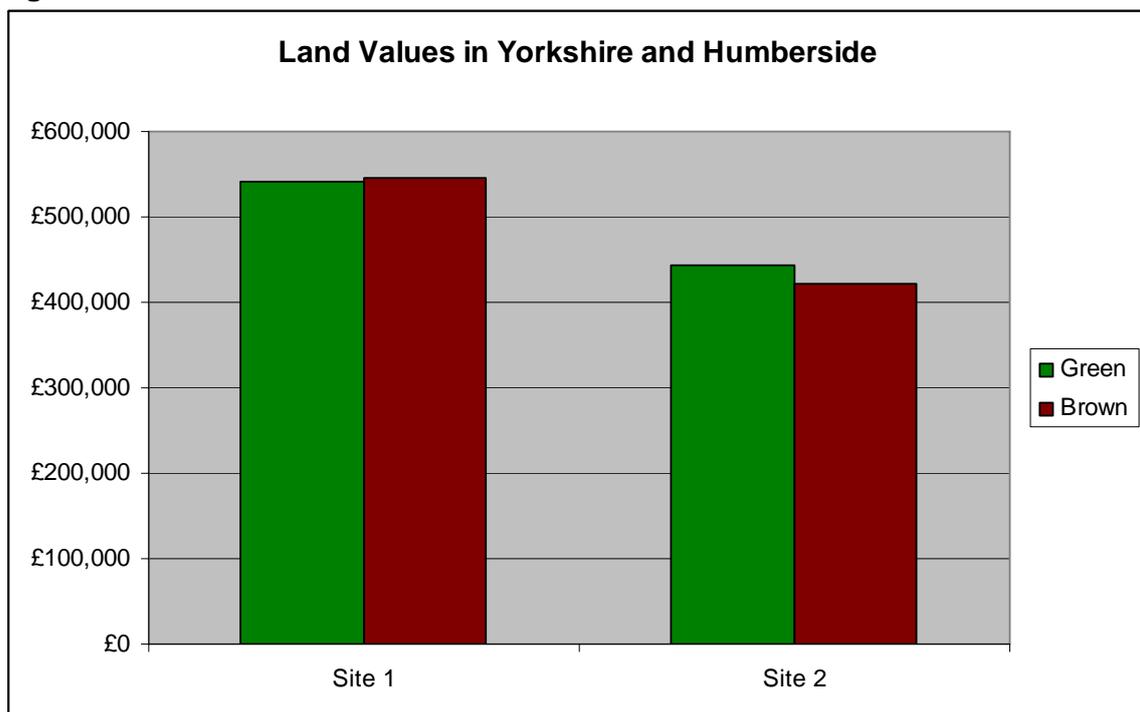
The mean land values of the site versions for the two sites in Yorkshire and Humberside were very similar. Mean land values were more variable in the South East. For site 1, the value of the green version was 13% higher than that of the brown version. The opposite pattern occurred for site 2, with a land value for the brown version 9% higher than that for the green. For there to have been conclusive evidence that improving the LQ of a site and its immediate setting would raise land values, the value of the green version of all sites would have had to have been significantly higher than the value of the brown version. The results show that the green version had a higher value than the brown version for only two of the four site variations. The greatest difference between green and brown versions was for South East site 1. This was the version with the fewest observations and the result was not statistically significant.

The estimated land values in Yorkshire and Humberside were very similar to those identified by the Valuation Office Agency (VOA 2006). In Sheffield, typical commercial development land is worth £575,000 per hectare, slightly higher than the mean values derived from the survey. Similarly, in the South East, the mean values returned by the survey reflect typical values of commercial transactions (between £1.5m and £2.0m per hectare).

Figure 1: Land Values in the South East



Figure 2: Land Values in Yorkshire and Humberside



The level of variance within the valuations for each site in each region was very high. This was partly because of the land valuation process. Land value can be assessed by comparing a subject site with similar sites that have recently been bought/sold or by producing a residual valuation for a specified scheme. The intention was for land valuers to use the latter, based upon the details of the scheme specified in the survey. However, given the large variations in estimated land values, it is likely that most valuers used their knowledge of similar transactions of land which do not necessarily reflect comparable land uses or permissions.

There was a similar level of variation within regions (Yorkshire and Humberside, site 1, Stdev = £280,000; site 2, Stdev = £200,000; the South East, site 1, Stdev = £935,000; site 2, Stdev = £1m). The standard deviations describe wide variations between individual valuations.

A number of outliers were removed for the analysis where valuations were considered to be inconsistent with other valuations for the site. In total, 25 valuations were excluded from the analysis for this reason. There were no relationships between the valuations and the characteristics of the valuers (for example, experience or size of employing organisation). The results of the Belgium survey, to be reported elsewhere, confirmed that the quality for the immediate setting of a site had no impact on its value.

Qualitative Results

During the survey, respondents were asked four questions about the impact of LQ on land values and marketability. Respondents could choose a response from a five point scale¹. Table 4 describes the results.

Table 4: Responses to Rating Questions

	Mean Responses		
	SE	YH	ALL
1. How does the LQ of the Site impact on Value? ¹	3	2.8	2.9
2. How does the LQ of the setting impact on value? ¹	3.24	3.14	3.2
3. Does high LQ improve Marketability ¹	2.75	3	2.9
4. How does LQ impact on Value? ²	3.33	3	3.2

Respondents were asked directly whether the quality of the landscape would have an impact on land value. Only one respondent thought that the LQ of the setting would have no impact on value. The majority of the respondents thought that it would have a little or a moderate impact. However, almost 25% said that it would have a high impact. A similar pattern exists for respondents' views on the impact of the LQ of the site on land values; although slightly more respondents considered that the impact would be moderate rather than little. This analysis shows that respondents believed that LQ does have an impact on value, even though it may be modest. However, these opinions were not reflected in the estimates of the values of the green and brown sites described above². This may be because valuers are not factoring the quality of the landscape into their valuations correctly or because they believe that the impact is too small to have an effect on the actual per hectare valuation figure.

Where LQ did have an impact on value it was suggested, by the majority of respondents, that the impact was split between a reduction in costs and an increase in revenues. The second most common response was that LQ will increase development revenues slightly through two effects. First, that the rents that tenants are prepared to pay will be higher. Second, that the investment yield may be lowered to reflect a reduction in risk because of a reduced potential for void periods associated with higher quality tenants. Responses to whether LQ would affect marketability were split between a little or a moderate impact. Over a quarter of respondents stated that LQ would have a high impact on marketability. LQ was believed to have more of an impact on marketability in Yorkshire and Humberside than in the South East.

¹Options for questions 1, 2 and 3 were (1) No impact, (2) Little impact, (3) Moderate impact, (4) High impact, (5) Very significant impact. Options for question 4 were (1) Reduces Development Costs Significantly, (2) Reduces Development Costs Slightly, (3) Equal Impact on Costs and Revenues, (4) Increases Development Revenues Slightly, (5) Increases Development Revenues Significantly, (6) LQ has no impact on land values

² There were no statistically significant relationships between responses to the questions described above and the valuation figures produced.

Respondents were also asked about their personal position with regard to environmental issues. Most respondents were either moderately or very concerned about the environment. Respondents in the South East were more likely to be very concerned about the environment than those in Yorkshire and Humberside – and were more likely to view LQ as improving marketability. This was the only relationship between the qualitative responses that was statistically significant.

Land values and property decision making

The results of the land value exercise determined that valuers did not believe that the LQ of the immediate setting of a site had an impact on land values. Land values reflect the demand for the development site from potential private sector developers, many of which are developing in order to sell the completed project to investors. We wanted to explore whether LQ was considered in the decision making processes of developers and investors. If, in fact, LQ played a key role in site selection for developers and was an important criteria within investment selection for investors then perhaps valuers were not incorporating the role of LQ in developer and investor demand into their valuations correctly. To explore this contention we undertook a series of interviews examining the role of LQ in developer and investor decision making.

Investor and Developer Decision-making and Landscape Quality

The aim of the interviews was to explore the role of LQ (hereafter LQ) in development and investment decision making. Developers and Investors are the providers of this space necessary for occupiers to function but they have different relationships to the space and those that occupy the space. Developers will have a second-hand view of space consumption, balancing the factors important in their decision-making with providing the space that they perceive will meet occupiers' demands and preferences. The investor is even further removed from the consumption of this space, effectively having a third hand view. The investor invests in space by balancing the factors that influence their decision-making with what they perceive to be the demands and preferences of occupiers and also the space available in the market at that particular time. Investors are almost disembodied from the space that they acquire.

Models of Location Decision-making

The theoretical model of Investor decision making used in the investor interviews is shown in Appendix 1. Several interviewees noted that the process as described was exactly that advocated by their own companies. The process was considered both logical and systematic and also a good basis for how investments should be undertaken. Other interviewees identified slight variations in the decision-making process adopted in their individual circumstances however in all cases the variation was minor.

The Developer decision-making process is shown in appendix 2: All interviewees set their decision-making process against a backdrop of market knowledge, experience and understanding. Several other interviewees also added 'gut feel' to this. These factors were considered to provide context to the decision-making process rather than forming a specific stage of the process. Developers tended to consider themselves experts in one particular geographical area (for example the North West or Southern England) or sector (i.e. specialising in offices, retail or industrial) and their activities tended to be confined to these areas. As a result of the perceived 'expert' nature of the developer, several interviewees suggested that market research be omitted from the process on the understanding they it stands as a contextual element alongside the entire process.

Factors influencing Investment Decision-making

For this study the main question was just where did LQ fit in the decision making processes? Investors ranked the factors that influence their investment decisions as follows:

- Return relative to the portfolio/ return of property in its own right (depending on nature of investment strategy)
- Location of site
- Access to workforce/staff
- Accessibility of site – private transport (particularly car parking ratios)
- Building design
- Quality of tenant and potential for voids
- Physical environment and quality of external environment

None of those interviewed identified occupiers as an important influence on their decision-making until prompted. Further to this, LQ was not mentioned as a consideration in the investment decision. Interviewees considered it too site-specific for the investor to consider in the overall investment decision, however it was felt to be a ‘bonus’ factor. Although not a pivotal factor with the same importance as returns or lease length, everything else being equal, LQ was felt to have a role to play in decision-making at a personal level. All interviewees, when presented with an attractive site with mature landscaping (see the images in appendix 3), considered it a better prospect for investment than an unattractive site or a site with immature landscaping.

Developers ranked the following factors that influence the decision-making process:

- Location
- Return of the site in its own right and rent
- Private transport access and car parking
- Quality of tenants and potential for voids
- Building design
- Accessibility
- Physical environment
- Sustainability

Interviewees were specifically asked whether they considered the priorities and preferences of the occupier when considering a particular development. It should be noted that although all interviewees emphasised that this was an important consideration none of those interviewed identified the occupier as an important factor influencing decision-making without prompting. None of the interviewees highlighted LQ as an influencing factor in the development decision; physical environment was mentioned by three interviews as having a low level influence.

LQ Factors and Performance

Investors were asked to identify those LQ factors which may influence the performance of the site using the images shown in appendix 3. In this context of the investment interviews, ‘performance’ was taken to mean achieving the highest return for the investor. Investors identified those factors at a macro level i.e. taking in the site and its setting and also at micro level i.e. specific factors within the site. The former ranked the LQ factors in order of perceived influence on performance as follows:

- Macro factors; overall perceived level of maturity of the landscape, views from the buildings, the presence of trees both on the site and immediately surrounding the site, sustainability issues such as public transport access and cycle paths;

- Micro factors; tree cover, a site with an open and accessible feel that remains secure, the 'right' car parking ratios, sensitive tree planting, high quality public landscape (linked to amenities of site) to enable occupiers to socialise and network and to give the site a better feel, avenue tree planting along entrance road and identifiable site entrance.

Investors felt that LQ was not a high priority for occupiers and were clear in the view that occupiers would not pay more for a site with high LQ, regardless of the possible benefits for the occupier. Interviewees felt that LQ had a minimal impact on performance.

Developers' responses to this section were highly detailed, with interviewees identifying specific features of the images that they perceived would contribute to, or detract from the performance of site. The three aspects of 'performance' that were pursued in the context of the developer were as follows:

- Potential for achieving higher rents;
- Potential ability to attract higher quality tenants
- Potential impact on liquidity of the site (i.e. ability and speed at which space is let or sold).

The LQ aspects perceived to influence performance are summarised in Table 5.

Table 5

Positive influence on performance	Negative influence on performance
Well located with good transport links	Poor location, poor/no transport links
Good car parking	Lack of well located car parking
Greened site, the presence of trees	Lack of maturity in landscape
Site complete and well maintained	Unfinished and uncared for site and poorly maintained
Good access, Site entrance with aesthetic impact and clear signage	Poor access, no discernable site entrance or lack of impact, no signage
Outside space for staff to use during breaks	No outside space, poorly designed space
Presence of water (preferably moving)	Lack of interest on site
Appropriate screening	Poorly designed or no screening
Good visible security	No security/ lack of consideration for safety of staff

The consensus amongst developers was that the only LQ factors that would have any significant influence on potential performance were the location of the site and its transport links. Interviewees felt that improving the LQ in other ways (identified in the Table above) would not generate more rent or more rental growth. However it was suggested that improving the LQ of the site would improve the liquidity of the site (i.e. the speed at which it is sold or rented) and a site with high LQ could potentially attract higher quality tenants. Developers were very clear in their perception that the priorities for occupiers lay with the location and the building. Most interviewees felt that LQ was not a priority for occupiers.

Conclusions

This paper described the use of visual images to represent LQ improvements used to identify whether 'greening' a site has an impact on its land value. Valuers were asked to value, through an internet survey, green and brown versions of the same site. By comparing the valuations of the site pairs it was possible to identify the impact of LQ on estimated land

values. The exercise was undertaken on sites in two regions; the South East and Yorkshire and Humberside.

Results showed no statistically significant relationship between LQ and land values. Indeed, in both regions one of the brown versions of the site was valued higher than the green version. For the other brown/green pair, the opposite was the case. Valuers did consider, qualitatively, that the LQ of a site and its immediate setting had a moderate impact on land values. However, this moderate impact was not reflected in their valuations. This may mean either that valuers are not correctly taking into account the impact of LQ during the valuation process or that the impact is so slight that it is not reflected in the land value. Valuers did think that LQ had an impact on marketability. This was confirmed through the investor and developer interviews who talked about LQ having an influence on liquidity; the ease of sales and lettings. Green sites were considered easier to market to occupiers. This is reflected in the marketing literature, where green images often dominate property particulars. But why are green sites easier to market? It may be because occupiers prefer to occupy space with a high quality environment. The ability to easily let space is attractive to investors because it reduces the chances of rental voids. Investors may be prepared to pay more for developments with a high quality landscape if they believe space will be easier to let. These views do not feed through into increase land values as the evidence is not there on which valuers to base their judgements.

One of the reasons why LQ was not factored at all into the valuation figure is the method used to estimate value. The residual valuation process produces a land value based on the characteristics of a specific scheme. It will produce a much more accurate land value than using evidence from similar land transactions, unless there are numerous transactions of land with very similar characteristics and planning permissions. In Yorkshire and Humberside, for instance, there is a lack of green commercial development sites. The majority of transaction evidence relates to sales of brownfield sites. In these cases, the values will reflect that character. The valuer will draw upon this knowledge base when valuing a green site. Consequently, (s)he will use evidence that does not reflect the possibility that LQ creates additional development revenues generating, in turn, higher land values. Evidence for this must come from transactions of green sites. The reverse may be true in the South East, where a high proportion of comparable evidence is based on green sites rather than brown sites. All sites are then valued on the basis that they are green because that is where the comparable transaction data come from.

Another factor which affects valuation practice is a lack of evidence that high LQ increases development revenues. Unless it is clear that occupiers are prepared to pay more for office space on a site and in an immediate setting with high LQ, valuers may not incorporate LQ into the valuation process. Similarly, if such evidence was available then developers would favour sites that provide high LQ because this will increase possible revenues. If all occupiers expect a high quality landscaped environment, which is the case for business parks in the South East, then if this were provided by a third party (such as a regeneration agency of local authority) development costs would be reduced.

This study has shown that none of those interviewed placed any significant level of importance on LQ aspects of business park sites. There exists the potential for the 'removal' of investors and developers from the business space occupier to lead to tensions and conflicts between what these groups perceive occupiers want (and therefore what they provide) and what the occupier actually wants. This is exacerbated by the secondary nature of the investors' dealing with the occupier (typically through an agent). However, the occupier may also be responsible for this distance in relationship between the perception of what the investor and developer thinks the occupier wants and the reality of what the occupier wants. The occupier may not be clear nor forthright about their exact requirements or may lack the

knowledge of exactly what is available in the open market, particularly in LQ terms (beyond car parking and a coffee shop). As a result, occupiers do not convey their requirements or preferences to the developer or investor either through direct communication or via the market (i.e. actual transactions).

Given the lack of importance of LQ to investor and developer decision makers then valuers were correct not to attribute any weight to the improved immediate setting of the site within their valuation figure. Although, *ceteris paribus*, developers and investors would choose a site with an improved setting they would not be prepared to pay any more for the site. Such improvements may well increase the marketability of such sites but it would not increase their land value. The question remains whether, financially, it is worth a third party; local authority, regeneration company etc, investing in LQ improvements in the hope of increasing private sector demand for sites. Although LQ may have an impact at the margins but it would not, according to our study, increase the amount the private sector would pay for the sites.

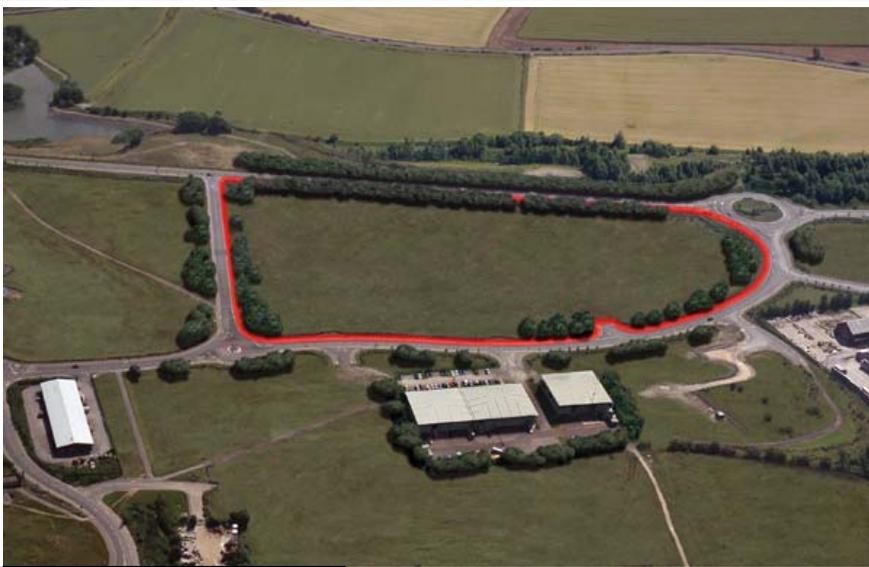
Appendix 1

Site 1 Brown



Site 1 Greened

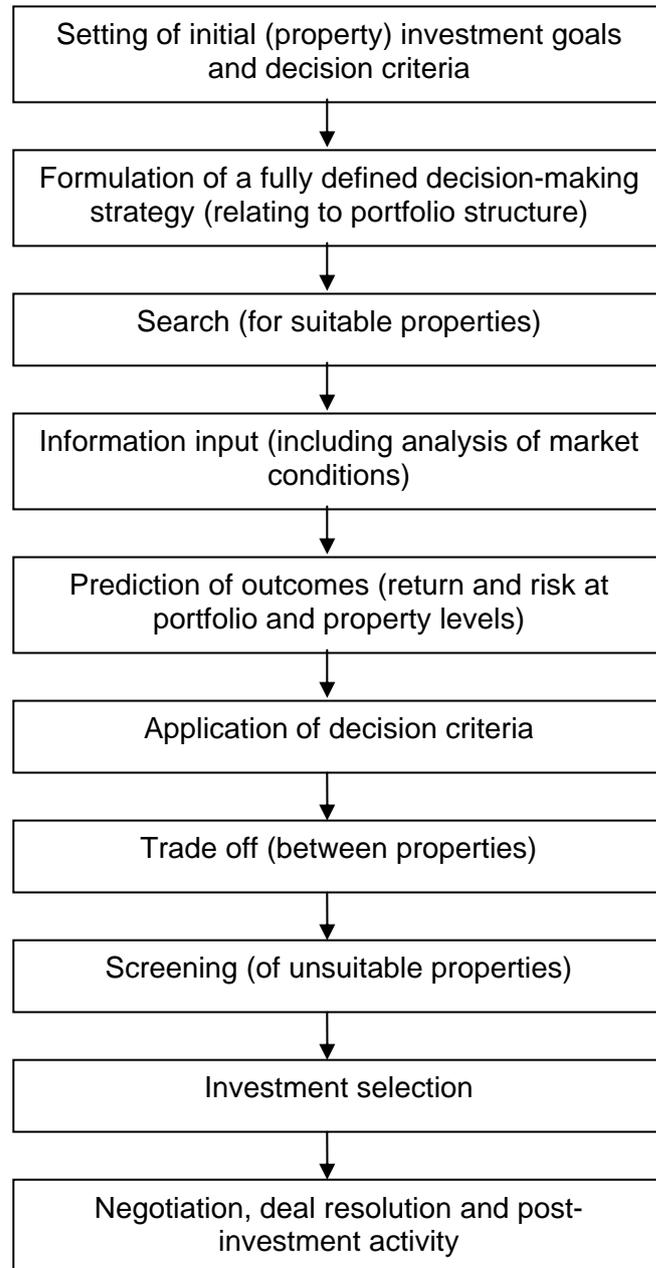
Site 2 Brown



Site 2 Greened

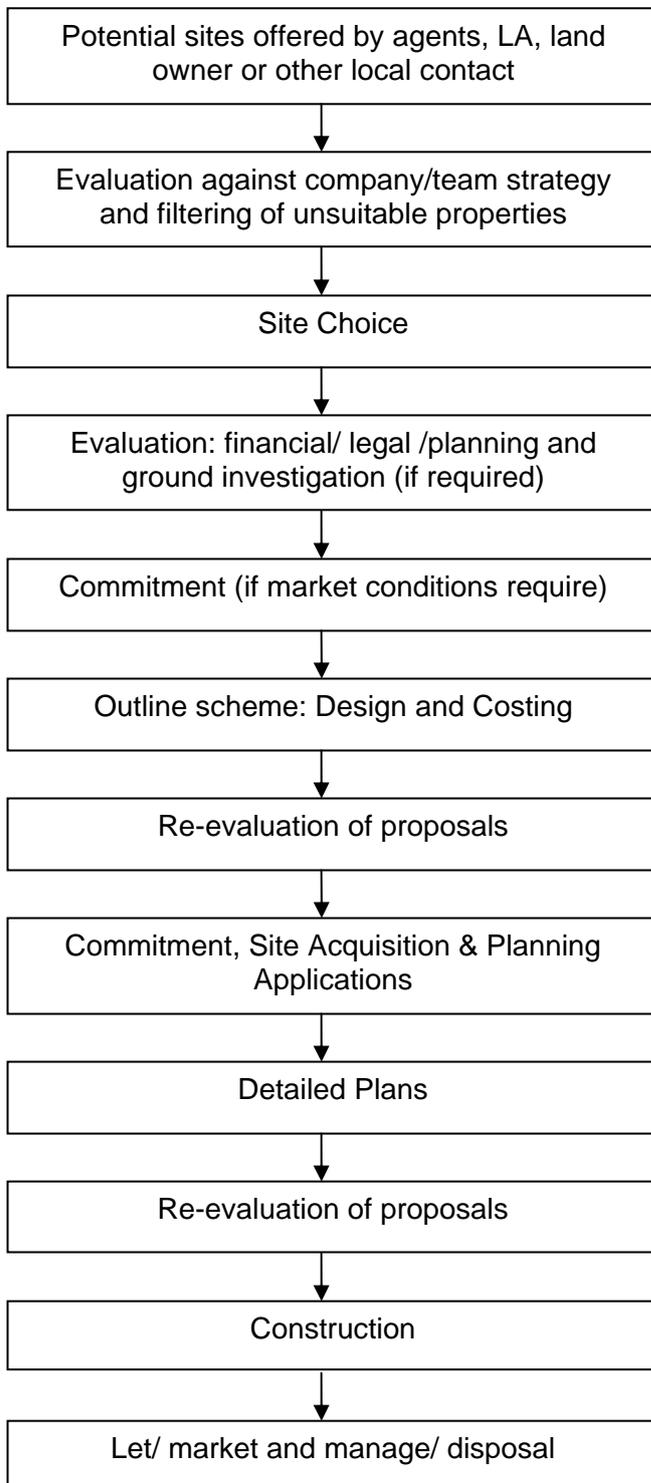
Appendix 2

Investment Location Decision-making Process



Appendix 3

Development Location Decision-making Process



Appendix 4 Aerial Images



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