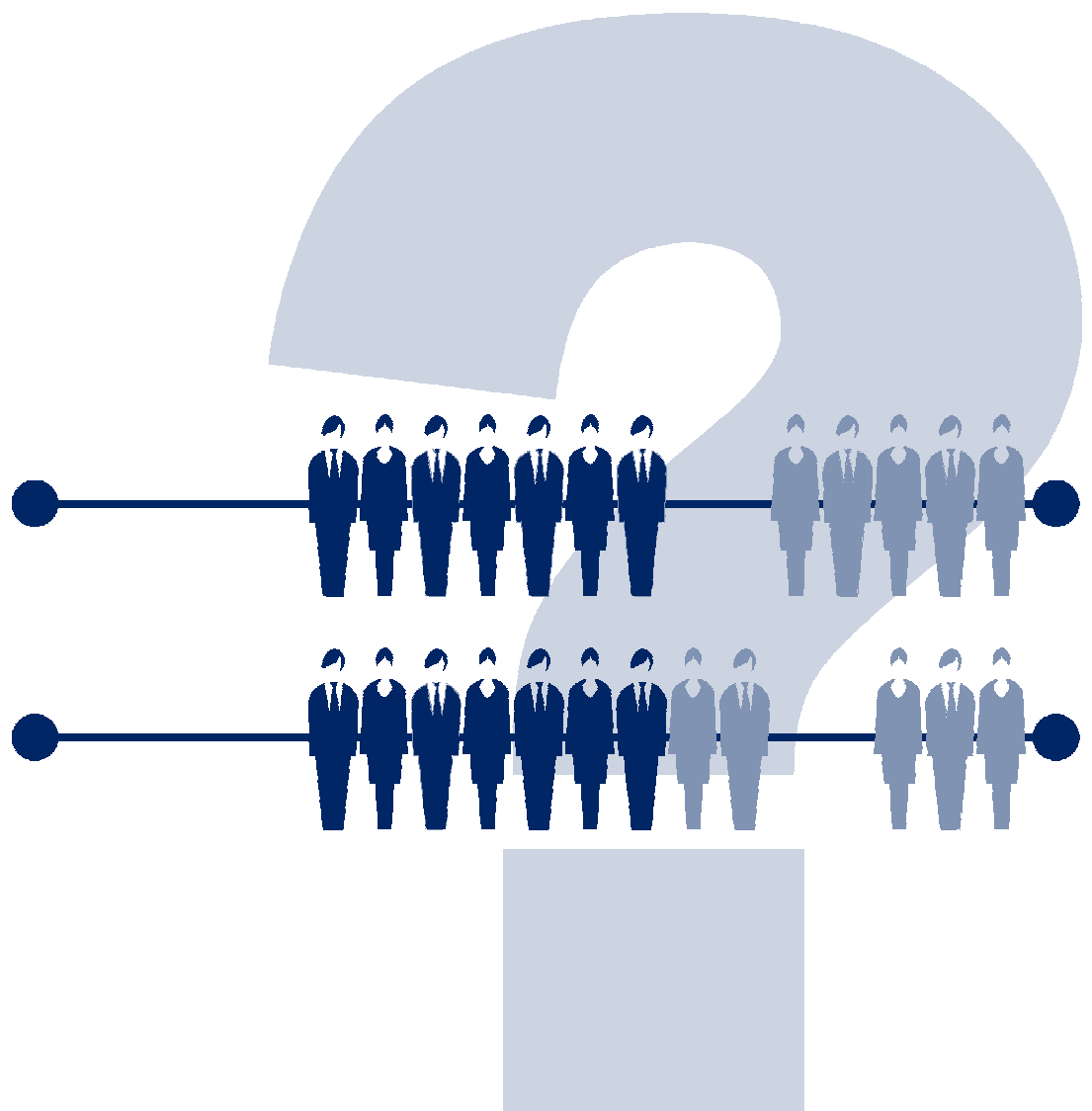




Overcrowded, Under-utilised or Just Right? Office Space: How much is enough?



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Office Space - How much is enough?

At a time when working practices are changing constantly, many businesses remain unaware of the new trends, choose to ignore what can be done to make best use of available office space, or are structured inappropriately to take advantage of change. Unrelenting technological advances and changes in where and how business is conducted are manifesting themselves in an environment in which an organisation must be cognisant of developing trends and current issues.

The balance between office space and support space can be affected by these changes to working practices insofar as business is redefining what 'work' is, and where it takes place. Thus the importance of office space use optimisation and balance is becoming increasingly recognised, valued and sought after.

Benchmarking is a key tool in effective asset management as we know it today. 'Overcrowded, Under-utilised or Just Right?' serves as a benchmarking reference point and an effective resource tool to establish an organisation's relative performance and to set new strategies for office occupation practices.

I trust you will find the results and conclusions useful and stimulating.



Paul Needham
Managing Partner
Gerald Eve

Isaac Newton is quoted as saying "There is no arguing against facts and experiments" when told of an experiment which appeared to destroy his theory. Just so in real estate research. Suggestions as to the future use of the office need to be based on solid facts, and this report 'Overcrowded, Under-utilised or Just Right?' seeks to do just that. The RICS Foundation is committed to a greater understanding of the ways that cities work and this report, the third in the series, continues to provide us with concrete and compelling evidence over time as to how we are using offices and the changes that are slowly but surely taking place. This report should be studied by anyone involved in the planning and management of office space and will be of great value to them in making more effective use of this vital but often ignored corporate resource.



Stephen Brown
Director of Research
RICS Foundation

A brief summary of selected findings of the Survey reveals:

- the use of space standards affect the density of occupation, however which type of standard is used makes a difference
- new working practices (NwP) have impacted on occupational density, although some are more effective than others
- almost two thirds of respondents to the Survey indicated that the use of new working practices had a positive effect on business operating efficiency. Only 1% reported a negative impact
- most of those choosing not to use new working practices said it was outside their corporate culture
- sales offices were the most densely occupied organisational function
- organisations occupying space for a longer period of time recorded lower densities
- offices occupied on a leasehold basis were more dense than their owner-occupied counterparts
- open plan occupation was more dense than enclosed offices
- the use and overall allocation of ancillary space goes some way to explaining the relative overall densities. The allocation to meeting and conference space varies by activity, however storage allocation has declined significantly over time
- furniture and technology will play an increasingly important role as facilitator in enabling the efficient occupation of office space
- a national overall benchmark average of 16.3 square metres per employee

Visit the interactive website at <http://www.geraldeve.com/ood/index.cfm> or www.rics-foundation.org to establish your own customised benchmark comparison.



Introduction



In 1996, the Royal Institution of Chartered Surveyors (RICS) and the Department of the Environment, Transport and the Regions (DETR) sponsored Gerald Eve to undertake pioneering national research into office space utilisation and to establish benchmarks in office occupational density. As a consequence, the first Survey was published in 1997. The RICS Foundation continued its support of the research with the second Survey, published in 1999, and this, the third Survey published in 2001.

The results of this Survey establish new office occupational benchmarks. It also provides an analysis and our interpretation of the drivers of change at the occupier level. The results are compared and contrasted with both the 1997 and 1999 Surveys where available. The patterns and trends emerging from this analysis are then identified and analysed. The broad themes include:

- the breakdown of office occupational density various number of categorisations
- an analysis of support space allocation and usage
- the impact of new working practices on office occupation
- the effect of open plan layouts on office densities

The information upon which the benchmark analyses are based was collected by postal questionnaire survey between November 2000 and February 2001. A total of 531 valid responses, representing over 1.2 million m² of net floor space and over 74,000 employees, were collected to form the basis of the analysis, the most collected to date for any of the 'Overcrowded, Under-utilised or Just Right?' series. The overall average net floor area in this sample was 2,328m².

Each questionnaire was designed to collect information on space utilisation and working practices on a single property. Whilst there is a significant overlap of returns which span all three Surveys, the data sets are not identical and therefore cannot claim to be a pure time series. The average, rather than the median, is used extensively throughout the report. Whilst there are technical arguments which favour both approaches, we have settled on consistency with the previous two Surveys, and used the average.

Office occupational density, for the purposes of this Survey is defined as the measure of intensity of use of space. It indicates how much space each person occupies within the workplace and simply divides the net internal floorspace by the number of employees employed at that workplace. It is also important to note that a high number of m² per person indicates a low occupational density.

Conversely, a low number of m² per person indicates a high occupational density.

- high density: 9.7 m² per employee
- average density: 16.3 m² per employee
- low density: 23.2 m² per employee

Net internal area as utilised in this Survey, comprises three components.

- actual workspace - where desks or workstations are located in an open plan or cellular office environment
- ancillary space - areas local to the workplace such as circulation and some storage
- support space - centralised functions including training, meeting, dining, reception and conference rooms which support the organisation

Despite these caveats, the results are generally consistent with the results from the two previous Surveys and therefore provide confidence that the figures are broadly representative of office occupation in the United Kingdom.

This Survey does not attempt to measure the level of satisfaction amongst individual occupiers, nor does it address productivity or profitability amongst surveyed organisations. Slightly different sample sets between the three Surveys must be taken into consideration when comparing the results, although in some instances, the differences are not statistically significant. Some percentage response columns may not tally to exactly 100 due to the effects of rounding.

Occupational density, the number of employees accommodated in an organisation's office, impacts directly on the occupier's bottom line. The two fundamental inputs into the office density equation, staff costs and total property costs, are typically the two largest costs encountered in any organisation. The combination of these two factors provides a benchmark about which organisations must be cognisant and therefore a clear property strategy should be a key factor in the business plan.

**Net internal area
comprises three
components:**

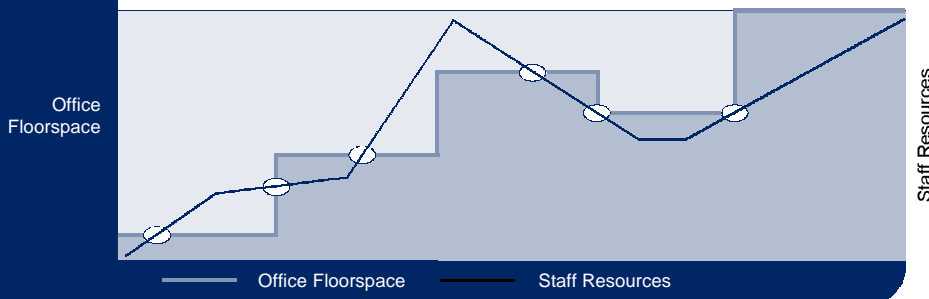


**Density in the
context of asset
management**



Business strategies and relative performance are the prevailing drivers of the number of employees an organisation requires. However, these drivers are fluid and as a consequence, maintaining the optimum occupational density appropriate for each organisation can be difficult. The principal reason is that office property is not a liquid commodity. To complicate matters further, the optimum occupational density may not always be static either.

Office Occupation Concept Diagram



Occupational density benchmarking and performance measurement is less about cost-cutting to find the minimum amount of space required, but more about occupying existing space or planning future space more effectively. Rationalisation, relocation or acquisition all fundamentally depend on the basic inputs of these types of performance measurement.

Benchmark Breakdown

National Benchmark



The 2001 Survey has revealed an average overall national benchmark of 16.3 square metres per office based employee (m²). This compares with 16.6m² in the first Survey in 1997 and 15.8m² in the second Survey in 1999. By way of comparison, the overall national median for 2001 was 14.9m² compared to 15.2m² in the 1999 study. The average (or mean) refers to the sum of the observations divided by the number of observations, whereas the median refers to the middle observation when arranged in ascending order.

The 2001 results ranged between 10.6m² for the lower (first) quartile and 19.7m² for the upper (third) quartile.

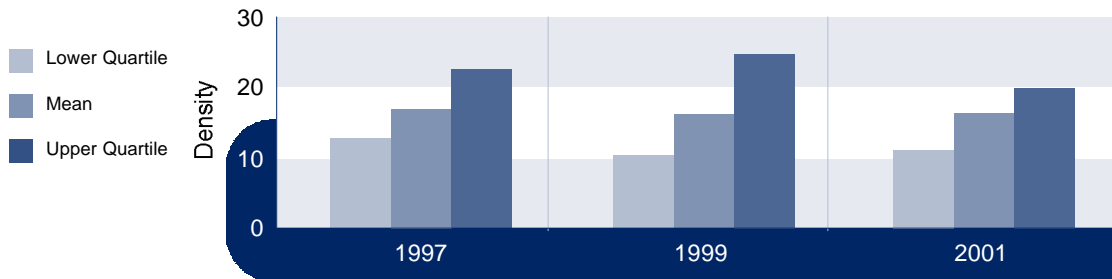


High Density



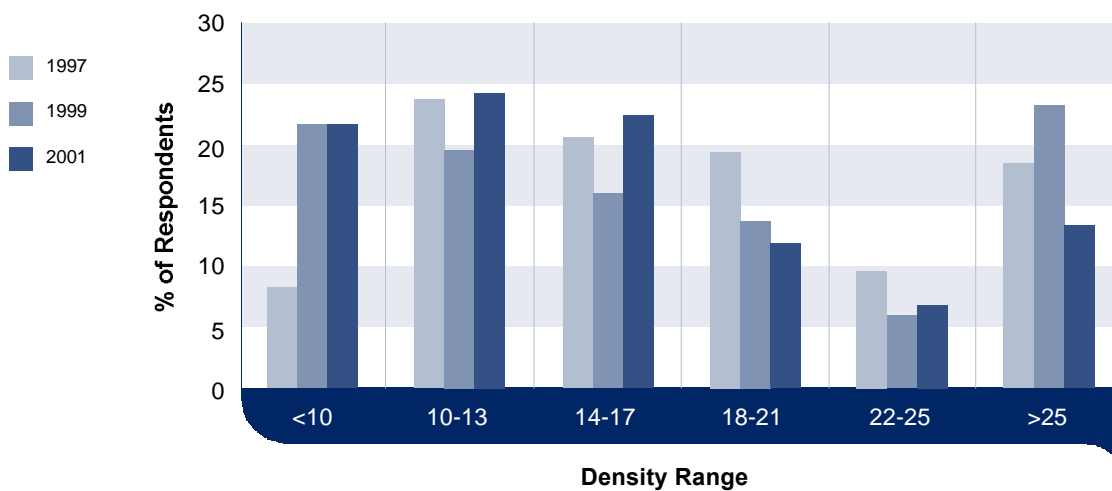
Low Density

Density Ranges



Whilst this overall average figure is, in itself, worthwhile as a general guide and rule of thumb, the real value in this benchmarking exercise comes at the closer level of analysis allowing an organisation to match more closely their own characteristics to establish a more accurate picture of industry standards.

Distribution of Responses



In terms of the distribution of responses collated by density bands, the pattern is very similar to the 1999 results except there were fewer responses from properties with low densities.

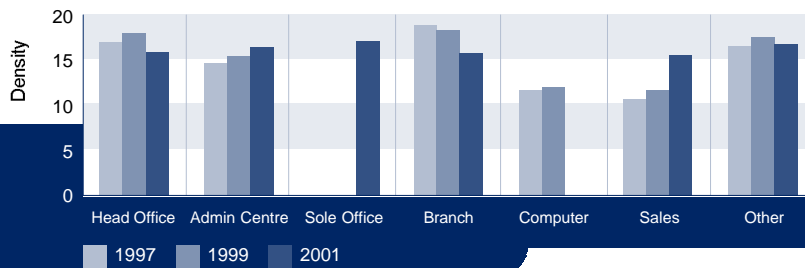
By using the number of workstations rather than the number of employees as the denominator in the density calculation, a workstation density of 18.0m² is revealed. Similarly, the average workstation to employee ratio is 92%, indicating that there are more employees than workstations. This figure is consistent with the gradual increase in the implementation of new working practices. The numbers of employees matching exactly the number of desks was only observed in 39% of the sample set.

Function

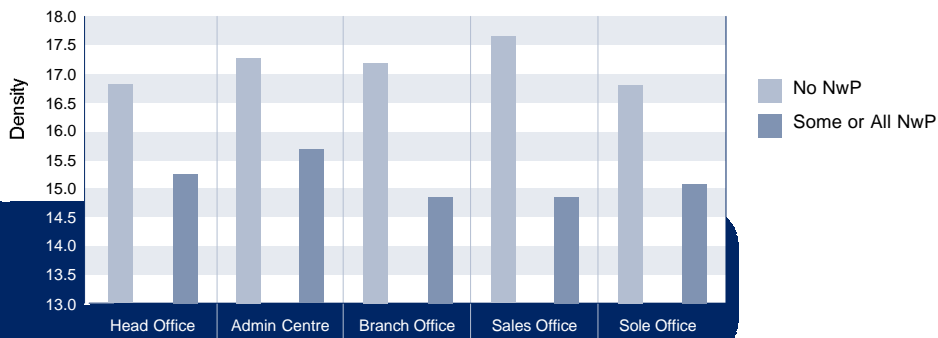


When dividing the results into their respective over-riding function, it was, for the third consecutive Survey, the sales offices which were most densely occupied (15.7m²). As sales offices tend to have a more time-flexible and mobile workforce, it is little surprise that the use of new working practices is significantly more extensive than in other functions.

Density by Function

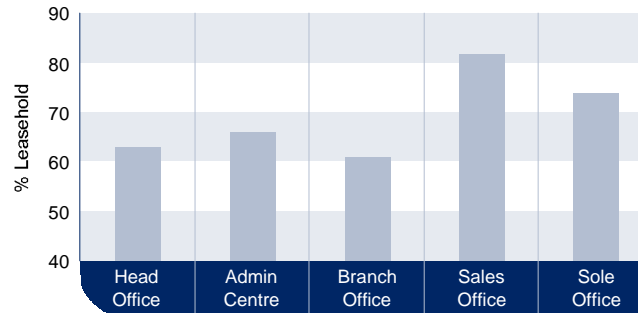


New Working Practices Density by Function



Sales offices also tend to require significantly less support space than the other functions noted. Finally, sales offices also have a higher tendency to be occupied on a leasehold rather than

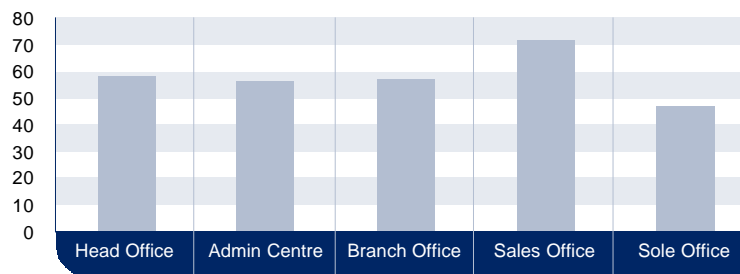
Function by Leasehold



freehold basis than the other categories (refer 'Tenure' section page 16) and, as a consequence of these three drivers, tend to maintain higher density.

At the other end of the spectrum, sole offices (where the organisation has only one office) were the least densely occupied at 17.2m². Sole offices tend to use new working practices less than other categories. Sole offices also had the highest overall average staff attendance in the office.

New Working Practices Usage by Function



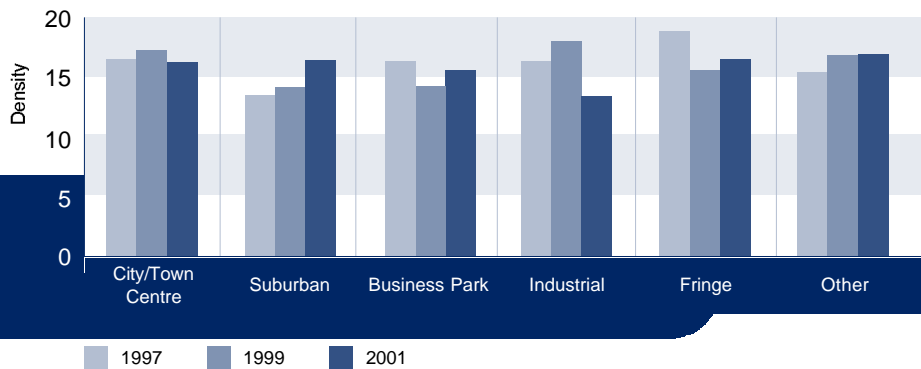
Location

Despite the significant turnaround in densities by location for the industrial sector, it is believed that the sample set (at 2%) is insufficient to be wholly reliable. Therefore, the most densely occupied location overall is the business park, at 15.5m². Among the factors which begin to explain this result is the fact that most business parks are relatively new and therefore do not possess the legacy of



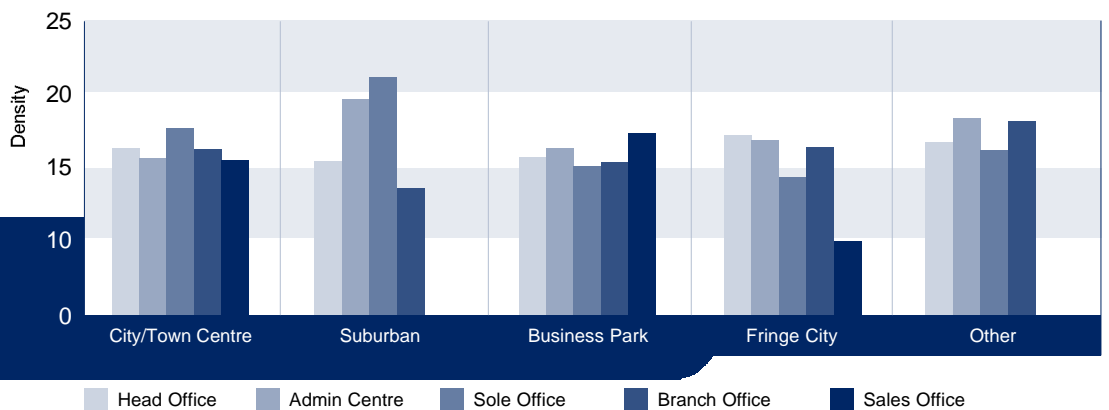
rigid structures and less flexible designs often associated with city and town centre buildings. Business parks also have, according to the results of the survey, a higher utilisation rate of new working practices than other locations. Of those companies utilising new working practices, business parks maintain a higher density.

Density by Location



Contrasting with the 1999 Survey, suburban and fringe locations both recorded the lowest densities (16.5m²). In 1999, it had been contended that suburban centres were the location of many sales offices and that most of these offices had few and smaller support facilities and space. The small range of responses from this survey (1.0m² compared to 3.6m² in 1999) suggests that, from this sample set, there is little to choose between the categories and that this factor was not a significant driver of occupational density patterns.

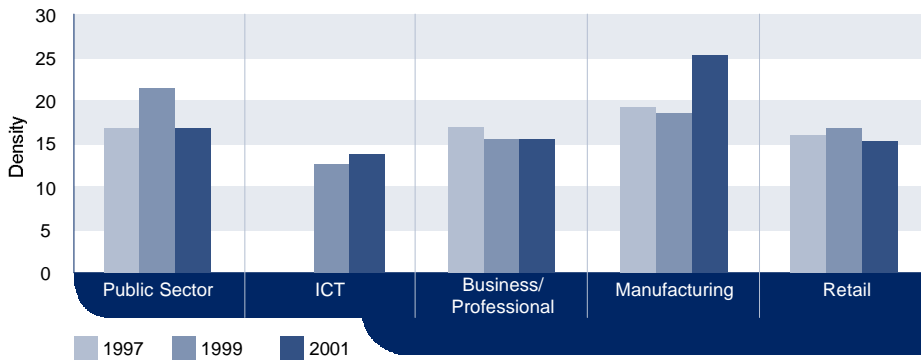
Function by Location





The information and communications technology sector has, once again, proved to be the business sector with the highest average density at 13.7m², compared to the 12.6m² in the 1999 survey. This generally reflects the nature of the industry. The manufacturing business sector (as distinct from the industrial location noted above), unsurprisingly recorded the lowest density. Space tends to be less of an issue in the manufacturing sector as the costs of occupation generally tend to be lower where the sector tends to locate itself - industrial parks, ports and larger manufacturing plants.

Density by Activity



The public sector has also recorded the next lowest density after manufacturing, although significantly higher than the 1999 result. The Government sector has taken steps including consolidation and commissioning studies to ensure that their occupational density patterns fall closer into line with the private sector. That effort may now be beginning to pay off. It is worth noting that although the combined public sector figure is 16.8m², the 'not for profit' sector figure (19.0m²) can be split out leaving the true government/quasi government density figure at 16.2m².

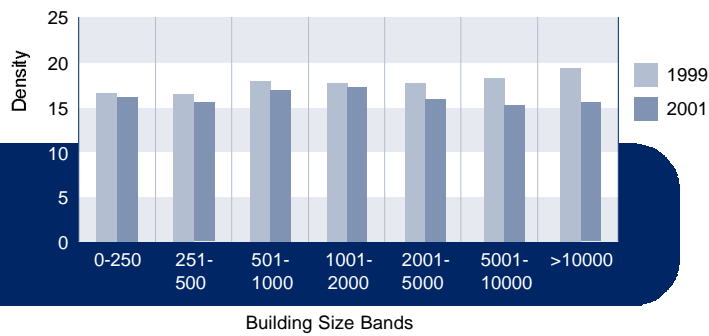
The 'not for profit' sector may include some volunteer workers who may not appear in the official employee figures, thereby distorting the overall return. It is also likely that many 'not for profit' organisations are situated in older listed buildings which are likely to be less flexible and have limited scope for an efficient open plan layout.

Building Size

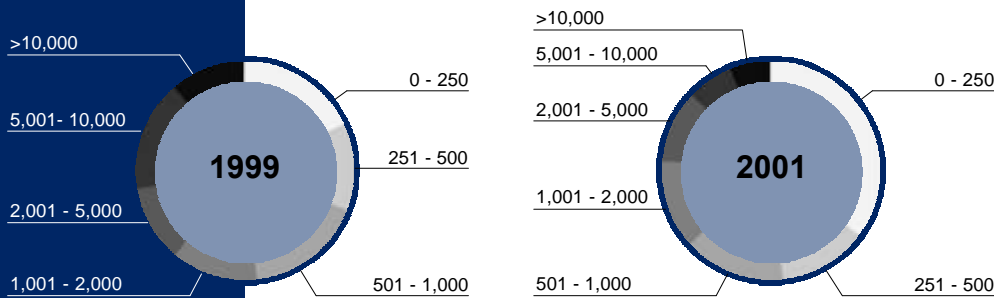


The sample set produced a slightly higher concentration of smaller occupancies than in the previous Survey, which is generally more reflective of the overall property marketplace. The results also reveal a pattern that the larger and smaller properties all show higher densities, whilst the medium sized premises on this scale, showed the lower densities. Smaller organisations occupying smaller premises generally tend to be more cost conscious and find managing their space more closely somewhat less challenging.

Density by Building Size



Responses by Building Size



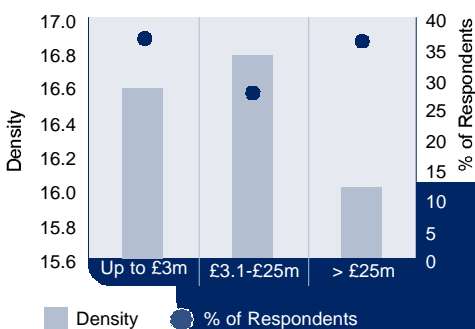
The results of the Survey also suggest that it is now the larger organisations that are beginning to adopt new working practices and other occupancy strategies. The Survey found that the adoption rate of new working practices amongst companies with turnover above £25 million is 20%, whilst for



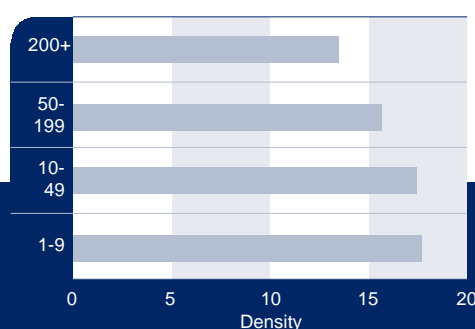
companies with a turnover between £3 million and £25 million, the adoption rate is 11%. Companies with a turnover of less than £3 million have an overall new working practices adoption rate of 13%. This goes some way to explaining the shape of the bar chart. Indeed, large consultancy firms such as Ernst & Young and Accenture (formerly Andersen Consulting) have often led the way in the implementation of new working practices.

The size of an organisation, as determined by annual turnover, is not a significant driver of its overall occupational density in the Survey. The fact that larger organisations display a slightly higher overall density is partly a reflection of their higher adoption rate of new working practices.

Density by Turnover



Density by Staff Numbers



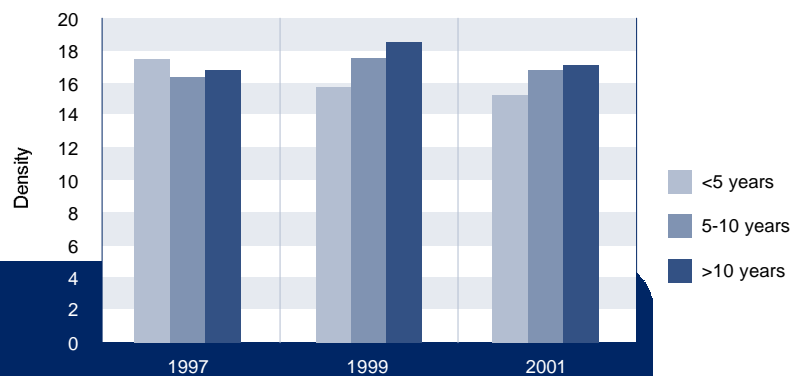
This result is also consistent with occupational density when measured by aggregate employee numbers. This result is also consistent with the analysis of changing occupancy requirements. More than half (55%) of the companies who indicated that their preferred option would be to increase occupational densities had more than 50 employees. Similarly, 62% of companies indicating that their preferred option was to increase new working practices employed more than 50 people.

Length of Occupation

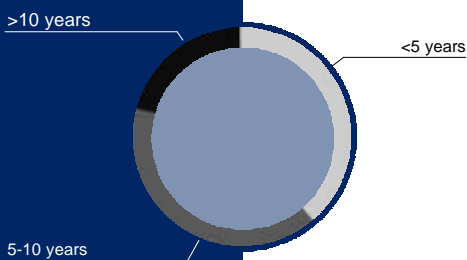


The results of the 2001 Survey confirm the strong correlation between length of occupation and reducing densities. The figures clearly suggest that the longer a firm occupies its space, the less able or willing it is to control that space effectively. Space planning appears more likely to take place on taking occupation and that space is then likely to evolve with the company rather than be actively managed, monitored, planned and organised. The longer an organisation occupies an office on a freehold basis, the more difficult it becomes to accounting for the real costs of occupation.

Density by Length of Occupation



Response Rate by Length of Occupation



It is, of course, more difficult to control a wide variety of work types and to overcome established individual expectations when space is so often seen as a status symbol and a sign of authority in an organisation. In addition, the costs of reorganisation can appear, at first anyway, to be prohibitive. However, this may be false economy.

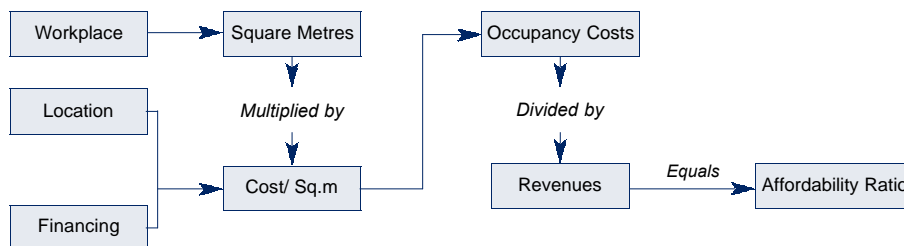


Total costs of occupation of an office are generally made up of six elements (Axcell et al, 2001):

- rent
- rates
- annualised cost of fit-out & furniture
- hard facilities management - Insurance, internal repair & maintenance, internal moves
- soft facilities management - telephones, catering reception reprographics
- management - total annual costs of associated fees and management of real estate & facilities management

The survey indicates that for the median portfolio, rent (39%) and rates (13%) together represent 52% of total office costs. This is contrasted against a total of 36% for facilities management. The report is also able to identify the average cost of a workstation (allocated 14m²) as £9,744, ranging from £18,682 in London's West End to £7,183 in Nottingham. These costs are on a total cost of occupation basis including the elements noted above.

The advantage of this detailed benchmark breakdown, a complementary measure to occupational density, is the ability to more accurately assess the cost-effectiveness of alternative office occupancy solutions. Core space, held on a freehold or long leasehold basis, flexible space held on a shorter term lease (albeit with a higher rental) to facilitate easier exit strategies, and 'as required' space, occupied on a license basis with a service such as a serviced office provider, may well provide a more balanced portfolio. This may also become the commonly recognised portfolio composition in future to accommodate the three most important new office requirements of location, property costs and ability to exit (Gibson 2000).



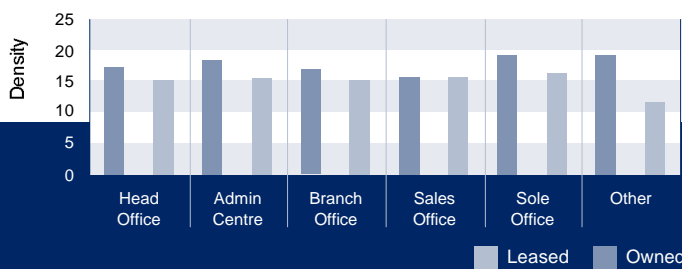
Another widely accepted performance measure is the 'affordability ratio' which measures the total occupancy cost against company revenues.

Tenure

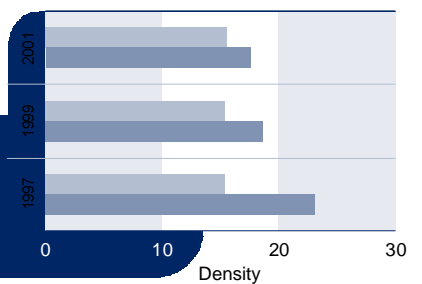


This measure relates the organisation's property costs with its overall financial performance and is complementary to the occupational density in performance benchmarking.

Density by Tenure & Function



Density by Tenure



Other than the minimal differential in sales office, leasehold properties continue to be more densely occupied than their owner-occupied counterparts. The difference is most obvious in sole offices where the average density for leased premises is 16.2m², whereas the owner-occupied premises are occupied at a density of 19.3m², a differential of 3.1m² per employee.

This suggests that the known costs of occupying space on the terms of a lease enables the organisation to calculate more accurately its total economic cost of occupation than those with less certain on-going economic opportunity costs in ownership. These ownership occupancy costs will most likely not reflect either book value or original purchase price.

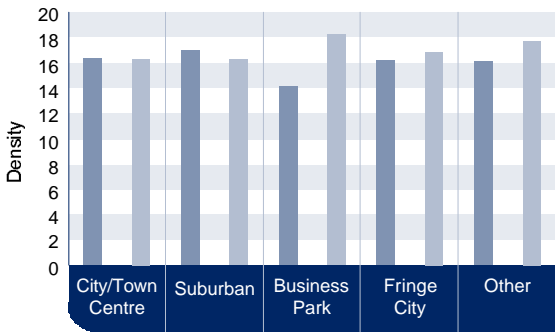
Purpose Built v Converted Buildings



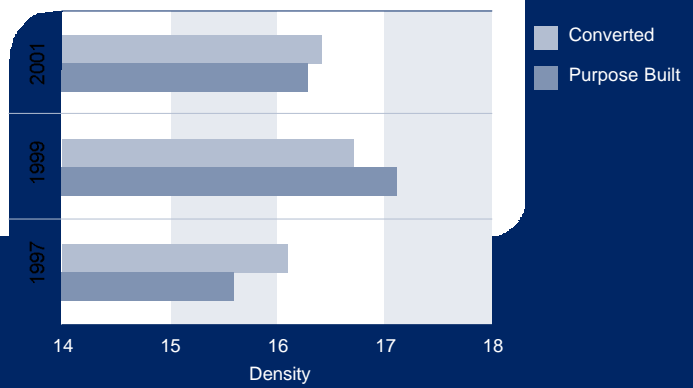
The results from the Survey are inconclusive on whether purpose built or converted buildings provide lower densities. The 1999 results reversed the findings from 1997, whilst the 2001 Survey produced almost identical figures and certainly not sufficiently statistically different to make a confident judgement. The only conclusion which can be drawn on a general level, is that this issue is not a significant driver of occupational densities across the board.

However, at close-up level, the figures reveal a difference which goes some way to explaining the balance. Older converted buildings from the sample have higher densities (17.2m²) than purpose built buildings (18.8m²). This is not unexpected, as period buildings converted since that time would normally have a more efficient floor space ratio. The reverse is true of modern buildings, also as

Density by Location & Building Type



Density by Building Type



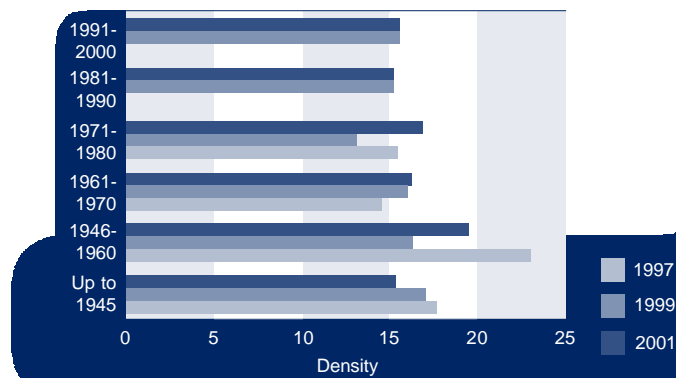
anticipated. Whilst converted modern buildings have a density of 17.4m², purpose built buildings have a density of 14.7m².

Age of Building

This concept is generally carried through and confirmed when cutting the data purely by the age of the premises. Nevertheless, the survey result for the pre-1945 buildings is counter-intuitive. At 15.3m², the pre-1945 occupancy figure matches that for the more modern post-1980 buildings. It is possible that, although we have ended up in the same position we were in a century ago, it could be for different reasons. Whilst the older buildings have generally provided less efficient cellular



Density by Age

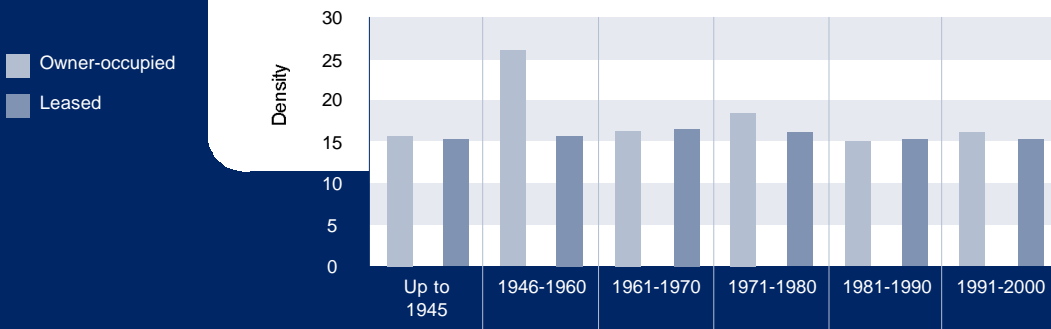


space with large support space allocations, newer premises have tended to provide more creative and informal meeting space. It seems as though these two countervailing methods of working have, ironically enough, balanced themselves out.

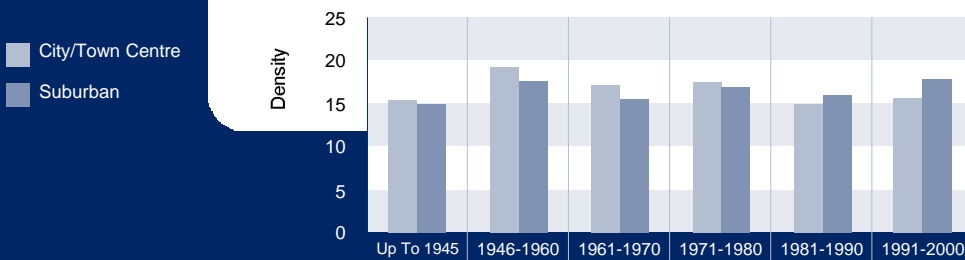
The post-war buildings, with the lowest densities, contain larger boardrooms and significantly more storage than the other age categories (refer 'Ancillary support space utilisation' section on page 25). Cellular offices (whose densities are lower than open plan configurations - refer 'Internal layout' section on page 24) in these buildings are also more likely.

Further, it seems to be the owner-occupied premises in the post-war period buildings which are driving the lower overall densities. Apart from this aberration, the tenure does not significantly alter the shape of the bar chart.

Density by Tenure & Age



Density by Age and Location

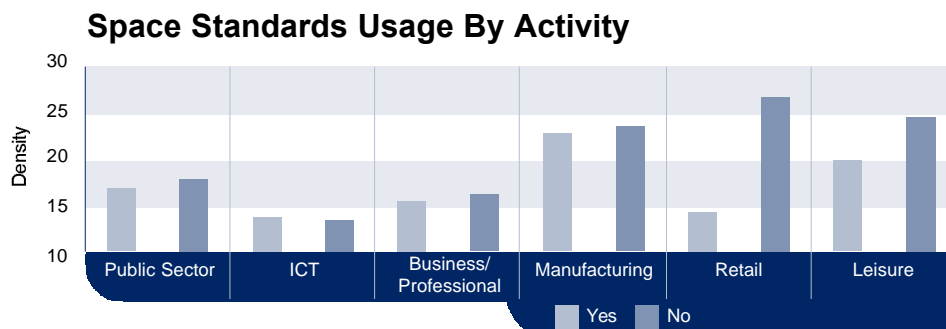


A building's age, when observed by its location, displays a similar pattern, particularly in the city/town centre where densities are significantly higher, possibly due to the less rigid and more flexible nature of the more modern buildings. Suburban buildings, as noted previously, generally tend to be less densely occupied, and so it is when viewing the results by age. However the pattern is more obtuse and there appears to be a lack of an obvious driver for the results.

Space Standards



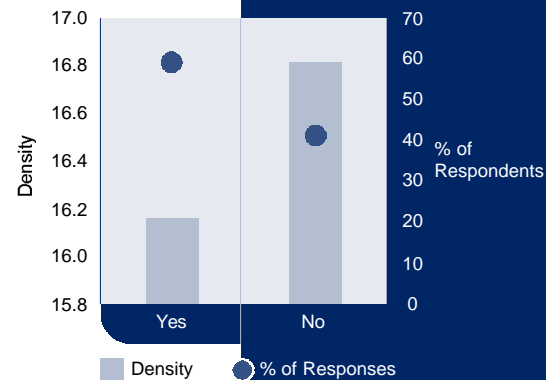
The hypothesis taken into this particular analysis was that space standards should have a significant bearing on occupational densities. This proved to be the case in all but one observation when the space standards usage data was compared with the organisation's activity. It can be concluded on the basis of this evidence that occupational density efficiency is enhanced by the adoption of a space standards policy.



Space Standards Use

On an overall basis, 59% of organisations responding reported that they use some type of space standard. However, counter-intuitively, the overall picture suggests a smaller benefit than was anticipated (the differential between 16.2m² and 16.8m²).

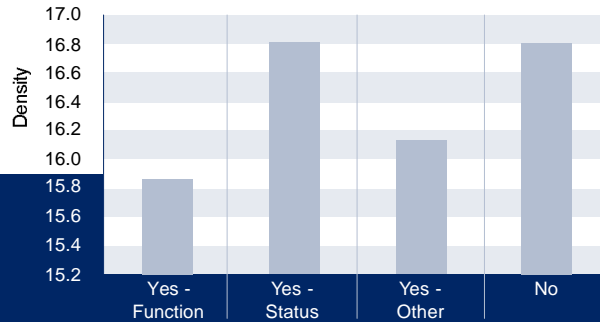
However, a closer investigation reveals an important difference between types of space standards adopted. It is clear that the adoption of a space standard based on status (16.8m²) is not as effective as a standard based on function (15.9m²) or any 'other' standard (16.1m²). The adoption of a standard based on status actually gives the same result as not adopting any at all (16.8m²). This implies that opting to not allocate on the basis of status, with the possible consequent implication of personal office space or at least increased space utilisation, can achieve a more effective occupation strategy.



New Working Practices



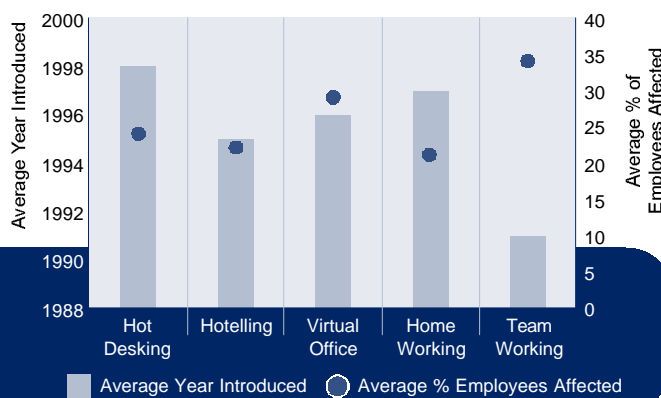
Space Standards Allocation By Type



Whilst we still generically refer to these methods of working as 'new', some are not quite so new. Despite this, it appears that we remain in a period where changes in working practices are being accepted slowly and, in some cases, reluctantly.

The average year of the introduction of hot-desking (defined for the purposes of this survey as the ability to select any workstation in a workplace on a first come, first served basis where connectivity and basic essentials are provided) was 1998. Whilst the concept has existed for considerably longer, it appears that its popularity is growing, given the number of organisations who note 1999 and 2000 as their year of introduction - 38% of organisations have implemented hot-desking within the last two years alone. Of those companies who had introduced hot-desking, an average of 24% of staff were affected, indicating that seldom was an entire organisation exposed to this working practice, but rather, selected teams or departments whose work styles were deemed suitable.

New Working Practices Usage



Although fewer organisations had adopted hotelling (reserving in advance a workstation with full support), it has been used, on average, three years longer than hot-desking, and affects 22% of the workforce. The virtual office (effectively a laptop with connectivity used anywhere) had a higher adoption rate at 23% of staff. The average year of introduction was 1996. Home-working was the most popular new working practice at 42%. An average of 21% of staff are affected, although this does not necessarily imply that these workers are based exclusively at home and does not distinguish between ad-hoc home-working and home-working as a formal organisation strategy. Among the perceived drawbacks of home-working are the sense of isolation, lack of team-work, reduced support and promotion opportunities, and separating home and work life. The average year of introduction of home-working was 1997.

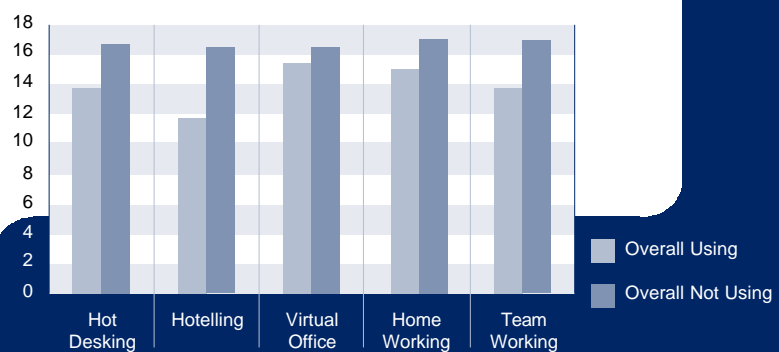
Team-working (a team assembled for a specific project and disbanded on completion) had been adopted by 21% of respondents however it affected a relatively high 34% of staff. This concept is considerably older, having been introduced in 1991 on average.

Evidence of the worth of implementation of new working practices can be clearly seen in the overall differential between those who have and have not adopted them. The overall average difference is 2.1m² per employee. This is comparable with the 3m² per employee revealed by the 1999 Survey.

The differential ranges between 1.2m² between those who do and do not use the virtual office and 4.7m² for the use of hotelling. The lower figure for the virtual office could in part be explained by the probability that an employee who uses a computer laptop with connectivity out of the office, is also more likely, for now anyway, to have a permanent base in an office. A similar reason could be put forward for the 1.9m² differential in home-working. It is envisaged that as people spend increasing amounts of time doing 'work', however that is defined by the organisation, away from the office, the more likely it is that permanent desks will be transformed into shared desks using either hot-desking or hotelling.

As an example of a practical implication of this potential space saving, consider a company with a requirement of 2,000m² net. Using the overall national benchmark of 16.3m² and at an annual rental of £400 per m², the company could save £101,000 per annum

New Working Practices Density by Use

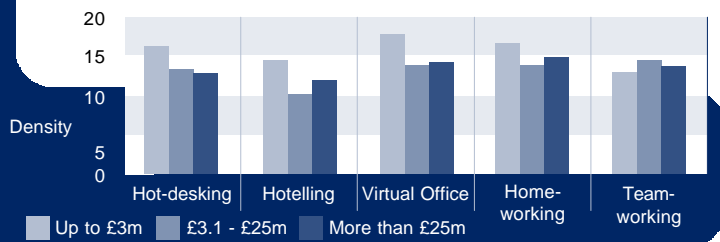


(or 12.7%) by implementing new working practices. Associated savings in business rates and service charges in addition to the rental saving, certainly make new working practices worthy of consideration from a financial perspective.

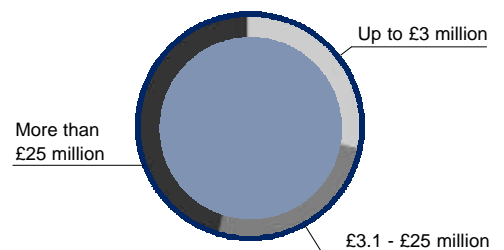
Nevertheless, as noted below, there are a number of organisations for whom this type of working practice is not appropriate.

When the usage of new working practices are investigated by company turnover as a proxy for the size of the organisation, we can reveal that results of the 1999 Survey have been turned on their head. In four of the five types of working practices, it is the larger organisations whose density is higher than the smaller organisations. This could be tied in to the increased preponderance of hot-desking introduced over the past two years since the time of the 1999 Survey and the consequent reduction in occupational densities noted above. This could therefore be the beginning of a trend which sees the larger organisations take the lead in the implementation of new working practices. Economies of scale and the ability to effectively trial smaller teams within the organisation are also obvious advantages.

Density by Turnover of New Working Practices



New Working Practices Usage Rate

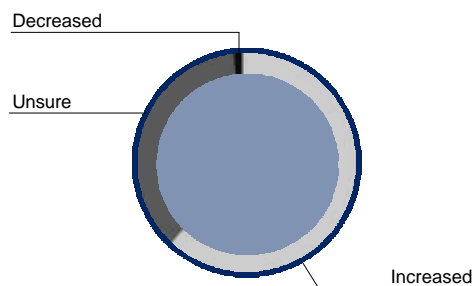


Organisations were invited to assess the impact of the introduction of new working practices on their own operating efficiency. Whilst many responses were anecdotal rather than empirical, the overall message was clear. Of those organisations who had implemented some form of new working practice, 62% indicated that business operating efficiency had increased. 37% were unsure or were still measuring the impact, whilst a total of 1% indicated that business efficiency had decreased.

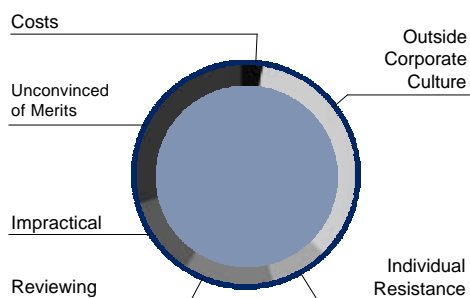
Those organisations opting not to use new working practices were also invited to indicate their reasons. The normalised list indicated that the most common reason, at 35%, was that new working practices lay outside their corporate culture. The number of organisations who were unconvinced of the merits of new working practices was also significant in the sample set (30%). The least common response was implementation costs of a new working practice at just 3%.

New working practices were investigated by location to establish if one or any locational types used the new ways of working more or with more 'success' than others. All locations followed the familiar pattern whereby densities were higher amongst those organisations who adopted some or (rarely) all new working practices.

New Working Practices Effect on Business Efficiency



Reasons For Not Using New Working Practices



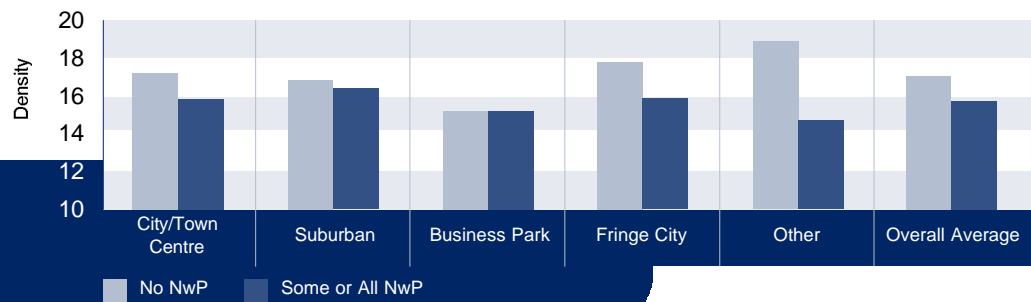
It is likely that the fringe city and suburban locations would host satellite centres, smaller offices of the organisation with 'touchdown' space (whereby an employee visits the office, plugs into the organisation's network, does what is necessary and leaves). These are often operated on a hotel basis. Whilst the initial result, indicating only a small difference between those who do and do not utilise new working practices, may seem surprising, it may also be that some of these facilities may in time themselves become redundant. The principal concept behind the satellite centre is to meet clients, colleagues and business associates and to upload and download information. It is anticipated that with the advent of totally wireless connectivity, the requirement for such centres will be diminished. The meeting and greeting function could be economically outsourced to a flexible office/conference facility provider.

New working practices by region gave a similar result, with regions such as the South West, West Midlands and Greater London all benefiting from new working practices.

Organisations have a range of both property based and management based options when the need to alter their current space occupancy arrangements arises. The 1997 Survey indicated that the introduction of new working practices was the preferred option. This was, however, contradicted by

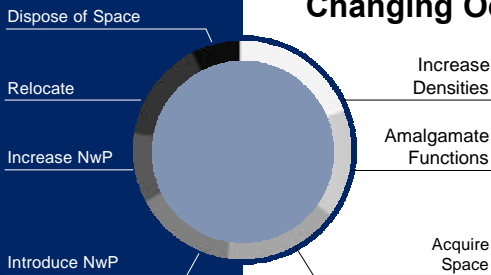


Density of New Working Practices by Location



the results of the 1999 new working practices analysis. By 1999, the most popular option was 'more stringent space standards/increase occupational densities'.

Changing Occupancy Requirements



Increasing occupational densities remains the preferred option in the 2001 Survey, followed closely by relocation, acquiring space, the amalgamation of functions and the introduction of new working practices. The results were closely matched. However, it is possible that the continued rental and other costs making up the total costs of occupation combined to drive the 'increase densities' response to the fore.

Internal Layout



The questionnaire invited respondents to indicate, in broad terms, their internal office configuration in order to establish and confirm a hypothesis that open plan space led to higher occupational densities. The majority of respondents indicated that their office was mostly open plan, implying that there were some enclosed offices and this reflects fairly the general office market.

The differential in occupational densities between mostly open plan (categorised as more than 50% open plan) and mostly cellular (the inverse) was 3.2m² in favour of open plan offices, confirming the hypothesis.



Open Plan

Totally open plan configurations recorded the highest density of all at 15.0m². This is no surprise given the reduced requirement for dividing walls, duplication of circulation space and the likelihood of a higher utilisation of central meeting areas.

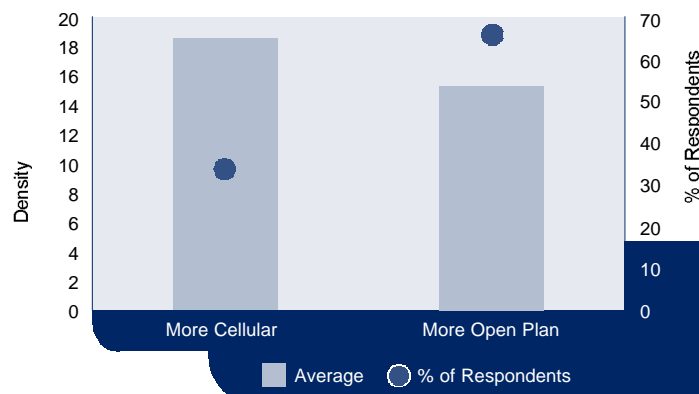
The open plan layout also provides occupational flexibility and the opportunity for cost savings from churn (employee relocation within a building), particularly if a generic office furniture regime is in place.

Internal area breakdown

It is widely accepted that absolute definitions for net internal area vary by profession and purpose, however, for the purpose of simplicity in the collection of information in this Survey, net internal area includes:

- open plan, enclosed workspace and associated circulation space
- meeting, conference and resource rooms
- kitchen and dining facilities
- dedicated storage
- reception area exclusively occupied by the organisation

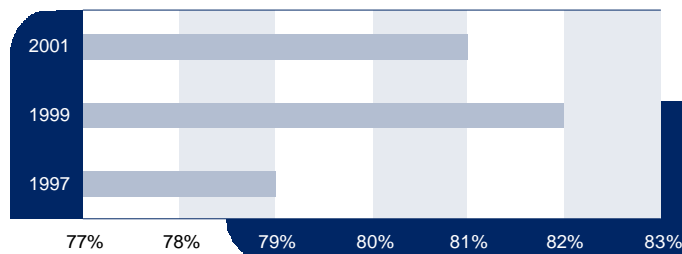
The Effect of Internal Layout



Ancillary Support Space Utilisation

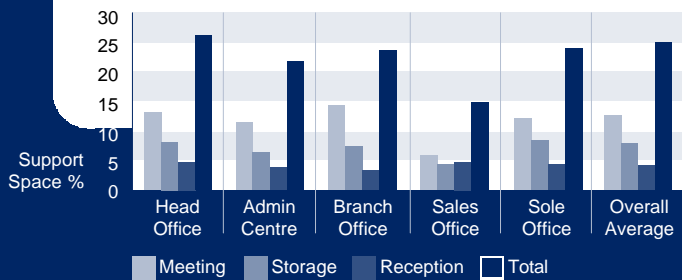
The sample set has facilitated the analysis of support space as a proportion of net internal area. The results reveal that, on average, 25% of net internal area is devoted to support space split between the broad categories of meeting, storage and reception space (exclusively occupied within the property). Apart from sales offices, which clearly stand out, the results are similar across the board.

Net to Gross Space Ratio

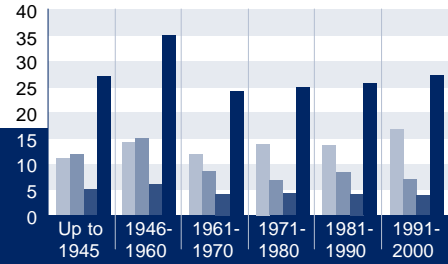


Branch and head offices utilise the largest relative proportion of their space in meeting rooms, whereas sales offices have a relatively small allocation. This goes a long way to explaining the lower overall densities of sales offices in general. Branch and head offices also use a relatively large proportion of their space as storage.

Support Space by Function



Support Space by Age



The same analysis split by building age reveals that there has been little change in office buildings built in the the past four decades in terms of overall allocation of space to support functions. The 1990s buildings, however, do have a slightly higher meeting room allocation which possibly reflects the increasing importance of this type of space to business in general where they are increasingly driven by communication and interaction amongst peers. The data also indicates that this allocation consists of a larger number of smaller rooms, on a proportional basis, than the meeting area allocation from earlier decades.

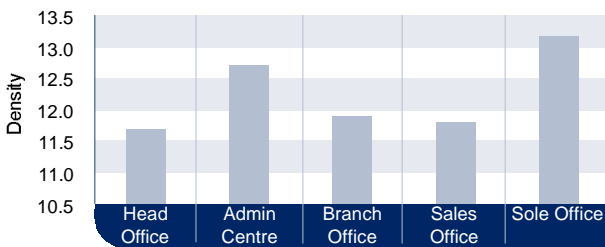
One of the more striking results from this analysis is the relative decline in the allocation to storage space within the building. The decline from 12% and 15% in pre 1945 and 1946-1960 buildings respectively, to a more modest 7% and 8% in buildings post-1960, reflects the nature of document storage (computerisation) and the relative costs of dedicating office floor space to storage rather than employees. Reception area allocation remains unchanged over the past four decades at 4%, down from 5% and 6% in the pre 1945 and 1946-1960 buildings.

The investigation of office space net of meeting, reception and storage facilities has also allowed the analysis of an effective 'net occupational density'. The average 'net occupational density' for the 2001 survey is 12.6m². A breakdown by function reveals a range between 11.7m² for head office property and 13.2m² for sole offices. Sales offices have a smaller allocation of support space and therefore do not retain their advantage when the effect of support space is removed. The head office support space allocation was slightly higher whilst the overall density figure was not significantly above the highest density. As a consequence, head office property gains more from the removal of this space.

Finally, the support space results are presented in terms of their relevant activity. The analysis provides the same end result of a 25% allocation to support space. The leisure sector has the highest allocation, driven by the relatively large amount of meeting space. The business/professional sector has the lowest overall allocation similarly driven predominantly by their rather surprising limited allocation to meeting space.

The relative occupational densities of those respondents who did and did not subcontract storage away from the premises revealed a substantial net floor space saving for those who did subcontract file storage. The results were consistent across all activities and indicate that sending filing to a secondary (cheaper) location can be a space, and by implication money-saving exercise.

Net Density by Function

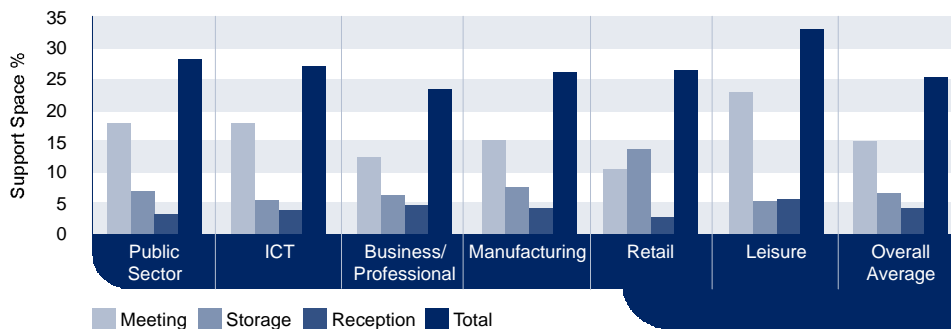


This theory is transformed into a practical application below.

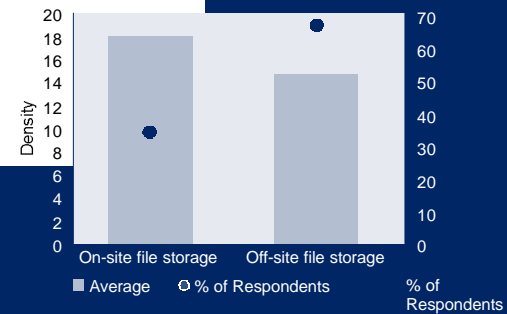
Gross Internal Area	12,350	
Net: Gross Ratio	81%	
Net Internal Area	10,004	
Meeting allocation	13%	1,300
Storage allocation	8%	800
Reception allocation	4%	400
Actual workstation space		7,503
Net workspace allocation	12.6	
Number of workplaces		595

It was no surprise to discover the space saving benefit of off-site file storage. However, it was the size of the average space saving which was noteworthy. On average, the 66% of respondents who indicated that they used off-site file storage (14.6m²) had an average occupational density 3.3m² higher than those who did not (17.9m²). This was particularly the case for smaller companies (as measured by annual turnover), where the differential was 6.1m². Whilst these figures don't pretend to suggest that off-site storage was the sole driver of the differential in this analysis, the differential is sufficiently significant to suggest that off-site storage does increase occupational densities.

Support Space by Activity



The Effect of Storing Files Off-Site



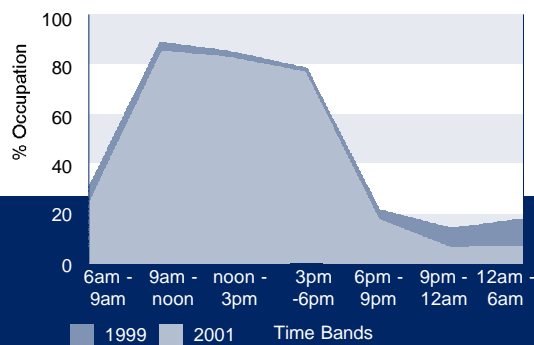
Time Spent in the Office



The time spent in the office by employees tracks the results from the 1999 Survey closely. Once again, it is the morning slot of 9am to mid-day that sees more employees in the office.

The early morning slot of 6am-9am also remains more popular than working late between 6pm and 9pm. The overall average attendance at the workplace across the board was lower in the 2001 Survey than in 1999. This could be symptomatic, and possibly a pointer to the future that the physical building, commonly referred to as the 'workplace', may be losing its importance as a place to do 'work' and more a place to meet, communicate and exchange ideas.

Time In Office



The time spent in the office broken down by function reveals a similar pattern. The highest overall morning presence is sales offices. Sales offices also have more employees present in the early evening time period between 6pm and 9pm with lower presence in-between. This is likely to be a result of early morning team meetings and paper work after the day's calls. The highest number of unsociable hours (between 9pm and 6am) was recorded by the sole office category - smaller businesses with fewer resources to complete required tasks. Head office and sole office employees recorded the highest presence across the board.

Observed by activity, business and professional employees recorded the highest number of unsociable hours whilst the public sector recorded the lowest presence in this time category.

A study by Eley and Marmot in 1997 revealed that employees did not spend more than 45% of their working day at their work station. This also raises questions about the efficiency of office occupation.

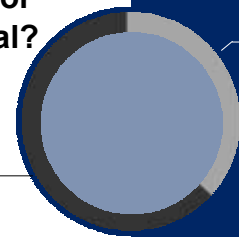
Curiosity Corner

Any set of statistics, if sufficiently large, will throw up a number of curiosities, and this set is no exception. The questionnaire gave the respondent the opportunity to complete their floor areas in square metres or square feet. Despite the best efforts of regulatory and professional bodies, 63% of respondents chose to reply in square feet.

Metric or Imperial?

Responses in Sq.Ft

Responses in Sq.M



Case Study

In 1999, the management team of Laing Property, who are responsible for the corporate real estate function of Laing Property Plc, took the decision to investigate the relocation of their Borehamwood, Hertfordshire office to London's West End. As much of their time was spent in the West End, the commuting time taken to travel between the two locations was recognised as inefficient. Proximity to agents and being located in the heart of London's corporate property community were identified as key business objectives. However, the most significant obstacle facing Laing Property was finding a way to meet its location objectives at an acceptable cost.

The team of six employees sought office space which would not compromise the performance of their daily activities in a supportive environment and at an acceptable cost.

The solution was to lease from BT Property state of the art flexible and mobile furniture complemented by wireless computer technology. This allowed Laing Property to obviate the need to invest in fixed furniture, cabling, raised floors or information/ communication technology. Other Laing employees also have the opportunity to hot-desk.

The relocation involved moving from 92.9m² to 46m² and a density of 15.5m² per employee to 7.7m². Noise and distractions are not reported to be an issue by the employees, although there was some up-skilling in the discipline of paper file retention and storage. Even this does not now present any difficulties. Among the most positive benefits is the ability to communicate openly and share creative ideas.

The relocation was revenue neutral.



New working practices in use at Laing Property



More familiar and traditional office environment



Part of the apparent success of this relocation lies in the choice of flexible, adjustable and mobile furniture. Moving the employees' desks together creates a meeting area and can be as big or as small as necessary. The workstation hubs each contain a personal computer connected to a wireless radio wave Local Area Network (LAN), minimal storage space, a cordless keyboard and mouse, a digitally enhanced cordless (DECT) telephone, and a flat screen monitor on a swivel arm. Each workstation desk-top can be individually height adjusted and is available in various sizes, although they are significantly smaller than traditional office desks. More recently, an independent power cell has been developed by BT Property which will enable the removal of the final cord - the power cord as batteries are planned to be powered by office lighting.

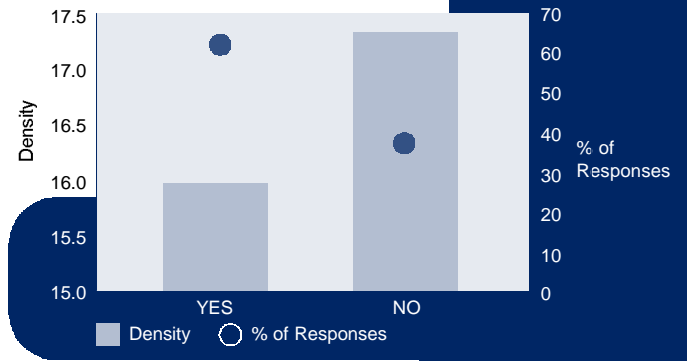
Significant advantages of using a flat screen monitor as opposed to a standard 17 inch cathode ray tube (CRT) visual display unit include the weight and bulk differential, reduced glare and flicker. In addition, flat screens produce only 15 watts of heat, compared to 300 watts produced by the CRT unit. The differential in the amount of energy consumed to both power the respective units and to remove the heat they each produce (via the air conditioning) can be significant.

Two thirds of respondents stated that their organisation utilises an Intranet. The occupational density of those organisations who do use an Intranet is 16.0m², compared to the 17.3m² of those who do not. Whilst this is clearly not (yet) a driver of occupational densities, it could be regarded as symptomatic. Usage is most evident in 1990s buildings where the occupational density differential between those who do and do not use an Intranet is 2.3m². A higher rate of usage is scarcely surprising in newer buildings given the likelihood of built-in capacity to accommodate the extensive cabling required across a LAN. However, this may not always be the case as wireless technology becomes increasingly mainstream.

Among the advantages of wireless applications according to BT Property's Workspace Technology are:

- the removal of the need for raised floors and suspended ceilings for information technology cabling
- reduced height between building floorplates
- reduced electrical power specifications with less complex power distribution
- simpler and faster voice and data fit-outs and removals
- extended life for some older office buildings or those with poor air conditioning or low ceiling heights
- reduced heat gain
- lower air conditioning costs

Intranet Usage



One problem is that wireless technology, as it currently stands, is not able to carry the same quantity of information at the same speed as conventional connectivity. However, with the imminent arrival of the Hyper/LAN2, wireless networks are anticipated to match cable.

Future developments include the passive pico cell, developed by BT researchers which receives and transmits computer and telephony signals from a small wall mounted unit. The unit has a range of 100 metres indoors and uses the light in its optical power cable to power the unit. Teething problems such as the requirement for a direct line of sight for a printer are slowly being overcome. Radiation does not seem to be a problem as all these items, including the DECT telephones, produce less radiation than does one conventional 17 inch CRT monitor.

Bluetooth is another concept which is being developed to assist the wireless office, although early versions were criticised for compatibility problems. A unit located in the office will enable computers, mobile telephones and Palmtop Digital Assistants (PDA) etc to 'talk' to each other. By sharing information, connectivity is enhanced.

Flexible Office Space

A fundamental incongruity between property owners and property occupiers (as lessees) is the willingness to give and take flexibility. To permit a lessee to have flexibility in a lease destabilises an investor's financial interest in the property. Nevertheless, lease lengths have been shortening. Offices have seen the largest reduction in lease lengths of the three standard property categories (the others being retail and industrial) over the 1999-2000 period according to the BPF/IPD Annual Lease Review. Since 1990-1992, the average lease duration has fallen by over eight years to sit at just over twelve years. In 1999-2000, the average period to the first break was eight years, a fall of almost five years since 1990-1992. An additional consideration is the Accounting Standards Board proposal to capitalise the term certain of any organisation's lease commitment onto their balance sheet as a liability.

Despite these statistics, eight years is a long time for a company to commit to an office space when changes in business cycles and performance can vary widely over that time. Optimisation of space can therefore be difficult. Shorter contracts and serviced offices have gone some way to alleviating this dilemma. However the lack of adequate accurate cost data and an evaluation framework to enable like for like comparisons and assessment of the added costs of fit-out, servicing and the opportunity cost involved have been identified as problems (Gibson 2000).

The research identified the ability to exit an occupational agreement when it was no longer required as a key consideration. While lessees were willing to pay for this option, there was an over-riding lack of clarity as to how much should be paid and when for the risk transfer of greater flexibility.



Conclusion



The question of allocation of office space to the individual is a perplexing one. A fine line must be drawn between office occupational efficiency and the systematic deconstruction of a regime of status and authority symbolised by a cellular office. New working practices, we have seen, are not appropriate for all organisations, the most common reason being that they fell outside the 'corporate culture' or had met resistance from staff or management. Managers also noted their reluctance to be removed from the place of work with the consequent loss of direct control over the output of his or her charges.

It is those organisations with a strategy of appropriate space allocation who, according to the results of this Survey, succeed in maintaining efficiency in the occupation of their office space.

Nevertheless, attraction and retention of high calibre employees is fundamental as the building is only the facilitator for the organisation's output. It is therefore a case of horses for courses, with each organisation needing to establish their own business plan with appropriate property benchmarks in place.

There are evident benefits in the adoption of new working practices and space utilisation protocols, however it requires a strategy which fits the corporate culture for them to be successful.

Looking Ahead

This series of office occupational density studies has yet to be undertaken during an economic and/or property recession. Whilst we hold every hope that the fourth edition, due for publication in 2003, won't put that fact to the test, it would certainly provide a valuable empirical insight into how organisations act when the winds of change blow through the corridors (or hot-desks) of power.

The main longer term trend in organisations is toward individuals and groups becoming more interactive (Laing et al 1998). The research contends that the most appropriate environmental systems to facilitate this shift in organisational demand are likely to be more responsive and controllable at a local level than conventional types.

Continued monitoring will unveil attitudes to the use of space. Will it be sardines or oysters? Or neither? Will organisations move toward the totally open plan *modus operandi*? The positive implications can outweigh the drawbacks of background noise, loss of privacy and status. A clear and positive strategy appears to be a pre-requisite. Will organisations reject the trend toward space utilisation standards and revert to traditional cellular space? Or will there continue to be a mix of different space types, each suitable to the type of function it hosts. This seems to be the key to the most efficient use of space - the balance between financial considerations and creativity of employees. Flexibility of design and space use seems fundamental to the efficiency of use, both in terms of the physical space and the equipment used within it.

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Bibliography

Axcell A, Proctor A & Fennell B (2001) A National Survey of Total Office Costs, Department of Property Valuation and Management, City University Business School (Real Estate Finance & Investment Research Paper 2001.01), London

BPF/IPD (2000) Annual Lease Review, London

Eley & Marmot (1997) Involving People In Office Space Planning in Frost, Y (Ed.), Evolution of the Office to Support Flexible Working, Future Work Forum at Henley, Henley Management College

Gibson, V (2000) Evaluating Office Space Needs & Choices, in association with Hedley C, IPD Occupier's Property Databank and Proctor A/Fennell B, Actium Consult, The University of Reading

Laing, A Duffy F Jaunzens D and Willis S (1998) New Environments For Working - the re-design of offices and environmental systems for new ways of working BRE/DEGW, London

National Audit Office (1999) Management of Office Space, Report by the Comptroller and Auditor General on the Ministry of Defence Estate, HMSO

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