

GREENING THE UK for greater dividends



The Triangle case study



Image credit: Hab Oakus | <http://www.haboakus.co.uk/triangle/>

Summary

Central to Apple's business model is the objective to develop '*insanely great products*'. For a short period of time this year, Apple's market capitalisation surpassed that of Exxon, making it the most valuable company in the US. In today's economy, excellence and innovation pay. Could '*insanely great landscapes*' have the potential to yield greater economic dividends?

The Horticultural Trades Association (HTA) has set out to explore the economic benefits and wider returns from excellence in green infrastructure investments. Using The Triangle development in Swindon as an example and the recently released *Green Infrastructure Valuation Toolkit* prototype as an assessment framework, the HTA casts light on the unrecognised returns of high-performance landscapes.

The Triangle case study findings – between £0.23 and £0.4 million in returns for less than 0.2 hectares of soft landscaping – provide strong grounds for thinking twice in the future about cutting out planting or failing to explore the functional potential of landscape and planting schemes during design.

Background image credit: Hab Oakus | <http://www.haboakus.co.uk/triangle/>

Introduction

At a time when the rationale for every investment is being examined as never before and localism is the defining scale for driving change, public and private sector investors are seeking increasingly robust evidence of potential returns.

In response, a consortium of organisations – including partners responsible for environmental protection, economic development and urban design – has developed a unique toolkit of valuation techniques for green infrastructure.

The *Green Infrastructure Valuation Toolkit* provides – for the first time in the UK – a flexible framework for identifying and assessing the potential economic and wider returns from investment in natural assets and landscape improvements. The toolkit was released as a prototype in February 2011 under a Creative Commons license and can be accessed by all for free at www.bit.ly/givaluationtoolkit. An explanatory user guide with case studies can also be downloaded.

As a network of users emerges, the Horticultural Trades Association (HTA) has taken the lead on trialling the toolkit on housing developments and commercial schemes. In its 2010 local authority survey, the HTA found that only 10% of respondents described the level of planting on their council's new urban developments as excellent – leaving a vast majority experiencing far from 'insanely great landscapes'.

Rather than coming at a premium, could excellence in planting and soft landscaping yield greater returns? So much attention is often given to buildings that it is easy to forget about the role of external spaces. To find out, the HTA approached landscape architect firm Studio Engleback and developer Hab Oakus – a partnership between Kevin McCloud's company Hab and housing group GreenSquare, to assess the value of the landscape and green infrastructure investments built into the Triangle development in Swindon. Set within a borough experiencing one of the fastest population growth rate in England, the 43 new home development is scheduled to be completed by early Fall 2011 and has already been saluted by a Landscape Award.

Green infrastructure benefits

The *Green Infrastructure Valuation Toolkit* estimates the benefits of green infrastructure across 11 categories:

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| 1. Climate change adaptation and mitigation | 7. Labour productivity |
| 2. Water and flood management | 8. Tourism impacts |
| 3. Quality of place | 9. Recreation and leisure |
| 4. Health and wellbeing | 10. Biodiversity |
| 5. Land and property values | 11. Land management and products from the land |
| 6. Investment | |

This framework is not perfect – for example, some areas of benefits such as transport are yet to be incorporated – but it provides a good starting point and has been tested widely.

A set of tools has been developed within each of the 11 categories to look at how the range of green infrastructure benefits deriving from an asset or investment can be valued:

- In monetary terms - applying economic valuation techniques where possible to scope out potential economic impacts (i.e.: those directly affecting GVA) and assess wider economics benefits (i.e.: value of non-market goods/services).
- Quantitatively – for example with reference to jobs, pollution, temperature, visitors...

- Qualitatively – referencing case studies or important research where there appears to be a link between green infrastructure and economic, societal or environmental benefit, but where the scientific basis for quantification and/or monetisation is not yet sufficiently robust.

To ensure results are easy to interpret and compare, monetised findings are expressed in terms of Net Present Value (NPV). This captures the sum of the present and discounted future flows of net benefits of a particular asset over its entire lifetime. A discount rate is used to reduce future benefits and costs to their present time equivalent.

More information on the toolkit and contact details to join the network of users collaborating to improve the current prototype can be found at www.bit.ly/givaluationtoolkit.

The Triangle



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Built on a former caravan park in a tightly constrained backland site, the Triangle is a 43 home eco-housing development located within walking distance from the Swindon railway station.

High demand for housing in the local area or the fact that the scheme is being developed for a Registered Social Landlord has not meant that “*just enough landscaping was put in to tart things up*”, but quite the opposite, as Studio Engleback, the landscape architect practice for the project explains. The goal has been to create “*a ‘green’ or environmental infrastructure that provides a series of environmental services*”.

The development was designed to achieve high sustainability standards with all 43 homes built to code level 4. The external spaces were designed with a similar focus on performance, with a strong emphasis on providing space for people, for food growing and for surface water attenuation. The resulting design features a homezone surrounding a central green, with satellite spaces for two kitchen gardens and car parking.

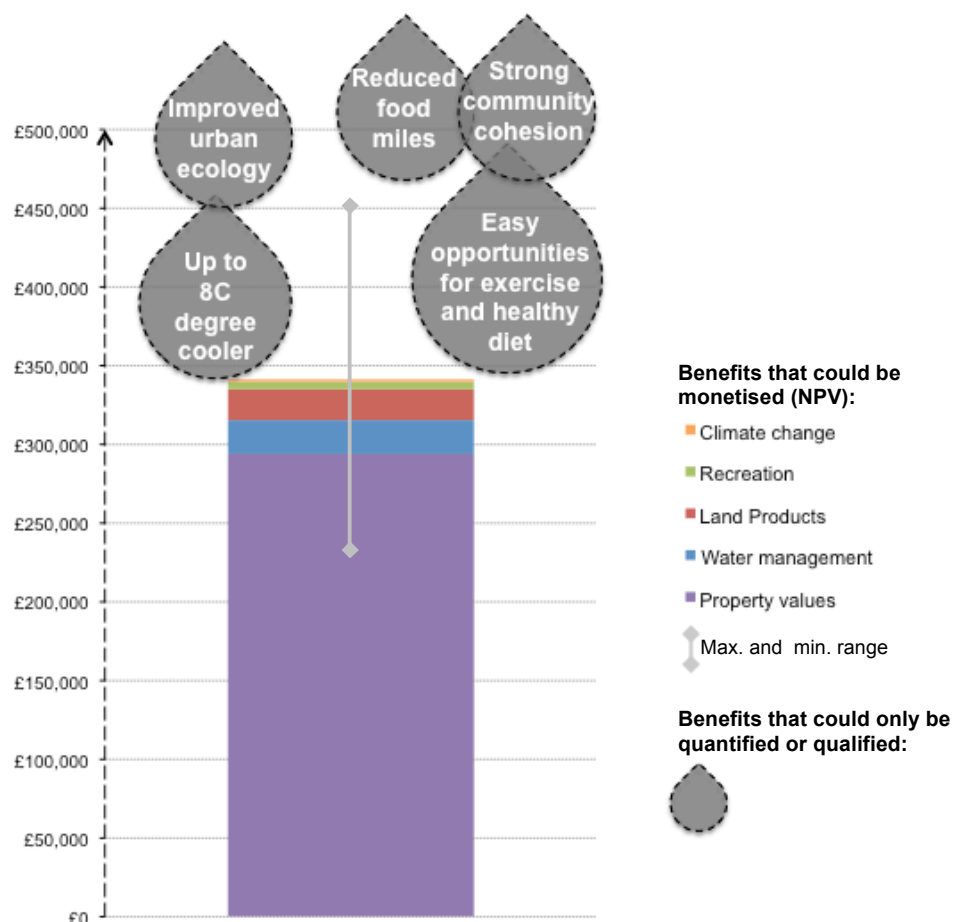
Green infrastructure characteristics and beneficiaries

The Triangle occupies a 0.8-hectare site, a little under 25 per cent of which is intended to be green space. 80 new trees are being planted, 75 percent of which are dwarf or trained espalier fruit trees that liven the front gardens of each of the terraced house. Fruit trees are also combined with fruit bushes such as black currants, gooseberries, redcurrants and raspberries to create edible hedges around the two kitchen gardens (totalling just under 600 square meters) and screen the car parking areas. Climbing plants set to run on the gabion walls separating the front gardens further helps to expend vertically the extensive and layered green cover the site enjoys. The central green features the larger canopy trees, as well as a swale that will contribute to the management of the stormwater runoffs from the site.

43 new households are expected to move in, most of which are participants in a rent-to-buy scheme. This will translate into 100 and new 130 residents, which will likely include a significant proportion of children. Given its 'cul-de-sac' position in an infill site, The Triangle enjoys limited connectivity. As a result the scheme's green spaces are unlikely to attract passers by in the same way as a more exposed and visible public green space would. However, some of the site features, including the kitchen gardens are designed to foster 'gardening club' type of activities, which may draw a limited number of participants from the outside.

Results

Using the *Green Infrastructure Valuation Toolkit* to assess the potential economic benefits associated with the green infrastructure investment made at the Triangle exhibits significant monetisable returns in five main areas:



Climate change adaptation and mitigation

The combination of new grass areas, trees, bushes and climbing plants exhibit a significant cooling effect. The peak surface temperatures are expected to be up to 8C degrees lower to what they used to be when the site was a caravan park. This benefit, though uncostered, will greatly enhance residents' comfort, particularly during the summer months.

In addition, a small benefit from the value of stored carbon in trees (0.3 tonnes of CO₂ per year) is calculated at £1,470 at present value. This figure does not account for the carbon stored and sequestered in other forms of vegetation than tree or in soils.

Water management

The creation of permeable, water-absorbent landscape reduces the amount of water entering the local combined sewer system by over 600 cubic meters per year. In turn, this reduces the need for water treatment, lowering associated operational costs, including energy consumption and carbon emission. The present value of these benefits was calculated to be £4,300.

More importantly, the soft landscape areas of the scheme are also designed to manage and infiltrate on-site all the surface water run-offs from the development, which will alleviate the local combined sewer system. As a result, the Triangle's residents will be eligible for a rebate on their water drainage service charge. The present value of this saving was estimated at £17,500.

Place and Communities

The home-zone environment combined with the generous and inviting communal spaces creates a setting for social interactions. All chances have been maximised to create an environment where people will choose to engage in social activities – such as children playing together, adults engaging in informal conversations, organising/participating in various block parties, etc. – rather than interact minimally. However, quantifying, or placing a monetary value on this was not possible.

Health and wellbeing

The homezone and central green provide a great opportunity for children to freely run, cycle and walk around. Evidence shows that adults who have engaged in more creative and active play as children are more likely to have health protective behaviours, such as eating a healthy diet and taking regular exercise.

The scheme is also expected to have an impact on adults' physical activity and mental health, particularly for those involved with the two large kitchen gardens. It was estimated that the tending and harvesting of the edible landscapes had the potential to draw 1 in 5 adults. This would represent 15 to 20 people who can fulfil a significant proportion of their weekly recommended amount of exercise right on their doorstep.

Various green infrastructure elements in the scheme such as trees, bushes and climbing plants also have a modest impact on improving air quality. The saving from other pollution control measures was calculated to be £50 at present value.

Property values

Well laid out and kept parks and green spaces are proven to enhance property values in the neighbourhood. Work undertaken by Dunse for the Royal Institution of Chartered Surveyors (RICS) used Aberdeen as a case study area. It found that the overall premium for a property next to a park, relative to a similar property 450 metres away, is positive across all house types. The price premium ranges between 0.44 per cent and 19.97 per cent depending on house and park type. Given the high quality but very local nature of the amenity green spaces created at the Triangle, it was estimated that the uplift would range between 3% and 6% consistent with the mean values found in the Aberdeen study in relation to amenity green space and local parks. On that basis, all the new properties being developed at the Triangle were considered to have their values enhanced by the quality of the external environment. The total value of this was estimated to be between £190,000

and £400,000 at present value. More detailed market analysis would be needed to make a more precise estimate.

Investment

There is anecdotal and qualitative evidence that high environmental quality is an important factor to some businesses. Investing in green infrastructure can both improve the quality and the image of an area or a specific site, leading to new investment and employment. In the context of The Triangle, the drastic change in environmental quality brought by the scheme undoubtedly improves the image of the site. However, given the cul-de-sac layout of the development, its modest size and its location in an already built up residential area, it is unlikely that this transformation will impact private sector investments in the area beyond the effect on adjacent residential property values already captured above.

Labour productivity

Research suggests that well planned, accessible green infrastructure can be expected to have an impact on short term absenteeism from work as well as on worker's effectiveness on the job. As part of a residential scheme, The Triangle's rich landscape features are unlikely to directly impact individuals at work, unless a large proportion of residents work from home – which is not substantiated by evidence at this stage. However, as discussed above, the scheme is likely to have an impact on residents' health through providing adults with opportunities to garden and thus be more physically active. 2003 Research from the World Health Organisation (WHO) in the US showed that physical activity programmes involving 30 minutes of exercise a day reduced short-term sick leave by between 6 and 32 percent. The gardening opportunities offered by the Triangle's two kitchen gardens and other edible landscapes might not suffice to fuel all year-round, for those interested, the level of exercise required to match the 30 minute threshold set by the WHO research. As a result, it was not possible to quantify or monetise the effect the scheme may have on supporting a more productive workforce, although some degree of impact is likely.

Tourism

Due to their small scale and hidden location, the new green spaces created by the development were deemed not to have any potential to attract outside visitors and contribute to the local tourist economy.

Recreation

The central green clearly provides an attractive space for children to play. Using 'willingness to pay' measures conducted in similar neighbourhood space, the recreational value was calculated to be £4,900 at present value.

Biodiversity

The rich, often native, plant palette and combination of landscape features chosen for the scheme such as the small pond and bioswale with riparian planting, the multiple the fruit tree hedges and shrubs, or the selection of a biodiverse mix for the lawn area will significantly enhance the wildlife potential of the site, benefiting birds, invertebrates and small mammals. The habitats created are not significant enough though, either in size or in the species they are likely to support, so that their value can be assessed using 'willingness to pay' transfer values arising from research.

Land products

Altogether, the kitchen gardens and the fruit trees and bushes have the potential to yield a rather generous harvest, which has been estimated in the range of 900 and 1,800 kg of fruit and vegetables per year. The present value of this crop was estimated to be in the range of £14,000 to £25,000. These figures do not account for the value of the carbon emissions avoided.