

**Abstract.** The demand for Internet connectivity in office buildings opens up opportunities for landlords to provide added-value services to their tenants. This article seeks to explore the hypothesis that the provision of high bandwidth telecommunications to a building increases its value relative to buildings without this facility. The article builds upon research undertaken into existing use of the Internet over the past two years as evidence of demand for facilities and explores the likely impact of the provision of connectivity on different types of office. The connected building is defined and issues affecting its valuation analyzed. Finally, a hypothetical business model is constructed for a large multi-let building to demonstrate the likely income stream and timing that would be applicable.

## Introduction

The ability to link people, data and systems instantaneously using sophisticated communications technology—connectivity—is having an effect on real estate. Connectivity is an issue that touches all parts of the real estate spectrum. In particular, it affects the developer, the occupier and the owner through the mechanism of added value.

The hardware side of connectivity has had the potential to add value for twenty years or more. The development of standards for cabling systems in the mid 1970s gave the developers of real estate the ability to deliver a messaging infrastructure with a building in the same way as power and telephones. The logic of this development however, was undone by the sheer pace of change encapsulated in Moores Law.<sup>1</sup> The practical implications of this revolutionized the technology and communications industries and pushed the concept of general connectivity as part of real estate infrastructure to the back of the queue.

The 1990s have seen the emergence of a standard software environment suitable for commercial use—the Internet. The commercial value of the Internet starts with the identification of added value and how this can be managed to justify the costs of installation. In a real estate environment, the onus of specifying, implementing and maintaining Internet link facilities generally has been down to the occupier, and justified in terms of the enhanced capacity to do business in a competitive

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marketplace—that is to say, through the facilities management route of supporting business need.

Such connectivity does not come cheap. While it is relatively easy for an individual to acquire an Internet connection, a multi-user, corporate Internet connection is expensive to install and maintain because the users have to provide their own infrastructure on which to build their own specialist systems. With a variety of systems and protocols available, each user's system has tended to be bespoke, complicated, and hence costly.

On the hardware side, the installation of local area networks (LAN's) in a single office and the subsequent connection of LAN's to other LAN's (either within the same country or overseas) to create wide area networks (WAN's) is a major part of the IT budget. To this can be added the indirect costs of dislocation and the related fitting-out. As far as software is concerned, while the network operating systems provide management at a technical level, they provide nothing in terms of application support, leaving this substantial cost to the user.

Not surprisingly, we are seeing organizations moving away from tailor-made systems in favor of those with common standards. Local and wide area networks are being overlaid by Intranets, with those networks, ultimately, being connected to the biggest wide area network of them all, the Internet.

To put this into a real estate perspective, any forward-thinking developer should consider the opportunity presented by the fact that, by 2000, 75% of the PCs in any one building are expected to require Internet connectivity.<sup>2</sup> The objective of this article is to consider that opportunity. It examines the hypothesis that the creation of Building Area Networks (BAN's), installed, developed and maintained as part of the building infrastructure will have a significant impact upon value in the future.

## **Current Research**

The general impact of information and communications technology on the ownership and occupation of real estate has been discussed at length in various papers and articles particularly Borsuk (1996) and Becker and Joroff (1995). These emphasize the importance of technology as a facilitator in the optimization of real estate holdings and offer up radical strategies for addressing a substantial over-supply of real estate in the future.

Very little has been written, however, in the area of the pragmatic use of the network technologies within a real estate framework that actually changes very slowly in terms of both supply and demand.

Two recent papers have attempted to quantify the demand for connectivity. The Internet Report from Morgan Stanley and the H+H Marketing Connectivity Survey.

Morgan Stanley's Internet Report was published as a guide for its worldwide investor client base, and offers some revealing forecasts for the levels of Internet connectivity. For example, the projected growth of connected computers for email purposes (59% this year, rising to 74% in 2000) and Internet/Web (39% this year, rising to 54% in 2000) led the authors to conclude: "We believe that, within a decade, there is a good chance that the PC and the Internet will become ubiquitous. In our opinion, the only factor that will preclude PCs from accessing the Web will not be lack of demand but rather lack of bandwidth." From a facilities perspective, this means that 75% of an occupier's staff will require a network connection of adequate performance to facilitate communication.

The H+H Marketing connectivity research was conducted on behalf of King Sturge & Co in February 1997 and repeated in 1998. This survey investigated levels of connectivity and satisfaction among major office occupiers in the United Kingdom.

In 1997, generally respondents viewed the Internet in a positive light and, despite the fact that most were accessing the Internet using the fastest modems, the majority were disappointed by the speed of access. As a result, most predicted that they would need to upgrade their method of access within a year. This was amply demonstrated by the 1998 survey that showed that the average speed of user access had risen by 66% over the year with ISDN users particularly up from 12.5% in 1997 to 43% in 1998 (see Exhibit 1).

Nevertheless, the survey found that 53% of users were not content with their speed of access and 88% expect to up-grade this method of access within twelve months, leading to a forecast surge in the installation of leased lines.

The importance of connectivity to the modus operandi of business is demonstrated by the massive 70% of respondents that reported that they work remotely from home at least part-time and the 68% of businesses that support remote access to their networks. Ninety-one percent of respondents have access to the Internet, with 63% having access

**Exhibit 1**  
**Projected Use of the Internet**

Users	1997	1998	1999	2000
PCs	191	219	246	269
Email (m)	80	130	180	200
%	42	59	73	74
Internet	46	82	134	157
%	24	37	54	58

Source: The Internet Report (Morgan Stanley).

at home and at work. Of those without access, all believed that they would probably have access within the next year (see Exhibit 2).

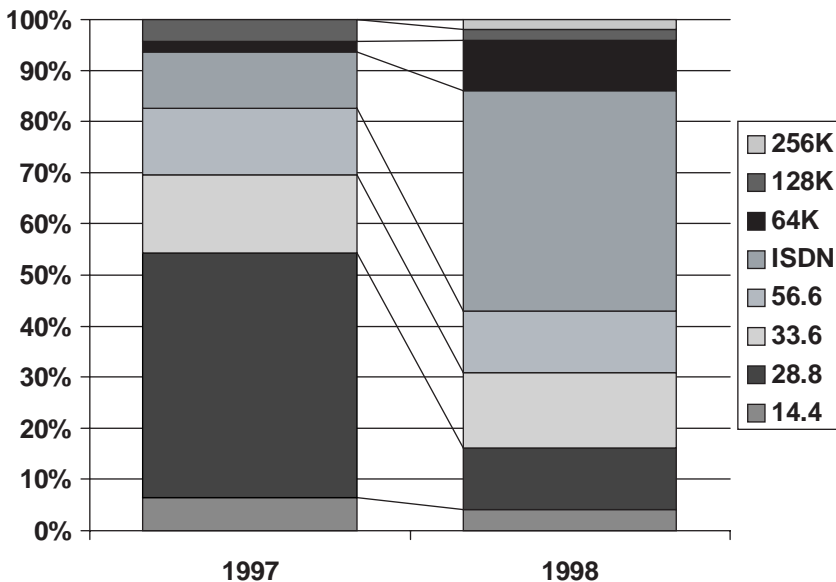
### Implications for Property

The combined effect of standardization in communications and the rising demand for connectivity is that, increasingly, landlords are expected to provide the infrastructure within buildings to which tenants can connect specialist equipment. However, economies of scale are available where the landlord buys capacity in bulk and sells on the right to use his high-quality service, at a profit, thus providing additional revenue and rapid payback on his investment. The principle has most relevance to serviced offices, multi-tenanted office buildings and large corporate multi-site occupations.

#### *Serviced Offices*

The serviced office occupier is seeking instant occupation, undisturbed enjoyment of the property, often for longer periods than the traditional working day, and easy access to a wide range of contacts with as personal an impact as possible. Payment for a fully-serviced facility means there is every incentive for the operator to provide full connectivity.

**Exhibit 2**  
**A Dramatic Increase in the Speed of Connection**



Source : King Sturge Connectivity survey.

This is particularly so as operators are already experiencing a gradual reduction in revenues from traditional income generators, such as fax services, as users adopt sophisticated office productivity software that allows them to do much more with their own PCs. In view of their charging structure, serviced office operators may be able to offer Internet access priced on a “per connected PC” basis.

### *Large Office Occupiers*

At the other end of the spectrum, large office occupiers, such as banks, government agencies and utilities, have a vast, but nevertheless diminishing, occupied estate, developed according to historic, and now operationally obsolete, business needs. The opportunity to reduce their leased estate may be driven by termination dates and break clauses; whereas the opportunity for reducing their freehold estates is likely to be driven by redevelopment possibilities. In these circumstances, the core estates will be determined as much by the shrinkage of property as business need.

Connectivity enables the retained estates to meet business needs because much of the function of the occupiers will no longer be related to locally accessed customers, or markets, or time because technology facilitates the easy transference of data between sites, which makes location, from this point of view, less relevant. From a financial standpoint however, it is harder to see an additional revenue stream from connectivity; rather, the benefits will come from reduced overheads and greater value in use from the retained estate.

### *Multi-Tenanted Office Buildings*

New developments and refurbishments need to minimize voids, maximize income and sharpen yields. This is particularly important with older buildings on rolling refurbishment programs with shortening leases—reducing the length of voids at the end of each shorter lease is critical to any appraisal.

The provision of communications infrastructure is highly attractive to potential tenants because they will have to install their own systems if the landlord has not already done so, costing them time and money. Instead, the landlord supplies very fast Internet access to all the tenants, at prices hard to achieve elsewhere for a comparable service, via a building-wide system. Here, it may be considered that the landlord is creating a BAN and providing Internet access as a standard utility.

The major difference between this scenario and that for serviced office centers is in the pricing. In large buildings, it is not feasible to price per connected PC. Instead, tenants’ usage should be metered and charges levied accordingly.

In view of the hybrid characteristics of connectivity, part hard FM (cabling), part soft FM (services), part management, there will need to be some pioneering work in specification of the service and validation of charging systems with the operator’s policy hinging on cash flow. This points towards an “open book” joint venture

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between the building owner and the Internet service provider. If the landlord, as is likely, appoints an operator to provide a full facility service, the market will determine whether the landlord can charge a license fee to the operator, or the operator can require a fee from the landlord. This will depend on the quantum of the betterment to the landlord.

## **The Connected Building**

### *Objectives*

The objectives of a connected building are threefold:

- To bring twenty-four hour Internet access and high-speed data transmission services to a building as a standard utility, wired through the cores to “edge of floor”, for ultimate connection to tenants own computer networks—a BAN.
- To deliver high speed Internet access at a discount to the cost that would be born by the tenant acting independently.
- To deliver easy access to building facilities through the network.
- To provide an income stream for the landlord, adding value to their interest and improving the marketability of their real estate.

### *The Principle*

In this model, the developer/landlord bears the cost of installation to floor edge. The tenant bears the cost of connection to its own network. Tenants share the BAN giving fast access to the Internet and availing themselves of specific services available on the BAN.

Usage is metered and tenants select a pricing plan to suit their likely consumption. By buying bandwidth wholesale and retailing the service to clients, landlords generate an additional income stream, adding value to their interest.

### *Examples*

The International Financial Centre in London is a 320,000 sq. ft. 1970's built office block being refurbished as a connected building.<sup>3</sup> The IFC proposes to install an internal, fiber optic data distribution system, with a very high-speed permanent connection to the Internet, to which occupiers may connect their own computer networks.

Ethernet sockets will be provided in every leaf to allow occupiers to instantly connect their own networks to the system, without having to install their own specialist equipment, allowing email and electronic files to be sent either around the building

or around the world at incredibly high speeds. Occupiers will be responsible for their own security, although the IFC will offer technical consultancy to assist with this.

The package will incorporate entry level Internet access, at speeds up to 156 times faster than could be achieved for services at the same price in the open market. With access speeds fixed at the fastest reasonably available, occupiers will pay for what they use.

Permanent access will be offered, delivered to individual PC's or to network servers, at speeds of up to 10MB per second with prices starting at £5,500 per annum (a price comparable to the slowest non-modem service available today).

Occupiers may purchase access in bands according to their anticipated usage of the system. The entry level (£5,500 per annum) allows occupiers to consume 5GB of data per month—approximately the amount they would expect to consume if they used a conventional 64k per second leased line connection to its maximum capacity.

In the heart of New York's financial district is 55 Broad Street, a 1970's built office block. This was the head office of Drexel Burnham Lambert vacated in 1990. "The world's most wired work space."<sup>4</sup>

The New York Information Technology Center is one of the few buildings in the world to offer satellite reception and transmission facilities and single- and multi-mode fiber optics. In addition, it boasts high speed category five copper wire, video conferencing facilities and Internet access from DS-3 to fractional T-1—from 10 to 100 Mbps of bandwidth is available. It has also pioneered ITCWWNET—a global network of smart, ready buildings and the world's first content driven Intranet.

### *Advantages*

*To the tenant.* As far as the new tenant is concerned, the installation of their connection is fast and efficient. Everything the new occupier needs is already there—"Plug and Work" describes the principle.

All tenants have access to the full bandwidth in the building giving very fast access at a cost significantly below that they could purchase on the open market. This bandwidth is limited only by the capacity of the BAN, minimizing upgrade considerations in the future. Access to the BAN is charged on a usage basis with the opportunity to select the most cost-efficient method. The BAN is monitored and maintained independently twenty-four hours a day and is part of the building service, offering one point of contact for all infrastructure. Tenants can also benefit from the applications layer available on the BAN, which would give easy access to building services and local facilities.

*To the landlord/developer.* As far as the landlord is concerned, the availability of connectivity is consistent with current research into market demand and its provision

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**Exhibit 3**  
**Connectivity Assumptions**

	Year 1	Year 2	Year 3	Year 4	Year 5
Occupancy (%)	20	70	90	90	90
Connectivity (%)	50	70	90	100	100

For illustration only: installation cost over three years, per annum is £60,000; amortized installation cost over three years, per annum is £20,000; and annual maintenance ins £20,000. Tenants pay a once-only fee of £500 to be connected.

may therefore add to the marketability of the building as a business location. In the short term, this may also give competitive advantage.

By buying wholesale and selling retail, the landlord can generate an additional income stream and through a partnership agreement with an Internet Service Provider, payback can be achieved quickly. Additional income may also be generated through the use of the BAN to advertise additional services to the occupiers building a community of interest.

### **A Hypothetical Business Model**

This hypothetical business model considers a new 150,000 sq. ft. building in central London with a maximum of thirty tenants and an installed 2MB leased line (one of the fastest services available in the UK). Internet access is distributed throughout the building using fiber-optic technology, with connection points left under the floor in the tenant's demise ready for connection to their own networks, using standard protocols and sockets. The tenant does not have to install any specialist equipment—the plug 'n work principle.

The model assumes the take-up and connectivity rates shown in Exhibit 3. The hypothetical cashflow forecast for the landlord are shown in Exhibit 4.

**Exhibit 4**  
**Cashflow**

	Year 1	Year 2	Year 3	Year 4	Year 5
Number of Connected Tenants	3	15	24	27	27
Gross Revenues (£)	10,000	70,000	167,000	315,000	490,000
Total Costs (£) <sup>a</sup>	48,000	95,000	164,000	220,000	305,000
Net Profit (£)	38,000	25,000	3,000	95,000	195,000
Cumulative Profit (£)	38,000	63,000	60,000	35,000	230,000

<sup>a</sup>Includes amortized installation costs.



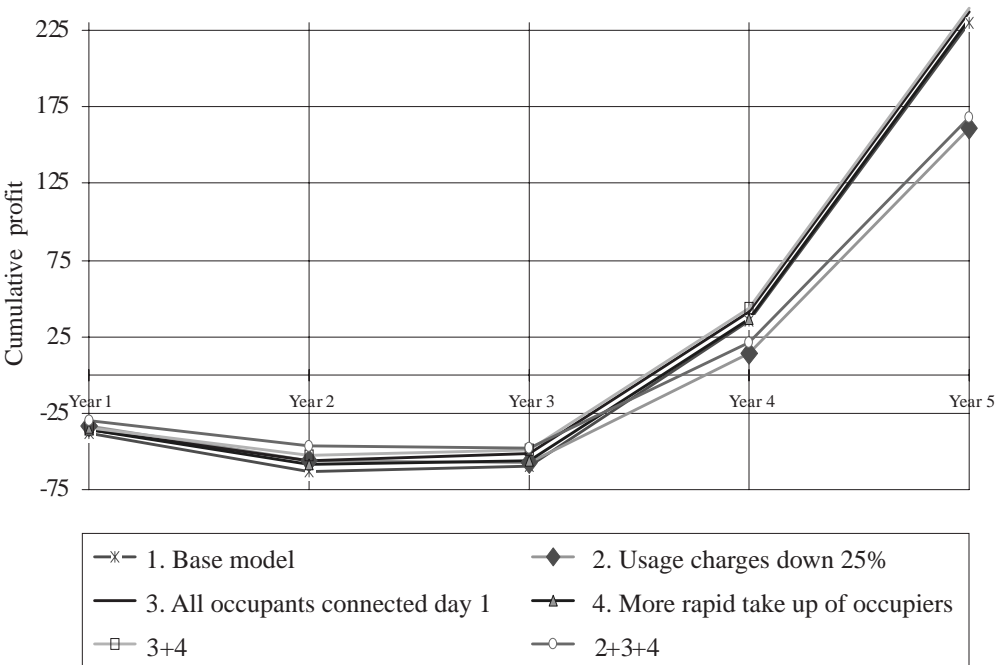
Using this model, with a pattern of take-up typical of a conventional office development, the provision of connectivity moves into profit in Year 4. Clearly, if the rate of connectivity is higher or the space is taken up more quickly—perhaps as a result of the additional tenant advantages that this provides—profitability can be reached much more quickly.

Exhibit 5 shows the sensitivity of the model to variation in the component variables. Various scenarios are explored in the chart:

- Scenario 1: Base model as described in the cash flow statement.
- Scenario 2: Showing the impact of a 25% reduction in connect and usage charges.
- Scenario 3: Showing the effect of all occupiers being connected to the BAN at day 1.
- Scenario 4: Showing the impact of accelerated take up of space in the building.
- Scenario 5: Combination of 3 and 4.
- Scenario 6: Combination of 2, 3 and 4.

This demonstrates the relative lack of sensitivity to a range of changes. None of the scenarios alter the year in which the investment returns a profit, but they do have a small impact upon the amount of that profit in Year 4 and Year 5.

**Exhibit 5**  
**Sensitivity Analysis**



## Valuation

Comparing our “connected” building with a more traditional one, there are four possible components of additional value:

- A lower yield, reflecting the improved quality of the building, but this relates only to the “hard” FM element.
- Quicker leasing resulting in fewer voids, this will be evident in the marketplace.
- A higher rent—attractive as this is, a fixed overage flies in the face of a flexible user-driven service.
- An occupation charge—this seems the ideal method comprising a base figure and variable element with the operator being treated as a utility. This is moving leasing towards FM.

The experience of serviced office buildings, and the general occupier demand for occupation agreements rather than long leases, means that many multi-let office buildings are potential candidates for connectivity. Selection criteria will be rigorous in physical, market and financial terms; the rewards for the distinguished buildings will be substantial.

In comparing the valuation of these buildings with shorter occupation agreements, but providing higher levels of service-based connectivity, with buildings let on traditional (to the UK) twenty-five year leases, the key issue is whether these can be valued with regard to trading potential. That is to say, can the apparent disability of reduced security of income be replaced by a valuation that recognizes the diversity of sources of income stream.

Anecdotal evidence suggests that, in any event, the average length of lease has reduced substantially over this economic cycle tilting the balance in favor of this approach.

The effect that a branded operation can have in promoting a service to occupiers and generating a premium over traditional market rents and service charges points towards a strong corporate ownership which needs to be taken into account.

## Connectivity = Value?

The requirement for connectivity is demonstrated clearly in the research amongst clients underpinning this article and from other independent sources. It is less clear, however, that the real estate industry is reacting with appropriate vigor to this in the provision of connected buildings or service agreements.

Clearly, the potential is there for forward-looking landlords and developers to take advantage of this opportunity to provide better building services and thereby improve the marketability of their buildings. That this provision can also generate a useful income stream is also apparent, especially given the minimal amounts of expenditure at risk.

As to asset value, the initial test bed will be the asset valuations ascribed to buildings in the portfolios of serviced office companies. The issue will be the extent to which these buildings are viewed as properties valued with regard to trading potential. Thus, the diminished security of income is replaced by a valuation that recognizes the diversity of the income stream and the potential for reduced void periods through greater marketability.

The connected building sits easily in an environment in which occupiers are giving increasing prominence to value for money. Protection from the overheads of installation, optimized charging structures and easy access to building facilities all reduce costs and improve operational value.

This principle also works well for landlords who are maximizing the value of their assets by providing an income stream while attracting those companies forward-thinking enough to take advantage of the facilities.

There are, as yet, few examples. Those shown in this article may be the exception rather than the rule but for them connectivity certainly equals value.

## Notes

<sup>1</sup> Broadly that the power of microprocessors would double, and the cost halve, every year.

<sup>2</sup> Morgan Stanley Internet report.

<sup>3</sup> [www.ifc.net.uk/](http://www.ifc.net.uk/).

<sup>4</sup> [55BroadSt.com](http://55BroadSt.com)—The Digitalization of Physical Space.

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