

High-Rise 'Luxury' Apartments



lift performance and specification review

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Executive Summary

The development of high-rise buildings is on the increase in many UK cities; high-rise living rather than the demand for offices is fueling the rush to erect tall buildings. Studies show that 44% of new homes in Britain are now apartments.

One key element in the design of a high-rise residential building is the vertical transportation; moving people efficiently from one part of the building to another. However, little research has been conducted into the specification of lifts for this building type and they are often seen as a cost rather than an investment. At the design stage there is pressure to maximize the sellable space and therefore reduce the space required for lift services.

While clear standards are available for other types of building (including low-income high-rise buildings) the standards for high-rise 'luxury' residential buildings are vague and do not take into account the building users. This coupled with the lack of reference sites in the UK make vertical transportation planning very difficult.

There are also many environmental and safety issues to consider when planning for lifts such as; fire-fighting and evacuation capabilities, movement of goods in and out of the building along with waste disposal management. These are all critical considerations when planning a vertical transportation strategy and may not necessarily sit comfortably with passenger usage.

It is interesting to note that most residential units in high-rise buildings are sold off plan to investors. At this stage elevation is unimportant to them as they are more interested in layouts, views, fixtures & fittings etc. However, once the apartments are occupied the vertical transportation is very important to the residents. If a building is under-elevated the value will decline over time and it is very difficult to add lifts to an existing building.

The strategy for vertical transportation is critical to the success of the building and must be treated as a priority at the planning and design stage. For a luxury high-rise residential building the lifts should reflect the décor and design of the building and should become almost a second lobby for the residents.

This study has gone some way in defining the high-rise residential market and identifying the users' needs. It has also exposed a knowledge 'gap' as far as professional guidance and standards are concerned. Our skyline is set to change and we must ensure the buildings are built with the final users needs in mind so we create buildings to be proud of and buildings that will stand the test of time.

*.... the penthouse owes more to the invention of the **safety elevator** than it does to the demands of the seriously wealthy for a premium perch.*

Luxury Real Estate
The Truth About Penthouses
By Michael O'Flynn

Introduction

This D2E International sponsored study examines the technical specifications and customer requirements for vertical transportation within the luxury high-rise apartment building sector.

There has been very little published research in this area as this type of apartment block has not been associated with the luxury market in the UK until recently. This review aims to fill this information gap.

The review focuses on the lift technical specifications within this sector along with the residents needs and desires, as well as reviewing important factors as highlighted by other interested parties, such as managing agents, lift companies etc.

It starts by defining the market sector and looking at the history of high-rise apartments in order to gain a better insight into where the market has come from and where it is going in the future.

The methodology used to complete this research is based around interviewing key players within the market and conducting a series of detailed customer satisfaction surveys to identify the key issues and the relevance of these issues to the end-users (i.e. the building residents and managing agents).

The review also looks at other factors influencing this market sector, such as; regulations, demographics, social trends and overseas influences.

Scope of the review

This review looks at high-rise buildings that are either wholly or mainly used for residential purposes in the UK. It will focus on the luxury end of the market and will concentrate on prestigious developments found mainly in UK cities.

This sector is often termed 'high-rise apartment buildings', an American term used in an effort to distance these new buildings from the older tower blocks from the 1950s and '60s. An apartment block is 'a multi-unit high-rise apartment building'. For the purpose of this study we classify high-rise as buildings with over 12 storeys. The detailed specifications and technical requirements for this sector will focus on all vertical transportation requirements for the building, including; passenger lifts, goods lifts, fire lifts and any other lift or escalator requirements.





Figure 1 – Typical 1960's Tower Block, South Wales



Figure 2 – Beetham Tower, Manchester

History of apartment blocks

In the UK after the Second World War there was a massive need for housing to replace ageing 19th Century dwellings and replace buildings destroyed by bombs. The 'quick-fix' was tower blocks. Initially, they were welcomed as they were seen as modern living with fantastic views, usually built in central locations.

However, as the buildings deteriorated they soon gained a reputation as undesirable low-cost housing associated with growing crime levels. In 1968, UK tower blocks hit an all time low with the partial collapse of Ronan Point bringing new construction of tower blocks to a standstill.

In recent years, some council or ex-council high-rise buildings have become popular with young professionals due to their excellent views, desirable locations and architectural pedigrees. After a gap of almost 30 years, new high-rise flats are once again being built in Glasgow, London, Manchester and Liverpool, this time for wealthy professionals.

While there is still a long way to go before we all live in the towers now familiar in many US and Asian cities there is a definite shift in the UK away from houses towards flats.

The National House Building Council (NHBC) states that in 1997 47% of new homes built in the southeast were detached houses with only 14% flats. In 2003, 46% of new homes were flats compared to only 19% detached houses.

Across England as a whole the proportion of detached houses fell from 44% to 32% between 1997 and 2002. Over the same period flats rose from 15% to 32%, indicating a trend in the UK towards high-rise living.

High Rise Britain

The UK's tallest residential building – No 1 Millharbour in the London Docklands - boasts 700 apartments located in two interlinking towers rising to 36 and 50 storeys. This is just one of many similar projects now underway in cities across Britain. With house prices soaring across the UK, and many people unable to afford a traditional family home, is the answer high rise apartments? With the 47 storey, 171m high Beetham Tower in Manchester selling two-bedroom apartments at £700,000 (seven times the average price of a house in the area) it is clear this development (along with many other high-rise schemes) is not intended for low income earners or first time buyers.

'... these high profile projects have far more to do with Sex and the City than Only Fools and Horses'

The return of high-rise Britain?
BBC News
Duncan Walker



Figure 3 – 'Sex and the City' Style apartment blocks



Figure 4 – 'Only fools and horses' image of apartment blocks

There are many projects underway across the UK's cities with most developments aiming for the luxury end of the market.

There are several key factors driving the high-rise apartment 'boom' in the UK;

- Soaring **cost of housing** in UK created by a shortage of homes
- **Planning policies** protecting the countryside while encouraging development on brownfield sites
- **Housing trend** moving away from traditional houses towards flats and apartments and the desire for 'city living'
- Population growth and **demographic changes** in the way we live (i.e. increase in the meal-for-one society with people choosing to live by themselves) increasing demand for housing
- Gap in supply and demand adding to **housing stock** problem – 220,000 new homes required each year with only 170,000 being built
- Changes in **wealth distribution** and the trend towards 'sexy' apartments with great views across cities and aspirations of living the 'penthouse lifestyle'
- **Influences from overseas**, in particular the US and Asian cities where high-rise living is popular

It appears that the new wave of high-rise apartments is much more aligned to 'Sex and the City' (Figure 3) than the traditional 'Only fools and horses' (Figure 4) image of high-rise Britain.

With these developments offering great views, high-tech features, top of the range fixtures and fittings and exceptional design along with leisure and entertainment facilities it is clear why they are commanding such high prices in the market.

High Rise Development – Key Drivers

As mentioned in the High Rise Britain section, there are several key factors influencing the market for high-rise developments. It is important to understand these factors as they will have an impact on the future trends for housing in the UK.

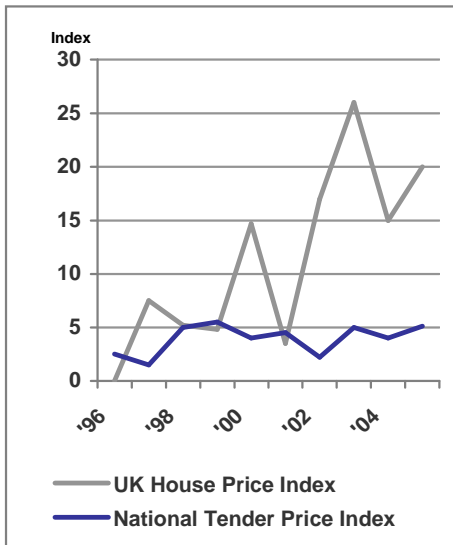


Figure 5 - House Price & Build Cost Inflation

Cost of Housing

The rapid increase in house prices experienced in the UK over the past 10 years or so have significantly outpaced the rate of growth in development costs. This has opened up a significant gap between build costs and selling prices, improving the margins for developers and therefore enabling developers to develop more expensive high rise schemes. Figure 5 illustrates this house price and build cost inflation.

Planning Policies

There has been a definite trend over the past 10 years or so towards the preservation of the countryside. However, councils are still under immense pressure to meet the growing demand for new housing. The combination of these two factors has led to the policy of encouraging developers to build on brownfield sites. The main provincial centres such as Manchester, Liverpool, Newcastle, Glasgow and Birmingham are all vying for the title of the UK's second largest city and have received considerable support from the councils for high rise schemes.

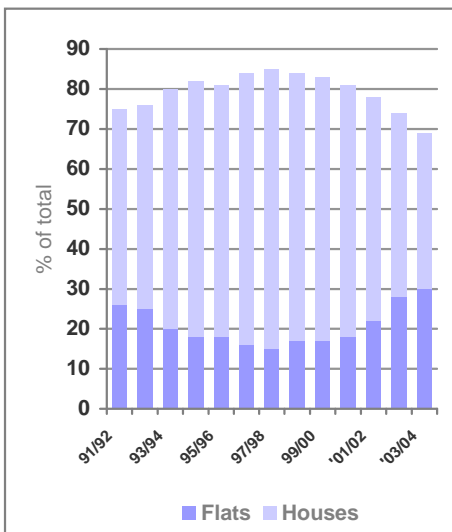


Figure 6 – New Build residential units by type

Housing Trends

City centre living in the UK has traditionally been associated with social housing and low cost terraced housing. It has only been in the last 10 years that the trend has started to change and the residential housing offer has developed. The development of this new market has changed the dynamics of many UK city centres. Figure 6 shows the increasing importance of flats in the overall market in England and Wales. As the percentage split for flats has increased steadily since 1997/98 the percentage of houses has fallen.

The National House Building Council (NHBC) latest statistics show that almost half of new homes started in the UK to end August 2006 were flats and maisonettes.

In 2000, high rise building made up less than a quarter (22%) of new housing stock in the UK, however in 2005 this doubled to 44%. 2006 figures continue to show that apartments are dominating the market place.

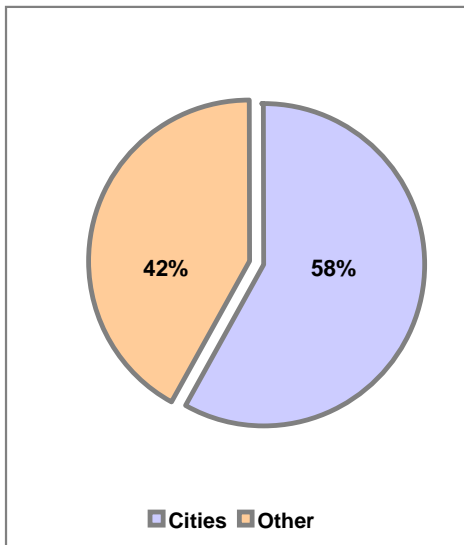


Figure 7 – Percentage of Population living in cities in 2003

Changes in Demographics

In 2003, 58% of the English population lived in cities. There has been a reversal in decline of city population with cities accounting for 42% of population growth between 1997 and 2003. London provided 34% of England's total growth. There has been a convergence in population growth rates with Birmingham, Leeds, Sheffield, Manchester, Liverpool and Newcastle moving up steadily from their high losses in the early 1990s.

Another change in demographics over the past 10-15 years is in the way we live. More and more people are choosing to live by themselves, increasing the demand for housing and moving the market towards smaller units.

The Housing Stock

Based on the 2000 population projections, and assuming every household has a separate home, plus an additional 3% for vacancies, England will require approximately 215,000 new homes per year from 2001 to 2021. Actual housing completions fell to 130,019 in 2001 and averaged 139,600 per year between 1997 and 2001. If maintained, this rate of completions will only meet 60-65% of the likely demand over the next 20 years, with an average shortfall of some 70,000 homes per year. This could mean a shortfall of some 1.5 million dwellings by 2021.

These statistics have added pressure on the city planners, councils and developers to increase the speed of development in city centres and encouraged the development of high rise residential towers.

Wealth Distribution

The new wave of apartments being built in the UK is not doing much to ease the problems of affordability for first time buyers or low income earners. The new luxury apartment blocks are landmark schemes such as Manchester's Beetham Towers where two bedroom flats are selling for £700,000 (seven times the average price of a home in the city).

Overseas Influences

Major cities in the United States along with many Asian countries such as Singapore and Hong Kong have embraced high-rise city living for many years. These countries have a major influence on the new wave of developments hitting the UK with many overseas investors keen to gain a foothold in the UK high rise market.



Figure 8 – Influence from overseas on UK developments

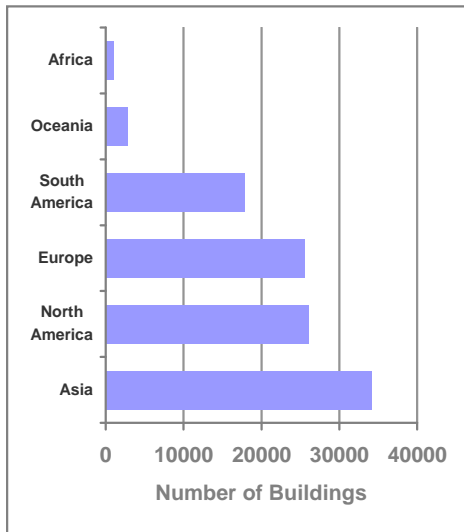


Figure 9 – Number of Skyscrapers in each Continent



Figure 10 – Number of Skyscrapers in each European Country

The World Market

Asia has by far the most number of skyscrapers (defined as 12 floors or more) with some 34,000 accounting for 32% of the total world market. North America has 24% with Europe just behind with 23.75%. These numbers are for the total number of skyscrapers in each continent and not just residential units.

In Asia the most active country by far is China with over 13,000 skyscrapers, followed by Japan, with over 5,000 and Singapore & South Korea with over 3,000 each.

As you would expect in North America nearly 20,000 of the buildings are in USA and 5,000 in Canada.

Europe has some 25,500 skyscrapers across some 20 countries. Spain has the most skyscrapers with 7,486 followed by Russia with 3,357 and the UK with 3,043. Germany, Netherlands, Ukraine and France also have significant numbers (over 1,000).

European Focus

The housing market in Europe recorded a turnover of 489 million Euros in 2003 and the forecast for 2004 is a 2.8% increase on 2003. Further increases are expected in 2005 and 2006 of 0.7%. Residential construction accounted for 46.5% of all construction output across Europe.

The housing market is moving at different speeds across Europe. The Spanish residential market is slowing down as is the UK market, although the Eastern European market is booming. The Eastern European market is different from the UK market, as many smaller size units (60-100m²) are built for the local market, whilst larger units are reserved for investors and the emerging middle class.

UK High Rise Residential Buildings

The UK market for high-rise buildings is led in the UK by London but is closely followed by Glasgow, Birmingham, Manchester and Leeds.

In the UK there are some 3,957 high-rise buildings at one stage of the construction cycle (Vision, Proposed, Approved, Planned, Cancelled, Under Construction, Completed, Renovated or Demolished). Of these 67% (2,661) are residential buildings.

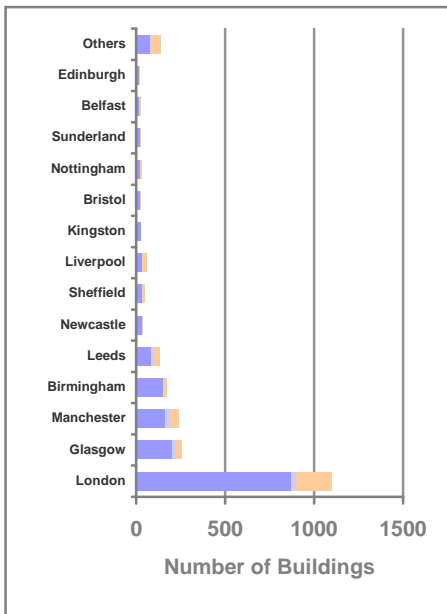


Figure 11 – UK Residential Projects for each City

UK Residential Developments

In the UK there are 2,661 residential high-rise projects. For this study the following projects have been excluded:

- 69 Cancelled
- 240 Demolished
- 8 Renovated

Therefore there are 2,344 projects in the UK, of which:

- 1,779 (76%) are completed
- 124 (5%) are under construction
- 441 (19%) are either vision, planned, approved or proposed

With 1100 (47%) of the high-rise residential projects based in London it is apparent that the Capital is where the main focus is. However, Cities such as; Glasgow with 254 (11%), Manchester with 239 (10%) and Birmingham with 170 (7%) projects are also key cities.

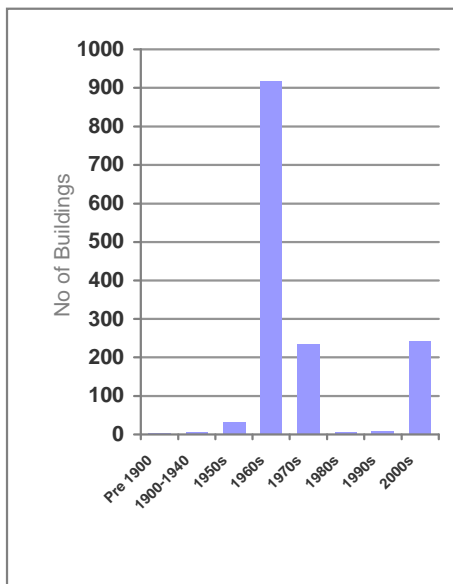


Figure 12 – UK Residential High Rise Building Construction

The overall UK trend (Figure 12) for high rise residential buildings shows that in the 1960s and 1970s there was a massive boom in high rise residential buildings - as the need for quick-fix housing to replace ageing stock and bomb damaged homes kicked in. The trend for high-rise slowed to almost nothing in the two decades that followed due to its unpopularity. In 2000 and beyond the trend for 'new, luxury' high rise apartments have clearly become apparent.

Composition of Residential Skyscraper

The break down of costs for a residential skyscraper are effected by many factors such as; height of the building, size of apartments, design, location and quality.

Height

Construction costs rise as the height of the building increases. The major rise in building costs is between the 12th and 40th floors largely due to the complexity of the building which only benefits from economies of scale from 40 floors up. Costs tend to level off from 50 storeys.

Size of apartment

The larger the apartment the cheaper it is to build as the mechanical services, bathrooms and kitchens form a large proportion of the cost and for smaller units these form a larger percentage of the cost.

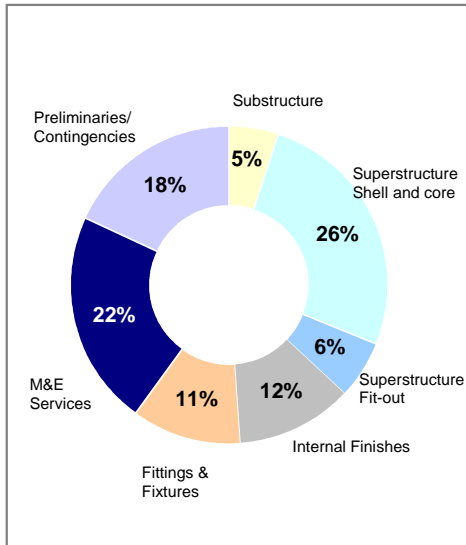


Figure 13 – Typical costs associated with luxury apartment

Design

These prestigious developments require a unique design and look which increases the overall cost. The aim is to develop a land-mark building which will increase the desire for investors to purchase apartments in the building.

Location

High-rise luxury apartments will be built in central city locations where land costs are at a premium.

Quality

A large percentage of construction costs will be spent on mechanical and electrical elements such as; cooling systems, wiring, networks and high security. The bathroom and kitchen fittings will be of a high quality and add to the overall costs.

Figure 13 shows the breakdown of cost associated with a typical high-quality residential apartment. As you can see 22% of the costs are associated with the mechanical and electrical engineering services, second only to the superstructure costs.

Vertical Transportation Costs

The costs associated with the vertical transportation (lifts) are linked to the number of floors within the building. Lifts within luxury residential buildings must have the capacity to move large numbers of people at peak times. The preferred solution is to increase lift speed rather than increase the number of lifts as this would impact on net floor space.

The requirement for fast lift speeds and high quality engineering leads to a cost premium for lifts. In addition, there must be provision for fire-fighting control on lifts over 18m high. The movement of goods (furniture and waste) must also be considered in any scheme.

Benchmark figures for lifts indicate that they expected to contribute 3% of the total costs to the contract sum.

Figure 14 shows a typical lift layout for a high-rise residential building, consisting of:

Tower 1 (Highest)

- 4 Residential Lifts
- 1 Refuse Goods Lift

Tower 2 (Lowest)

- 3 Residential Lifts
- 2 Serviced Apartment Lifts
- 1 Bicycle Lift



Figure 14 – Lift layout for high-rise building

From This

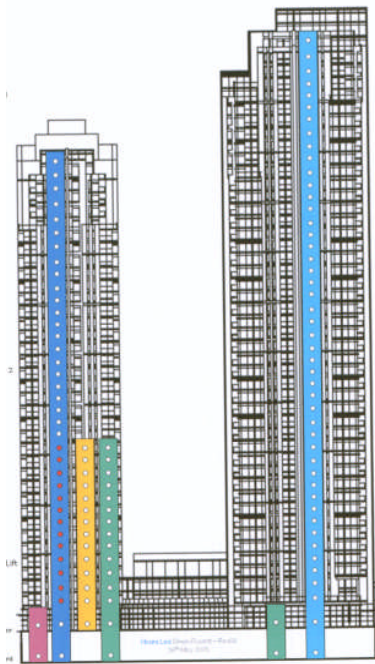


Figure 15 – Pan Peninsula drawings

To This



Figure 16 – Pan Peninsula completed towers

Building a High-Rise Apartment Block

Taking a high-rise project from concept through to completion is a long process involving many different people and many stages. Each project will vary depending on its location, size, usage etc but the stages below are the fundamental building blocks for any project.

Vision

The land must be acquired and the vision created. This will involve investors, developers, architects and local planning committees.

Proposals

A series of proposals will be developed outlining different schemes for the site.

Planning

The planning process will involve many consultation groups including; local councils, architects, local residents and other stake holders.

Approval

The plans will need full approval before the construction can commence.

Construction

The property developer will employ major contractors and specialist contractors to carry out the construction work. There will also be a project manager employed to oversee the entire project.

Commission

Once the building has been constructed it must be commissioned.

Pan Peninsula

Figure 15 and 16 show the Pan Peninsula building, London developed by Ballymore Properties Limited with Skidmore Owings & Merrill as the architects. This two tower building has retail space but primarily consists of 356 residential units.

The tower rises some 150m high with 50 floors. The scheme was proposed in 2002 and is due to be completed in 2007.

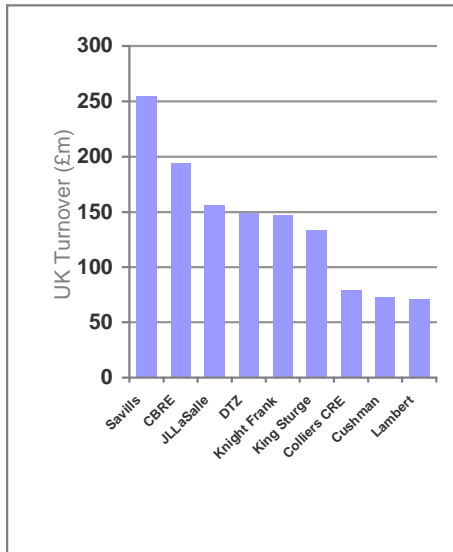


Figure 17 - Top 10 UK Agents in 2006 by turnover

The Players

There are many players in this market. For the purpose of this report the focus shall be on the architects, property developers and agents,

Architects

There are many architects involved in the high-rise apartment market. Some of the most active include; Foster & Partners, Skidmore, Owings & Merrill, Squire & Partners, Broadway Malyan & HOK International to name but a few.

Property Developers

For large projects such as high-rise apartment buildings special companies are set up just for that project. These are often backed by one of the large property developers, such as; Ballymore, Redwell, St George, Barrett, Redrow, City Lofts, and Berkerley Homes.

Agents

The top ten agents in the UK have grown by some 260% over the past 10 years. Figure 17 shows the top 10 UK agents. The largest three firms in the world (CBRE, Jones Lang LaSalle and Cushman & Wakefield) are headquartered in America but the next three (DTZ, Savills and Knight Frank) are based in the UK. These companies are beneficiaries of globalization and an absence of competition from outside the UK/USA. For these companies the World is now their market.

Vertical Transportation Players

In the Lift and Escalator Industry there are only four or five companies that would be involved in this market sector, they are; Otis, Kone, Schindler, Thyssen and Mitsubishi.

Each of the major lift companies has the technical knowledge and the products to handle projects on this scale.

It is important that the major lift companies can demonstrate a track record for high-rise buildings and have strong references when bidding for these projects.

Much of the experience in the UK has been gained in either high-rise office or hotel buildings as the new style luxury apartment towers are a fairly new phenomenon in the UK.

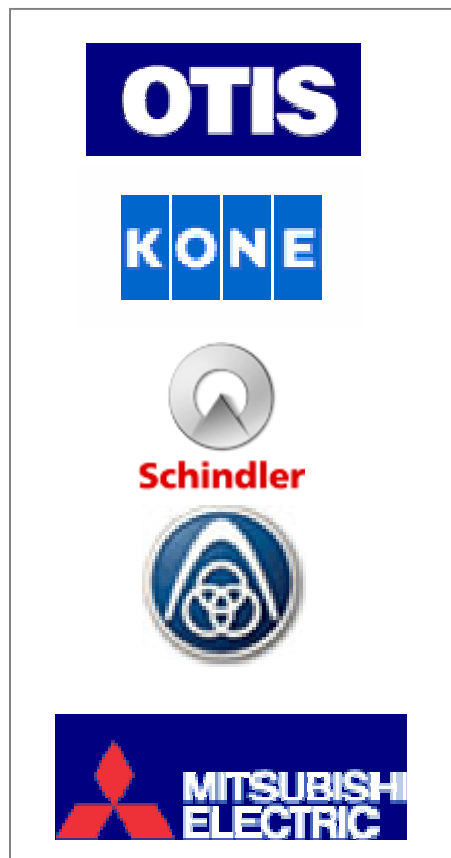


Figure 18 – Major players in the lift industry



Figure 19 – Key sources of information for standards

Conventional Standards

The conventional standards for lift design and the performance criteria associated with lifts have gone relatively unchallenged over the years. It is generally accepted in the industry that the sources for the design of lifts are;

- British Standard 5655 Part 6
- CIBSE Guide D – Transportation Systems in Buildings
- British Council for Offices Best Practice Guide
- EN81-1

These sources along with industry papers by Strackosh, Barney etc. give guidance as to the lift performance depending upon the building usage and are based around the following criteria:

Handling Capacity

This is the percentage of the diversified population arriving during five-minute morning up-peak periods that are required to be transported by the lifts.

Building Occupancy Density

This is the calculation for the number of people residing within the building per meter squared.

Average Interval Time

This is the time (in seconds) between successive lifts arriving at the main access level.

Car Occupancy

The car loading capacity factor is the nominal load carried by a lift on each journey defined by a percentage of the lift car capacity.

Other Factors

The guides also suggest other factors be taken into consideration, such as: Stair Factor, Door Open times, Door Dwell times, Motor Start delay, Lift Car acceleration.

	Luxury Flats
Handling Capacity	8%
Occupancy Density	See Below
Average Interval	20-30s
Car Occupancy	80%

	Occupancy (People)
Studio	1.0
1 Bedroom	1.5
2 Bedroom	2.0
3 Bedroom	3.0

Figure 20 – CIBSE Luxury Apartment criteria summary

Residential Buildings

Sophisticated standards have been developed for buildings such as offices, retail premises and hotels due to the number of these types of buildings in the UK. However, historically, high-rise apartments in the UK have been designed for low-income local authorities where vertical transportation considerations have been very low priority. This is reflected in the lack of detail outlined in the CIBSE Guide D for residential buildings. Figure 20 shows the key criteria published by CIBSE in relation to high-rise luxury apartments.

Other factors CIBSE reflects upon in its guide include; providing a safe and pleasant environment, being able to move easily around the building, DDA compliance, providing more than one lift if the building is over 5 floors and the provision of a goods lift or as a minimum a dual purpose lift.



Figure 21 – Passengers

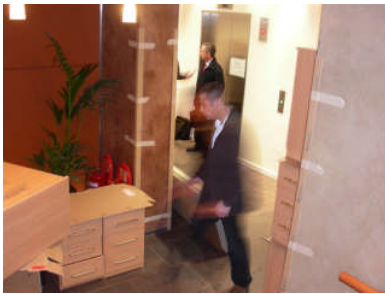


Figure 22 – Deliveries

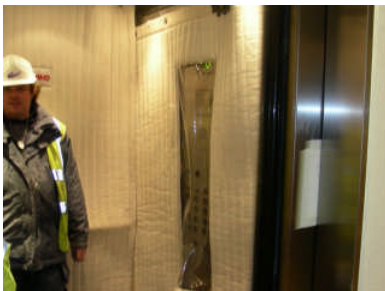


Figure 23 – Goods / Trade

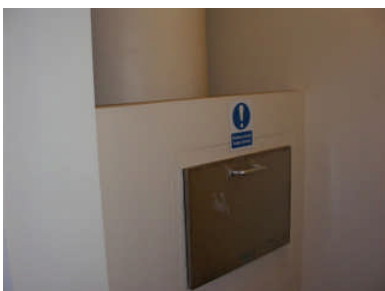


Figure 24 – Waste Disposal

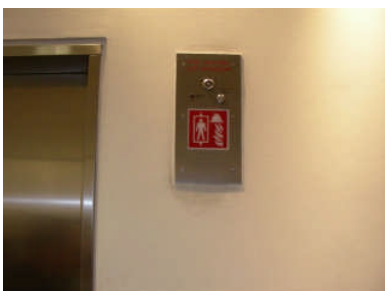


Figure 25– Fire-Fighting

Lift Uses in a Residential Building

It is important to understand exactly what the lifts within a building will be used for by understanding all the various activities that may occur on either a daily, weekly, monthly or annual basis. The following are the key activities:

Passengers

The movement of people from one floor to another throughout the building, mainly from the entrance lobby to their occupied floor. This will include residents, guests and staff.

Deliveries

Regular deliveries such as; post, parcels, groceries etc. on a regular (daily) basis.

Goods

Delivery and movement of goods such as furniture, apartment refurbishment & decoration and general tradesman waste.

Waste Disposal

The disposal of regular household waste on a daily basis for either recycling or disposal.

Fire-Fighting / Evacuation

The use of lifts for fire-fighting purposes and evacuation of people in the case of an emergency.

General

There are several very important factors that need to be taken into consideration when planning the lifts within a high-rise building and the uses of the lifts. Factors such as;

- A fire-fighting lift must be provided if the building is over 18 meters high.
- A fire-fighting lift cannot be used for goods or deliveries.
- A fire-fighting lift must be clearly marked as such on every landing.
- The goods lift must be able to move large pieces of solid furniture (as opposed to flat pack furniture associated with offices).
- The goods lift must be protected as it will be used by builders and tradesmen.
- The disposal of waste will create smell and possible spillages in the lift car.

Fire-fighting regulations are very important in the design of a building. A summary of these regulations is provided below.

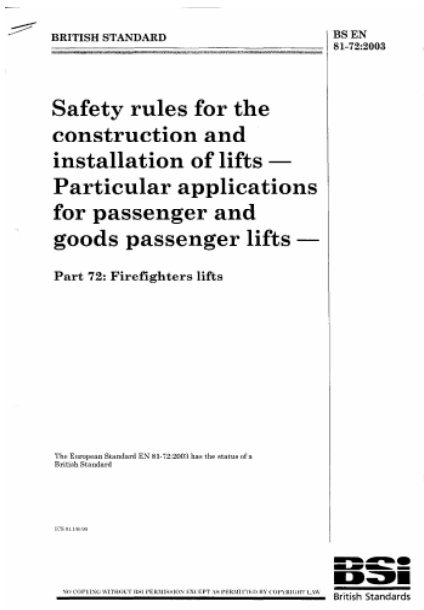


Figure 26– British Standard Regulations

Fire-Fighting Regulations

BS EN81-72:2003 Part 72: Firefighters Lifts sets out the requirements for fire-fighting lifts.

The following assumptions were made whilst writing this standard:

- The fire protected lobby and lift well are designed to restrict the ingress of smoke.
- The building design limits the flow of water into the lift well.
- Fire-fighters lifts are not escape routes, such as staircases etc.
- Firefighters lift accesses at each level to a protected lobby.
- Negotiations have to be made between the owner/customer and installer concerning; the intended use of the lift, environmental conditions, civil engineering problems, and other aspects related to the place of installation.

The regulations will have a significant impact on the design and aesthetics of a building as each floor must have a fire protected lobby and clear signage (see Figure 27).

The lift car must contain certain items such as a trap door to the ceiling, stepping points within the car and intercom unit (see figure 28).



Figure 27– Fire-Fighting Lift signage



Figure 28– Fire-Fighting Lift Car

“...feeling of luxury”

“...total travel time – from calling lift to arriving”

“...overall quality of the lift”

“...feeling of space”

“...goods lift separate from passengers”

“...enough lifts so do not have to wait too long”

“...low running costs”

“...need to be fast”

“...all about living the lifestyle – high-rise living”

“...good reference point would be the trump towers”

“...feeling of speed”

“...need to have a residential feel to the lifts”

“...should look really good – not like office lifts”

A selection of comments from the many interviews conducted during this research.

Challenging the standards

The technical standards outlined are used to determine the number, size and speed of the lifts within a building. However, may be important to challenge these standards and reflect upon the following key issues:

- Do these standards reflect the requirements of a luxury residential building?
- Have the end users (tenants) requirements been taken into account?
- Are the same criteria relevant for this type of building as used for other building types?
- Are these standards based upon solid research into requirements for luxury apartment blocks?

The evidence reviewed in this research study appears to indicate that we are right to challenge these standards and we will demonstrate this in the remainder of this report.

What the users/experts think

When questioned about the important factors to consider as far as vertical transportation systems are concerned in high-rise luxury apartment blocks, the following issues were seen as the most important (as defined by the users and experts):

Speed

The total time taken from calling the lift to arriving at the required destination.

Comfort

The overall smoothness and general comfort of the transportation.

Ambiance

The feel of the lift car in terms of smell and temperature control.

Aesthetics

The lift should have a feeling of luxury, light, bright and reflect the look and feel of the building.

Quality

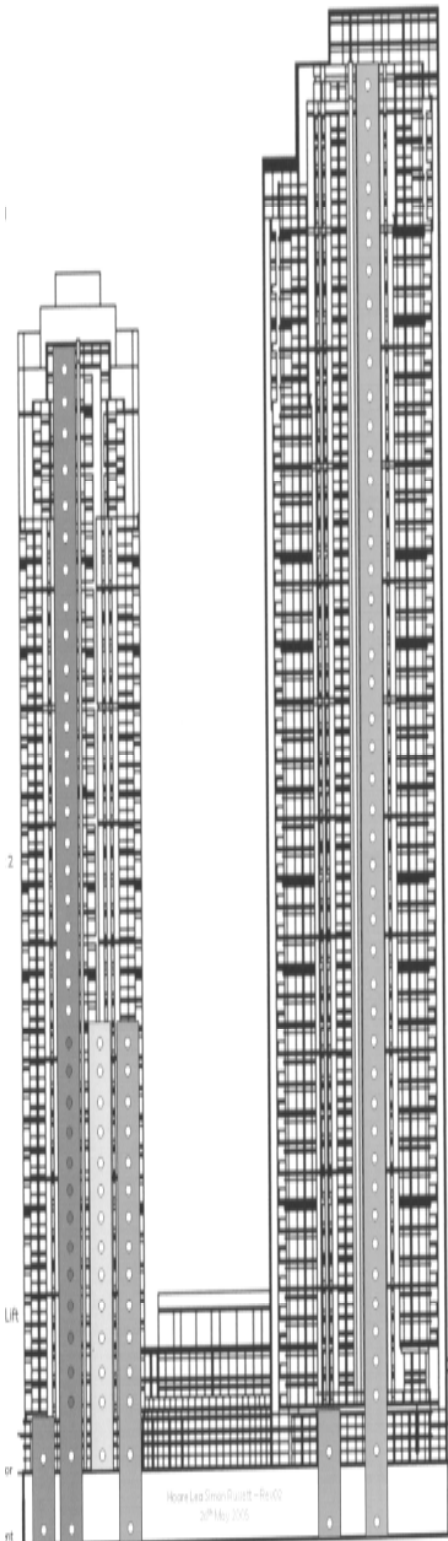
The overall quality of the lift - making passengers feel safe and secure and enjoy the experience.

Size

The feeling of space within the lift car is important and adds to the overall comfort and ride.

Reliability

The lifts should always be working and never trap passengers.



Luxurious

The lift should include luxury ‘wow’ items such as TV/Information screens and key codes for higher floors.

Other

Other important issues were raised like the disposal of waste and the use of lifts for contractors and deliveries. Passengers want the lifts for passengers.

Answering the questions?

Do the standards reflect the requirements of a luxury residential building?

The professional standards have been written based mainly on the experience of high-rise low income apartments popular in the 1960s in the UK. They reflect the important issues found in other types of buildings such as offices and hotels but maybe miss the key factors associated with luxury high-rise buildings. When a resident has paid a great deal of money to purchase an apartment in a luxury development they expect the lifts to reflect the overall design and feel of the building. They want to be able to travel to their residence quickly, without interruption and in surroundings that make the journey enjoyable rather than either routine or unbearable!

The standards do set parameters for the journey time and the various elements that constitute journey time but they do not allow for all the ‘soft’ issues such as the look and feel of the lift installation.

Have the end users (tenants) requirements been taken into account?

No. The technical specification of the lift installations are catered for to some degree but the overall performance specification and aesthetic requirements need to be written in more detail. Many apartments are sold off-plan and the purchasers have many questions about the location, size, view, fixtures and fittings etc. However, not many people consider the lifts at this point as they are only considering the purchase from front door in – not how to reach the front door. Once they occupy the apartment and are using the lifts on a daily basis only then will the importance of the vertical transportation become apparent.

It is important that the softer issues outlined above are considered when applying standards to installations as these are important factors to the end users of the building.



Are the same criteria relevant for this type of building as used for other building types?

In the UK we have a great deal of experience when it comes to planning and building offices, hotels and other buildings. The experience gained from these building is useful when planning high-rise luxury apartment buildings. However, we must understand that there are major differences in the way the buildings are used and this must be reflected in the standards for vertical transportation. For example, in a high-rise luxury apartment building;

- Will there be a major up-peak and down-peak?
- Will there be much inter-floor travel?
- What sort of furniture will need to be transported to the apartments?
- What type of refuse will be moved from the apartments?
- Who will require access to the floors?

Are these standards based upon solid research into requirements for luxury apartment blocks?

Due to the lack of real examples of these types of building in the UK it is fairly certain to assume that more research is required in order to understand the real requirements.

There are now some key developments either in progress or reaching completion which will give good bench-marking for relevant standards.

Standards versus Expectations

From the research conducted we have constructed a table outlining the lift users' expectations against the professional standards (see below Figure 21) which demonstrate two key points:

- Only two of the lift users' expectations are considered by the professional standards (Speed and Comfort).
- The other user expectations are difficult to quantify.

This matrix starts to quantify the expectations versus the standards for vertical transportation in a modern day high-rise luxury apartment building. It probably asks more questions than it answers but it does provide a framework based for future studies.

Lift Users Expectations

Parameters

Professional Standards

Speed

The total time taken from calling the lift to arriving at the required destination.

Comfort

The overall smoothness and general comfort of the transportation experience.

Ambiance

The feel of the lift car in terms of smell and temperature control.

Aesthetics

The lift should have a feeling of luxury, light, bright and reflect the look of the building.

Quality

The overall quality of the lift making passengers feel safe and secure and enjoy the experience.

Size

The feeling of space within the lift adding to the overall comfort and ride

Reliability

The lifts should always be working and never trap passengers.

Luxurious

The lift should include luxury 'wow' factors such as TV/information screens and key codes for higher floors.

Other

The passengers should not have to contend with waste disposal, contractors or goods transportation.

Fast

Smooth

Pleasant

Luxury

Safe

Large

Reliable

Wow!

People

1

8%

80%

20-30

8-9

17

various

other

Occupation Density

The number of people residing in the building measured by people per room.

Handling Capacity

The percentage of the population arriving during a 5 minute up-peak period (2 Way).

Car Capacity

The actual load carried by a lift on each journey as a percentage of the car capacity.

Interval Time

The time in seconds between successive lifts arriving at the main access level.

Travel Time

The total time taken in seconds to travel between floors in a building.

Waiting Time

Time (in seconds) from when a passenger either registers a call or joins a queue until the lift doors open

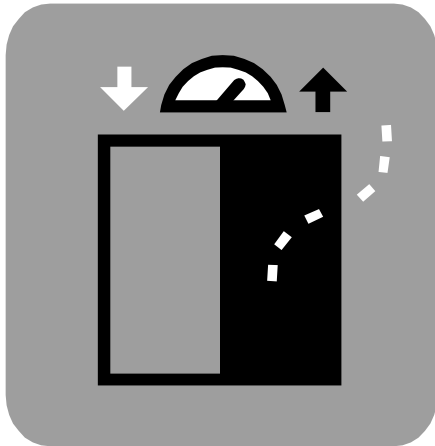
Transit Time

Time (in seconds) from when a passenger enters a lift to when the doors start to open at destination floor.

Users Issues

There are no professional standards outlined for these user issues

Figure 29 Standards versus Expectations



This study has gone some way into defining the market for high-rise luxury residential buildings and has established a set of lift users' expectations. However, it has not defined a set of parameters required to clearly specify the vertical transportation needs within this market. Further in depth research is required to establish a set of professional standards for this growing market sector.

The Parameters

We need to bring together the lift users expectations and the professional standards into one concise and clear document for the specification of lifts within high-rise residential buildings. This study has identified the criteria required to do this. However, we need to specify the parameters that are acceptable for all interested parties (i.e. residents, managing agents, architects, developers, contractors and lift companies). This exercise will require further investigation and a review of multiple sites in order to get an accurate view of the parameters required.

Conclusions

D2E International set out to review the technical specifications and customer requirements for vertical transportation within the high-rise luxury building sector. During the course of the research we have ascertained that;

- the market for this type of building is growing and is set to continue growing in the future
- there is a major influence on this market from overseas, especially USA and Asia
- there are relatively few reference sites in the UK for this type of building
- 22% of the costs associated with these buildings is for M&E services with approximately 3% for vertical transportation
- the process from conception to realization is complex and involves many players
- conventional standards have gone relatively unchallenged
- the level of detail outlined in the standards for high-rise luxury residential buildings is minimal
- there are many different uses for lifts within a building ranging from passenger movement through to goods, waste disposal and fire-fighting
- users and experts define the important issues in these buildings as; speed, comfort, ambiance, aesthetics, quality, size, reliability and luxury
- the current set of standards do not accurately reflect the requirements of a luxury high-rise residential building
- the criteria used to plan this type of building are different from other types of buildings

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Contributors

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- Ballymore
- BBC News
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- Office of National Statistics
- Otis
- Property Week
- Savills
- Schindler
- Skyscrapers
- St George
- Stanhope PLC
- Wikipeda

Feedback

This is an on-going study which will be updated and used as the basis for future studies. If you would like to contribute to the development of this then please contact Mark Fairweather at D2E International on mark.fairweather@d2einternational.com.