



Green Infrastructure - Added Value

Mersey Forest



Final Report

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Appendix 1 – Financial Appraisals

1.0 INTRODUCTION

1.1 The Mersey Forest Team commissioned BE Group to undertake a study of how green infrastructure can play a part in generating value from new commercial development. The study will provide an overview of past research into how well planned green infrastructure and investment into the wider business environment can have positive role in both the initial development process and the ongoing management and development of a range of commercial property.

1.2 The study will look at three areas of potential added value in particular:

- Uplift in land value
- Reduced time period from initial investment to generation of income
- Occupancy rates.

1.3 Each of these factors impacts on the financial return of an investment and affects decisions about when and where to invest capital.

Background

1.4 There is a general belief that investing in the environment where people live and work will provide real benefits in the long term, both to the well being of the community and also to those investing in property, whether it is a house owner, building owner or property developer/investor. However, there appears to have been little research undertaken to quantify the financial benefits.

1.5 A number of studies have been undertaken to look at the wider benefits of investing in green infrastructure and the environment, particularly for the residential sector. These benefits have included health and well being, labour productivity, quality of place, security and the leisure and tourism benefits¹².

1.6 In financial terms, it is accepted that creating a high quality environment stimulates regeneration, attracts home occupiers, attracts businesses and workers. There is evidence of parkland areas, urban green space and waterfront locations attracting higher residential property values than poorer quality surrounding areas. There is

¹<http://publications.naturalengland.org.uk/file/1356275>

²<http://www.eftec.co.uk/keynotes/seminars-2012/gi-webinar-presentation/download>

also evidence that this translates to the commercial market place. For example, values around the London Squares are higher than on nearby streets.

- 1.7 Mersey Forest has been involved in developing a Green Infrastructure Valuation Tool Kit, together with other partners. This is aimed at bridging the current gap between evidence and practice in assessing the benefits of green infrastructure and translating the evidence base into a business case for investment. The aim is to quantify in economic outputs such as contribution to Gross Value Added (GVA), monetary benefits and non monetary i.e. social and environmental benefits.
- 1.8 Quantifying monetary benefit is perhaps the most difficult. GVA can be assessed by identifying factors such as jobs created, number of visitors attracted, homes built, etc, and this also translates to the social benefits.
- 1.9 However, it is considered that a model for quantifying increase in monetary value through development is needed which could identify uplifts in property values from increased occupation, increase in rents, and longer term security of income. This study looks at the historic background and research and adopts a methodology for quantifying value.

Methodology and Aims

- 1.10 The approach to this study is to review past research that has been undertaken that look at the effects of green infrastructure. There are a number of published studies, which look at a range of economic and social benefits. Whilst none specifically identify a methodology for valuation, there is good evidence of the benefits. These cover both residential and commercial property and are drawn from studies both in the UK and in the US.
- 1.11 The methodology in the Green Infrastructure Valuation Tool Kit is reviewed to understand how benefits can be quantified using the Tool Kit.
- 1.12 Consultations were undertaken with a number of active developers in the North West of England. These are primarily commercial business park developers; agents involved in commercial lettings, sales and investment advice; and large property investors.

- 1.13 Using the findings from the consultations, BE Group's knowledge of the market and further research, a number of case studies have been made to illustrate how investment in green infrastructure can help raise property values, particularly in the longer term, accelerate returns and reduce the number and frequency of void space.
- 1.14 The findings of the research and the feedback from the consultations are brought together in a financial model that shows how green infrastructure and other environmental investment can have an effect on the long term value of a development or property investment.

2.0 EARLY STUDIES

Introduction

- 2.1 Green infrastructure has been the subject of extensive academic and policy based research over the last 15 years, with the economic benefits of that infrastructure forming a significant subset of research studies. However, research into the likely uplifts in property sale values and rents achieved has focused on the benefits to residential property of relevant green infrastructure such as public parks and gardens. In comparison, only a few past studies have considered the benefits to commercial development, and specifically new commercial development, of relevant green infrastructure investments.
- 2.2 This section therefore summarises a number of the earlier studies that have specifically considered the impact of green infrastructure on values for commercial development and, where possible, new commercial development. It is not intended to be an exhaustive context review but rather to give a flavour of how past researchers have considered the benefits of green infrastructure in this context.

Early Studies – How Green Infrastructure can Impact on Commercial Investment Decisions and Property Values

The Influence of Trees and Landscaping on Rental Rates at Office Buildings – Robert J. Laverne and Kimberly Winson-Geideman (2003)

- 2.3 This study is some 11 years old and focuses solely on experiences in the United States. It is therefore not considered in detail. However, it is worth noting the overall finding of a mass survey of office properties (85 buildings consisting of 270 individual leases) that *“landscaping with a good aesthetic value added approximately 7 percent to the average rental rate of a building. Good building shade was also highly valued, positively impacting rental rates by about 7 percent.”*
- 2.4 Landscaping that functions as a noise barrier or that provides good space definition was found to have no measurable impact on rental levels, nor does incremental increases in the amount of canopy cover, turf, or flower beds. Landscaping that blocks key views can actually reduce rental values by up to 7.5 percent.

Does Money Grow on Trees? – CABA Space (2005)

- 2.5 This study considered the benefits of urban green space, primarily in relation to urban parks. However, case study research did consider the experience of property developer Arlington Business Parks which built an £800 million property portfolio around the concept of offering modern work environments within high quality green spaces. In all its business park developments, some 30 percent of the site area was left undeveloped as communal parkland. In addition, around a quarter of each development plot was allocated to green space (with, typically, another quarter taken up by the building footprint and half by car parking and circulation). The soft landscape component represented between 0.8 percent and 2 percent of the total build cost on a plot, depending on the specification and cost of the building.
- 2.6 Following this model, Arlington saw its rental income almost quadruple, to £38 million within the four years to the end of 2002. In 2004, the commencing rental for customers such as Vodafone and Clearswift at Arlington Business Park, Reading was around £29/sqft, with a further service charge of £5.49/sqft for the maintenance of plot and communal landscaping and infrastructure. This was comparable to city centre rental levels at this time. General rental levels for commercial office space in other Thames Valley areas such as Marlow and High Wycombe were between £21 and £25/sqft in 2004.
- 2.7 Arlington's business parks enjoyed high occupancy rates and good occupier loyalty. In 2004 there were 450 different companies - employing a total of 65,000 people - on the 22 sites, and many of those businesses occupied buildings on more than one park. In 2002, for example, Hutchison 3G (now 3) took new buildings on Arlington's parks at Birmingham and Manchester.

Creating a Setting for Investment: Project Report – South Yorkshire Forest Partnership, et al (2008)

- 2.8 The Creating a Setting for Investment project aimed to examine the links between landscape quality and economic investment decisions. The study included internet surveys of professional land valuers to quantify the impact of 'greening' on the value of out-of-town brownfield business park development sites. Research was carried out in the UK and in Belgium.
- 2.9 The research indicated that all types of business would prefer a higher level of landscape quality of both site and setting as long as the priorities of vehicular access

and proximity to workforce are met. However, knowledge based businesses (business services, research and development) are more sensitive to landscape quality than those engaged in manufacturing or storage and distribution activities. Landscape quality, is important for the knowledge sector as it is perceived to communicate success and expertise and by offering a higher quality working environment it serves to attract highly skilled employees.

- 2.10 For manufacturing and logistics activities, the need for storage space and hard-standing means the external environment plays a more functional role than in the knowledge based sector. Large paved areas are prioritised over planted social spaces. The social use of external spaces was highlighted by business services, research and development and, to some extent the storage and distribution companies. This was not considered important by the manufacturers consulted.
- 2.11 Occupiers, particularly those who receive visitors, are concerned with creating the right image. This focuses on a 'neat and tidy' entrance, which gives a business-like, professional image. The whole site should look 'cared for' implying a well maintained appearance although the cost of maintenance is a concern and typically low maintenance solutions are desired. Smaller companies were concerned not to project an image that is 'too flashy' giving the impression that they are spending too much money on non-essentials. Features such as sculptures fall into this category, while 'wildlife friendly' features such as ponds can be placed away from main entrances and access roads, around the periphery of the site, or in the wider setting, where they do not compromise the more formal 'business-like' image.
- 2.12 The layout of sites should be and well signed ensuring individual companies are easy to find. The signage of individual plots should be easily visible, not obscured by planting. Security is of major concern to occupiers. In the UK, the majority of occupiers on business parks expressed a desire to exclude the community from their sites as they were seen as a security threat.
- 2.13 In terms of changes in rental values, a survey of 36 UK occupiers suggested that businesses would pay up to 5.3 percent more for a high quality setting immediately surrounding the property and 5.3 percent less for low quality immediate surroundings. The same survey also noted that occupiers were willing to pay 5.4 percent for a high quality setting across the wider business park and beyond. However, they would pay 12.2 percent less if the wider environment was poor. Thus

occupiers placed more emphasis on discounting the effect of poor landscaping than on adding a premium for high quality landscaping.

- 2.14 Survey work suggests that existing or proposed green infrastructure does not have a strong impact on land values prior to completion of development. Rather it can improve the image and setting for investment as a soft location factor. (even if not strong, any uplift enables increased borrowing, potentially bringing forward development – this will have an impact on returns)

Open Space: An Asset Without a Champion? – Gensler the Urban Land Institute (2011)

- 2.15 In October 2010, Gensler, in partnership with the Urban Land Institute (ULI), conducted an online survey of 350 investors, developers, property advisors and public sector workers in 33 European countries about the importance of urban open spaces and their commercial value. The definition of ‘urban open space’ was broad and extended to include public parks, squares, outdoor public venues, open waterfront, small landscaped areas between buildings and roof terraces, including green infrastructure in employment areas.
- 2.16 Overall, 95 percent of respondents believed that open space adds value to commercial property and would be prepared to pay at least 3 percent more to be in close proximity to open space. More London based survey respondents believed in the value of open space than their European counterparts, with 97 percent feeling that open space adds value to commercial property. 93 percent of London based respondents were prepared to pay at least 3 percent more to be within close proximity of open space. From those, almost a third would be prepared to pay between 5 percent and 10 percent more; while another 35 percent would be prepared to pay between 10-15 percent more and 16 percent would pay in excess of 10 percent more.
- 2.17 In 2011, average commercial rents in central London were £47.8/sqft in London, with an overall commercial real estate value of £9.3 billion. This therefore represents some £1.3 billion in untapped investment for the city. (explain a bit more this untapped value)

2.18 Respondents also ranked the main criteria they would use for choosing office space for their business or purchasing it as an investment. Ranked in order, the seven criteria were:

1. Geographic Location
2. Cost
3. Proximity to Public Transportation
4. Amenities (retail, food outlets, gyms, entertainment, etc.)
5. Access to Open Space
6. Prestige of Address
7. Building Aesthetics.

2.19 As can be seen, proximity to open space was seen as the fifth most important criteria when choosing an office location.

2.20 73 percent of those surveyed believe that open space could act as a crucial catalyst for economic development. This figure increased to 79 percent among investors, 77 percent among public sector workers, and 87 percent among architects, engineers, property agents and consultants.

Langthwaite Grange: Transnational Assessment of Practice – MP4 and the University of Sheffield (2010)

2.21 This study assessed a programme for environmental improvement at Langthwaite Business Park, formally Langthwaite Grange Industrial Estate (the Estate), a large (57 ha) industrial estate located on the edge of South Kirkby, Wakefield District. The overall aim of the programme was *“to create a vibrant setting for investment through effective and critical environmental and physical regeneration”*.

2.22 Prior to programme investment the three main issues with the Estate were:

- Security – A survey undertaken in 2004 indicated 338 crimes had been committed here. The estimated total value of goods stolen was £108,410 with an additional £205,524/year spent on security measures. Only 30 percent of these crimes had been reported to the police, indicating that businesses had very little faith in the ability of the police and companies complained of few or no criminals being caught or convicted

- Environmental issues centred on the Estate's run down appearance, fly tipping and the use of the estate by vagrants and drug users. Exit interviews with managers and landlords of businesses leaving the estate highlighted crime and the 'unattractiveness' of the site as the key reasons for leaving.
- Poor quality of roads and pavements and the lack of signage and street names.

2.23 Improvements undertaken through the programme, through a partnership of the local authority and local business association over 2006/07, included:

- An Estate wide security system
- New boundary fencing set back from the pavements softened with hedging
- Removal of old walls
- Footpaths improved and verges protected from vehicle damage
- New entrance and site signage
- New trees, although this was limited due to conflicts with the position of the CCTV system.

2.24 The study identified the following practical benefits from this investment:

- *“New Business and Jobs – As of February 2007 16 new businesses had located to the Estate bringing over 200 new jobs and a total of more than £6 million investment. Anecdotal evidence indicates that the improvements themselves were instrumental in this but the positive publicity surrounding the project contributed greatly to the changed perception of potential investors. No specific marketing was undertaken. Occupancy of the estate remained high, as of 2010.*
- *Crime – A reduction of 70 percent in reported crime was recorded in the first year after improvement work started and this has been maintained. As well as having an economic impact through reducing the financial burden of crime there was evidence from interviews with businesses that the fear of crime had also been reduced.*
- *Image and Confidence –The image of the site has improved a particularly important factor for businesses who receive visitors. It was reported that businesses are now happier to have visitors and people feel as if they are now on a ‘business park’ rather than an industrial estate. Changing the name to Langthwaite Business Park completed this transformation. New signage*

has improved the legibility of the Estate making it easier for visitors to find their destination and has contributed to the more positive image.

- *The role of place-making and place-keeping - Compared to many new business parks the overall landscape quality of the Estate is still not high. It appears that it is the degree of change, raising it from a very poor level to a 'standard' level through addressing the main environmental eyesores (such as fly tipping and damaged boundary fencing) that has had the biggest impact. The improvements have reinstated a sense of pride and responsibility for the estate. No doubt the new security measures have made the biggest impact on the project's success. However it is doubtful whether the project would have been as successful without measures to improve the visual appearance and signage of the Estate. Much of the success in improving the image of the site lies in the fact the site is now perceived as being 'cared for' and the ongoing management is crucial in maintaining this perception."*

Birchwood – Neglected Asset, Prime Opportunity - BE Group (1996)

- 2.25 Whilst not a report about the financial return green infrastructure might bring, this study looked at the Birchwood area of Warrington to review prospects for the future economic prosperity of the area and identify weaknesses. The basis for the study was a series of interviews and a business questionnaire, and the findings of the survey gave an insight to the rationale of why a company might locate in an area.
- 2.26 Birchwood was developed in the 1970's/1980's by the New town Development Corporation. The area was previously a wartime ordnance factory with widespread dereliction and little environmental benefit. Much of the area was left with large swathes of concrete bunkers, blast walls and workshop areas.
- 2.27 The Development Corporation planned Birchwood as an out of town suburb with new roads, footways, large areas of parkland, landscaped corridors along the routes, housing and commercial areas with strong structural landscaping.
- 2.28 Since the 1980's the area has matured, and today much of the development is screened. However, during the 1990's a number of landowners – BNFL, Taylor Woodrow and UKAEA – felt that the area was being neglected by Warrington Borough Council. For example, the main route from the M62 had been downgraded to a rural road to reduce the maintenance requirements. The report was

commissioned to highlight the strengths of the area to business, but to also identify weaknesses and issues that, if left unaddressed could result in businesses turning away from the area.

- 2.29 The survey asked what were the key property selection determinants when looking for a location. The findings are set out in Table 1 and environmental quality was not highlighted as a key concern.

Table 1 – Determining Factors for Investment

Determinant	Number of Companies	Percentage of Respondents
Motorway communications	78	49.7
Central location	50	31.8
Clients/suppliers	32	20.4
Suitable premises	21	13.4
Local founder/spin off	15	9.6
Historic	13	8.2
Cost	9	5.7
Transport links	6	3.8

Source: BE Group, 1996

- 2.30 However, when companies were asked to identify the strengths of an area, image of environment was second after motorway proximity, ahead of premises criteria, skills and labour availability. This suggests that whilst not a factor that will determine which area a company might choose, once that locational criterion is satisfied, and then the question of what a business wants becomes more of a qualitative one in which the environment can feature.
- 2.31 As a result of the study, Birchwood Forum was established as a public/private sector forum, run by the business sector to address the issues and ensure that Birchwood is maintained to a standard that will continue to attract high calibre business.

Early Studies – Valuation Toolkits

Building Natural Value for Sustainable Economic Development: The Green Infrastructure Valuation Toolkit User Guide – Natural Economy Northwest, et al. (2010)

- 2.32 The toolkit is intended to help bridge the current gap between evidence and practice when it comes to investments in green infrastructure. It uses practical methods to

value green infrastructure projects, making it easier to:

- *“Understand and make the case for investment across a broad suite of partners*
- *Compare the benefits from green infrastructure with other developments*
- *Prioritise between the different opportunities that are available.”*

2.33 It is informed by a number of earlier evidence base studies which are acknowledged here, but not considered in detail. These include:

- *“The Economic Benefits of Green Infrastructure: The public and business case for investing in Green Infrastructure and a review of the underpinning evidence– Natural Economy Northwest (2008)”*
- *“The Economic Benefits of Green Infrastructure: Developing key tests for evaluating the benefits of Green Infrastructure – Natural Economy Northwest (2008).”*

2.34 The toolkit defines green infrastructure as: *“a collection of natural assets which provide multiple functions and services to people, the economy and the environment. These natural assets span spatial scales and types of land use. For example, they include:*

- *Woodland*
- *Water Courses*
- *Coastal Habitats*
- *Highway Verges*
- *Parks*
- *Urban Trees*
- *Private Gardens*
- *The Grounds of Hospitals, Schools and Business Parks.”*

2.35 The toolkit provides a set of calculator tools, to help assess an existing green asset or proposed green investment and translate the findings into a business case. It looks at how the range of green infrastructure benefits deriving from an asset or investment can be valued:

- *“In monetary terms - applying economic valuation techniques where possible*
- *Quantitatively - for example with reference to jobs, hectares of land, visitors*
- *Qualitatively – referencing case studies or important research where there appears to be a link between green infrastructure and economic, societal or*

environmental benefit, but where the scientific basis for quantification and/or monetisation is not yet sufficiently robust.”

“The toolkit does not assess the quality of the design or detailed management requirements of green infrastructure.”

2.36 Table2 summarises the toolkit process.

Table 2 – The Toolkit Process

Stage	Step	Tasks
1. Preparation	Step 1: Initial analysis	Scope and gather the information needed on the purpose, physical characteristics and beneficiaries of the project or site being assessed.
	Step 2: Identifying beneficiaries	<p>Estimate the number of beneficiaries from the project or site being assessed. This will be needed for assessing recreation, tourism, health and property benefits.</p> <p>The affected population will be an estimate of the relevant ‘user’ and ‘non-user’ population – the beneficiaries of the investment:</p> <ul style="list-style-type: none"> • ‘Users’ benefit directly, by using the new or improved green infrastructure - think of people using a park, or a new cycle path. • ‘Non-users’ may also derive a benefit - for example, a city dweller may value investment to safeguard a rural habitat even if they have no intention to visit the site. <p>In many cases, the most appropriate approach to identifying beneficiaries will be some form of population or household density or catchment analysis. Understanding this is important, as the value Green Infrastructure adds to a green infrastructure investment - and in particular non-marketed goods - is sensitive to distance. There is a reduction in value further away from the green asset.</p>
	Step 3: Project data entry	Enter the core data required in the Toolkit Calculator.
2. Assessment	Step 4: Key benefits identification	Identify the breadth of benefits likely to be associated with the project or site being assessed. Benefits that can be quantified and monetised will be evaluated using the Calculator. Qualitative benefits will be captured through a narrative in your final return on investment case
	Step 5: Applicable tools selection	Identify tools applicable to your project and check whether additional data entry might be needed to run the tools selected. Use the Cost-benefit assessment sheet in the Calculator to document your conclusions on the applicability of each tool.
	Step 6: Tools application	Work through the tools. Most will require manual input of additional data
3.	Step 7: Cost-benefit	Develop a full cost-benefit appraisal, compiling and interpreting results from individual tools and evidence

Stage	Step	Tasks
Reporting	appraisal development	<p>base review.</p> <p>The toolkit cannot count everything. What it does count is designed to be robust enough for initial project appraisal, providing a range of figures indicating the potential impact of a green infrastructure intervention or even an existing green infrastructure asset</p>
	Step 8: Reality-testing	<p>Critical review: ‘are you sure the results from the cost-benefit assessment make sense?’</p> <p>Whenever the evidence base suggests ranges in values, the calculation tools should be used with both the low and high value to present the results as ranges.</p> <p>The summary of evidence associated with each benefit category also highlights any sensitivity issues that should be taken into account – for example where the occurrence or extent to which a benefit occurs is highly dependent on specific factors.</p>
	Step 9: Return on investment case	<p>Write your return on investment case articulating the full range of benefits associated with the project or site assessed.</p> <p>The cost-benefit appraisal sheet in the Calculator features at the bottom a ‘value for money test’ to help report results on value and compare to costs. The test compares an indicative assessment of the present value (PV) of those benefits that can be monetised to the costs of implementation - both initial capital and long-term maintenance. The cost benefit appraisal also describes the project benefits in non monetised terms through compiling indicative non-monetary quantitative outputs and short qualitative descriptions of applicable benefits.</p> <p>Comparing the PVs of the benefits from green infrastructure assets or improvements against associated capital and revenue costs and discounting on a common basis, is particularly relevant given that the benefits of green infrastructure investment can be long term. For example, a canal-side improvement may create the setting for investment over a period of five to 10 years.</p> <p>‘Discounting’ is based on the premise that people prefer to receive benefits in the present rather than in the future. The toolkit is designed to help its users express the net present value* (NPV) of green infrastructure assets – that is their value in present terms, accounting for all the net benefits the assets will bring over their lifetime. The discount rate is used to reduce future benefits and costs to their present-time equivalent.</p> <p>For green infrastructure projects, however, it is generally accepted that it is not possible to monetise all their benefits.</p> <p>The judgement made within the toolkit is that three components are required:</p> <ul style="list-style-type: none"> • Contribution to Gross Value Added (GVA) • Other economic benefits, additional or alternative to the ‘GVA’ benefits perhaps more closely associated with social, environmental and welfare economics • Nonmonetisable - at least at this point - typically

Stage	Step	Tasks
		environmental and social benefits.

Source: *Natural Economy Northwest, et al. (2010)*

Summary

- 2.37 Research over the past 10-15 years has demonstrated that green infrastructure can play a part in improving the attractiveness of an area to business occupiers, which in turn can have a positive effect on property values.
- 2.38 Some of the studies have attempted to quantify value. Increases in rental values are perhaps the most direct indicator, with rents rising from 5 percent or higher where green infrastructure has improved the environment. In the case of the Arlington example, the Reading Park saw rents around 30 percent higher than its competitors.
- 2.39 Beyond the financial benefits, the effect of green infrastructure can be measured in different ways. The Birchwood Study sought to understand why businesses are attracted to move or stay in the area, and the quality of the environment was seen as the area's greatest strength after motorway proximity. And these factors are developed further by applying the valuation toolkit. This assesses a whole range of factors to determine a number of outputs green infrastructure can bring, including monetary benefits measured through uplift in GVA and other non monetary benefits.

3.0 NORTH WEST CASE STUDIES

Introduction

- 3.1 A number of business park locations have been reviewed to provide examples of the effect green infrastructure can have on property values. The case studies do not provide definitive evidence; rather they provide opinion on the performance of the various locations from owners and asset managers, supplemented by research and knowledge of the locations from the study team.

Birchwood Park Warrington

- 3.2 Birchwood Park comprises approximately 52 ha (130 acres) which was created in the late 1990's and has been developed over the past 15 years following its purchase by MEPC from the United Kingdom Atomic Energy Authority (UKAEA). The site was previously a research park for the UKAEA and was made up of a variety of buildings, some dating back to its wartime use as an ordnance factory, whilst most were offices laboratories and workshops built in the 1950's/60's.
- 3.3 At the time of the sale, the area had little landscape merit, and much of the site around the buildings was hard standing, some grassed areas, and derelict or cleared areas.
- 3.4 Whilst common areas were maintained to a reasonable level, the lack of landscaping was in stark contrast to the surrounding Birchwood area which had been developed by Warrington and Runcorn development corporation through the 1970's and 1980's, again from the larger former ordnance factory. This saw a high level of investment in new roads, footways, structural landscaping and both residential and commercial development. It followed the New Town model of creating new linked communities with the emphasis on environment. The result today is a mature community with business parks, housing, retail and also mature landscape areas.
- 3.5 MEPC were able to create a new business park at the heart of Birchwood, but rather than remove and redevelop all the area, the company initially retained many of the existing buildings, refurbishing these in parallel with the creation of new office and warehouse developments. Today a good number of those buildings remain, including Thomson and Chadwick Houses comprising over 30,000 sqm of offices in two six-storey blocks, and a number of the 'north light' laboratory buildings.

- 3.6 From a very early stage in the development cycle, MEPC placed an emphasis on creating a quality environment through the external appearance of buildings, creation of landscaped communal areas and landscaping in and around the development sites. This comprised both formal and informal green areas and public art. With an existing strong landscaped environment outside the park, MEPC wanted to raise the quality even higher.
- 3.7 Bridgewater Place perhaps exemplifies the company's approach to quality. The buildings are five modern steel and glazed offices with a boulevard walkway running in-between and landscaped with a mix of planting, sculpture and a water feature. The development sites alongside have been grassed over and trees planted to avoid the impression of a derelict site.
- 3.8 The soft landscaping and planting is considered to be very low cost in comparison to the hard areas, and a single sculpture which cost around £40,000. A line of 20 trees along one road cost only £10,000. Landscaping as a whole for the development was put at significantly less than 1 percent of the contract value of £40 million.
- 3.9 The development was sold earlier this year, and MEPC considered that the overall investment contributed significantly to the improvement of the investment value. In discussions, MEPC was keen to stress that green infrastructure, alongside strong management, quality of the buildings and delivering the facilities was one of a package of measures that contribute to uplifts in value.
- 3.10 That uplift can be quantified both through the levels of rents achieved, incentives offered, in comparison to surrounding developments, and also in the value that was realised on the sale of the site earlier this year.
- 3.11 Chadwick House, the 1950's office building was achieving rents of £5.00 per sqft in the mid 1990's following the MEPC investment in the park and buildings, the rents doubled in a few years. Bridgewater Place from its initial construction in the early 2000's has consistently returned the highest rents in Warrington, and today are some 20 percent higher than surrounding schemes. Incentives such as rent free periods are generally much smaller. This reflects the demand for the location and the ability to let space. The reduction of rental void through buildings standing empty and shorter rent free periods is a significant contributory factor to raising values.

- 3.12 Birchwood Park also has areas of industrial development. The investment in landscaping here is limited, and it is considered that the locational factors for industrial occupiers are much more to do with the building and how appropriate it is for a specific distribution or manufacturing process.
- 3.13 The ability to let and re-let space is key to long term value, and MEPC believe that this confidence in the location will continue to attract occupiers, driving value upwards. The quality of environment is seen as an important element in achieving this. The majority of the site was purchased in 1997 for £21 million, (a further area was bought 2-3 years later). In 2014, Birchwood Park was one of three parks sold for £430 million. The quality of Birchwood Park was seen as the main driver to achieving that value.

Daresbury Park, Runcorn

- 3.14 Daresbury Park was originally developed in the 1990's by Limewood Developments, the development arm of the local brewing group Greenalls. The site was already in an attractive semi rural location at Junction 11 of the M56 and adjacent to the Daresbury Park Hotel. The developer and Halton Borough Council were seeking to create a high quality office park to compete with south Manchester locations and out of town parks such as Birchwood.
- 3.15 Limewood created a high quality entrance immediately off the roundabout and commenced planting the structural landscaping that would run alongside estate roads, sit around development plots and link the built areas to the strong landscape assets such as the Bridgewater Canal and footpaths and lanes in the vicinity.
- 3.16 At the same time, a strong marketing campaign was launched to attract office occupiers to what was a new location. Whilst the site had been granted consent for the offices, and also a retail and café area, development was not started immediately. The result was little interest in the site for the first two years of its development. Whilst the investment in the green infrastructure continued, this alone was not enough to bring in tenants.
- 3.17 A decision was made to bring in a joint venture partner, and construction was planned and commenced. It was at that time that the interest grew and lettings were

achieved. Rents started conservatively, but steadily, as the area matured and the location became established.

- 3.18 The sale of the whole site by the Greenalls Group to developer/investor Marshalls represented a combination of a number of investment factors. The location and the improvement in demand for offices in that location was one, but the quality of the environment was another major factor, and this helped the vendors achieve a return on the early loss leading spend. Marshalls are known for the formula that they provide, which has an emphasis on the type and size of building rather than the investment in green infrastructure. In buying Daresbury Park the company recognised the investment that had already taken place and that for occupiers there is now a high quality attractive environment. Value is very much dependent on the ability to attract those occupiers to generate income and capital receipts.
- 3.19 Around Junction 11 are a number of office developments. Again, location is an important factor, but Daresbury Park achieves rents that are up to 20 percent higher than the other schemes. Those do not have scale and level of green infrastructure, and other environmental factors, in particular the adjacent industrial park and the busy A56 do have an effect. Several occupiers have stated that they were prepared to pay a premium to be located at Daresbury Park despite buildings and location being adequate on the other parks in the vicinity.

Lingley Mere, Warrington

- 3.20 In the early 1990's United Utilities (then North West Water) purchased a 36 ha site from the Commission for New Towns to develop a campus for its own use. The site was part of the former Burtonwood Airbase, and whilst much was greenfield, the area was flat and featureless.
- 3.21 United Utilities planned out the campus with striking buildings around a landscaped lake, but with over 60 percent of the site undeveloped. The company has worked with development partners to add value to the site by undertaking some development to attract new businesses. The current partner is Muse Developments and their philosophy since becoming involved is to focus on the quality of the environment. The slogan 'Blue Water, Green Heart' was used to market and identify the location.
- 3.22 Muse have placed an emphasis on the environment and the site incorporates a mix of water, structural landscaping. The actual level of new speculative development is

quite limited. Up to the start of the recession two schemes of offices were developed alongside the United Utilities occupied buildings. These let well, and occupiers were prepared to pay a premium rent above nearby schemes to reflect the quality.

- 3.23 In the mid 2000's rents peaked at around £17.00/sqft. The nearest development which was offering similar buildings did not see rents rise above £14.50/sqft.

Wirral Waters

- 3.24 Peel Holdings own substantial areas of the River Mersey, both on the northern bank around Liverpool and on the Wirral side at Birkenhead. The Birkenhead area is known as Wirral Waters and Peel has embarked on a long term programme of regeneration and redevelopment which will change the nature and appearance of the area centred on the vast dock area known as West Float. The whole regeneration area covers over 200 ha.
- 3.25 Much of the area is cleared brownfield land, and in economic terms is viewed as an area suffering from market failure through lack of demand, low values and limited new development. Underpinning the long term area improvement which is shown through the masterplan is blue and green infrastructure. The blue capitalises on the water asset both from the Mersey and the dock areas, whilst the green infrastructure was non-existent in an industrial landscape.
- 3.26 At a very early stage Peel has worked with Mersey Forest and the Forestry Commission to start the greening process with a three year tree planting process. The results have been tangible. Roads that previously were featureless and sites seen as derelict have been tree lined. The involvement of the community was seen as important as part of the process and the planting extends into existing communities rather than just improving the environment around development sites.
- 3.27 In contrast to the approach at Salford Quays, where Peel sought to achieve early returns on investment at the expense of the longer term environmental benefits, at Wirral Waters, the company want to invest now to achieve benefits in the longer term. This level of upfront expenditure represents something of a 'calculated risk' for the company.
- 3.28 Peel sees the project as taking 5-10 years to bring about the projected uplift in values. They are starting from a low base, but in time expect industrial and residential

land values to rise to a level where investment returns will show a positive return. Development is shortly to commence with the creation of a new facility for Wirral College.

- 3.29 Peel, have not looked to quantify the value of the green infrastructure, but common to other schemes the company see the investment as part of a wider package of measures to create a new environment for growth. From experience, Peel consider that the change in value will be manifested through attraction of developers, which will shorten the period from cost expenditure to capital receipts; the attraction of occupiers, both residential and commercial, and in terms of commercial development An adjustment to the investment yields that purchasers may expect based on expectations of future attraction of higher rents and reduced void time.

Summary

- 3.30 The North West has a number of high profile business parks that have been developed with green infrastructure as an integral element within the development process. These parks now stand out as high quality locations and can generate higher values than neighbouring, competing schemes where the investment in landscaping is not at the same level.
- 3.31 From the consultation process it is clear that the green infrastructure has played a part in delivering quality, but it cannot be viewed in isolation, rather it is one of a package of measures that a developer will seek to implement to create the right environment to attract occupiers.
- 3.32 The experience at Daresbury Park at its inception demonstrates that landscaping alone does not create the quality. All parks have invested in the buildings, hard landscaping, and also ongoing maintenance and management. As a result of these investments, the developers have benefitted from increased rents and reduced voids in the occupation of space, which in turn translates into value. Birchwood Park, which was sold earlier this year, provides an example of how investment can result in significant uplifts in value.
- 3.33 Peel Holdings are at an early stage of the development process with Wirral Waters, however, the company intends to incorporate lessons learned from its experience at Salford Quays here. Investment in a poor quality area suffering from dereliction and a poor quality environment is already seeing the area improve. The model Peel is

developing extends beyond the commercial areas and embraces the surrounding community. The benefits are beginning to be realised with new development including the college now committed to move to the area.

- 3.34 Much of the work by Peel has been in partnership with Mersey Forest and the Forestry Commission, which shows how the business community can work in partnership to deliver change.

4.0 VIABILITY TESTING

Introduction

- 4.1 The findings of the earlier research and the consultations which are the basis for the case studies suggest that green infrastructure does have an important role and does contribute to the financial viability of a new development.
- 4.2 The attraction and retention of businesses to a developer or property investor is a key factor, as tenants and the rental income that they generate underpin the value of the property as an investment. Maximising that rental income in turn will improve that value. This can be achieved through:
- Reducing the initial period from completion of development to signing a tenant
 - Minimising the level of incentive that a tenant is offered to take the lease, which may be a rent free period or a capital contribution to fit out of the space
 - Increasing the rental income above other neighbouring locations.
- 4.3 Green infrastructure is just one of the factors that will achieve these goals, but when comparisons are made in a location between developments of different quality, then trends can be identified that quantify these factors. Birchwood, Daresbury and Lingley Mere are all locations that can demonstrate uplift in rent above its rivals. 10 years ago, the study of the Arlington Parks identified a similar uplift.
- 4.4 A more detailed analysis of take-up rates for developments and the incentives that are offered will enable those trends to be measured. Consequently, a financial appraisal can build these factors to determine a change in value.
- 4.5 The purchase of a property as an investment is dependant on the rent providing long term income to the investor. If the investor is confident that the rent is secure, or that his risk of replacing a tenant is low as a result of high demand for the property, then a higher price might be paid. That risk factor is reflected in the yield the income produces. The higher the price, the lower the yield he will accept.
- 4.6 The quality of environment, including green infrastructure can have a small, but significant effect on the yield. Some market commentators suggest that an investor

may apply a 0.1-0.2 percent adjustment where it is felt the quality is strong. A drop in yield means an increase in value to the investor.

- 4.7 Combining these factors will enable a model to be developed. The model is based on a simple residual financial appraisal, where the overall value generated from letting or selling buildings is compared with the cost of creating the development. The residual value can be assessed in terms of the profit a developer might achieve, or alternatively the surplus available to purchase the land initially.

Assumptions

- 4.8 The model that has been developed is illustrative and can be used to provide a residual value, with or without green infrastructure having a material effect. It assumes the following:
- An office development of 85,000 sqft
 - A market rent of £16.00/sqft, with uplift to £17.00/sqft with green infrastructure. This represents an increase of 5-6 percent with green infrastructure investment, a fairly conservative level of growth given that some of the examples in Sections 3.0 and 4.0 talked about a 20 percent uplift. However, this lower figure recognises that green infrastructure sits alongside other factors, such as good management and security, in generating the rental gains mentioned above. It also recognises that not all the rental gain generated by green infrastructure will be realised at the first letting, rather it will accrue in rental increases over the lifetime of the scheme (assuming that the green infrastructure continues to be well maintained)
 - A rent free period of either 12 months or six months
 - An initial void of either 18 months or 12 months
 - An additional cost of £200,000 to pay for the green infrastructure.
- 4.9 Table 3 summarises the differences between a similar development with or without green infrastructure. With regards to the development costs, costs without green infrastructure are minus the £200,000 investment in that element. However, those costs are still higher because they assume that a scheme of lower environmental quality will take longer to let/sell than one with more green infrastructure. In this study we have suggested an extra six months of vacancy. Thus the costs of financing the development, before income comes in to start repaying that borrowing, will be higher as the borrowing period will need to be longer.

Table 3 – Valuations with, and without Green Infrastructure (£)

Element	Without Green Infrastructure	With Green Infrastructure
Development Value	18,758,600	19,931,000
Development Cost	19,546,000	18,726,500
Residual Land Value (Loss)	(810,000)	1,204,500

Source: BE Group, 2014

- 4.10 When the yield is also adjusted by 0.2 percent the values change again and these are summarised in Table 4.

Table 4 – Valuations with, and without Green Infrastructure – 0.2 percent Yield Change (£)

Element	Without Green Infrastructure	With Green Infrastructure
Development Value	18,758,600	20,494,000
Development Cost	19,546,000	19,041,700
Residual Land Value (Loss)	(810,000)	1,454,300

Source: BE Group, 2014

- 4.11 It is clear from the example illustrated that the different elements can make a significant difference. The £200,000 investment in green infrastructure will not only be recovered, but results in a net uplift in value, from a loss of £0.8m to a profit of £1.2 million, when the tenancy variables are built in. This increases to £1.5 million when the yield is also adjusted.
- 4.12 In reality green infrastructure is just one of several factors that will result in that uplift, and a more complex sensitivity analysis can change a wider range of variables to reflect development viability.
- 4.13 The model which is based on a cash flow analysis can be extended to increase the size and nature of a development over a longer period, for example a number of years. Conversely, the scale of development can be reduced to a point where the additional cost becomes a burden rather than a benefit, i.e. landscaping is a cost, but does not result in rent increases or a reduction in void periods.

Summary

- 4.14 This section seeks to quantify the financial benefits which have been highlighted in the various reports and case studies. An improved environment can attract business. This in turn will have a direct affect on rental levels, incentives and period vacancy rates. A strong demand will enable a developer or investor to manipulate these elements.
- 4.15 Increased confidence in letting space and keeping the space occupied will be reflected in a reduction in assessment of risk. This is manifested through the investment yield an investor will initially seek from a development. The lower the initial yield, the higher the value.
- 4.16 A model based on a standard financial appraisal has been developed to show how changes to these elements can combine to increase value over and above any increase in cost attributed to green infrastructure. The increase in value can be significant.
- 4.17 However, not all development will show the same benefits. Investment needs to be long term and this will be seen over time particularly with larger schemes and Strategic Investment Areas. The model can also be used to assess smaller developments and there may be a point where cost of landscaping will not translate to increase in value.

5.0 CONCLUSIONS

- 5.1 Green infrastructure is one of a number of factors that can affect viability and profitability and green infrastructure alone is unlikely to result in an uplift in value
- 5.2 There have been a number of studies that point to how green infrastructure has an effect and is seen as a positive benefit. Some of the studies have provided statistics and examples where the quality of the environment including landscaping and green infrastructure do contribute to uplifts in value. The Arlington study, for example, demonstrated that setting aside areas of common green space and landscaping within development plots resulted in the measurable uplifts in rentals, some 20 percent above competitors' space. The study did not go as far as measuring the end value and how that compares with other developments of a lesser quality.
- 5.3 The 1996 Birchwood study, which was based on a survey of occupiers in the area, illustrated that once a locational decision is made, the quality of the environment becomes important to a business. Maintaining a quality environment will help attract and retain businesses. This was also demonstrated in the West Kirkby study where improvements to a rundown estate increased tenancy and employment levels, and combined with other measures, crime dropped significantly. Retention of tenants is a key factor in maintaining and increasing value.
- 5.4 The case studies reinforce the importance of green infrastructure. All the examples show that developers who invest in the environment, through quality of buildings, and the surrounding hard and soft landscaping, can secure much higher rents again, around 20 percent above competing schemes that have not seen the same level of investment. But green infrastructure is not considered as a single factor that will attract businesses. Rather it is part of a package of measures. The slow start at Daresbury Park provides a good example of this where the quality of environment, both through the existing countryside and the investment in new landscaping, was not the factor that brought the tenants to the development. Rather, it was a combination of factors, most notably including the provision of high quality buildings.

- 5.5 Green infrastructure investment will not automatically lead to an increase in value in all cases. Office development, for example, is much more sensitive to environmental quality. The value of industrial and in particularly warehouse development does not seem to be affected in the same way. Office workers are much more aware of and sensitive to the surroundings, whereas warehouse/industrial operators will primarily look at the building and location and its ability to meet its logistics/manufacturing needs.
- 5.6 Building a model to illustrate how value can be increased through investment in green infrastructure is possible by adapting a standard financial appraisal. This takes development value and from that deducts the development costs to show whether there is a surplus which provides a profit to the developer. Different variables such as rental levels, incentives, void periods, and the cost of green infrastructure invested can be altered to show the effect on value. As the illustrative valuation in Section 4.0 shows, the uplift in value from improving these variables can easily outweigh the cost of providing the green infrastructure. In the case study given, even modest benefits such as a 5-6 percent increase in rental value and a shorter void period for the completed properties (around six months) can move development from a loss to £1.2 million in profit. If a reduction in yields is also assumed, since the development is more lettable and thus a slightly lower risk to the developer/investor, then that profit increases to some £1.4 million.
- 5.7 The reduction in risk that is a result of being able to attract and retain tenants in turn can be shown through an adjustment in the investment yield. Investment experts suggest that the yield can reduce by 0.1-0.2 percent with green infrastructure Investment, and consequently, that will have a large impact on value. The larger the development, the greater the impact.

Appendix 1

Financial Appraisals

APPRAISAL SUMMARY

CALdes Software

Sub total Totals

No GI

File name: Mersey

Option: 3

Proceeds

Unit breakdown	Net Area	Value	Yield	per ann	Purch. Costs	Gross	Net
Office	85,000	@ 16 /ft2	7.25%	1,360,000		18,758,621	18,758,621
Total Proceeds				1,360,000		18,758,621	18,758,621

Construction

Office	Gross area	@ ft2	Start / Period	
Office	100,000	120.00	1 / 12	12,000,000
Total construction				12,000,000

Fees

Architect	5.00%	600,000
Quantity Surveyor	3.00%	360,000
Structural Engineer	2.00%	240,000
Mechanical & Electrical	1.00%	120,000
Project Manager	0.50%	60,000
CDM	0.01%	1,000
On-line management	0.30%	36,000
Planning		3,000
Building regulations		3,000
Letting legal fee	1.00%	13,600
Letting agent fee	10.00%	136,000
Sale legal fee	0.75%	140,690
Sale agent fee	2.00%	375,172
Total fees		2,088,462

Tenants Inducements

Office	1,360,000 as rent free cost.	1,360,000
Total Tenants Inducements costs		1,360,000

Other costs

Office Other Costs	200,000
Total other costs	200,000

Finance

Pre-PC Interest	Over 12 months	364,706
(Source 1	@ 5.00%	1,474,093
Void Interest	Over 18 months	1,109,387
Total finance		1,474,093

Gross development costs

16,311,793

Net profit

2,446,828

Profit on Cost

15.00%

Profit on GDV

13.04%

Development Yield

8.34%

NPV

757,622 @ 10.00%

Profit Erosion

34 Mths

Land

	Stamp duty	Legal	Agent	Gross	Net
Tranche 1	1.00%	0.50%	1.50%	-810,762	-787,148
LAND COST				-810,762	-787,148

APPRAISAL SUMMARY

CALdes Software

Sub total

Totals

Yield adjusted

File name: Mersey

Option: 2

Proceeds

Unit breakdown	Net Area	Value	Yield	per ann	Purch. Costs	Gross	Net
Office	85,000	@ 17 /ft2	7.05%	1,445,000		20,496,454	20,496,454
Total Proceeds				1,445,000		20,496,454	20,496,454

Construction

Office	Gross area	@ ft2	Start / Period	
Office	100,000	120.00	1 / 12	12,000,000
Total construction				12,000,000

Fees

Architect	5.00%	600,000
Quantity Surveyor	3.00%	360,000
Structural Engineer	2.00%	240,000
Mechanical & Electrical	1.00%	120,000
Project Manager	0.50%	60,000
CDM	0.01%	1,000
On-line management	0.30%	36,000
Planning		3,000
Building regulations		3,000
Letting legal fee	1.00%	14,450
Letting agent fee	10.00%	144,500
Sale legal fee	0.75%	153,723
Sale agent fee	2.00%	409,929
Total fees		2,145,602

Tenants Inducements

Office	722,500 as rent free cost.	722,500
Total Tenants Inducements costs		722,500

Other costs

Office Other Costs	200,000
Total other costs	200,000

Finance

Pre-PC Interest	Over 12 months	480,709
(Source 1	@ 5.00%	1,300,770
Void Interest	Over 12 months	820,060
Total finance		1,300,770

Gross development costs

17,823,561

Net profit

2,672,893

Profit on Cost

15.00%

Profit on GDV

13.04%

Development Yield

8.11%

NPV

1,145,308 @ 10.00%

Profit Erosion

34 Mths

Land

Tranche 1	Stamp duty	Legal	Agent	Gross	Net
Tranche 1	4.00%	0.50%	1.50%	1,454,689	1,372,348
LAND COST				1,454,689	1,372,348

APPRAISAL SUMMARY

CALdes Software

Sub total Totals

Advanced GI

File name: Mersey

Option: 1

Proceeds

Unit breakdown	Net Area	Value	Yield	per ann	Purch. Costs	Gross	Net
Office	85,000	@ 17 /ft2	7.25%	1,445,000		19,931,034	19,931,034
Total Proceeds				1,445,000		19,931,034	19,931,034

Construction

Office	Gross area	@ ft2	Start / Period	Purch. Costs
Office	100,000	120.00	1 / 12	12,000,000
Total construction				12,000,000

Fees

Architect	5.00%	600,000
Quantity Surveyor	3.00%	360,000
Structural Engineer	2.00%	240,000
Mechanical & Electrical	1.00%	120,000
Project Manager	0.50%	60,000
CDM	0.01%	1,000
On-line management	0.30%	36,000
Planning		3,000
Building regulations		3,000
Letting legal fee	1.00%	14,450
Letting agent fee	10.00%	144,500
Sale legal fee	0.75%	149,483
Sale agent fee	2.00%	398,621
Total fees		2,130,053

Tenants Inducements

Office	722,500 as rent free cost.	722,500
Total Tenants Inducements costs		722,500

Finance

Pre-PC Interest	Over 12 months	467,913
(Source 1	@ 5.00% 1,274,534	16,483,123 Max. borrow)
Void Interest	Over 12 months	806,620
Total finance		1,274,534

Gross development costs

17,331,877

Net profit

2,599,158

Profit on Cost

15.00%

Profit on GDV

13.04%

Development Yield

8.34%

NPV

1,106,811 @ 10.00%

Profit Erosion

34 Mths

Land

Stamp duty	Legal	Agent
Tranche 1	4.00%	0.50%
		1.50%

Gross Net

1,204,790 1,136,594

LAND COST

1,204,790 1,136,594