

New working practice and office space density: a comparison of Australia and the UK

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Abstract

The growth of facilities management has brought with it a greater emphasis on the way in which we use office space. The drive for greater economic efficiency has resulted in more intense use of offices and the introduction of new office practices. This paper compares the effect of new office practices on office densities in both Australia and the UK. Comparing the office use across a range of organisation functions and use categories, it provides a framework for future performance measures within the selected markets and wider comparison of office space globally and, as such, establishes a foundation for the development of strategic asset plans based on clear measured objectives.

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Introduction

Corporate office space use is changing. We are working in less space for longer hours and adopting innovative new work practices in order to remain competitive and drive our organisations forward. This is the current belief of many corporate real estate consultants and workspace designers. There is, however, limited empirical research to either support or disprove this presumption. If it is true that many organisations are adopting new working practices then is this having the desired affect in reducing overall office space requirements and, if so, what does this mean for the corporate infrastructure resource manager in terms of future strategic asset planning?

This research paper seeks to provide some of the answers regarding current office use patterns and provides a methodology for forecasting future trends in space use patterns. This objective is achieved by first reiterating a number of findings first presented at EuroFM (2003) reporting on a survey of current office use within Australia and second by comparing and contrasting the Australian results with those from similar studies undertaken in the UK.

Background

The provision of reliable quantitative data on which to compare and evaluate facilities performance is the cornerstone of efficient and effective management. The old adage “you can’t manage what you can’t measure” is as true for corporate infrastructure resourcing as it is for any other business improvement initiative.

A review of the facilities management literature over the past couple of decades reveals a healthy growth in the level of published research that provides a number of metrics against which to benchmark our asset performance. The ground breaking research of Zeckhauser and Silverman (1983) urged us to recognise the value of real property to the business. In the UK, Avis *et al.* (1989), and in the USA, Joroff *et al.* (1993) demonstrated that real property assets account for up to 30 per cent of a company’s capital and that a very large proportion of businesses fail to recognise the need to manage their real property assets or to measure asset performance.



There now exist a number of organisations regularly collecting and publishing benchmark data across a range of metrics that will allow facilities managers to benchmark their property against national averages. The Property Council of Australia and International Property Databank in the UK are typical of these publicly available benchmark providers. Yet, despite the growing level of published property measures, there is still a need for many organisations to embrace the strategic management of their property assets. A recent survey of European business by Ernst & Young (2002) revealed that more than half of the organisations surveyed did not have a strategic asset management plan and that a staggering 23 per cent did not measure property performance at all.

The metrics commonly applied to measure property performance are typically quantitative in nature and concentrate on the operating costs of various elements of the facility. This narrow approach to facility performance measurement has been the subject of considerable criticism as such performance measures necessarily do not take account of the intensity of property utilisation or the quality of the workspace provided (Varcoe, 1996; Simpson, 1996). There is a need to develop performance measures to provide facilities managers with benchmark measures of workplace quality in order to satisfy the corporate need to attract and retain the best staff and to enhance business productivity (Bon *et al.*, 1994; Brackertz *et al.*, 2002).

Provision of corporate office space is ever changing as new methods of working are introduced in the quest for greater efficiency and economy. The notion that one work position serves all of an employee's activities has changed, workplace design now looks at "activity settings" in that "position no longer means place". The office layout may incorporate a range of spaces, open-plan, meeting spaces, quiet concentration areas, and conference facilities through which employees move as the type of work they are undertaking at any point in time changes (Stone and Luchetti, 1985). The team-based working environment particularly lends itself to this freeform workspace design. Other organisations have also recognised the apparent waste in providing dedicated work stations 24 hours a day when they may only

be used for 10 or 20 percent of that time. The use of techniques such as hotelling, hot-desking and virtual office or home working in the delivery of efficient office space has attracted many organisations (Reardon, 2001). Many organisations, recognising the high costs of office provision and the drive to higher density of use, have set across-the-board, and perhaps somewhat arbitrary, office density targets. This practice is particularly common within larger corporations and the public sector, where policy dictates a target occupancy density (GREG, 2001). However, as with other aspects of corporate office use strategies, there is very little research which provides any quantitative measure of the uptake of modern officing techniques or any indication of the impact that such new methods of using valuable space might have on the organisation's total space needs.

The need to develop an ongoing time series measure of workplace occupation and the effect of new working practices was recognised in the UK in the RICS/Gerald Eve (2001) research paper, *Overcrowded, Under-utilised or Just Right*. This research sought to identify the density of office occupation as an indication of office use efficiency and, at the same time, to identify the extent to which new office use techniques had been adopted. Evaluating the density of office use and the use of modern office techniques over a series of similar surveys provided a measure of the changing nature of office use. The UK series has been undertaken on three occasions, 1997, 1999 and 2001 and thus provides a valuable benchmark against which to evaluate not just UK office occupancy density but also to apply to other regions.

Recognising the value of the UK office density study as a benchmark for corporate real estate asset planning, the RICS Facilities Management Faculty supported the University of New South Wales in conducting a similar survey of office density in the Australian market (Warren, 2003). The Australian office density study was designed to complement and build on the UK studies, data being collected in such a way as to allow direct comparison between the two regions. The comparison of the UK and Australian office use patterns provides an interesting insight into the way that these two geographically diverse office markets have developed and the differing levels with which

they have embraced the new modes of office use.

Comparison of Australian and UK office densities

Both the Australian and UK office density studies (Warren, 2003; RICS/Gerald Eve, 2001), use similar methodologies to evaluate the density of office occupation within the two regions. The measurement of office occupation density is important in the preparation of strategic asset management plans. It provides facilities managers with a measure of how efficiently their office environment is being utilised and, more importantly, with the long-term trends in office density which will provide hard data to indicate future space requirements. Office density of occupation is based on the total net lettable area (NLA) or net internal area (NIA) as derived in Australia and the UK under their respective codes of measurement. Some minor variations exist between the measurement codes which could produce an error of 3 or 4 per cent in certain circumstances (Warren, 2002). The second factor in deriving density is the number of employees. This is measured in terms of the total number of full-time equivalents (FTE), making allowance for part-time and casual workers. Density is net area/FTE. Thus high density of occupation equates to a low square metre figure and corresponds with a greater intensity of use than a larger square metre figure which provides more space per person and a lower density.

The two office density studies were conducted via postal surveys of a range of business premises in 2002 and 2001 respectively. The surveys were targeted at property and facilities managers in a range of organisations of varying size and industry sector. In Australia, participants were sought from each of the major cities in each State. The total number of office premises in the two studies was 789 with a total floor area of over 2 million square metres and as such represents a substantial proportion of the office market in the two countries. Not all survey results provided full details of the properties they occupied. This could be an indication that this information was not available from existing management information systems in some organisations.

Only those responses providing adequate data and sufficient sample size are included in the Australian data set.

There are very significant differences evident between the two regions. The average density for the Australian market is 20.6m^2 compared to a UK average of 16.3m^2 . This would indicate that the average Australian occupies an additional 4.3m^2 or just over a quarter more space than their UK counterpart. The use of average or mean figures in comparisons is supported by the comparison of the medians, 19.5m^2 and 14.9m^2 respectively. The Australian data has a mode of 25m^2 .

A comparison of the upper and lower quartiles as shown in Figure 1 reveals that while the differential between the two regions is small in the lower range of densities, the disparity in the upper quartile is far greater, with a relatively large figure of 53m^2 for Australia.

This large upper quartile figure indicates that for this region's results there is a much broader range of office densities evident in the market and, as such, the level of reliability in this data set is diminished.

In addition to the presence of lower densities in a larger number of Australian offices, the data also shows a correspondingly fewer number of high density office situations. This shift from the high density end of the scale toward the lower density end is clearly seen in Figure 2. The percentage of respondents in the UK are greater in each of the chosen categories between 10m^2 and 17m^2 as opposed to Australia having the higher proportion of results in the upper three categories between 18m^2 and greater than 25m^2 . This figure also shows that nearly a quarter of the Australian responses occupy greater than 25m^2 , compared with just 13 per cent in the UK.

The measurement of average density across the entire range of survey respondents representing the whole market, while providing a good guide to the market, is not as valuable as a more detailed comparison on a sector by sector basis. The breakdown of the data into major sectors, including the type of function conducted in the office and the nature of the business organisation together with the relative location within a city context and size of the business, provides a greater insight into the manner in which organisations occupy their facilities.

Figure 1 Density range

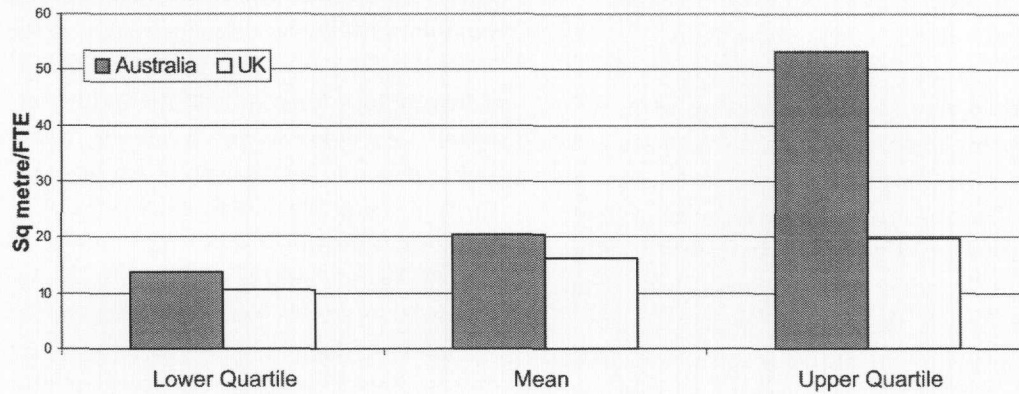
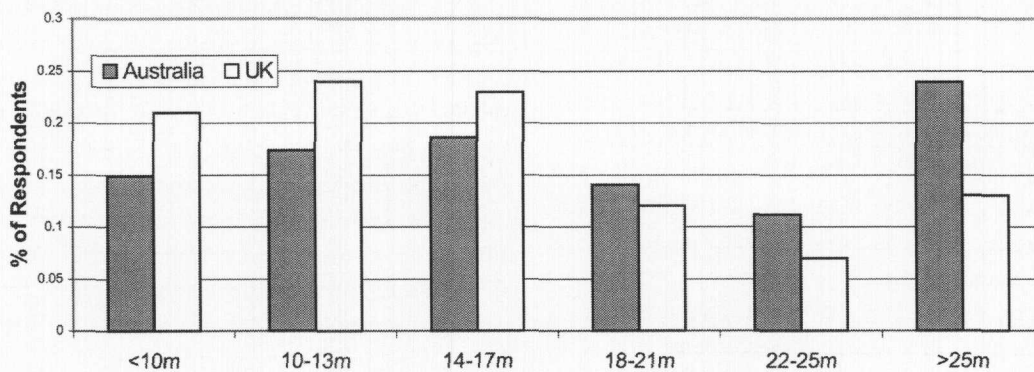


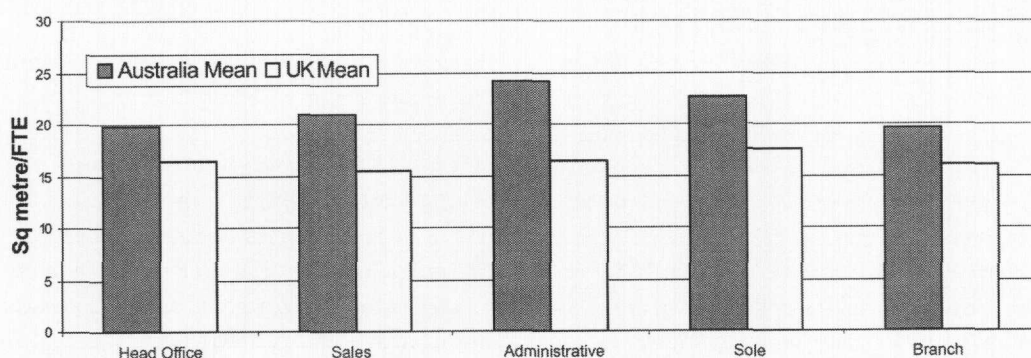
Figure 2 Distribution of office densities



The division of the data by function in Figure 3 confirms the existence of greater densities in the UK across all functional areas. What this figure also reveals is some differential between specific functions in the two countries. The UK data indicates that sales offices are the most densely utilised of the functional areas at 15.7m², followed by head office and administrative functions which are closely matched. However, in Australia, the branch office function is found to be the most densely occupied at 20.1m², closely followed by head office functions at 20.7m².

It is not clear why this disparity exists between the countries. It might be expected that administrative functions would be amongst the most intensively used space, which is certainly true for the UK, but the inverse in Australia. However, a similar argument might be proffered for branch offices, being the most densely used over head office accommodation. This proposition holds true for Australia but not for the UK. One possible explanation for the higher densities among head office and branch functions in Australia could relate to location of these functions

Figure 3 Density by function



within relatively more costly city centres encouraging a more intensive use than perhaps found in lower cost areas.

A comparison of office densities by location provides a reasonably consistent pattern between the countries. Figure 4 shows a close relationship between the two data sets on a location by location basis with the exception of office space within an industrial location where there is a wide disparity in the data, with the UK showing the highest density for this location and Australia the lowest. In both cases the city centre location has, as might be expected, among the highest density of occupation.

The other result of note is that of business parks in which both countries have consistently high densities of use. This is perhaps predictable given the nature of businesses typically found in these locations and the fact that most buildings in this sector would tend to be of modern construction and, as such, more likely to be adapted to modern office techniques.

The next major category by which to compare office use is the nature of the business undertaken within the premises. This comparison should reveal any pattern of use specific to the particular sector of the business market. While it would be desirable to measure by specific industries such as lawyers, accountants, telecommunications etc., the size of the current data base is insufficient to do this. The data comparison is thus conducted by dividing business activity into the much broader ranges of government sector, communications, industrial, business and professional. Figure 5 shows the results of the sector by sector analysis. This level of analysis reveals some interesting characteristics in the data.

The density for industrial sector businesses is very close for both the Australian and UK data, with the former closely matching the lower density figure for offices situated in industrial locations. Indeed the industrial sector is the only Australian category to have a higher density than that recorded in the UK, albeit in the sector having the lowest of all densities. This may support the notion that industrial sector offices are typically located in industrial locations. Yet, detailed examination of the survey results shows that less than one third of Australian industrial organisations are situated in industrial locations and is therefore only a partial explanation as to why the two density figures are similar.

After industrial, the public sector office is the next lowest density in the UK. A comparison between the business, professional sector and government sector is perhaps the closest proxy available for a public/private sector comparison. Both Australia and the UK show similar results in this comparison. The Australian public sector occupies 16.8 per cent more office space than their counterparts in the private sector. While in the UK, public sector offices are 9.7 per cent larger per employee than for the private sector.

The final major category for comparison is the relative size of the organisation. This can be derived from either the extent of the premises occupied or the financial turnover of the business. Both measures are provided in the original research documents but the physical size offers more appropriate results as, in terms of workplace design, it might be expected that organisations with whole or multiple floor tenancies will be able to reduce space use via various economies of scale.

The results categorised by a range of typical floor areas in Figure 6 again show similar

Figure 4 Density by location

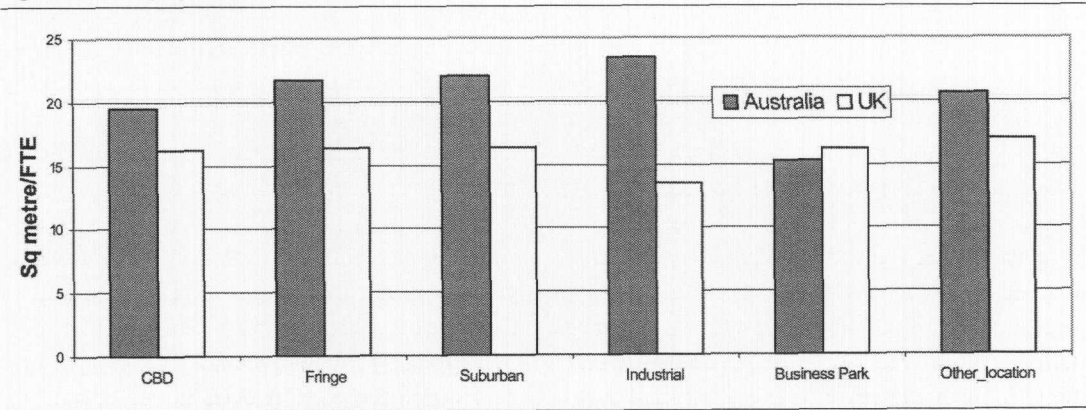


Figure 5 Density by business sector

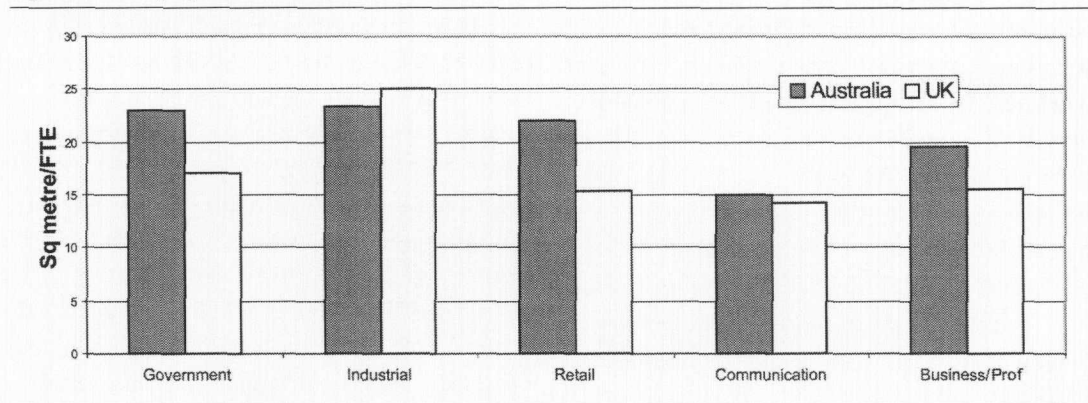
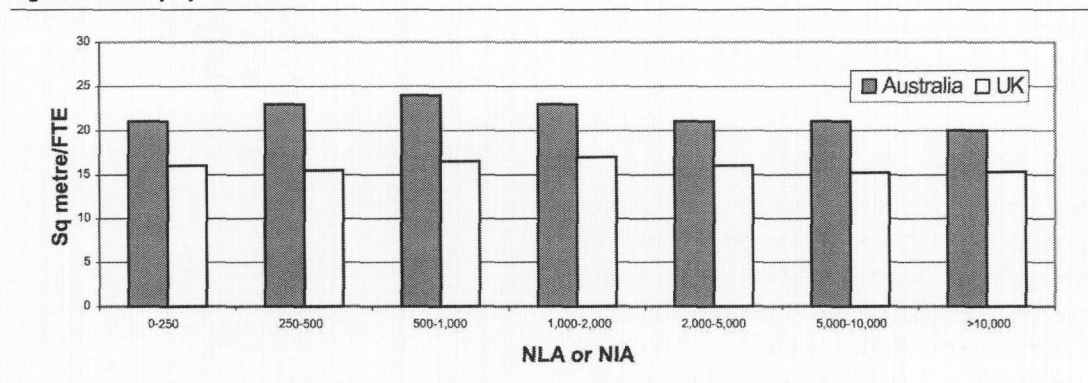


Figure 6 Density by office size



results between the two countries but with Australian figures consistently showing a lower density of occupation. As might be expected, the larger organisations with total floor areas exceeding 10,000m² have the highest densities. In the UK those with areas over 2,000m² have very similar densities. This observation is repeated in Australia where the density varies by less than half a metre between 2,000m² and 10,000m². Thus it appears that office size tends to have little or no effect on density in tenancies over about 2,000m² in either region.

The lowest densities occur at the 500m² to 1,000m² range in Australia and the 1,000m² to 2,000m² in the UK. It is not possible from the data provided to say why this is the case. It might be expected that efficiency of use would increase with the size of the office as economies of scale allow for optimum design. Alternatively the lower density could be attributable to a number of factors which might include an affect resulting from floor plate size. With typical office building having floor plates of around 1,000m² or less, the organisations with lowest density are those organisations that are occupying one or more whole floors. While they might be expected to benefit from the scale of the tenancies over

smaller part-floor tenants in optimising workspace configuration, the lease incentive to take whole floors could lead to space being acquired for which no immediate use exists or, more likely, the organisation spreading to take up the available space. The relatively high density exhibited by smaller organisations is also to be expected. While small to medium businesses are not able to take advantages of the economies of scale available to bigger organisations, anecdotal evidence suggests that these businesses are often more prepared to tolerate cramped conditions to reduce occupancy costs.

The final basis of comparison and the primary driver for both studies was an attempt to quantify the effects of new approaches to office use and how these techniques may influence the density of office use. Participants in the survey were asked if they had instigated any of the new practices, hot desking, hotelling, virtual officing and home working. In addition to identifying participation in any of these initiatives, participants were also asked to indicate the year in which they commenced these new practices and the percentage of staff participating in the process. The adoption of new office techniques does not necessarily

result in a higher density of occupation, although the objective of introducing such schemes is to increase the time any particular work activity setting is utilised; perhaps it may be that the space saved is reassigned to a more appropriate use. An example of this space utilisation may be when introducing hot-desking to reduce the number of workstations, additional team breakout areas may be introduced resulting in no increase in density of use but a more effective use of available resources.

On a national basis the results of new office techniques show an increased office density figure. This is much more pronounced in the UK market than in Australia. New office techniques overall in Australia make a marginal difference to the overall average density by reducing that density by just 1.2m² or 5 per cent. In the UK, however, data shows a reduction of 2.1m² as a result of new office techniques, a significant 12 per cent reduction over the non-new office organisations.

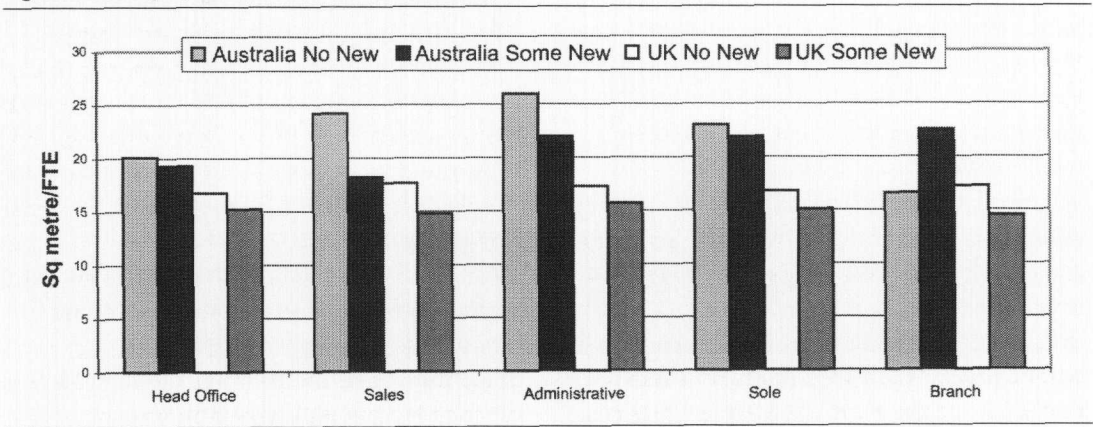
A clearer indication of how new office techniques can affect the efficiency of office use is more clearly seen at a greater level of analysis. A comparison of those organisations that have introduced new office techniques with those who have not within a business function level can be seen in Figure 7. This graph clearly shows that within most of the function categories a density increase occurs as a result of using new office techniques. The only exception to this space saving from new officing is evident in the figure for branch offices in Australia, which shows an increase in office space use in those organisations employing new office techniques. This increase cannot be easily explained and is contrary to data in all other categories.

The most marked increase in office density occurs in sales offices in both Australia and the UK. The increased density results in an average of 6m² less space per person in Australia and 2.9m² in the UK, in percentage terms 25 per cent and 16 per cent respectively. The Australian survey showed that 48.9 per cent of respondents had introduced some form of new office technique. The density results in Figure 7 do not reveal the extent to which new officing has been introduced. Although it is clear from both regions that organisations using new officing have higher office density, it is not possible to conclude that the higher density is attributable to the use of modern office design. The results do however allow us to conclude that organisations that have embraced new workplace activity settings do reduce the overall amount of space per employee, the reason for this saving presenting a clear opportunity for further research. How have the changes in workplace use affected not just density but workplace effectiveness? Are employees more or less productive in the higher density environment and are team-based activity settings providing greater productivity or would some types of business setting benefit from a more isolated cellular office setting. These questions cannot be answered from the data provided but are essential to the future determination of effective office provision.

Conclusion

If facilities managers are to manage their office environment in order to enable businesses to become increasingly competitive then they must be able to

Figure 7 Density by function and new office techniques



measure the efficiency with which they use assets. The intensity of office use, as measured by the density in the surveys, is a useful tool for facilities managers. It must be recognised, however, that no two organisations or offices are identical. It is also important to remember that density of use does not equate necessarily to the quality of space provided or the productivity of the organisation. Density, therefore, is only one measure of efficiency and does not necessarily reflect the effectiveness of space use.

Efficiency of office resourcing will reduce operating costs by increased density of occupation. It is entirely possible, however, that increased density may have a negative affect on effectiveness by reducing worker productivity as a result of what is considered by employees to be cramped working conditions. The survey results for Australia and the UK unfortunately are only able to measure efficiency of use in cost of occupation per employee terms, they are not able to determine how productive that employee is while in the particular workplace.

There is a marked difference between the data collected for Australia and the published results from the UK studies. The difference in the overall average density is 4.3m² or 26.5 per cent more space per person in Australia than in the UK. Further analysis of the data into the various sectors based on function, location and size of organisation show that the Australian office density is, in most cases, lower than that for the UK. The disparity between the two countries varies within each sector of operation in a range of plus 6.5m² in the retail sector to minus 1.8m² in the industrial sector, based on the UK figures. This differential as a proportion of the UK office density is between plus 42 per cent to minus 7.1 per cent. These space density differences have considerable resource implications for the organisations as this additional office accommodation is translated into additional rent and outgoings for the organisation, costs that have to be transferred directly to the bottom line of the company's balance sheet.

It is not possible from the data to conclude why the density differential exists between the Australian and UK regions. There are numerous possible explanations for the difference which include the difference in costs between the two countries in terms of rent and outgoings, the total operating costs

in London being three times those in Sydney (Higgins, 2001). Also the general nature of Australian construction being less constrained by space, factors such as less reliance on space heating, a need for greater ventilation and lower land and construction costs all contribute to the use of more space per person. While the use of more space per person increases costs, the lower total relative costs per employee in Australia result in a much reduced affect on the bottom line of the company. It may also be true that attempts to increase office density may have a more significant affect on worker productivity where staff have become more accustomed to a more open use of space.

The uptake of modern office practices is seen to have a consistent effect in both countries, as might be expected, by increasing the office density of those organisations adopting the new work practices by up to 25 per cent. This reduction in office space can represent a considerable cost saving to the organisation in reduced rent and outgoings. What must be considered though, and what the survey is not able to identify, is has the adoption in modern office practices had a positive or negative affect on productivity and has the total cost of implementing these new practices been less than the savings from the costs of traditional office provision?

It can be concluded from the comparison of the two surveys that not only are office densities in Australia consistently lower than in the UK but also the volatility of space use within the market is much greater. This volatility is evidenced by the number of organisations reporting space use well above the national average. It is not clear from the data why this is the case. Both markets have well developed facilities management professions and considerable attention has been paid to the efficiency of property resourcing over the last few decades. New office designs are reportedly targeting workspace ratios in the low teens, yet this is still not borne out by the survey results and requires further research. It is not possible from the data to arrive at any clear conclusions as to why this marked difference exists other than to perhaps conclude that it is a factor brought about by the lower costs of occupation in the Australian market and perhaps, to some degree, the change in the office market of the past decade with high vacancy factors and large amounts of

sub-lease space available. Each of these factors might cause organisations to be less efficient in their space use.

The implications for facilities managers are quite significant. The UK market based on the three-year time series shows a sound level of consistency from one year to the next and a growth in the density of office use over the period. It is reasonable to conclude from this a level of maturity in the market and a good level of awareness of the importance to the efficiency of the organisation of monitoring and controlling space use. The Australian survey results are unable at this time to provide any indication of future trends. These can only be achieved from repeating the survey over a number of years. By comparing the results with the UK time series, however, it is possible to make some general observations regarding the office market. The consistent use of much greater space per person indicates that office design and organisational allocation of space is quite different from the UK. The reasons for this difference are not clear from the data but warrant further research to establish the rationale. The much wider spread of office density could be an indication of a less uniform market and structured approach to office use and serves as a warning to potential occupiers that some office designs may be considerably more costly to occupy than others. It also appears that Australian organisations perhaps pay less attention to the efficiency of space use, with only 69 per cent collecting data on the cost of office operation and even less using this base data to develop any strategic asset management plans.

What must be noted by facilities managers if procuring office space in different regions of the world is that the local norms in terms of office design and space use differ and must be taken into account if local staff are to be provided with quality, appropriate office workspace to enable business. Within a global context, facilities managers procuring space for their organisations will need to be aware of this apparent disparity in the two markets and be cognisant of the differing workplace

practices within the two regions if they are to provide not only an effective but also an efficient workplace to support their organisation's strategic business objectives.

References

- Avis, M., Gibson, V. and Watts, J. (1989), *Managing Operational Property Assets*, Department of Land Management, University of Reading, Reading.
- Bon, R., McMahan, J.F. and Carder, P. (1994), "Property performance measurement: from theory to management practice", *Facilities*, Vol. 12 No. 12, pp. 18-24.
- Brackertz, N., Haywood, C. and Kenley, R. (2002), "Enabling process for strategic outcomes: CRE in the Australian private and public sector", *Pacific Rim Property Research Journal*, Vol. 8 No. 4, pp. 286-99.
- Ernst & Young (2002), *Views of Corporate Real Estate from the Boardrooms of Europe*, Ernst & Young Real Estate Advisory, London.
- GREG (2001), Australian Government Real Estate Groups, Benchmarking Report, unpublished.
- Higgins, D. (2001), *The Prime Office Market in Australia*, Axiss, Sydney.
- Joroff, M., Louargand, M. and Lambert, S. (1993), *Strategic Management of The Fifth Resource – Corporate Real Estate*, Industrial Development Research Council.
- Reardon, J. (2001), *Globalisation of Corporate Real Estate*, IRES World Congress, Alaska.
- RICS/Gerald Eve (2001), *Overcrowded, Under-utilised or Just Right? Office Space: How Much is Enough*, RICS Foundation, London.
- Simpson, E. (1996), "An assessment of facilities management performance: a look behind the scenes, a stroll around the block and a voyage into hyperspace", *COBRA 96*, RICS Research.
- Stone, P.J. and Luchetti, R. (1985), "Your office is where you are", *Harvard Business Review*, Vol. 62, March-April, pp. 102-17.
- Varcoe, B.J. (1996), "Facilities performance measurement", *Facilities*, Vol. 13 No. 10/11, pp. 46-51.
- Warren, C.M.J. (2002), "Benchmarking corporate real estate; fundamentals of measurement", *Pacific Rim Property Research Journal*, Vol. 8 No. 4, pp. 277-85.
- Warren, C.M.J. (2003), *Room for Thought: A Study of Office Use in Australia*, RICS/UNSW, Sydney.
- Zeckhauser, S. and Silverman, R. (1983) "Rediscover your companies real estate", *Harvard Business Review*, January/February, pp. 111-17.