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What is Building Refurbishment?

The traditional building cycle sees the built asset typically designed to last sixty years and undergoing a variety of changes prior to being demolished and a new facility commonly arising in its place. There are many buildings which have stood for much longer than sixty years and, in some cases, their external aspects are protected as listed buildings; however, they are often changed internally to reflect the modern-day demands of the working environment and the market. Likewise, there is an increasing trend for assets to be sweated over a relatively short lifetime of twenty or thirty years to maximise returns.

In all these scenarios, there is an element of building refurbishment that will take place. As can be seen from these examples, however, the scale, type and level of detail of the refurbishment are hugely variable.

Chapter Learning Guide

This chapter will provide an overview of building refurbishment, its growth globally and the challenge in trying to define its role to meet the changing business requirements.

- Definitions of building refurbishment;
- Size of market and global differences;
- Occupant satisfaction providing the link between productivity and well-being that can be influenced;
- Growth and changes affecting refurbishment;
- The future refurbishment and where the industry is going.

(Continued)

Key messages include:

- There is an increase in the level and scale of refurbishment taking place across a range of buildings;
- Building refurbishment is a standard approach to revitalising facilities to extend their life.

1.1 Introduction

The refurbishment of buildings is a long-standing practice dating back centuries as parts of stately homes, castles and churches have been extended and remodelled to reflect the wealth and architectural style of the owners at the time.

Whilst this aspect of the building lifecycle has been around for many centuries, it has not gained recognition in the recent past whilst failing to capture the imagination. With the recent growth in buildings and new construction, the refurbishment of the older stock has taken a back seat. Alongside this, there have been a loss of knowledge and inherent understanding of how to refurbish buildings in a sustainable manner across the various organisations involved in the built environment. This has resulted in many of the lessons needing to be relearnt.

There is an implicit recognition that many of the interventions we are now making through ‘retro-fitting’ are ‘experimental’. This is because the performance of innovative technologies, or new combinations of tried technologies, can be predicted only with limited confidence. The need to monitor eventual performance, especially under occupation, is paramount if we are serious about providing effective refurbishment. Evaluating building performance needs to be holistic and stretch beyond the narrow concerns of the building as a machine, to embrace a more organic (realistic) view of the built environment as the platform on which people live their diverse lives. This sentiment is discussed further in Chapter 3.

This book does not look at the decision whether or not to refurbish an asset, but is based upon the premise that the refurbishment decision-making process has concluded. Such decisions are complex, but might include the following areas:

- What does the financial modelling support?
- Which option delivers the best increase in lettable area?
- What does the local market require?
- Does the developer’s portfolio favour a particular option?
- Can the existing building be refurbished to a competitive level of quality?
- Is there an end-user preference for a particular option?
- Is there more than a marginal difference in new-build construction cost versus refurbishment cost?

Refurbishment is a large and ever-present element of construction workload, and one that becomes more important in a downturn. The challenge is to extract value out of tired commercial buildings through targeted investment. Refurbishment work is, by its very nature, diverse, ranging from redecoration to total reconstruction based upon a retained structure. What all refurbishment projects share in

common is a greater risk profile than the equivalent new-build project and, therefore, risk allocation is critical.

1.2 Definitions of Refurbishment

It is surprisingly difficult to find definitions of building refurbishment in the publications of the various professional bodies looking after this area, which may explain the additional lack of information on the subject.

Webster's New World College Dictionary¹ provides the following definition:

re·fur·bish (ri fūr'biʃh)

transitive verb

to brighten, freshen, or polish up again; renovate

Etymology: re- + furbish

Synonyms: awakening, face-lift, facelifting, rebirth, recharging, recommencement, refilling, reformation, regeneration, rejuvenation, renovation, reopening, replenishment, restoration, resumption, resurrection, revampment, revitalization, revival

The US Green Building Council provides the following definition in terms of major and minor refurbishments which will dictate the type of assessment methodology to be applied² (see Section 2.2 for more details):

'... a major renovation involves elements of HVAC renovation, significant envelope modifications and major internal rehabilitation.'

Likewise, the BRE provides the following for its assessment methodology approach³:

'... a major refurbishment project is a project that results in the provision, extension or alteration of thermal elements and/or building services and fittings.

- Thermal elements include walls, roofs and floors.
- Fittings include windows (incl. rooflights), entrance doors.
- Building services include lighting, heating and mechanical ventilation/cooling'

In both cases with BRE and USGBC, changes to buildings that do not affect the thermal performance or significant envelope changes are considered to be minor and part of the operational management of the building.

However, this is a simplistic approach whereby changes to a building that can affect the asset value are not captured under the criteria of a refurbishment categorised by the BRE or LEED. Typical areas include cosmetic changes to common areas such as the reception or lift lobbies involving decorating. Such 'refresh' examples have an effect in making the building more attractive to tenants and improving the occupants' conditions. Whilst consisting of fairly small changes, the 'refresh' market does represent a significant part of the refurbishment market.

An alternative approach of reviewing refurbishments within a building looks at the scale of the changes being made: from a light touch through to a fundamental alteration taking the building back to its shell. This kind of approach will cover and include a whole range of upgrades, refurbishments and retro-fits made to a building regardless of the scale and size of the change being made. The main basis of this is that all of these areas can be classed as refurbishments and there will be scope to improve the level of sustainability within these changes.

The British Council for Offices (BCO) considers four options that represent degrees of intervention into existing buildings⁴. These reflect many concerns raised as to how much, or how little, should be done to create a product of value that achieves the developer's objectives. The BCO approach concerns the extent of the redevelopment, the value this will achieve in the long run, the necessary levels of both internal and external improvement and how to avoid spending more than necessary to maximise return on investment.

A similar approach has also been postulated by BSRIA and the BRE based upon five levels including a final level which promotes demolition. The first four levels, however, broadly correspond to the levels of intervention captured by the BCO.

The section below provides a series of levels to define refurbishment, which will be used throughout the book, to help identify when sustainable refurbishment criteria are more applicable to some levels.

Table 1.1 captures the level of refurbishment necessary for a given building based upon a matrix combining the building's performance and its condition. Those buildings that perform well in both areas require relatively limited change to maintain market value or increase the level of their sustainable performance. Those buildings that score poorly in both areas will require a significant change. However, the levels are blurred, rather than absolute, as the number of factors influencing the choice of refurbishment needs to be included in a decision.

Level of Refurbishment

- Level 1: Light Touch/Refresh
- Level 2: Medium Intervention
- Level 3: Extensive Intervention
- Level 4: Comprehensive Refurbishment
- Level 5: Demolition

Full details of each of the five levels of refurbishment are provided below:

Table 1.1: Level of refurbishment

Building Performance	Building Condition			
	Excellent	Good	Poor	Very Poor
Excellent	Maintain	Level 1	Level 2	Level 3
Good	Level 1	Level 2	Level 3	Level 3
Poor	Level 2	Level 3	Level 3	Level 4
Very Poor	Level 3	Level 3	Level 4	Level 5

Level 1 – Light Touch/Refresh

This represents the lowest investment, and delivers the least opportunity to generate value from the potential improvements to the building, but is a quick and relatively unobtrusive approach. The scope of works includes decorating, changing carpet tiles, replacing ceilings, repairing and upgrading minor elements of the building, including servicing the building's plant. Office floorspaces are often the most heavily used areas and are particularly suited to the light-touch approach as less effort is required to improve them. Externally, little will change and the immediate impression will be that the building has undergone routine maintenance rather than a refurbishment; however, reception and entrance rebranding can easily be included within light-touch improvements and can have a significant impact on staff, visitors and potential tenants.

Typically, the light touch will be applied when tenants leave a building, or to refresh a tired owned building for customers and visitors and therefore its focus is on the areas most visible.

Level 2 – Medium Intervention

This would include the scope of works outlined in Level 1 plus the replacement of building services in part of the building, cores, reception upgrades and a revised workspace strategy. A 'medium intervention' would see the public areas and office floorspaces given a more significant overhaul with the replacement of materials, fixtures and fittings. This could include replacement of toilet sanitary ware, new lighting, reception floor materials and entrance features. Replacement facilities for teapoints and upgrades to communications room facilities can also be achieved. The level of refurbishment is likely to be limited to works that fall below the threshold where a Building Regulations, or an equivalent such as ASHRAE, application would be necessary.

Such an approach is more likely from an owner-occupied building where the facility forms part of the image of the organisation and retaining staff and therefore the refurbishment is a means to enhance this. In conjunction, owner occupiers have a greater potential to refurbish at any time rather than wait for leases to end or plan for disruption.

Level 3 – Extensive Intervention

This would include the works outlined in Level 2 plus a full replacement of building services, some building-fabric changes, possible extensions to the floor plates and the remodelling of cores and communal areas. The enhancements should be carefully considered to commit only to the most appropriate improvements necessary to meet current Building Regulations, or an equivalent such as ASHRAE, standards and to 'future-proof' the building for a further 15 – 20 years.

An 'Extensive Intervention' delivers an upgrade that will represent an enhanced asset in the developer's portfolio and enable it to compete with an average new-build product in the local market. Buildings that are multi-occupied are often suited to this approach, allowing landlords to provide a major change every ten to fifteen years.

Level 4 – Comprehensive Refurbishment

This option is the most expensive of the refurbishment options and carries the highest development risk. However, it creates the best opportunity to capitalise on the improvement in asset value and associated increases in rent and aims to attract a wider base of potential tenants. This level includes the works outlined in the previous levels plus further development opportunities outside the building. For a site that has a particularly high residual land value, major refurbishment options can be more financially viable than demolition and new build. The works will bring the building up to current standards and ‘future-proof’ it for 20–25 years. Level 4 considers fabric performance and the lifespan of materials as well as the running and maintenance costs of the fully occupied building. Issues such as the relocation of the complete plantroom to optimise floor space, by using the previous plantroom areas, and the introduction of more efficient plant machinery at roof level or new plant towers to the sides of building can be considered, subject to structural and planning limitations.

This level of refurbishment intervention and the associated levels of investment can extend the lifespan of a building by bringing all elements up to date and ensure the building is competitive with high-value new-build office accommodation in the local market. The whole building will be affected, so this option is most appropriate for an empty building or one at the end of its lease. The ability to extend the building and add floors is often considered at this level of refurbishment. In addition, development on land associated with the building, such as air-rights development above surface car parking, can be considered. This will enhance the value of the site and help deliver more area, potentially a wider range and mix of uses, and increased environmental credibility. At the extreme end of ‘Comprehensive Refurbishment’, only the structure might be retained, with complete replacement of the exterior envelope, services, cores etc.

Level 5 – Demolition

The final level covers the demolition of the whole building, which will enable the construction of a new facility or amenity space in the vacant area. The choice of demolition will have sustainable imperatives associated with it and also provides a baseline in terms of cost for a new building facility in its place.

Table 1.2, below, provides the costs associated with the refurbishment options calculated as an average figure, but also with the lower and upper quartile costs. As expected, the lower the degree of refurbishment, the lower the cost. However, at higher levels of refurbishment, the difference in costs between the upper value of one level and the average level of the next level is minimal and sometimes even lower. Understanding the risks for greater levels of refurbishment is critical to defining the costs, with errors of margin likely to be significant in determining the optimum solution for the building.

Different buildings will require varying levels of refurbishment treatments dependent on the occupants and use of the building. Typically, multi-tenanted buildings will undergo light-touch refurbishments to core areas at the time when tenants change to maintain a fresh face to the building, supported by an extensive refurbishment every 15 years to ensure the building is updated both in plant areas and across the tenanted areas. Similarly, an owner-occupied building typically will undergo a medium refurbishment either across the whole building or in parts.

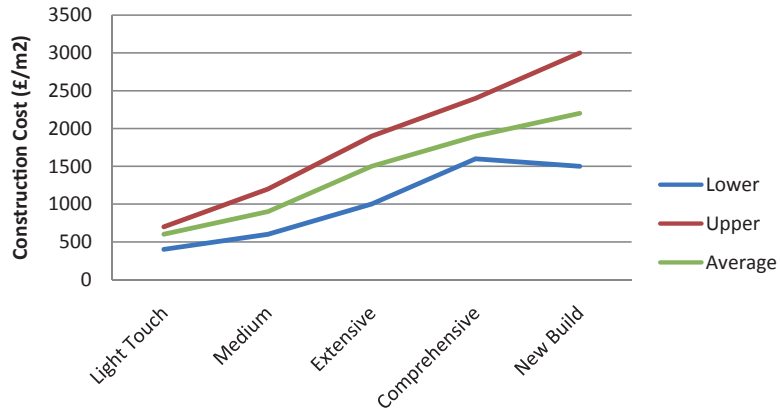


Figure 1.1: Cost assessment of refurbishment versus new-build construction costs.

Table 1.2: Cost assessment of refurbishment versus new-build construction costs

Degree of Refurbishment	Lower		Upper		Average		Average Difference from New Build
	£/m2	£/ft2	£/m2	£/ft2	£/m2	£/ft2	
Light Touch	400	37	700	65	600	56	-73%
Medium	600	56	1200	111	900	74	-59%
Extensive	1000	93	1900	177	1500	139	-32%
Comprehensive	1600	140	2400	223	1900	177	-14%
New Build	1500	139	3000	279	2200	204	-0%

In addition, there are the associated time reductions to bring the refurbished building to market as described in Figure 1.2.

Whilst refurbishment covers a range of diverse activities, the procurement options available do not generally cater specifically for the particular characteristics of refurbishment projects. In developing a strategy, the starting point is to understand the complexity of the project. The ability to influence and drive sustainable measures is also different across the various levels, with Levels 1 and 2 more limited by virtue of the reduced scope of work.

Key times for intervention for refurbishing include:

- When a significant gap emerges between the rents being achieved in your property and those in the same or equivalent locations;
- Your building loses a major tenant or multiple tenants and there are prolonged periods of vacancy;
- A major tenant’s lease is approaching its end and refurbishment offers an incentive to stay;
- Major plant requires refurbishing.

Simple refurbishment projects such as those covered in the Light Touch might be undertaken as part of a planned refresh cycle, or might be a short-term tactical investment to extend the economic life of an asset. The timeframe of the investment is typically five to seven years. There are a few complexities associated with

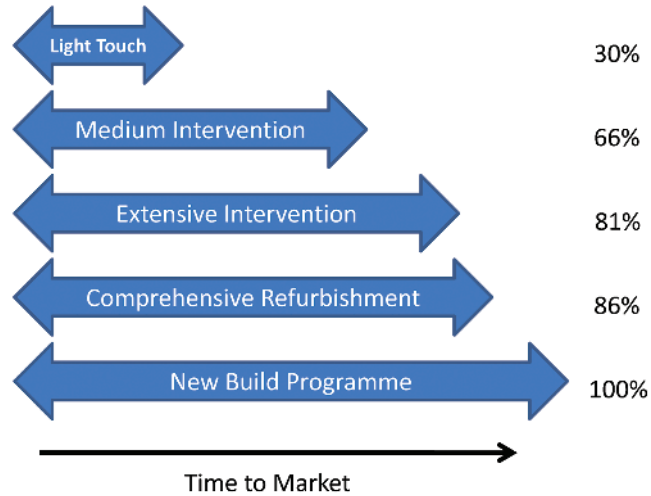


Figure 1.2: Time to market for the various levels of refurbishment.

this level of refurbishment such as elements of building services needing to be updated.

Medium-level projects generally involve upgrades to building services so the frequency investment is on a cycle of 15 to 25 years. Increasingly, improvements to the building fabric are required as a consequential requirement to meet Building Regulations. Refurbishments of this kind involve a greater level of risk associated with the existing building fabric and systems – either related to the reuse of some systems or the replacement or remodelling of windows and risers. The condition of the existing fabric and systems, together with any effects for end-users if refurbishment takes place within an occupied building, will have an impact on the level of risk for the project.

Major refurbishment is aimed at long-term remodelling of a building, addressing constraints such as circulation and maximising the potential offered by the site and the building consent. The risk with major projects is much greater but it can be met by the ability of an appropriate contractor to manage the risks. The maximum amount of information on building condition and any other risks need to be identified in advance.

1.3 Building Refurbishment Market and Size

In most developed countries, the existing building stock accounts for over 98 per cent of the total stock, with a replenishment rate of up to 2 per cent in peak times and lower than 1 per cent during times of economic difficulties⁵. Many of these structures were constructed prior to the recent global improvements in Building Regulations and Energy Standards. In the UK, more than 77 per cent of the commercial building stock was constructed before the energy-conservation measures were enforced⁶. This level is replicated across many other developed countries.

Conversely, the level of new build in the high-growth developing countries is significantly higher as new infrastructure is built to provide workplaces and homes for many of those arriving in the rapidly growing urban centres. India and China,



Figure 1.3: Existing built structures in Spain (a) and India (b) constructed to historic building standards requiring different levels of refurbishment.

in particular, have seen a significant increase born from such an urbanisation together with the increase in manufacturing and employment capacity to meet the requirements of global trade. Mostly being removed are poorly constructed buildings in order to increase the urban space and provide more stable and substantive building. As such, the level of refurbishment is more likely to be Level 5 (Demolition) than any other (Figure 1.3).

The refurbishment market is also affected globally by economic changes and investment effects which drive the use and availability of space together with the ability to provide the capital for upgrades to buildings. It is interesting to note that cities in developed countries have a significant refurbishment market due to lack of space in urban centres, which helps to support the refurbishment market. Conversely, the new-build programme of many developing countries with

expanding cities or new urban centres means a limited focus on refurbishing existing buildings.

Analysis by MBD shows that the repair-and-maintenance market is approximately 45% to 50% of the total building construction sector⁷ within the UK amounting to a spend in excess of £50 billion per annum. This figure includes a range of sectors and scale of refurbishment activities including commercial and domestic improvements. The report states: 'In the private non-residential sector, repair & maintenance expenditure has been increased strongly within the review period, reflecting a reduced level of new construction expenditure within the industrial sector in the early part of the review period as well as a significant slowdown in new construction activity within the commercial sector. Furthermore, although there has been economic growth, corporate profitability has remained under pressure encouraging repair & maintenance over new investment.'

Adaptive Re-use of Buildings – Portland, Oregon – Case Study

Where tight capital and weak markets for greenfield projects exist, adaptive use is an attractive approach to developers and to governments looking to create local jobs and fight climate change. Adaptive-use projects, aligned with inner-city regeneration, remain a bright spot and are commonly supported by government incentives.

In October 2009, President Obama issued an executive order that required the federal government to redevelop its own massive inventory of buildings through adaptive use and green renovation. Under the order, planning for new facilities or leases also has to consider sites that are pedestrian-friendly, accessible to public transit, and within existing central cities. As an example, the Edith Green–Wendell Wyatt Federal Building in downtown Portland, Oregon will receive \$130 million in federal stimulus money for a state-of-the-art sustainability retro-fit. The project will include a rooftop solar array, 50 per cent reduction in lighting energy, 65 per cent reduction in water use, and a renovated energy-efficient exterior.

However, it takes a significant set of additional skills to manage the challenges of adaptive use, involving a complex mix of resources: federal historic tax credits, federal brownfield development loans, state historic tax credits, state brownfield credits, tax increment financing, property tax abatements and other tools. Partners have often included governments, institutions and other businesses that have to find new structures to work together effectively. The key is to unlock the hidden economic benefits of adaptive use, in combination with other forms of sustainable development, so that the projects become fully market-driven. That requires finding and combining all potential revenue streams.

The new emphasis on adaptive use is coming partly from sustainability and economic development goals. A bigger factor is a tidal wave of demographic change, combined with changing spending habits. ULI's *Emerging Trends in Real Estate 2011* documents the trend: 'Infill over fringe – the

“move back in” trend gains force as 20-something echo boomers want to experience more vibrant urban areas and aging baby boomer parents look for greater convenience in downscaled lifestyles.’ Those demographic forces, together with changing markets and continued tight credit, mean a seismic, perhaps permanent, change in the development environment. This is providing a real focus on ‘repurposing’ existing buildings over the next three years, especially with the need to focus on urban areas.

Even with these incentives, there remain challenges for adaptive use and renovation, particularly where these are uncovered late in adaptive-use projects. Building codes act as an impediment, by not enabling a historical mixed-use project that has been reduced to a single use to be reconverted. Governments seem increasingly motivated to remove these barriers, in part because of the job-creating potential and other economic benefits of adaptive-use projects. Advocates point to the historical successes of projects like Vancouver’s Granville Island, an arts-and-market district where an initial public investment of just CDN\$25 million now produces CDN\$35 million in annual tax revenue alone – an eye-popping return of 140 per cent. Add to that an estimated 2,500 new jobs, and CDN\$130 million a year in additional economic activity.

While those kinds of returns are not often duplicated, research shows that such local economic activity does bring a bigger economic-multiplier effect for the community. That effect can be especially powerful with adaptive use of historical buildings.

The US building stock is constantly in flux, but presents a huge opportunity for change. Each year approximately 1.75 billion square feet of the nation’s 300 billion square feet of building space are demolished and replaced with approximately five billion square feet of new building space. In addition, about five billion square feet of building space are remodelled each year. Commercial buildings in particular are viewed as the best targets for improvement. In the US, for example, there are 74 billion square feet of non-residential space.

There was a prolific period of commercial-office development from the 1970s to the 1990s when many buildings constructed were designed to last 25 to 30 years and are therefore now reaching the end of their life and coming to the market as redevelopment opportunities. Importantly during this timeframe, the buildings were constructed to meet a speculative market and therefore constructed with a lower cost in mind to maximise profits.

Historically, buildings were constructed for occupation by multiple users who would be able to adapt and modify the interiors, and exteriors, to suit the requirements of the market. Larger houses became offices or hotels and were adapted to suit. However, there has been a trend more recently for buildings to be constructed for a finite use, reducing the ability for the building to be refurbished for alternative uses.

This has led to a situation whereby the refurbishment market is focused towards older building stock where it is feasible to make the changes. More modern

buildings will incur a significant cost to bring them back to market and therefore it becomes cheaper to demolish and rebuild.

This is forcing decisions to be made about the investment benefits of refurbishing the building relative to demolishing it and starting afresh. Buildings built between the 1970s and the 1990s are often defined by certain technical criteria and dimensional characteristics and have been impacted by incredible technological evolution over that period.

Growth in developing economies is still the priority, which leaves little potential for refurbishment on a major scale as it is easier to knock down and rebuild. The key for these economies such as in India and China is to learn from experiences within the US, Europe and similar countries and adopt green building practices. Nevertheless, some economies operating within constrained space requirements are looking to better utilise the buildings they have. Since 2005, Malaysia has been moving away from constructing new buildings in favour of refurbishing historic and old ones. This is due to a number of reasons, including the economic crisis, land limitation and sustainable issues.⁸

Endnotes

- 1 Webster's New World College Dictionary Copyright © 2009 by Wiley Publishing, Inc., Cleveland, Ohio. Used by arrangement with John Wiley & Sons, Inc.
- 2 LEED New Construction V2.2 Reference Guide October 2007
- 3 BREEAM user guide – www.breeam.org/
- 4 Can Do Refurbishment: Commercial Buildings of the 70s, 80s and 90s, British Council for Offices, October 2009
- 5 I. McAllister and C. Sweett, 'Transforming Existing Buildings: The Green Challenge', March 2007
- 6 'Surveyors lead plan to transform existing commercial buildings', *Energy in Buildings and Industry*, 2007; vol. 4, p. 8
- 7 The UK Facilities Management Market Development © MBD 2007
- 8 Occupant feedback on indoor environmental quality in refurbished historic buildings; S. N. Kamaruzzaman, M. A. Emma Zawawi, Michael Pitt and Zuraidah Mohd Don; *International Journal of Physical Sciences* Vol. 5(3), pp. 192–199, March 2010, www.academicjournals.org/IJPS