The Sustainable Property Appraisal Project

Developing property appraisal tools to assess building worth in accordance with the triple bottom line. This is a collaborative research programme combining the expertise and resources of industry, academe and the Government to apply principles of sustainability in property investment practice.

The Sustainable Property Appraisal Project

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1 Introduction

The aim of the Sustainable Property Appraisal Project is to provide property investors and occupiers with a system for reflecting sustainability within the appraisal of commercial property assets. The lack of such a system has contributed to the relatively slow response the property investment industry has made to the sustainability agenda in comparison with other investment sectors. With no means to measure sustainability within the commercial property stock or identify potential impact on property worth, the market has been unable to discern a clear business case to generate demand for property with positive sustainability characteristics. Whilst awareness of the significance of the issue has increased amongst both occupiers and investors, information has not been available to support the translation of that awareness into policy and practice.

The research has addressed this problem by asking how those issues, commonly bundled together to describe sustainability, are likely to impact on the functions of commercial property that contribute to property worth. The rationale for taking this approach is that it provides a means of engaging the property investors with sustainability, in terms clearly relevant to their overriding business objective. Making the risks attached to unsustainable property more transparent provides a mechanism for:

a) generating investor demand for more sustainable property, and
b) improving less sustainable property within investment portfolios.

This report presents the outputs of the research. These constitute the first steps achieved in providing investors and occupiers with the means to generate quantifiable information on sustainability within existing commercial property assets and linking this to the potential it has to impact on property worth.

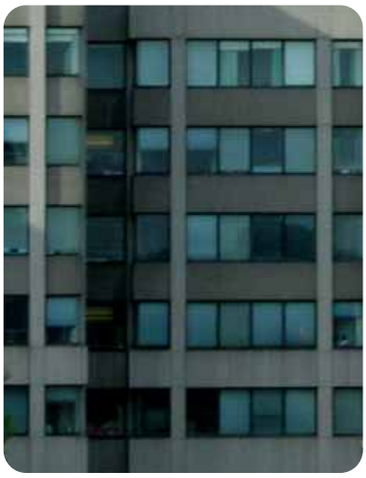
The following tools have been developed that enable an assessment of a property's sustainability to be reflected within an appraisal of its worth:

- the Future-Proofing Property questionnaire,
- the Sustainable Property Appraisal Tool,
- a pilot framework and sample for a Sustainable Property Investment Index.

The report sets out the terms of reference adopted for the research, the methodological approach taken to the development of the Sustainable Property Appraisal Tool and the theory and assumptions supporting the process of quantifying the sustainability criteria[1]. Each element is open to challenge and debate and the whole is presented as a starting point from which the property industry can develop a practical response to the sustainability agenda.

[1] *Three further working papers are available giving more detail on the developmental stages of the research and outputs. These can be downloaded from www.sustainableproperty.ac.uk.*

2 Defining Sustainability



The triple bottom line approach to defining sustainability was adopted from the outset of this work and is reflected within all the outputs. Whilst it is acknowledged that this is only one of the many definitions of sustainability that have been developed, it was considered the most appropriate for this work and for the current market context. It enables the economic sustainability that is fundamental to property investment to remain at the forefront of the appraisal process, whilst the environmental and social issues are linked in. This has enabled the research to bring sustainability issues to the centre of the property appraisal process by making a quantifiable connection between sustainability and property worth. As the economic context changes and environmental concerns perhaps increase, the balance of significance between the three elements will change. However, a definition that acknowledges the role of economic sustainability enables the policy, regulatory and market responses that will help to address environmental and other problems, to be explicitly reflected in the economic drivers of the business response.

Three major components form the key building blocks in reflecting sustainability in property worth:

a) a set of sustainability criteria that link the functionality of commercial property with its environmental and social impacts;
b) a system that measures property against those criteria;
c) a set of parameters that link performance under those criteria through to a calculation of property worth.

These three components are reflected through the three stages of the sustainable property appraisal process:

- measurement of a property's performance against the sustainability criteria using the Future-Proofing Property Questionnaire;
- reflection of that measured performance within the appraisal process through the Sustainable Property Appraisal Tool;
- inclusion of the information this produces in the investment decision-making process (see Figure 1).

Application of the Future-Proofing Property Questionnaire over whole portfolios over time will allow tracking of investment performance against sustainability performance. Linking this data to IPD investment performance data will enable the development of a sustainable property investment index.

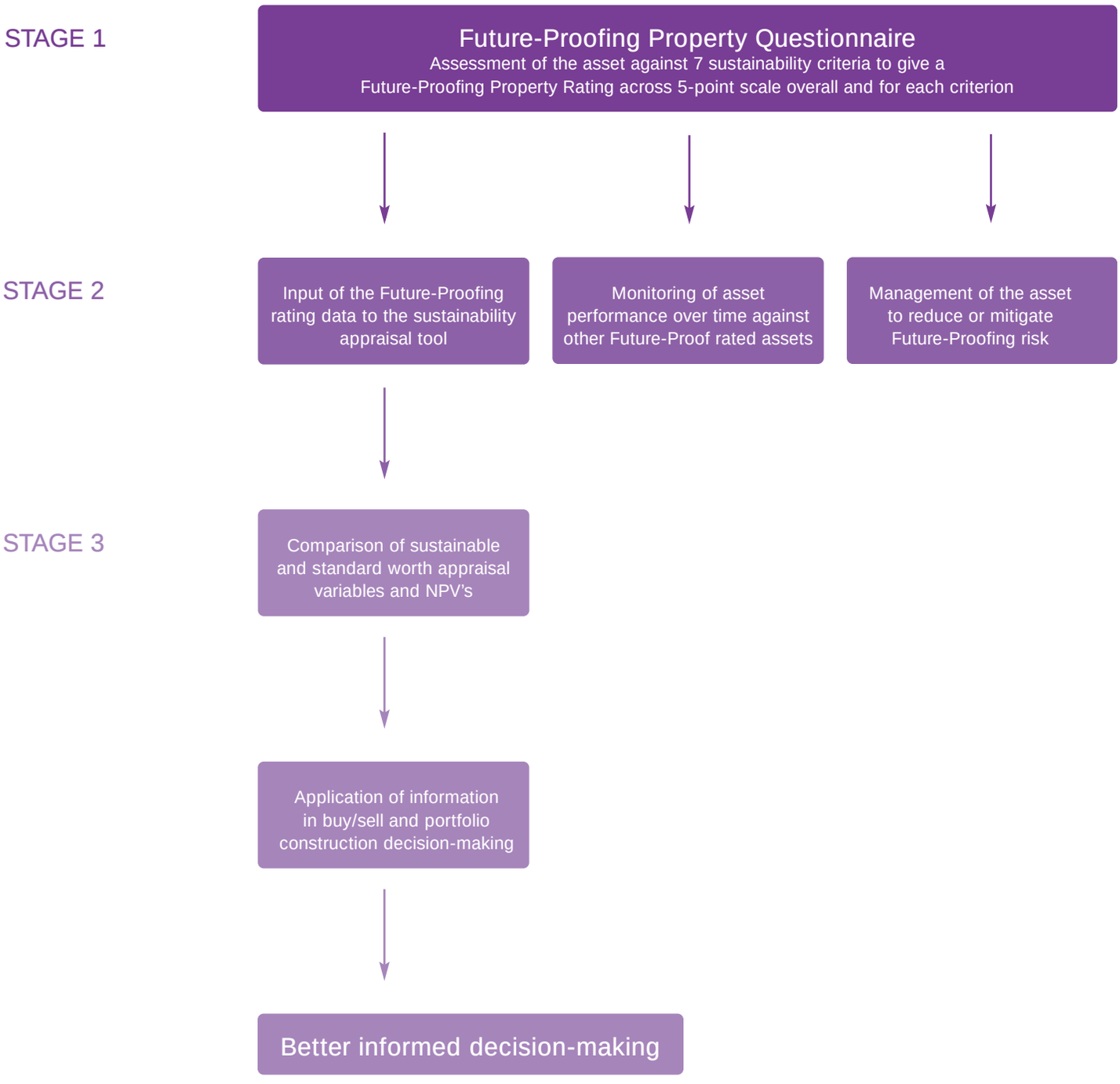


Figure 1: Project Schematic

3 Sustainability Criteria for Commercial Property

In establishing criteria for assessing the sustainability of commercial property, a set of basic characteristics were identified as a key requirement (Sayce and Ellison 2003a,b):

- simplicity: they should be easy to understand, transparent and accountable;
- scope: they should cover economic, environmental and social issues and overlap as little as possible;
- validity: they should have scientific or analytical validity, including capacity to respond to change;
- robustness: they should be unambiguous and independent of assumptions;
- focus: they should be limited in number;
- relevance: they should relate to a reasonable time horizon and to relevant spatial area;
- availability: they should be readily available from existing data collection system;
- functionality: they should clearly link sustainability with the primary functions of commercial property.

Having reviewed the wide range of existing indicator sets available and consulted with environmental specialists and the occupier and investor communities, the following nine indicators were selected as the most appropriate sustainability criteria for the project:

- energy efficiency,
- pollution,
- waste management,
- water management,
- climate control,
- accessibility,
- adaptability,
- occupier,
- contextual fit.

Common ground is shared between the sustainability agenda and property investment performance in assessing commercial property under some of these criteria, such as energy efficiency and water consumption. Other criteria are counter-intuitive to sustainability when viewed from the investor perspective; accessibility by car for example. Accessibility of location underpins economic sustainability for property and in the context of current transport availability, accessibility by car is often key to this.

Investment and sustainability performance is likely to be enhanced by good public transport access and local green travel plans in addition to car access, but, with the exception of some city-centre locations, car access normally underpins occupier demand and the economic viability of the asset. By adopting the triple bottom line, economic as well as environmental and social impacts are taken into account. This enables the sustainability criteria to be linked via an impact on the functional performance of the property through to performance as an investment asset and hence to property worth.

The Sustainable Property Appraisal Tool and the Future-Proofing Property Questionnaire that supports it, attempt to make a realistic assessment of the sustainability of a property based on seven of these nine criteria. Through the course of the research it has not been possible to identify a quantifiable link between the occupier and contextual fit criteria and investment property worth. These are therefore identified as relevant and worthy of further research, but are not incorporated in either the Future-Proofing Property Questionnaire or the Sustainable Property Appraisal Tool.

4 Assessing Sustainability within the existing Commercial Property Stock

4.1 Applying the Future-Proofing Property Questionnaire

The selected sustainability criteria have been developed within the research as a means of assessing the sustainability of any existing commercial property. This assessment is premised on two points:

a) that all commercial property can be rated in terms of its ability to perform as an asset under the changing demands generated by the sustainability agenda;
b) that from the investor perspective, only issues specific to the property and within the investor's realistic control are relevant.

By assessing a property in this way, it is possible to separate the assessment of the physical asset from any assessment of the behaviour of the occupier, which the investor can not control. Once the sustainability assessment is focused on physical characteristics, it is possible to 'audit' for them; does the property have energy efficient lighting? If it does not, it is likely the investor will have to install this over the next 5–10 years, and if it is not installed, the higher operational energy costs will strengthen a potential new occupier's negotiating position on rent.

The Future-Proofing Property Questionnaire uses a series of similar questions to assess a property's sustainability. It has been developed with the particular objective of providing a useable assessment tool for the commercial property market. The aim is to enable the bulk of the commercial stock to be assessed. To do this the questionnaire has to be capable of being administered quickly and cheaply by someone with a managerial connection with a large number of properties, for example a fund manager or managing agent. This crucially provides access to the majority of commercial property held in institutional investment portfolios.

These requirements gave rise to the questionnaire needing specific characteristics. It had to be:

- short;
- appropriate to a range of property types with minimum change in format;
- capable of completion by someone with a working knowledge of the property but without engineering or building surveying expertise;
- capable of generating sufficient relevant data to make a useful assessment possible;
- capable of generating information useful to the portfolio manager and investor;
- easy to analyse;
- capable of being linked to industry standard investment performance measurement data.

Many valuable assessment tools are available, but their take-up has not penetrated the commercial property market very deeply. Not having been developed for the investment sector they often incorporate occupier issues over which the investor has no influence, or focus heavily on environmental issues which do not reveal a complete picture of commercial property sustainability and can generate anomalous results in terms of investment worth. Usability is also often a major hurdle. Whilst more complex, sophisticated tools can give more detailed information, they are time consuming and often expensive to complete. This provides a major disincentive to them being adopted en masse by the market. Unless assessments are made on a substantially increased scale, sustainability will continue to fail to be addressed within the commercial property stock.

Whilst these assessment tools are important, for the purposes of a wide-scale assessment to be driven by the investment sector, a less complex and more focused series of questions was required.

The Future-Proofing Property Questionnaire[2] developed here consists of four questions that identify the property sector and type, followed by a series of tick-boxes under each of the seven sustainability criteria. Completion generates an overall numerical score and qualitative label, supported by a further score and label under each of the seven criteria. The scoring system that underpins it is specific to each sector and each property type. This approach enables the impact of each sustainability criteria to be tailored for different property sectors and for a range of different property types within each sector. This produces a fully-flexible weighted scoring system. This can also be updated as the sustainability agenda changes over time.

[2] *The Future-Proofing Property Questionnaire is included in full at Appendix A.*

The numerical scores that underpin the questionnaire generate the qualitative labels for each property. These are included for ease of analysis and cross referencing of performance within and across portfolios. The scoring is based on consultation and experimentation carried out during the course of the project. As the questionnaire is more broadly piloted and analysed it is anticipated the scores will be updated. Inevitably as the sustainability agenda changes and as property is updated the scores will have to be updated to reflect this.

The qualitative labels range across a five point scale:

- very poor performers,
- poor performers,
- typical performers,
- good performers,
- very good performers.

Extensive piloting has demonstrated that the questionnaire is capable of completion in 2–3 minutes by a managing agent or fund manager with a working knowledge of a portfolio. So far over 100 properties have been assessed, generating a database that can be analysed to show performance overall and under each criterion. This can be used to identify different levels of sustainability performance across a series of portfolios, areas of weakness or strength in a particular portfolio, or to identify properties that represent a particular risk.

The Future-Proofing Property Questionnaire forms Stage 1 of the Sustainable Property Appraisal Tool, and as a stand-alone tool also forms the foundation of the framework for a pilot sustainable property index. As the number and range of properties assessed using the system increases, a useful measure of investment performance will be developed.

The questionnaire will be made available for fund managers to use on the basis that anonymous data on future-proofing performance will be supplied back to the project team along with a reference number linked to IPD (where properties are included within the IPD Portfolio). This will enable refinement of the tool and the generation of data for the further development of the Sustainable Property Index. Over time, cross-examination of future-proofing characteristics against investment performance will provide valuable information for decision-making.

The second function of the Future-Proofing Property Questionnaire is its role within the Sustainable Property Appraisal Tool. It is on the basis of the numerical scores generated by the questionnaire that the appraisal tool makes small changes to the variables within the calculation of worth, enabling the appraisal to explicitly reflect sustainability. The next section of this report sets out this process and the methodology whereby this research has attempted for the first time to make an explicit and quantifiable link between sustainability and commercial property investment worth.

5 Linking Sustainability to Property Worth

The sustainability criteria are anticipated as impacting on property worth through five main avenues:

- rental growth,
- depreciation,
- cashflow,
- duration to let; and
- duration to sale.

Within the investment appraisal process these factors will impact on the cashflow or discount rate variables.

5.1 Rental growth

The parameters developed for rental growth assume a direct relationship between rent and occupier costs; any increase in occupier costs will reduce the amount available for rent. Whilst this is a simplification of the bidding process and the characteristics that determine rent, it is essentially true. Market factors dictate the rental level, but business productivity ultimately dictates the occupier's ability to pay. Basing the rental growth parameters on this premise suggests the impact will be anywhere between a maximum of £1 and minimum of £0 reduction in rental growth for each £1 increase in costs. Transforming a change in occupier costs into a percentage of current rental value enables an adjustment to be made to the rental growth figure (see Example 1 below).

This example assumes the impact on rental growth is 100% of the increase in cost. However this may not be the case. Whilst occupier costs are likely to impact on rent, the true effect is likely to be less than this given that costs in addition to rent and rates are held as less significant by occupiers (Gibson, 2001). This can be reflected within the model by scaling down the impact on rental growth through a multiplier.

Using Example 1 below, if the impact was estimated as being closer to 25% of the increase in cost, the resultant impact on rental growth would be more like .06% or a 6 basis points reduction.

Whatever view is taken, the potential impact on rental growth is a prediction and subject to the inaccuracies of any prediction. It is also therefore likely to differ from investor to investor. The model developed here enables the user of the Tool to set the parameter at whatever level of impact they consider most appropriate.

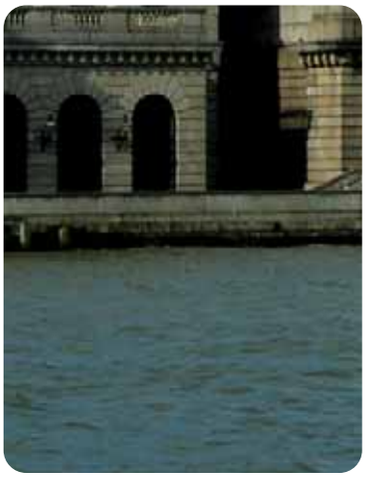
5.2 Depreciation

Rental depreciation is commonly used by appraisers to reflect refurbishment costs. It has therefore been selected as the most appropriate conduit for reflecting any increase in refurbishment costs attributable to retro-fitting to a standard compliant with stronger sustainability principles. The parameters set for adjusting the depreciation allowance are based on the increased cost attached to refurbishing to such standards.

Depreciation is controlled through capital expenditure on refurbishment and upgrade. Research by IPD and Reading University (Baume et al. 2004) has identified the level of annual capital expenditure on a range of property types, as a proportion of capital value. It can be argued that an appraisal of a property that scores poorly in terms of sustainability under criteria that can be addressed through refitting, for example climate control and waste management, should reflect this by depreciating the rent at a rate that allows for the additional capital cost required to bring the property up to a higher sustainability standard. To do this requires some understanding of the additional cost (if any) this would require.

Example 1

Current Rent:	£300 m^2
Current Cost (energy for example):	£15/m^2 or 5% rent
Predicted increase:	50%
New cost:	£22.50/m^2 or 7.5% rent
Potential rental growth reduction:	2.5% amortized over 10 years, say .247% per annum.



Research on refurbishment costs suggests that refurbishing to sustainability standards can generate a cost uplift of between 3% and 10%, (Davis Langdon and Everest and Mott Green Wall, 2003) although it must be noted that research in this area is scant. Recent research on cost increases to achieve a higher BREEAM rating in a new-build (as opposed to retro-fitting) suggest a cost uplift of 7% to raise a typically located air conditioned office building from a pass to an excellent rating (BRE/Cyrill Sweet, 2005). The cost impact on a naturally ventilated office building is less at 3.4%, again in a typical location. The most up-to-date research therefore gives some indication of the extra cost incurred for achieving higher sustainability standards for new-build, but not retro-fitting, which tends to cost more. The figures provide a useful baseline, to which some uplift must be added to allow for the extra cost of retro-fitting. Working them through into depreciation requires translating the uplift into an increase in the annual capital expenditure estimate, which can then be annualised as a percentage of the rent. (See Example 2 below).

5.3 Cashflow

In some instances a sustainability factor may impact directly through the cashflow. This will normally be due to a requirement for a one off or series of cash payments to insure against or mitigate a potential risk. Where this is the case, assuming the cost can be accurately estimated, a figure can simply be deducted from the cashflow at the appropriate point.

5.4 Duration to sale

As awareness of sustainability factors rises within the property investment and occupier communities, properties that perform poorly under specific sustainability criteria may take longer to sell than better performing assets within their class. Recent research has identified the median transaction period for commercial investment property to be 190 days or approximately 6 months, although it is emphasised that there are significant variations to this figure (Investment Property Forum, 2004). This research identified property-specific factors capable of delaying the sale of an asset but that are solvable over time, giving examples such as title problems or disputes with tenants. This type of problem would lead to the price achievable in the market being "significantly below the perception of market value with the problem solved" (ibid:7) which would delay any transaction, thus extending the duration to sale until either market value catches up with perceived value or the problem has been resolved.

Poor performance under sustainability criteria would clearly fit into this category of 'solvable problem'. The financial impact would be a function of the cost of resolving the problem (i.e. improving performance under the sustainability criteria) and the opportunity cost of the return foregone for the period of the extended duration to sale. The latter would depend on whether the motivation for sale was:

a) pressure to generate cash in which case an alternative asset may have had to be sold, or
b) because the asset does not conform to target portfolio holdings in which case the targeted improvement in portfolio performance would be foregone for a limited period. (ibid:25)

Example 2

According to recent IPD/Reading research (Baum et al 2004), offices in the south east of England incur rental depreciation of 0.7% p.a. and capital expenditure at a rate of 0.7% of capital value per annum. To refurbish to sustainability standards required to achieve an excellent BREEAM rating, the 0.7% capital expenditure will increase by anything between 3% and 7% for a new building. Allowing an increase to reflect the extra cost of retro-fitting, the uplift could be conservatively estimated at between 4% and 10% depending on the property type.

Focusing on the period up to final price agreement, the period most likely to be extended in these cases, the IPF research again found wide variation in the data but approximately 60% of their sample took up to 100 days (approximately 3 months) to achieve final price agreement. This gives a base line from which any extension to the sale period could be calculated.

The potential for the transaction period to be extended as a result of a low sustainability rating should logically be reflected in the risk premium for the property. It is a specific risk and will reduce the present value of the capital sum eventually received by an amount equivalent to the appropriate discount rate and time period of the delay. However, making an estimate of the possible extension of duration to sale that might be attributable to sustainability factors would be extremely difficult, particularly once market conditions are taken into account. For this reason the methodology is set out here as something that requires further investigation and analysis. It is not adopted within the model.

5.5 Duration to let

As sustainability issues become more high profile, property with a low sustainability rating is likely to become more difficult to let. This will increase the void period at lease end. Where a standard approach may be to allow a 6-month void at lease end, limited sustainability may increase this either by forcing early refurbishment or by reducing the market for the property.

The issue is made more complex by the wide variation in terms and conditions negotiated on taking a lease. For example agents within the City office market may be offering rent free periods of up to 12 months in a slow market, reducing to perhaps 3 months in a more buoyant one.

However, it could be argued that, whatever the market, a low sustainability rating will increase the void period at the end of the lease, beyond what the market is currently suggesting. If the current void is 12 months, a property with a low sustainability rating might be expected to take 15 months to let by comparison to others in the market. It is difficult to know whether this is the case until market awareness of sustainability factors increases and it is not possible to calculate the potential impact on property worth, as yet. Consequently this variable is set out here in a similar way to ‘duration to sale’; it is likely that sustainability characteristics will impact on property worth through duration to let, but further research is necessary for a clear methodology for modelling that impact to emerge.

5.6 Summary

These are the five conduits through which sustainability is identified as potentially impacting on property worth. However, the difficulties set out above with regard to duration to sale and duration to let have led to attention being focused on depreciation, rental growth and cashflow as the main conduits for impact. The Sustainable Property Appraisal Tool uses these three variables to estimate the impact of sustainability characteristics on property worth.

The discussion that follows explores each sustainability criterion individually, identifying appropriate, quantifiable links through to property worth. These are then translated into figures, which have been incorporated within the Sustainable Property Appraisal Tool as a first attempt to quantify the impact of sustainability on property worth.

6 The Sustainability Appraisal Tool Parameters – estimating the impact on property worth variables

6.1 Energy efficiency

Being concerned with future income and outgoings rather than past matters, this work focuses on operational energy efficiency and not embodied[3] energy. Operational energy efficiency impacts on the running costs of a property and therefore, potentially, on occupier demand. Indeed substantial research has been carried out in the USA to establish the financial benefits of low energy property (see for example USGBC 2003, The David and Lucille Packard Foundation, 2002b).

However, the UK property market operates significantly differently from most others in that:

a) the income accruing to the property investor (owner) is not directly affected by the property's running costs[4]; and
b) rental levels and energy costs tend to be such that the latter form a very small proportion of total property costs, reducing the tenant's incentive to reduce energy consumption[5].

Thus the business case for energy efficient property has so far been extremely hard to make in the UK and incentives for investing in energy efficient management systems and plant and machinery scant. Recent work by the Association of Energy Conservation supports this view (Association for the Conservation of Energy, 2004).

Where there has been investment in energy efficiency it has largely been voluntary and as part of a range of measures seeking to achieve corporate social responsibility objectives rather than direct financial ones. As such the development of properties to energy efficient specification has been largely confined to the owner-occupier sector (Laing, 2003).

However this low energy-cost environment is changing. Oil prices have risen some 30% since the beginning of 2004. Gas prices are also rising and the trend appears unlikely to change. Whilst the oil price rise is due more to market uncertainty than shortages of supply, this currently shows little sign of abating and will exacerbate the impact of the 2/3 increase in demand for oil predicted between now and 2030 (Deloitte Research, 2004).

Such an increase in demand prompts an examination of the supply infrastructure, both locally and internationally. There is already evidence of the local supply infrastructure in parts of London being stretched to capacity and little in the way of strategy to increase capacity (Coull, 2004). In terms of the international supply infrastructure, research implies current uncertainty over supply may well continue and worsen over the next 30–40 years (Deloitte Research, 2004).

The cost reductions achieved through deregulation of the energy supply markets are likely to shift to cost increases as the economic reality of the supply/demand equation takes effect. The impact will be exacerbated if the markets continue to reflect an unstable political-economic context for the energy supply industry.

As energy prices rise and awareness of the contribution of property to CO2 emissions grows, it is anticipated that the operational energy efficiency of a property will be increasingly significant to occupiers and, ultimately, investor demand. This may put pressure on owners to upgrade and retro-fit less energy efficient property to maintain demand. Changes to Building Regulations and the anticipated introduction of the EU Directive on Energy Efficiency in Buildings (Commission of the European Communities, 2002, ENDS 2004) are both leading the property market towards more energy efficient standards. Over time, the investment performance of less efficient property is expected to worsen unless and until it is upgraded.

6.1.1 Estimating an impact on worth

As an established element of occupier costs energy efficiency is reflected within the Sustainability Property Appraisal Tool through rental growth. This requires the basic assumption that an additional £x spent on outgoings will translate into £x less available for rent. Taking this assumption as a starting point it is then a simple exercise to calculate the potential change in ability to pay rent that would flow from an increase in energy costs. (See Example 3 overleaf).

Table 1 overleaf summarises estimated energy costs. It has to be treated with some caution given the variability in rental levels and limited data available on energy usage. Operational demand for energy will be higher per square metre within some sectors. For example retailing, and in particular food retail, has substantially higher operational energy estimates per square metre than other sectors.

[3] Embodied energy is that used in the construction of the property. i.e. materials, transportation of materials and construction processes etc...

[4] It is accepted that prospective tenants are wary of high service charges and other outgoings, but the impact on the investor flows through the tenants willingness to pay rent rather than directly as would be the case were outgoings netted off the rental income. This inevitably reduces the impact on rental income and thus the investor's concern with the operational efficiency of the property.

[5] Research by the Energy Efficiency Best Practice Programme identifies savings of £6.50/m² as achievable by improving air-conditioned premium space from typical energy use to good practice (Action Energy, 2003).

Statistics published by Movement for Innovation benchmark operational energy consumption for the worst performing retail property at 320kgCO2/m^2 (850 kgCO2/m^2 for food retail) as opposed to 250 kgCO2/m^2 for offices (M4I, 2000).

6.1.2 Significance across property type

As the biggest user of energy within the users analysed here, the retail sector is clearly most sensitive to price change. However, it is important to note that the high variability in rental levels clouds the issue. Whereas an average figure of 8% is supported by evidence from a retail portfolio of 62 stores, this average hides a variation from <1% to 12% in different store types within that one portfolio. Nonetheless, a substantial increase in energy costs will affect all property types. Example 3 uses an office building to set out how rising energy costs are expected to affect rental growth. (See Example 3).

The issue of energy efficiency is fast moving. Better and more plentiful energy data will become available on individual buildings as the requirement for energy certification takes effect. This will eventually generate data on a property by property basis and the Sustainable Property Appraisal Tool has been designed to incorporate this. Forecasts of energy prices will change and investors using the Tool will make their own decisions based on the available data and their estimate of how significantly that is likely to impact on rental negotiations. The Tool is designed to enable users to reflect these decisions and estimates within the parameterization process.

In essence, however, the more energy efficient the building, the smaller the impact any increase in energy costs on rental growth will be, and vice versa. Property that is efficient in terms of operational energy use is clearly a lower risk for both investor and occupier, particularly where the energy requirements of the occupier are high.

Example 3

- Prime office building with air-conditioning
- Energy costs per square metre: £16.50 (assumed)
- Current estimated market rent per square metre: £350.00
- Energy costs as proportion of rent: 4.7%

Assuming a 100% increase in energy costs over the next 5 years energy costs will increase by a further 4.7% of current market rent.

Increased cost amortised over 10 years: 0.46% per annum.

Based on a 1:1 ratio between rental growth and energy costs, rental growth would be reduced by 0.46% per annum.

Assuming a less significant relationship, the reduction in rental growth could be reduced by say 50% to 0.23% per annum.

Property type	Typical energy use kwh/m^2 p.a.	Energy costs/m^2
Office A/C prime	580	£16.50
Office A/C standard	400	£11.50
Office – naturally ventilated, open plan	230	£6.50
Office – naturally ventilated cellular	210	£5.00
Industrial <5000m^2 (heating only)	96	£2.88 (electricity)
	-	£1.30 (gas)
	-	£1.92 (oil)
Industrial>5000m^2 (heating only)	92	£2.76 (electricity)
	-	£1.24 (gas)
	-	£1.84 (oil)
Retail (non food)	-	8% [6]

Table 1: Estimated Energy Costs (Source: Action Energy 2003, DTI, 2004, JLL Office OSCAR, 2004)

[6] *Based on observation of one corporate portfolio of 60 outlets of varying sizes. Figures for individual units vary significantly. Energy use data for retail property is scant.*

6.1.3 Additional drivers for energy efficiency

Having addressed energy efficiency as a basic cost issue it is also important to explore it from the corporate responsibility (CR) perspective. The trend for CR reporting is making business energy consumption more high profile, it is one of the items regularly reported and for which targets can be set (see for example Boots, Prudential, USS Environmental Accounts). This implies that property consuming a higher than average level of energy in use will begin to fail to support the owner's and/or occupier's CR policies, particularly as new building regulations enforce greater energy efficiency in new and substantially refurbished property. Property developed or refurbished post enforcement of the 2003 Building Regulations is likely to be more energy efficient than that built in preceding years. Likewise property developed and substantially refurbished post the 2006 building regulations should again raise the standard in this area if policy objectives are to be achieved. The future introduction of energy labelling of commercial buildings will further heighten occupier and investor awareness and data.

6.2 Climate control

Air-conditioning has a substantial impact in terms of energy use and thus carbon emissions. However, property that is not air-conditioned is likely to accommodate fewer people and may provide a poorer working environment than property with an effective climate control system, particularly in town-centre or city-centre locations. Property without air-conditioning may perform better under the environmental heading within the triple bottom line, but may perform poorly under the social heading and begin to depreciate more rapidly as tenant requirements change, under-performing economically. From the property investor and occupier perspective this renders it less sustainable over-all. Such properties are likely to require air-conditioning to be retro-fitted in the short- to medium-term in order to maintain occupier demand and investor return.

It is important, however, to differentiate between different types of air-conditioning system. Older systems may be less effective and will be likely to have a negative impact on operational energy performance of a property. More modern systems may be more energy efficient and conform to current best practice standards but not allow sufficient flexibility for using more energy efficient systems or alternative technology as conditions allow.

Some property is fitted with both air-conditioning and mechanical ventilation or passive cooling to enable the optimum solution to be selected depending on climate. Some are designed to incorporate more energy efficient systems should the owner/occupier want to install them. To perform well in terms of sustainability, the climate control system should be modern and appropriate for the property type, user and location. In some instances this will lead to a property with air-conditioning having a higher sustainability rating for climate control than one with only natural ventilation. Whilst this seems counter-intuitive to sustainability principles, it reflects the three elements of the triple bottom line and the economic imperative that ultimately drives the property market.

6.2.1 Significance across property type

Whilst climate control is a requirement in some property types and locations, in others it is unnecessary. The Sustainable Property Appraisal Tool will adjust for the most appropriate climate control system according to property type and location. For example a city centre prime office building has a clear need for climate control, likewise a similarly located shopping centre. If this function is performed by a modern mechanical ventilation system and the building has been designed to allow for passive cooling when possible, this is likely to be the optimum solution in the current market. An out of town property is likely to have less need for climate control and an air-conditioning system will add to the operational energy usage unnecessarily, potentially negatively affecting occupier demand over time and speeding up the requirement to refit to a more energy efficient specification.

6.2.2 Estimating an impact on worth

The increased likelihood of retro-fitting being required where a property under-performs in terms of climate control suggests the depreciation rate should be increased if it is to be reflected within an appraisal of worth. The extent of the increase in depreciation

is based on the increased cost incurred, over and above that normally accounted for.

6.3 Pollutants

The majority of commercial property enjoys a relatively low risk of creating a pollution incident. Industrial property is clearly most at risk particularly that occupied by chemicals, metals or waste management businesses. However, environmental regulation affects all businesses and an investor needs to be aware of the implications of any risk of a pollution incident.

The risk attached to owning a property that pollutes the environment has increased in recent years in two respects:

a) The Environment Act 1995 establishes that in pollution cases where the polluter can not be found or can not pay, responsibility can fall to a "Class B" person. In the case of industrial premises, for example, this could easily be the landlord who would find themselves bearing the costs of clean-up and potential prosecution (Jayne and Skerrat, 2003);

b) the fines related to pollution are increasing. Whilst the low level of fines is a common criticism of current pollution prevention policy, the level of the fine is normally dictated by the seriousness of the incident and can in fact be substantial. In 2003 companies were ordered to pay fines of £73,000, £98,000, £100,000 and £250,000 for a range of pollution incidents (ENDS, 2004).

Liability for a pollution incident rests on, amongst other things, being deemed to have 'knowingly permitted' the incident. The first court decision under current contaminated land legislation[7], suggests the courts are giving the term 'knowingly permit' a broad meaning. To be considered to have 'knowingly permitted' contamination of land one must:

- have knowledge of the presence of the contaminants;
- power to prevent them from being there; and
- the ability and reasonable opportunity to prevent their presence or remove them (Cameron Mackenna, 2004, Circular 02/2000).

All of the above could reasonably apply to property investors rendering them potentially liable for an incident, suggesting the potential for liability has increased. A property's propensity to host a pollution incident should thus be reflected in a calculation of its worth. The most effective way of doing this is through an assessment of clean-up costs or the cost of risk-transfer i.e. environmental insurance.

6.3.1 Estimating an impact on worth

The increased risk attached to pollution and contamination combined with stronger legislation and environmental regulation has encouraged the development of an effective market in environmental insurance. The level of insurance premiums on such policies provides a useful means of quantifying the impact of pollution risk on property worth. It is difficult to give average figures for such premiums, each property being assessed and underwritten on its own merits. However, the data in Table 2 (below) give some indication of the level of premium that might be expected for a site specific 10 year Pollution Legal Liability policy, to cover liabilities arising from new or unknown historic conditions both on and off-site. (See Figure below).

It must be reiterated that these figures are indicative only[8]. Each property would be assessed separately and in certain instances specific conditions will be excluded from cover. However, the data enables an estimate to be made of the additional outgoings necessary to reduce the risks attached to holding property that performs poorly under the pollution criteria, by insuring against it. The different levels of pollution risk attributable to different properties are reflected through the selection of the most appropriate level of insurance cover, which is then reflected through the premium. Reducing the cashflow by the amount of the premium over the life of the cover effectively reflects the impact of

7 Sevenoaks District Council v Circular Facilities, Sevenoaks Magistrates Court, June 2004.

8 With thanks to Kevin Luckett at Ascent Insurance Brokers for his assistance in gathering the information in this table.

Risk category of property	Limit of Liability	Deductable	Premium
Medium	£1m	£25,000	£50,000–£60,000
Medium	£5m	£25,000	£100,000
Medium	£10m	£25,000	£130,000–£150,000
High	£10m	£50,000–£100,000	£200,000–£250,000

Table 2: Estimated Environmental Insurance Premiums

pollution risk within the investment appraisal process. The decision to purchase the insurance then lies with the investor.

6.3.2 Significance of pollutants across property type

Where a site has been developed on contaminated land, potential liability for future pollution problems and clean-up costs is likely to impact on the sale of the property particularly where development potential is contributing to value. However, these risks are now increasingly well understood and in most cases this could now be mitigated through insurance, the cost of insurance thus equating to the quantifiable impact on worth. This would hold true for all property types but insurance may be more expensive for property perceived to be a higher risk, for example industrial sites might be expected to be more expensive to insure than retail or office property.

For both retail and office property the main pollution risks on large sites are likely to come from underground fuel storage tanks. If a property has these, the risk of pollution is likely to be higher and environmental insurance may be required. Otherwise the main risk of pollution will be through leaks from air-conditioning systems. The quality and effectiveness of the air conditioning system is addressed specifically through the climate control criteria, so does not need to be accounted for again here and can be disregarded for appraisal purposes at this point.

6.4 Adaptability

Adaptability reflects the potential for a property to adapt to fulfill the changing requirements of the existing user, a new user or a different type of user. This will in turn reflect the physical constraints of the property, i.e. floor plate, construction type, m&e services, user requirements.

The Sustainable Property Appraisal Tool reflects two types of adaptability:

a) adaptability within use – the extent to which a property can support the needs of the existing occupier group or type without requiring major or frequent refurbishment and upgrading;

b) adaptability across use – the ease with which a property can be adapted to support the requirements of a new use type, for example a switch from commercial to leisure or residential.

Occupier requirements change relatively frequently. Retail occupiers change store layouts, manufacturers introduce new technology and production systems, office occupiers change working styles and practices and all businesses incur fluctuations in staff numbers.

Owners of property that can not easily and effectively accommodate change will have two options:

a) to refit the property so that it can, or

b) to accept a constrained letting potential and thus higher risk of voids, relatively rapid depreciation of the asset and thus reduced investment return.

The impact of changing occupier requirements is likely to be exacerbated by:

- shorter leases leading to earlier renegotiations or marketing of the property, and
- higher levels of density achieved by new working practices becoming more widespread.

6.4.1 Significance of adaptability across property type

The Sustainable Property Appraisal Tool only reflects adaptability within use in the assessment and appraisal of offices. The retail sector is characterised by frequent, regular refits of shop interiors, to support a relatively stable operational activity. The basic functional requirements of retail units remain relatively unchanging. The exception to this could be the development of show room stores, particularly for large goods and kitchens for example, where nothing is actually taken from the store itself, purchases being delivered from a warehouse. This changes the functional requirements of the store and, to some extent the activity of the shopper, but not to the extent that the physical arrangement of the property will have to change significantly.

The relatively low unit cost of manufacturing space, along with low worker/space ratios makes adaptability of space less of a business driver. Whilst space should be able to accommodate changing business

requirements lower internal specifications and relatively simple building design should support this.

The office sector is the most significantly affected by changing occupier requirements. This sector incurs high costs for high spec. space that can be expensive and complicated to retro-fit. Research suggests that this sector is experiencing relatively rapid changes in user requirements as working practice innovations are adopted in a bid to make space more cost effective (Warren, 2003, Vaan der Voordt 2004).

The trend appears to be towards higher densities in use of office space being achieved through greater use of flexible working techniques supported by technology. Bon et al's 2003 survey of corporate real estate practices identifies the incidence of teleworking policies as increasing from 19% of respondents in 1993 to 80% in 2002. Desk sharing policies have also increased over this period, although incidence remains lower, 46% of organisations in the survey have a desk sharing policy.

Space that is not easily able to support the variation in working practices now being adopted will be subject to costly refits in order to counteract functional obsolescence and maintain occupier demand. Conversely property that is adaptable will suffer less functional obsolescence, avoid the refit costs, maintain better occupier demand and thus demonstrate better sustainability.

This presents two ways of analysing the impact of adaptability on worth:

a) through the impact on rental growth as more functional space can accommodate better densities;
b) through the extra burden of refits necessary to maintain occupier demand in less adaptable property.

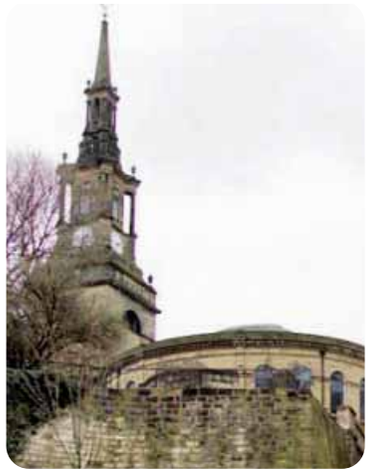
Research has found the majority of UK respondents occupying at 10–13 m^2/employee (Warren, 2003). BCO currently suggest 14m^2/person in their office fit-out guide (BCO, 2000). The highest densities were reported on business parks from which the research inferred higher efficiencies are being achieved in the more modern space available at these sites. The new work styles were found to be enabling density to be increased by as much as 12% in the UK.

The financial benefits accruing from such efficiencies will obviously increase with the level of rent and need to be offset against the costs of accommodating this type of change. Research by Vaan der Voordt, (2004) found that at rental levels of £110/m^2 (approximately £70/m^2) a 24% reduction in space requirements was necessary to offset the cost of adapting space. However, this drops to 9% at a rental of £330/m^2 (approximately £210/m^2). Office occupiers paying upwards of £200/m^2 for accommodation and seeking to expand may find new office organisation to be a more cost-effective solution. Space that does not enable them to do this, or makes it prohibitively expensive will begin to represent poor value for money when compared with a more adaptable alternative. If occupiers can achieve 12% higher occupancy levels by adapting their space, property that cannot accommodate this effectively becomes 12% more expensive than the most efficient space, and rental levels for such space can be expected to adjust accordingly.

The occupiers most likely to be aware of and affected by these changes are those with mobile, technology proficient personnel. Warren's work identified sales teams as achieving the highest occupancy densities, which complies with this analysis. He also identified private sector business and services and communications sectors as achieving higher densities than the industrial and public sector occupiers. This suggests the expanding sectors of the UK economy are those most likely to be able to take advantage of the space efficiencies reaped by new working practices and office organisation. Office property that cannot fulfil these requirements will require earlier refurbishment and refitting than perhaps initially anticipated. Where shorter lease structures are in place the impact on cash flow could be significant in the short- to medium-term.

6.4.2 Estimating an impact on worth

The upwards-only rent review inevitably protects the investor from mid-term negative fluctuations in rent. However, with average lease lengths currently standing at approximately 11 years for offices, the effect of the changes outlined above are already pertinent to investment returns. Office accommodation letting at more than £200/m^2 will be expected to be adaptable within the next 10–15 years. Any that is not will suffer reduced



rental levels or require refurbishment if it is to continue to compete at that level.

The parameters for adaptability within the Sustainable Property Appraisal Tool are based on this estimate of 12% efficiency gains and impact on any property let at more than £200/m^2. The Sustainable Property Appraisal Tool is currently set to reflect a maximum change in rental growth of +/-6%, giving 12% across the full range of performance. The rent at which the property lets will not fall in nominal terms but some change is anticipated in the rate at which this rent grows. If the property scores particularly well for adaptability its rental growth prospects may be better than for the standard within its class.

This percentage adjustment is then amortised over 10 years to give a maximum figure to apply to the non-adjusted, market rental growth figure. A multiplier is again applied to reflect the fact that adaptability of space is less significant in terms of occupier requirements than locational and cost issues. The impact on rental growth is again unlikely to be £1:£1 so the figure is reduced to reflect this, the deduction from rental growth being subject to a multiplier of less than 1. It is possible for individual investors to adjust this multiplier according to their own assessment of the potential impact of the criteria on rental growth.

6.5 Waste management

Increasing regulatory pressure affecting waste management is making waste a significant issue for many businesses. Landfill Tax on active waste is currently £18 per tonne and will rise by at least £3 per annum until it reaches a 'medium-to-long-term rate of £35 per tonne' (HM Treasury, 2004). For many businesses this is a significant business cost and has driven a move to recycling where possible.

6.5.1 Significance across property type

The prohibition of co-disposal of hazardous and non-hazardous waste since August 2004 has also raised awareness of waste management as an issue. Waste must now be sorted before it leaves a facility, raising waste management costs and increasing the space required for waste management and storage. This is likely to be more significant for industrial and manufacturing property than office and retail, but might be expected to impact on rental growth in the long term.

The anticipated introduction of the EU Waste, Electrical and Electronic Directive may impact rapidly on retailers' requirement for storage facilities, as they become responsible for the end-of-life safe disposal of electrical and electronic products (King Sturge, 2004). Property that fails to support businesses in waste management through insufficient and/or inaccessible waste storage, minimisation and management facilities will become less attractive to some occupiers over time.

In functional terms, property needs to be capable of supporting the occupier's waste management policy. This will normally require appropriate and accessible waste storage and management facilities, and a centralised recycling service (either privately or municipally run). From the investor perspective the extent to which the occupier makes use of such facilities is irrelevant (other than perhaps in CR terms). Sustainability of the property is thus assessed on the basis of the existence of these facilities. Property that performs poorly in this area will, over time, become less attractive to occupiers, particularly as waste management costs increase. This will have the effect of increasing the depreciation rate of such property, compared with similar but better served property within its class. Remedying the situation may require the allocation of space for recycling storage potentially reducing the net 'lettable' area of the building and requiring capital expenditure.

6.5.2 Estimating an impact on worth

The extent to which depreciation will change can only be estimated through the importance of waste management to the occupier group. Waste management is a more significant issue for retailers, particularly in shopping centres than for most office occupiers, for example, and this is reflected within the parameters of the Sustainable Property Appraisal Tool. More data is needed on the significance and financial implications of waste management in order for the issue to be reflected with greater accuracy within the appraisal. It is anticipated that increased waste regulation and taxation will focus further attention in this area.

6.6 Water management

The relatively low unit cost of water in the UK, particularly in relation to other property costs, renders water management a low priority for the majority of office occupiers when reviewing occupancy costs. Recent figures for air-conditioned offices in the City of London and West End estimate water costs as 10p per square foot per annum (Jones Lang LaSalle, 2004). Corporate Responsibility (CR) policies are consequently a much more significant driver for water management facilities than cost at the present time within the UK. This is manifesting itself through increasing interest in equipment designed to reduce consumption, such as spray taps, and the use of grey water and harvested rainwater, particularly for maintenance of landscaped areas.

6.6.1 Significance across property type

Being driven by CR policies makes water management important for occupiers who publish CR reports and use their CR credentials within their marketing strategies. The types of property most likely to require water management systems are consequently those likely to be owned or occupied by these types of organisation: prime office buildings and major retail centres for example. Standard office buildings and smaller retail centres are still likely to be affected but less acutely.

6.6.2 Estimating an impact on worth

Prime property without water resource management facilities, particularly that designed for major corporate occupiers, will require upgrading in order to maintain maximum occupier demand, most likely at the next point of refurbishment. This will increase the cost of refurbishment and is most effectively reflected up until the point of refurbishment, within the depreciation rate. Where property under-performs in comparison to others within its class the depreciation rate should therefore be increased by an amount reflecting the extra cost incurred in installing water management equipment. These costs can be kept minimal, particularly where dual, low volume flush toilets and spray taps are installed at refit. Installation of greywater and rainwater recycling systems comes at greater cost but would not be appropriate for all property.

6.7 Accessibility[9]

Accessibility is fundamental to both property value and worth. It is currently reflected in standard valuation and appraisal processes. However, the extent to which the accessibility of a property might be impacted by policy directed at changing transport patterns is not currently explicitly reflected in the standard property appraisal process. The Sustainable Property Appraisal Tool addresses this by making an assessment of the impact reduced accessibility might have for a property.

Transport is increasingly subject to Government policy, regulation, subsidy and incentive. Both The Transport Act, 2000 and PPG 13 seek more sustainable solutions to commuting as a means of mitigating the environmental consequences of increased car travel. The Energy White Paper (DTI, 2004) identifies “better vehicles and lower carbon fuels” (p12) as key to the reduction of carbon emissions over time.

Existing measures have yet to bring about much change in commuter behaviour. Across the UK, 71.2% of commuters travel to work by private vehicle. In London the figure is substantially lower at 40.5% but this is still high given the mass transport alternatives of a substantial underground and bus network (ONS, 2002). The requirement for occupiers to develop Green Travel Plans, particularly where expansion is planned, has been identified as having some success in reducing car use, (BCO, 2004). However, the costs to business associated with achieving this are extremely variable and the effect on productivity is as yet unmeasured.

This administrative and economic context makes it imperative that the accessibility characteristics of a property are considered carefully. The triple bottom line approach to sustainability adopted throughout this work requires the acceptance that whilst car-based travel may be environmentally damaging, it is an important form of access in both social and economic terms for a large proportion of the existing property stock. It is clear that, whilst it may be desirable in environmental terms for property to be accessed by foot or public transport by its users, this is not possible for the majority of existing real estate in the UK. Furthermore, in terms of business efficiency, restricting access to these transport

[9] *Accessibility here refers to the ease with which a property can be reached, as opposed to ingress, egress and circulation which is the subject of the Disability Discrimination Act.*

modes may undermine productivity and compromise employee recruitment and retention.

Fiscal and regulatory policies focused on transport, along with real increases in fuel costs make it crucial to environmental, social and economic performance that property is accessible via a range of transport forms. Ideally this should include public transport, local pedestrian access, private transport and adequate parking provision where mass public transport is not available. Any property accessible only or predominantly by car/road will be increasingly vulnerable to regulatory change and rising fuel costs, which are likely to impact business productivity and therefore occupier demand.

6.7.1 Impact across property type

For office property, proximity to good national and local rail networks can substantially improve accessibility and reduce the risk attached to uncertainty with regards transport policy and energy prices. Research into commuting identifies longer public transport journeys, particularly train journeys, as less stressful for commuters than long car journeys and more popular (Junnila, 2004, McLennan and Bennet, 2003). Legal and General Property's research into accessibility placed similar importance on the availability of strong rail links (Legal and General Property, 2004).

Whilst many retail centres provide important local facilities, many are also linked to and supported by a regional catchment area. This makes adequate parking provision and car accessibility for shoppers fundamental. Two points can be drawn from this. The first is that real increases in fuel costs may impact on consumer travel patterns as they search for economies; retail property located close to other compatible functions may be less vulnerable to falling trade. The second point is the importance of the availability of at least one mass public transport node for the continued success (economic sustainability) of retail centres.

6.7.2 Estimating an impact on worth

Four measures of the impact of accessibility on business profitability have been identified:
- employee productivity,
- employee recruitment,
- employee retention,
- customers visits.

It is likely that employee productivity is impacted by accessibility. However, so far, research has failed to produce a robust means of measuring changes in employee productivity. Until this is developed the potentially major impacts on productivity made by different working environments can not be quantified and will not be reflected in property appraisals.

Employee recruitment does have measurable attributable costs. A property characteristic, for example ease or difficulty of access, that causes an occupier's recruitment or retention figures to move away from the average for the organisation (either up or down) therefore has a quantifiable cost attached to it. However, this is only effective for office premises. Retail and industrial property has a much lower worker/space ratio and would be more affected by accessibility for customers and deliveries respectively.

Offices

The costs associated with employee recruitment (and therefore saved through employee retention) can be costed. They manifest themselves through tangible expenses in the form of management time, administration and training, for example. According to the Chartered Institute of Personnel Development 2004, the average cost of recruiting managers and professionals is £7,000 including an amount attributable to loss of turn-over.

Research by Opportunity Now in a quite detailed breakdown of administrative and management costs, estimate the replacement cost of a junior manager earning £25,000 p.a. to be £21,930 (Opportunity Now, 2001). These estimates provide an initial foundation from which the impact of limited or compromised accessibility might be assessed through increased staff recruitment costs.

Average staff turnover in the UK was 16% in 2003, stable since 2002 (CIPD, 2004). Recruitment and retention are significant issues for all businesses. Taking a mid point between the two estimates of recruitment cost, £14,465, and an average staff turnover of 16%, for each employee a business might spend £2,314.40 on recruitment. Assuming

a density of 14m²/person (BCO 2000) this equates to £165/m² for office space. If lack of accessibility increases staff turnover from 16% to 17% recruitment costs will increase to £175/m² an increase of 9.4% or £10/m². If an occupier suffers an increase in staff turnover as a result of accessibility, this will equate to an extra cost per square meter of space that they will not be willing/able to pay in rent. Conversely, a highly accessible property may reduce the level of staff turnover, contributing to business profitability by reducing recruitment costs in similar fashion.

Retail

The most important accessibility issue for retail property is for customers. Broad averages suggest that for each shopping trip non-food spending per shopper group is £50 and food spending £80. Spend will inevitably differ considerably from centre to centre, but using these averages as a starting point it is possible to begin to estimate the impact of reduced shopper accessibility on retail property.

Focusing on non-food spending, every 1% change in number of visitors could impact turnover by 50p per shopper. A non-food based shopping centre achieving say 10 million visitors per annum with an average shopper group size of 4, might be expected to achieve non-food spending of approximately £125m per annum:

10 million people
2.5m shopper groups of 4 people x £50 non-food spending per group
£125m
If restricted accessibility reduces the number of visitors by 1%, the impact on turnover would be 50p x 2.5 million shopping groups; £1.25 million per annum.

Given an estimate of the number of visitors to a centre and its area, it is possible to estimate the impact in terms of spending, and therefore potential impact on rental growth, of a percentage change in the number of shoppers due to a change in a retail centre's accessibility.

The parameters within the tool are based on an average footfall/m²/pa of 250 persons and 4 people in each shopper group. Based on the broad averages of shopper spend outlined above, each square meter generates:

250/4 x 50 = £3,125 per annum of spending.

If the number of shoppers falls by 1% the impact would be to reduce retail spend by £31.25/m² per annum. This can be translated into a potential impact on rental growth over time (see Example 5, bottom left).

Research by the Centre for Transport Studies at Imperial College indicated a 5.52% reduction in business at John Lewis's Oxford Street store in the 6 months following the introduction of the congestion charge (Bell et al, 2004). Whilst research by Transport for London (TFL, 2004, 2005) suggests the impact is much more limited, just a 1% reduction in business is clearly significant for retailers and therefore ultimately for retail rental growth in individual centres.

For a major destination shopping centre such as Bluewater, for example, which has approximately 27 million visitors each year, the impact would be scaled up substantially. It would ultimately feed through to rental growth as occupier demand began to reflect the poorer trading conditions.

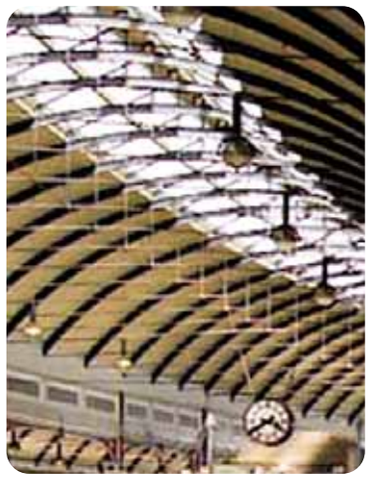
Example 5

1% reduction in shoppers = -£31.25/m²
As a proportion of an overall rent of (say) £500/m = 6.25%
Amortized over 10 years = 0.625%
Reduced by say 50% to reflect impact on rental negotiation = 0.3125%

In this example, the rental growth would be reduced by 31.25 basis points to reflect a loss of 1% in customer visits.

Manufacturing / Industrial

Manufacturing and industrial occupiers rely heavily on a labour force that must have good access to its property and the delivery and dispatch of raw materials and goods. In many instances the labour force will require public transport access and clearly good road network access is necessary. However, increasing uncertainty over fuel prices



suggests manufacturing/industrial property that is only accessible by road will subject its occupiers to increased haulage costs and either reduced labour supply or higher labour costs. Whilst it is accepted that changes to accessibility will impact on rental growth, it is not possible yet to price these for industrial and manufacturing space. It might be possible to do this through haulage costs and the impact of any anticipated increase in fuel costs.

6.8 Contextual fit

Contextual fit refers to the extent to which a property is appropriate for its surroundings and provides a successful point of interaction with the local community. There are clearly instances where the presence of a particular property enhances or degrades a location. The London Eye fits so well within its environmental context or setting that it could be described as having had a catalyst effect, triggering new and increased business activity and social activity in its neighbourhood.

In contrast, a property which does not 'fit' within its local environmental context can deter social and business activity in the area, or simply fail to generate the level of activity anticipated at development stage.

These are subtle issues that in many instances will not be relevant to a calculation of worth. However, in some instances contextual fit can have a significant impact on long-term investment worth of a property. It is not currently possible to make any realistic estimate of what this impact might be in monetary terms. Contextual fit has therefore not been developed as a parameter for the Sustainable Property Appraisal Tool.

6.9 Occupier

This criteria examines the impact the reputation of the occupier might have on property worth. A tenant with a particularly high profile, poor reputation might reduce the liquidity of the asset by reducing demand from other investors.

Conversely a tenant with notable CSR credentials could have the opposite affect. Some investors already screen out particular occupiers suggesting an existing acceptance of the impact of occupier on asset value. Once public awareness and approbation becomes focused on a particular organisation the impact on property worth could be significant. It will be felt through an increased yield on the subject property and reduced value of any adjoining property as lettings become harder to achieve. It may also increase voids if the property is stigmatised by association.

Occupiers are increasingly aware of the risks that neighbours can represent, particularly in multi-tenanted properties and schemes. Some occupiers have a clear understanding of who they do and do not want as neighbours. However, whilst understanding of this issue and the importance of occupier to risk and reputation is increasing, it is not yet possible to quantify the impact this criteria might have on property worth. No sufficiently robust link has been established between the reputation of the occupier and the investment function of property to be able to quantify it for the Sustainable Property Appraisal Tool.

7 Applying the Sustainable Property Appraisal Tool

The changes the Sustainable Property Appraisal Tool makes to the calculation of worth variables are the most complex element of this research. The rationale behind these parameters has been set out above and the figures currently incorporated are based on this and a series of consultations and pilot studies. However there are two important points to note with regards these parameters:

a) this is the first step in producing anything that so specifically links sustainability through to worth. Whilst the rationale has been carefully thought through, researched and discussed, it is presented as a starting point for further debate. Better means of linking sustainability with worth will be developed over time and we welcome such developments;
b) the parameters will change with the political-economic context and the tool must be constantly monitored and updated to remain current. The sustainability agenda itself is driven both by public and private sector policy, often in response to external stakeholder groups as well as fundamental issues such as climate change and resource depletion.

Appendix B contains a series of 8 case study properties that have been appraised using the Future-Proofing Property Questionnaire and the Sustainable Property Appraisal Tool. These include a range of different properties, including business parks, shops, shopping centres and offices. With one exception these are not properties where sustainability was a design issue. They display a range of Future-Proofing labels from Poor Performer to Good Performer and reveal over and under estimates of worth; positive sustainability characteristics are ignored alongside negative ones in the standard appraisal process at present. So far the differential in net present value generated using the Sustainable Property Appraisal Tool, has ranged from -5% to +1.85%. But it must be reiterated, the sample of properties is very small (8).

Table 3 adjacent shows the Future-Proofing Rating band for each property and the Net Present Values (NPV's) generated using a standard appraisal and a sustainability appraisal. These results highlight some interesting points. The overall Future-Proof Rating is a useful tool that can be used to divide properties into 'bands' of performance. These properties range from Poor Performers through to Good Performers, with the poorest performer in terms of Future-Proof rating generating the biggest negative difference in NPV when these characteristics are taken into account.

The variations in the ratings and NPV's highlight how important it is to look at the scores achieved under each sustainability criterion. This gives a clearer indication of where a property's vulnerabilities might lie in terms of sustainability and future investment return. For example the NPV of a retail property with a low score in energy efficiency will be more severely affected than an office or industrial property with a similar score because energy costs, which drive the change, are normally a higher proportion of retail rents. Similarly a high score in accessibility would outweigh the impact of low scores in some other categories.

The results produced by the Sustainable Property Appraisal Tool are useful as a means of analysing the implications a property's future-proof rating might have in terms of worth. The spreadsheet generates different rental growth, depreciation and risk rates depending on the data input and a property's scores under each category within the Future-Proofing Property Questionnaire. It is however, only a tool. It is intended as an aid to analysis, it does not attempt to provide a definitive answer to the risk issues raised by sustainability. As in the case of other multifarious risks and considerations affecting a property's worth, individual investors will ultimately determine these.

Pilot Property	Future-Proofing Property Rating	Standard NPV	Sustainability explicit NPV	% change
Retail 1	Poor	£81,941,626	£78,044,073	-4.99
Retail 2	Typical	£84,904,908	£81,377,074	-4.34
Retail 3	Typical	£6,578,254	£6,316,856	-4.14
Retail 4	Typical	£114,198,367	£110,767,540	-3.10
Offices 1	Typical	£73,768,044	£71,852,635	-2.67
Retail 5	Typical	£2,072,871	£2,041,604	-1.53
Offices 2	Good	£196,869,962	£197,727,958	0.43
Offices 3	Good	£11,372,296	£11,509,583	1.19
Offices 4	Good	£18,528,247	£18,876,900	1.85

Table 3: Pilot Study Results

8 Conclusion

Consultation with industry has indicated that the outputs of this research project resonate with property investors' desire for progress in understanding how sustainability might affect property worth. The tools enable analysts to interrogate the implications sustainability has for property investment performance explicitly and the use of a standardised set of criteria has been welcomed as delivering a potential robustness to the process that was not available before. This in turn presents new opportunities to analyse performance against particular sustainability criteria and to identify key areas of vulnerability within the property stock.

Over time such analysis should drive demand for property that performs better under key sustainability criteria, as these assets will be expected to perform better under standard investment criteria, impacting on worth. Increasing demand for sustainability within commercial property assets is key to raising the sustainability of the property stock as a whole. Sustainability criteria will become more commonly reflected in refurbishment and refit programmes as they become recognised as providing an additional means of ensuring long term investment return. The tool is available, on request, to the investment community for study and further feedback.

The parameters established through this project are presented as work in progress and not as a definitive answer to the link between sustainability and worth. It is key to developing a keener understanding of sustainability and better, more accurate parameters, that the industry continues to work in this area. Establishing more data and clearer quantifiable links is fundamental to developing the industry's understanding of this area of risk to potential investment return.

The research has also identified sustainability criteria that are important to the sustainable performance of property but that are as yet not possible to quantify; no clear link can be established between two of the criteria identified within the research and a property function that can be priced. However, this does not mean these criteria will not impact on worth, simply that we cannot make any estimate of what this impact might be yet. It is important the industry continues to examine these criteria with a view to developing a means of quantifying that impact and thereby reducing the unknown risks attached to investing in property.

The Future-Proofing Property Questionnaire has strong potential to move the industry forward in assessing and analysing sustainability. Whilst the questionnaire might be criticised as limited in technical scope and detail, it is strong in terms of relevance to the property investment sector and has been very favourably received by industry. The relative speed and ease with which it can deliver data on sustainability across a commercial property portfolio makes it particularly useful in addressing sustainability within the broader property stock as well as the small handful of properties that might be considered sustainable according to current thinking.

Appendices

Appendix A: The Future-Proofing Property Questionnaire (completed for a hypothetical property)

Appendix B: 8 Case Studies






Property Sector	**Retail**	
Property Type	E Single Shop Unit	
Property Grade	Prime	Total Score 24
Location Type	City Centre	Rating: Typical

Appendix A: Future-Proofing Property Questionnaire

Sustainability Assessment

1 Operational Energy Efficiency

Which of the following features does the property have:

			Subject score
• Modern building management system	[x]		
• Movement sensitive/auto-off lighting	[x]		
• Low energy lighting	[x]		4 Typical Performers
• Access to a local renewable energy source	[ ]		
• A CHP plant	[ ]		

2 Adaptability – do not tick for Retail properties

Which of the following features does the property have:

• Regular footprint	[ ]		
• Plant depth 15–18m	[ ]		
• Column grid >7.5m	[ ]		
• Floor – Ceiling height >=2.7m	[ ]		
• Raised floors	[ ]		0 N/Applicable 0
• VAV, fan coil or no air-conditioning	[ ]		
• Is this property adaptable across use	[ ]		

3 Climate Control

How is the interior climate controlled?

• A/C <5 years old	[x]	Tick one only	
• A/C 5–9 years old	[ ]		
• A/C 9+ years old	[ ]		
• Mechanical ventilation <5 years old	[ ]		
• Mechanical ventilation 5+ years old	[ ]		6 Good Performers
• Natural ventilation	[ ]		
• Capacity for alternative cooling system	[x]		

4 Water Management

Which of the following water management features does the property have?

• Low flush toilets	[ ]	Tick one only	
• Dual flush toilets	[x]		
• Controlled taps	[ ]		
• Controlled flush urinals	[ ]		
• Washroom control system	[ ]		0 Very Poor Performers
• Rainwater harvesting	[ ]		
• Greywater recycling	[ ]		

5 Waste Management

The property is serviced by:

• Accessible waste storage facilities	[ ]		
• Adequate waste storage facilities	[ ]		2 Typical Performers
• Centrally controlled recycling service	[x]		
• Municipal recycling service	[ ]		

6 Accessibility

By which of the following forms of transport can the property be accessed (no more than 1/4 mile away)

• Car	[ ]		
• Train (local terminus)	[ ]	Tick one only	
• Train (major terminus)	[x]		
• Bus	[x]		
• Underground	[x]		
• Foot	[ ]		
• Bicycle	[x]		
The property has:			
• Adequate parking	[ ]		12 Good Performers
• Bicycle racks	[x]		
• Showers	[x]		

7 Pollution – tick for Industrial property only

• Does the property present a risk in terms of pollutants?	[ ]		
If yes, please select the most appropriate level of liability for insurance cover:			
£1m	[ ]	Tick one only	
£5m	[ ]		0 - N/Applicable
£10m	[ ]		
>£10m	[ ]		

Basic Details:	
Property Sector	Office
Property Type	D Business Park
Property Grade	Prime
Location Type	Out of Town

Appendix B: Case Study 1

Date of Valuation	25–Dec–04
Tenure	Freehold
Purchase Costs	5.75%

Sale Assumptions	Standard Worth	Sustainable Worth	
Sale date	25–Dec–14		
Years to sale	10.00		
Exit yield	7.75%	7.26%	
Exit costs	1.00%		
Return			
Depreciation	1.00%	0.975%	
Risk free rate	5.00%	5.00%	
Risk premium	3.75%	3.75%	
Discount rate	8.75%	8.75%	
Growth Rates	Standard Rental Growth	Sustainable Rental Growth	Net Sustainable Rental Growth
Year 1	1.00%	1.49%	0.52%
Year 2	1.50%	2.24%	1.26%
Year 3	1.50%	2.24%	1.26%
Year 4	1.25%	1.87%	0.89%
Year 5 onwards	1.00%	1.49%	0.52%
Market Rent per m^2	£285.00		
Other Factors			
Refurbishment costs:	£0		
Building inflation	6%		
Other Costs – Fees & Management			
Rent review fees	7.00%		
Management costs	0%		
Void service charge psq ft	£0.00		
Rates per sq ft	£0.00		
Inflation on costs	3%		

Sustainability Factors	Impact Line	Office	Energy Rating
Operational Energy Use	Rental growth	A Office A/C Prime	2
If energy cost is known enter	Cost per sq m		4 Poor Performer

Property Type		D Business park Score from Questionnaire	Total Score
Adaptability	Rental growth	8	27
Climate control	Depreciation	3	3 Typical
Waste	Depreciation	2	-
Water	Depreciation	0	-
Accessibility	Rental growth	12	-
Industrial Only			
Pollution – Environmental Insurance Premiums	1 Premium <£60,000		
Pollutants	Rental growth	0	
Contextual fit	Rental growth	-	
Occupier impact	Risk premium	-	

Sustainable Criteria	Sustainable Criteria	Office	Basis Points Adjustment
Energy Use	Rental growth	2	-0.82141
Adaptability	Rental growth	8	1.13973
Pollutants	Rental growth	0	0.00000
Accessibility	Rental growth	12	0.17407
Contextual fit	Rental growth	4	0.0000
Occupier impact	Risk premium	4	0.0000
Climate control	Depreciation	3	-0.10000
Waste	Depreciation	2	0.02500
Water	Depreciation	0	0.10000

Results	Gross	Net	% Change
Standard Worth	£131,596,558	£124,441,190	-
Sustainable Worth	£135,567,399	£128,196,122	2.93

Basic Details:	
Property Sector	Office
Property Type	D Business Park
Property Grade	Prime
Location Type	Out of Town

Appendix B: Case Study 2

Date of Valuation	25–Dec–04
Tenure	Freehold
Purchase Costs	5.75%

Sale Assumptions	Standard Worth	Sustainable Worth	
Sale date	25–Dec–14		
Years to sale	10.00		
Exit yield	8.25%	8.26%	
Exit costs	1.00%		
Return			
Depreciation	1%	0.9250%	
Risk free rate	5.00%	5.00%	
Risk premium	4.25%	4.25%	
Discount rate	9.25%	9.25%	
Growth Rates	Standard Rental Growth	Sustainable Rental Growth	Net Sustainable Rental Growth
Year 1	1.00%	0.99%	0.06%
Year 2	1.50%	1.48%	0.56%
Year 3	1.50%	1.48%	0.56%
Year 4	1.25%	1.23%	0.31%
Year 5 onwards	1.00%	0.99%	0.06%
Market Rent per m^2	£150.00		
Other Factors			
Refurbishment costs:	£0		
Building inflation	6%		
Other Costs – Fees & Management			
Rent review fees	7.00%		
Management costs	0%		
Void service charge psq ft	£0.00		
Rates per sq ft	£0.00		
Inflation on costs	3%		

Sustainability Factors	Impact Line	Office	Energy Rating
Operational Energy Use	Rental growth	A Office A/C Prime	2
If energy cost is known enter	Cost per sq m		4 Poor Performer

Property Type		D Business park Score from Questionnaire	Total Score
Adaptability	Rental growth	8	31
Climate control	Depreciation	3	2 Good performer
Waste	Depreciation	4	-
Water	Depreciation	2	-
Accessibility	Rental growth	12	-
Industrial Only			
Pollution – Environmental Insurance Premiums	1 Premium <£60,000		
Pollutants	Rental growth	0	
Contextual fit	Rental growth	4	
Occupier impact	Risk premium	4	

Sustainable Criteria	Sustainable Criteria	Office	Basis Points Adjustment
Energy Use	Rental growth	2	-1.48060
Adaptability	Rental growth	8	1.13973
Pollutants	Rental growth	0	0.00000
Accessibility	Rental growth	12	0.32844
Contextual fit	Rental growth	4	0.0000
Occupier impact	Risk premium	4	0.0000
Climate control	Depreciation	3	-0.10000
Waste	Depreciation	4	0.00000
Water	Depreciation	2	0.02500

Results	Gross	Net	% Change
Standard Worth	£6,940,200	£6,562,836	-
Sustainable Worth	£6,900,032	£6,524,853	-0.58

Appendix B: Case Study 3

Basic Details:	
Property Sector	Office
Property Type	A Office City Centre
Property Grade	Prime
Location Type	City Centre

Date of Valuation	25–Dec–04
Tenure	Freehold
Purchase Costs	5.75%

Sale Assumptions	Standard Worth	Sustainable Worth	
Sale date	25–Dec–14		
Years to sale	10.00		
Exit yield	8.00%	8.50%	
Exit costs	1.00%		
Return			
Depreciation	1%	1.50%	
Risk free rate	5.00%	5.00%	
Risk premium	4.00%	4.00%	
Discount rate	9.00%	9.00%	
Growth Rates	Standard Rental Growth	Sustainable Rental Growth	Net Sustainable Rental Growth
Year 1	1.00%	0.50%	-1.00%
Year 2	1.50%	0.75%	-0.75%
Year 3	1.50%	0.75%	-0.75%
Year 4	1.25%	0.62%	-0.88%
Year 5 onwards	1.00%	0.50%	-1.00%
Market Rent per m²	£375.00		
Other Factors			
Refurbishment costs:	£0		
Building inflation	6%		
Other Costs – Fees & Management			
Rent review fees	7.00%		
Management costs	0%		
Void service charge psq ft	£0.00		
Rates per sq ft	£0.00		
Inflation on costs	3%		

Sustainability Factors	Impact Line	Office	Energy Rating
Operational Energy Use	Rental growth	A Office A/C Prime	2
If energy cost is known enter	Cost per sq m		4 Poor Performer

Property Type		D Business park Score from Questionnaire	Total Score
Adaptability	Rental growth	4	19
Climate control	Depreciation	0	4 Poor performer
Waste	Depreciation	0	-
Water	Depreciation	1	-
Accessibility	Rental growth	12	-
Industrial Only			
Pollution – Environmental Insurance Premiums	1 Premium <£60,000		
Pollutants	Rental growth	0	
Contextual fit	Rental growth	-	
Occupier impact	Risk premium	-	

Sustainable Criteria	Sustainable Criteria	Office	Basis Points Adjustment
Energy Use	Rental growth	2	-0.63371
Adaptability	Rental growth	4	0.00000
Pollutants	Rental growth	0	0.00000
Accessibility	Rental growth	12	0.13254
Contextual fit	Rental growth	4	0.0000
Occupier impact	Risk premium	4	0.0000
Climate control	Depreciation	0	0.50000
Waste	Depreciation	0	0.05000
Water	Depreciation	1	0.05000

Results	Gross	Net	% Change
Standard Worth	£47,223,690	£44,655,971	-
Sustainable Worth	£45,447,466	£42,976,327	-3.91

Basic Details:	
Property Sector	Office
Property Type	B Office Town Centre
Property Grade	Prime
Location Type	Town Centre

Appendix B: Case Study 4

Date of Valuation	25–Dec–04
Tenure	Freehold
Purchase Costs	5.75%

Sale Assumptions	Standard Worth	Sustainable Worth	
Sale date	25–Dec–14		
Years to sale	10.00		
Exit yield	7.50%	7.25%	
Exit costs	1.00%		
Return			
Depreciation	1%	1.05%	
Risk free rate	5.00%	5.00%	
Risk premium	3.50%	3.50%	
Discount rate	8.50%	8.50%	
Growth Rates	Standard Rental Growth	Sustainable Rental Growth	Net Sustainable Rental Growth
Year 1	1.00%	1.25%	0.20%
Year 2	1.50%	1.88%	0.83%
Year 3	1.50%	1.88%	0.83%
Year 4	1.25%	1.57%	0.52%
Year 5 onwards	1.00%	1.25%	0.20%
Market Rent per m^2	£247.50		
Other Factors			
Refurbishment costs:	£0		
Building inflation	6%		
Other Costs – Fees & Management			
Rent review fees	7.00%		
Management costs	0%		
Void service charge psq ft	£0.00		
Rates per sq ft	£0.00		
Inflation on costs	3%		

Sustainability Factors	Impact Line	Office	Energy Rating
Operational Energy Use	Rental growth	A Office A/C Prime	2
If energy cost is known enter	Cost per sq m		4 Poor Performer

Property Type		D Business park Score from Questionnaire	Total Score
Adaptability	Rental growth	8	29
Climate control	Depreciation	2	3 Typical
Waste	Depreciation	0	-
Water	Depreciation	1	-
Accessibility	Rental growth	16	-
Industrial Only			
Pollution – Environmental Insurance Premiums	1 Premium <£60,000		
Pollutants	Rental growth	0	
Contextual fit	Rental growth	-	
Occupier impact	Risk premium	-	

Sustainable Criteria	Sustainable Criteria	Office	Basis Points Adjustment
Energy Use	Rental growth	2	-0.93716
Adaptability	Rental growth	8	1.13973
Pollutants	Rental growth	0	0.00000
Accessibility	Rental growth	16	0.05005
Contextual fit	Rental growth	4	0.0000
Occupier impact	Risk premium	4	0.0000
Climate control	Depreciation	2	0.00000
Waste	Depreciation	0	0.00000
Water	Depreciation	1	0.05000

Results	Gross	Net	% Change
Standard Worth	£13,123,557	£12,409,983	-
Sustainable Worth	£13,321,411	£12,597,079	1.49

Basic Details:	
Property Sector	Retail
Property Type	F Parades & Terraces
Property Grade	Prime
Location Type	Town Centre

Appendix B: Case Study 5

Date of Valuation	25–Dec–04
Tenure	Freehold
Purchase Costs	5.75%

Sale Assumptions	Standard Worth	Sustainable Worth	
Sale date	25–Dec–14		
Years to sale	10.00		
Exit yield	6.50%	6.75%	
Exit costs	1.00%		
Return			
Depreciation	1.20%	1.41%	
Risk free rate	5.00%	5.00%	
Risk premium	2.50%	2.50%	
Discount rate	7.50%	7.50%	
Growth Rates	Standard Rental Growth	Sustainable Rental Growth	Net Sustainable Rental Growth
Year 1	1.00%	0.75%	-0.66%
Year 2	1.00%	0.75%	-0.66%
Year 3	1.00%	0.75%	-0.66%
Year 4	1.00%	0.75%	-0.66%
Year 5 onwards	1.00%	0.75%	-0.66%
Market Rent per m²	£350.00		
Other Factors			
Refurbishment costs:	£0		
Building inflation	6%		
Other Costs – Fees & Management			
Rent review fees	7.00%		
Management costs	0%		
Void service charge psq ft	£0.00		
Rates per sq ft	£0.00		
Inflation on costs	3%		

Sustainability Factors	Impact Line	Office	Energy Rating
Operational Energy Use	Rental growth	K Retail (non food)	0
If energy cost is known enter	Cost per sq m		5 Worst Performer

Property Type		F Parades & Terraces Score from Questionnaire	Total Score
Adaptability	Rental growth	0	18
Climate control	Depreciation	1	4 Poor performer
Waste	Depreciation	3	-
Water	Depreciation	0	-
Accessibility	Rental growth	14	-
Industrial Only			
Pollution – Environmental Insurance Premiums	1 Premium <£60,000		
Pollutants	Rental growth	0	
Contextual fit	Rental growth	-	
Occupier impact	Risk premium	-	

Sustainable Criteria	Sustainable Criteria	Office	Basis Points Adjustment
Energy Use	Rental growth	0	-0.38778
Adaptability	Rental growth	0	0.00000
Pollutants	Rental growth	0	0.00000
Accessibility	Rental growth	14	0.14195
Contextual fit	Rental growth	4	0.0000
Occupier impact	Risk premium	4	0.0000
Climate control	Depreciation	1	0.10000
Waste	Depreciation	3	0.00000
Water	Depreciation	0	0.07500

Results	Gross	Net	% Change
Standard Worth	£4,876,342	£4,611,198	-
Sustainable Worth	£4,768,176	£4,508,914	-2.27

Basic Details:	
Property Sector	Retail
Property Type	F Parades & Terraces
Property Grade	Tertiary
Location Type	Town Centre

Appendix B: Case Study 6

Date of Valuation	25–Dec–04
Tenure	Freehold
Purchase Costs	5.75%

Sale Assumptions	Standard Worth	Sustainable Worth	
Sale date	25–Dec–14		
Years to sale	10.00		
Exit yield	7.50%	7.77%	
Exit costs	1.00%		
Return			
Depreciation	0.50%	0.4875%	
Risk free rate	5.00%	5.00%	
Risk premium	3.50%	3.50%	
Discount rate	8.50%	8.50%	
Growth Rates	Standard Rental Growth	Sustainable Rental Growth	Net Sustainable Rental Growth
Year 1	1.00%	0.73%	0.24%
Year 2	1.00%	0.73%	0.24%
Year 3	1.00%	0.73%	0.24%
Year 4	1.00%	0.73%	0.24%
Year 5 onwards	1.00%	0.73%	0.24%
Market Rent per m²	£440.00		
Other Factors			
Refurbishment costs:	£0		
Building inflation	6%		
Other Costs – Fees & Management			
Rent review fees	7.00%		
Management costs	0%		
Void service charge psq ft	£0.00		
Rates per sq ft	£0.00		
Inflation on costs	3%		

Sustainability Factors	Impact Line	Office	Energy Rating
Operational Energy Use	Rental growth	K Retail (non food)	1
If energy cost is known enter	Cost per sq m		5 Worst Performer

Property Type		D Business park Score from Questionnaire	Total Score
Adaptability	Rental growth	0	22
Climate control	Depreciation	3	3 Typical
Waste	Depreciation	4	-
Water	Depreciation	0	-
Accessibility	Rental growth	14	-
Industrial Only			
Pollution – Environmental Insurance Premiums	1 Premium <£60,000		
Pollutants	Rental growth	0	
Contextual fit	Rental growth	-	
Occupier impact	Risk premium	-	

Sustainable Criteria	Sustainable Criteria	Office	Basis Points Adjustment
Energy Use	Rental growth	1	-0.38778
Adaptability	Rental growth	0	0.00000
Pollutants	Rental growth	0	0.00000
Accessibility	Rental growth	14	0.11306
Contextual fit	Rental growth	4	0.0000
Occupier impact	Risk premium	4	0.0000
Climate control	Depreciation	3	-0.10000
Waste	Depreciation	4	0.00000
Water	Depreciation	0	0.07500

Results	Gross	Net	% Change
Standard Worth	£2,284,967	£2,160,725	-
Sustainable Worth	£2,237,353	£2,115,701	-0.98

Basic Details:	
Property Sector	Retail
Property Type	H Shopping Centres 20+ Units
Property Grade	Secondary
Location Type	Town Centre

Appendix B: Case Study 7

Date of Valuation	25–Dec–04
Tenure	Freehold
Purchase Costs	5.75%

Sale Assumptions	Standard Worth
Sale date	25–Dec–14
Years to sale	10.00
Exit yield	6.50%
Exit costs	1.00%
Return	
Depreciation	0.50%
Risk free rate	5.00%
Risk premium	2.50%
Discount rate	7.50%
Growth Rates	Standard Rental Growth
Year 1	1.00%
Year 2	1.00%
Year 3	1.00%
Year 4	1.00%
Year 5 onwards	1.00%
Market Rent per m²	£300.00
Other Factors	
Refurbishment costs:	£0
Building inflation	6%
Other Costs – Fees & Management	
Rent review fees	7.00%
Management costs	0%
Void service charge psq ft	£0.00
Rates per sq ft	£0.00
Inflation on costs	3%

Sustainable Worth with Matrix		
6.72%		
0.70%		
5.00%		
2.50%		
7.50%		
	Sustainable Rental Growth	Net Sustainable Rental Growth
	0.78%	0.08%
	0.78%	0.08%
	0.78%	0.08%
	0.78%	0.08%
	0.78%	0.08%

Sustainability Factors	Impact Line	Office	Energy Rating
Operational Energy Use	Rental growth	K Retail (non food)	0
If energy cost is known enter	Cost per sq m		5 Worst Performer

Property Type		H Shopping Centres 20+ Units Score from Questionnaire	Total Score
Adaptability	Rental growth	0	23
Climate control	Depreciation	2	3 Typical
Waste	Depreciation	3	-
Water	Depreciation	0	-
Accessibility	Rental growth	18	-
Industrial Only			
Pollution – Environmental Insurance Premiums	1 Premium <£60,000		
Pollutants	Rental growth	0	
Contextual fit	Rental growth	-	
Occupier impact	Risk premium	-	

Sustainable Criteria	Sustainable Criteria	Office	Basis Points Adjustment
Energy Use	Rental growth	0	-0.38778
Adaptability	Rental growth	0	0.00000
Pollutants	Rental growth	0	0.00000
Accessibility	Rental growth	18	0.16543
Contextual fit	Rental growth	4	0.0000
Occupier impact	Risk premium	4	0.0000
Climate control	Depreciation	2	0.30000
Waste	Depreciation	3	0.00000
Water	Depreciation	0	0.10000

Results	Gross	Net	% Change
Standard Worth	£105,662,568	£99,917,322	-
Sustainable Worth	£102,449,189	£96,878,666	-3.14

Basic Details:	
Property Sector	Retail
Property Type	J Retail Warehouse (single unit or whole park)
Property Grade	Secondary
Location Type	Out of Town

Appendix B: Case Study 8

Date of Valuation	25–Dec–04
Tenure	Freehold
Purchase Costs	5.75%

Sale Assumptions	Standard Worth	Sustainable Worth with Matrix	
Sale date	25–Dec–14		
Years to sale	10.00		
Exit yield	6.50%	6.89%	
Exit costs	1.00%		
Return			
Depreciation	0.50%	0.65%	
Risk free rate	5.00%	5.00%	
Risk premium	2.50%	2.50%	
Discount rate	7.50%	7.50%	
Growth Rates	Standard Rental Growth	Sustainable Rental Growth	Net Sustainable Rental Growth
Year 1	1.00%	0.61%	-0.04%
Year 2	1.00%	0.61%	-0.04%
Year 3	1.50%	0.92%	0.27%
Year 4	1.50%	0.92%	0.27%
Year 5 onwards	1.50%	0.92%	0.27%
Market Rent per m^2	£360.00		
Other Factors			
Refurbishment costs:	£0		
Building inflation	6%		
Other Costs – Fees & Management			
Rent review fees	7.00%		
Management costs	0%		
Void service charge psq ft	£0.00		
Rates per sq ft	£0.00		
Inflation on costs	3%		

Sustainability Factors	Impact Line	Office	Energy Rating
Operational Energy Use	Rental growth	K Retail (non food)	0
If energy cost is known enter	Cost per sq m		5 Worst Performer

Property Type		J Retail Warehouse (single unit or whole park) Score from Questionnaire	Total Score
Adaptability	Rental growth	0	12
Climate control	Depreciation	0	4 Poor performer
Waste	Depreciation	4	-
Water	Depreciation	0	-
Accessibility	Rental growth	8	-
Industrial Only			
Pollution – Environmental Insurance Premiums	1 Premium <£60,000		
Pollutants	Rental growth	0	
Contextual fit	Rental growth	4	
Occupier impact	Risk premium	4	

Sustainable Criteria	Sustainable Criteria	Office	Basis Points Adjustment
Energy Use	Rental growth	0	-0.38778
Adaptability	Rental growth	0	0.00000
Pollutants	Rental growth	0	0.00000
Accessibility	Rental growth	8	0.00000
Contextual fit	Rental growth		0.0000
Occupier impact	Risk premium		0.0000
Climate control	Depreciation	0	0.25000
Waste	Depreciation	4	0.00000
Water	Depreciation	0	0.05000

Results	Gross	Net	% Change
Standard Worth	£76,534,644	£72,373,186	-
Sustainable Worth	£71,571,736	£67,680,129	-6.93

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