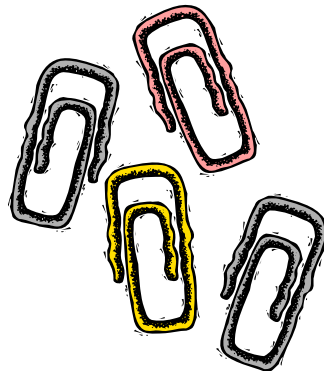


# Employment Densities Guide

2<sup>nd</sup> Edition | 2010



# Contents

- 1 Introduction ..... 1**
  - Use of employment density calculations ..... 1
- 2 Calculating Employment Densities ..... 2**
  - Employment densities ..... 2
  - Average employment density figures ..... 2
  - Measuring floorspace ..... 2
  - Vacant space ..... 3
  - Measuring employment ..... 4
  - Calculating employment densities for redevelopment projects ..... 5
- 3 Table of Employment Densities ..... 6**
- 4 Guidance Notes ..... 7**
  - Average densities ..... 7
  - Density variances ..... 7
    - a) Density variances within Use Types ..... 7
    - b) Changing working practices in offices ..... 10
    - c) Density variance through size of premises ..... 12
    - d) Density variance through location ..... 12
    - e) Density variances amongst English regions ..... 12
    - f) Density variances over economic cycles ..... 13
    - g) Density variance through building age ..... 13
    - h) Density variance through energy efficiency ..... 13
    - i) Changing technologies in industrial, warehouse and distribution sectors ..... 14
    - j) Length of occupation and type of tenure ..... 14
- Appendix 1 – References ..... 15**
- Appendix 2 – Floorspace Definitions ..... 16**
  - Gross External Area – GEA ..... 16
  - Gross Internal Area – GIA ..... 17
  - Net Internal Area – NIA ..... 18
- Appendix 3 – Shift working ..... 19**
- Appendix 4 – Definitions of Office Types ..... 20**
- Appendix 5 – Use Classes Order ..... 22**
- Appendix 6 – Differences between the 1<sup>st</sup> and 2<sup>nd</sup> Editions ..... 23**

# Abbreviations

Abbreviation	Definition
ASHE	Annual Survey of Hours and Earnings
BREEAM	Building Research Establishment Environmental Assessment Method
DEFRA	Department for Food and Rural Affairs
FT	Full time
FTE	Full Time Equivalent (employee)
GEA	Gross External Area
GIA	Gross Internal Area
HCA	Homes & Communities Agency
IPD	Investment Property Databank Ltd
LFS	Labour Force Survey
NIA	Net Internal Area
OECD	Organisation for Economic Co-operation and Development
ONS	Office of National Statistics
PT	Part time
R&D	Research & Development
RDA	Regional Development Agency
RICS	Royal Institution of Chartered Surveyors
UK SIC(92)	UK Standard Industrial Classification of Economic Activities
WAG	Welsh Assembly Government

# 1 Introduction

- 1.1 This Employment Densities Guide 2<sup>nd</sup> Edition (the Guide) updates English Partnerships' 2001 Employment Densities Guide (the 1<sup>st</sup> Edition). The Guide has been authored by Drivers Jonas Deloitte with input from Locum Consulting, IPD and Colin Buchanan. Data and analysis from the 1<sup>st</sup> Edition has been retained where it is still relevant.
- 1.2 The purpose of the Guide is to assist appraisers in the estimation of employment generated by property development based on 'employment density' ratios. Ratios are generally expressed as the number of square metres per employee. Lower numbers imply a higher density of employment. The Guide's primary audience is practitioners in the Homes and Communities Agency (HCA), the Regional Development Agencies (RDAs), Urban Development Corporations (UDCs), successor bodies to these organisations, the Welsh Assembly Government (WAG) and Local Authorities.
- 1.3 The Guide is intended to be used in planning, appraising and evaluating economic development and regeneration programmes and projects. The indicative employment density figures in the Guide incorporate broad assumptions. Users should read the supporting narrative to understand how to apply the ratios. When development-specific information is available it should be used in preference to the indicative figures in this Guide.
- 1.4 The main information sources used for updating this guidance are:
  - employment densities data available within the public domain;
  - in-house data and expertise from Locum Consulting, IPD, Colin Buchanan and Drivers Jonas Deloitte; and
  - discussions with occupiers and operators on typical employment densities and variance factors. (The information gathered from these discussions has only been used to 'sense check' the guidance figures as the limited sample base was not statistically significant.)
- 1.5 Further information on data sources can be found in Appendix 1.
- 1.6 Section 2 of the Guide explains how employment densities are calculated, together with the principal variables. Section 3 sets out the Table of Employment Densities by Use Class and Type and basis of the floor area calculation. Section 4 comprises guidance notes on using the data in relation to each Use Class and Type.

## Use of employment density calculations

- 1.7 The average floorspace requirement per Full-Time Equivalent (FTE) employee of a particular use class can be used in a number of situations, including:
  - forecasting the number of jobs that will be generated by a development;
  - developing a masterplan for a regeneration or economic development project to inform the selection of the best option for developing the site; and
  - assessing the value for money of the project, i.e. the cost per job (the sum of the public investment divided by the forecast number of jobs to be created).

# 2 Calculating Employment Densities

2.1 This section provides details on the method and issues that must be considered when calculating densities.

## Employment densities

2.2 Employment density refers to the average floorspace (in m<sup>2</sup>) per Full-Time Equivalent (FTE) member of staff. It is used as a measure of intensity of building use and an indicator of how much space each person occupies within the workplace. Details on how to measure floorspace and employment are provided below.

## Average employment density figures

2.3 Average employment densities are derived from surveys of a large number of buildings. However, since the 1<sup>st</sup> Edition, limited new survey work has entered the public domain. No primary research has been undertaken for this Guide. As such, the figures in this guide are the best available average for each defined land use from sources available to the authors (see Appendix 1).

## Measuring floorspace

2.4 The Royal Institution of Chartered Surveyors (RICS) recognises three principal measurements of floorspace: gross external, gross internal and net internal. These are calculated following the RICS Code of Measuring Practice (the 6<sup>th</sup> edition being current). In summary these are:

- (i) **Gross External Area (GEA)** – this measurement includes walls, plant rooms and outbuildings, but excludes external space such as balconies and terraces. It has a narrow field of use mostly limited to calculating building costs for large industrial and warehouse buildings, planning applications and approvals, council tax banding, and rating in Scotland for industrial buildings.
- (ii) **Gross Internal Area (GIA)** – this refers to the entire area inside the external walls of a building and includes corridors, lifts, plant rooms, service accommodation (e.g. toilets). It is a widely used metric used in calculating building costs, marketing, valuation, property management and rating (in England and Wales) of industrial buildings (including ancillary offices), warehouses and leisure units and also the valuation of new residential developments.
- (iii) **Net Internal Area (NIA)** – this is commonly referred to as the net lettable or ‘usable’ area of offices and retail units. It includes entrance halls, kitchens and cleaners’ cupboards, but excludes corridors, internal walls, stairwells, lifts, WCs and other communal areas. It is a widely used metric and is the recognised method for marketing, valuation, property management and rating for offices, shops and supermarkets.

2.5 Appendix 2 sets out further detail on what is included and excluded within each of the above measuring bases.

**Floorspace metrics**

- 2.6 In Section 3, the Table of Employment Densities gives the measurement basis for each Use Class. It is recommended that the relevant floorspace metrics are used consistently throughout a project’s development, appraisal and evaluation.
- 2.7 It is important to understand the basis of floorspace measurement and to use it consistently. If necessary, a given figure on one basis can be converted to the appropriate basis for the employment density type.

**Converting gross internal to net internal area**

- 2.8 Gross internal to net internal ratios can vary significantly according to use:
  - for office space the gross figure is typically 15-20% higher than net internal space;
  - for all multi-tenanted buildings the range may be higher than 15-20% given the space allocated for shared or common areas; and
  - for larger warehouses, the net area can be as much as 95% of the gross area.

**Use 15-20% as a general benchmark for converting gross to net areas in office and retail properties.**

Worked Example 1 – Converting GIA to NIA

<b>Example Development:</b>	1,000m <sup>2</sup> GIA development of B1 General Office space
<b>Appraisal:</b>	<p>NIA is derived by applying benchmark:</p> <p style="text-align: center;">1,000m<sup>2</sup> x (100-15)% = 850m<sup>2</sup> NIA</p> <p style="text-align: center;">OR</p> <p style="text-align: center;">1,000m<sup>2</sup> x (100-20)% = 800m<sup>2</sup> NIA</p> <p>The figure used will be dependent on the level of space efficiency anticipated at the building. For more efficient buildings, use a lower conversion percentage of 15%.</p>

**Vacant space**

- 2.9 When evaluating actual densities, only the occupied floorspace should be used in the evaluation. Include a note on the amount of unoccupied space so that the basis of the calculations are clear. This mitigates the risk of the vacant area distorting the employment density figure.

Worked Example 2 – Calculating vacant space

<b>Example Development:</b>	<b>1,000m<sup>2</sup> NIA development of B1 General Office space</b>	
<b>Appraisal:</b>	<b>Apply benchmark of 12m<sup>2</sup> per FTE:</b>	<b>1,000m<sup>2</sup> ÷ 12m<sup>2</sup> per FTE = 83 FTE</b>
<b>Evaluation:</b>	<b>Just 750m<sup>2</sup> of the building is occupied:</b>	<b>750m<sup>2</sup> ÷ 12m<sup>2</sup> per FTE = 63 FTE in occupation</b>
	<b>NOTE: the building has remaining vacant space of:</b>	<b>1,000m<sup>2</sup> - 750m<sup>2</sup> = 250m<sup>2</sup></b>
	<b>equating to a potential additional capacity of:</b>	<b>250m<sup>2</sup> ÷ 12m<sup>2</sup> per FTE = 20 FTE</b>

2.10 Note: the FTE and employment density figures in Section 3 are based on 100% occupation of a building.

2.11 Vacancy rates in buildings can vary significantly. There is no ‘rule of thumb’ to allocate a vacancy rate for any specific reason such as Use Type, scale, timing or location. It is recommended that in carrying out a project appraisal, sensitivity analysis is used to generate a number of vacancy rate scenarios (e.g. 50%, 70%, 90%) for, say, twelve months after first occupation of the building to assess the impact on the forecast gross jobs figure.

## Measuring employment

2.12 Employment can be measured in several ways:

- **Actual** – the number of employees who are full-time, part-time, or on contract.
- **Full-Time Equivalent (FTE)** – the number of total hours worked as a proportion of the average annual hours worked in a like-for-like full-time job.
  - 1 FTE means the person works full-time,
  - 0.5 FTE means the person works half-time. Thus two part-time staff who work half-time each will equal 1 FTE.

2.13 In evaluating completed projects it is recommended that FTE numbers are used to measure employment achieved. These figures should be compared with the employment forecast made as part of the project appraisal. Where there is a significant variance (i.e. +/- 10%) between ex ante appraisal and ex post evaluation, an explanation for the difference should be provided in the evaluation.

## Trends in Full and Part -Time Working

2.14 The ONS Annual Survey of Hours and Earnings (ASHE)<sup>1</sup> provides data on the proportion of employees working full or part-time in different occupations:

- Service industries: part-time employment ranges between a low of 40% (found in the financial services sector) and a high of 63% (found in the leisure and recreation sector – reflecting shift patterns in bars, pubs and restaurants and seasonal working).

<sup>1</sup> ONS Annual Survey of Hours and Earnings 2009: <http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=15313>

- Manufacturing: less than 10% are part-time.
- 2.15 With regard to the proportion of hours worked by part-time staff to FTE, the majority of part-time staff work between 45% - 55% of full-time hours, with an overall average of 50% for all services and industry.

**A ratio of 2:1 part-time staff to FTE should therefore be applied.**

### Calculating employment densities for redevelopment projects

- 2.16 Predicting employment density figures during the project appraisal stage is most accurate for new build (or recently constructed) properties and less accurate for older properties. This is because new buildings are usually designed with regular shaped floors and capable of servicing the employment densities set out in Section 3. See also Section 4 for guidance on density variances in older buildings.
- 2.17 When an occupied building is to be redeveloped, care needs to be taken in the application of employment density metrics when calculating the additional new jobs created by the project (i.e. the gross number of jobs accommodated in the redeveloped building less the previous number of jobs in the original building). If firm data are not available on employment in the original building and employment density ratios are used to determine employment levels, appraisers should adjust for the type and age of the building(s) concerned and the businesses within them, following the guidance provided in section 4.



# 3 Table of Employment Densities

- 3.1 Employment densities can be used in the appraisal of potential employment in property regeneration and economic development projects. Most of the broad categories of use contain wide ranges of density. The figures in the table below are indicative only of the levels of employment that could be generated.
- 3.2 Where appraisers use significantly different figures (i.e. +/-10%) from those set out below, they should specify the reasons for the variation and justify them in the specific context of the project. Potential reasons for departing from the figures in the table are discussed in Section 4.
- 3.3 A more detailed description of the Use Class classifications is in Appendix 5. Further description of the Use Type for offices is provided in Appendix 4.

Use Class	Use Type	Area per FTE (m <sup>2</sup> )	Floor Area Basis	Comment on potential variation	
<b>Industrial</b>					
1	B2	General	36	GIA	Range of 18 - 60 m <sup>2</sup>
2	B1(c)	Light Industry (Business Park)	47	NIA	
<b>Warehouse &amp; Distribution</b>					
3	B8	General	70	GEA	Range of 25 - 115 m <sup>2</sup> The higher the capital intensity of the business, the lower the employment density
4	B8	Large Scale and High Bay Warehousing	80	GEA	
<b>Office</b>					
5	B1(a)	General Office	12	NIA	Includes HQ, Admin and 'Client Facing' office types
6	B1(a)	Call Centres	8	NIA	
7	B1(a)	IT/ Data Centres	47	NIA	A blended rate of the above B1(a) uses where they are found in out of town business park locations
8	B1(a)	Business Park	10	NIA	
9	B1(a)	Serviced Office	10	NIA	
<b>Retail</b>					
10	A1	High Street	19	NIA	Town/ City Centre
11	A1	Food Superstores	17	NIA	
12	A1	Other Superstores/ Retail Warehouses	90	NIA	Includes the back office function area as well as the customer facing areas Range of 10 - 30 m <sup>2</sup>
13	A2	Financial & Professional Services	16	NIA	
14	A3	Restaurants & Cafes	18	NIA	
<b>Leisure &amp; Visitor Attractions</b>					
15	C1	Budget Hotels	1 employee per 3 bedrooms plus casual staff		
16	C1	General Hotels (3 star)	1 employee per 2 bedrooms		
17	C1	4/ 5 Star Hotels	1 employee per 1.25 bedrooms		
18	D1	Cultural Attractions	36	GIA	Very wide range exists, so use with caution. Excludes external areas
19	D2	Cinemas	90	GIA	
20	D2*	Amusement & Entertainment Centres	70	GIA	Range of 40 - 100 m <sup>2</sup> - excludes external areas
21	D2	Sports centres and Private Clubs	65	GIA	

\*some 'Sui Generis' Use Classes are applicable for this Use Type. See Appendix 5 for a list of Sui Generis uses.

# 4 Guidance Notes

- 4.1 These notes are to be read in conjunction with the table in Section 3. They explain a wide range of factors affecting density.

## Average densities

- 4.2 The average density quoted is the mean figure, where it is possible to do so from a number of sources of data. Where new data sources are scarce, the median has been used as this reflects better statistical practice.

## Density variances

- 4.3 Factors that may affect employment density variances from the mean or median within the different Use Classes and Types include the following:

- a) type of activity within Use Type
- b) working practices
- c) size of premises
- d) location
- e) region
- f) economic cycle
- g) building age
- h) energy efficiency
- i) reliance on technology
- j) length of occupation and type of tenure

### a) Density variances within Use Types

- 4.4 Some Use Types, particularly in the industrial sector, have wide-ranging employment densities. This section highlights issues which give rise to the range.

#### Industrial and warehousing

- 4.5 B8 warehousing range is from 25m<sup>2</sup> to 115m<sup>2</sup> per FTE – the wide variation results from small amounts of very low density warehousing. For example, long term and large scale storage facilities for perishable (fresh or frozen) food warehousing has significantly higher employment densities than for non-perishable foods.
- 4.6 Technological developments and restructuring in most industrial sectors is setting a trend for an increase in floorspace per head so that average density is likely to become lower over time.

#### Office

- 4.7 Definitions of the office types are set out in Appendix 4.

4.8 Occupational densities for all office types have increased significantly since the publication of the 1<sup>st</sup> Edition of this Guide in 2001 (see Appendix 6 for a comparison). This is supported by anecdotal evidence that shows there is now much greater awareness amongst occupiers of the relationship between space efficiency and cost of occupation. Higher densities are achieved through more efficient space planning, new ways of working and improved communications technology.

### **Serviced offices**

4.9 Whilst the occupational density of individual units within serviced offices is comparatively high at 7m<sup>2</sup> per workstation, the actual employment density of serviced office property is around 10m<sup>2</sup> per FTE. The provision of shared facilities such as reception, breakout space, meeting rooms etc., account for 30% of the total NIA within a serviced office centre. This reduces the overall employment density, even when taking into account the operator's own staff.

4.10 This Use Type is characterised by changes in density as the nature of the product is innately flexible and occupation by licensees is short term. The two main causes of temporary fluctuations in employment density are:

- The extent to which desk sharing within licensed units and the use of communal 'touch-down' 'virtual office' by subscribers will produce greater employment density than the number of workstations the operator actually provides.
- The higher level of churn of occupiers (compared with conventional offices) can lead to frequent peaks and troughs of vacant space within a centre. Average workstation vacancy rates range between 10% for 'economical' centres and 30% for premium centres, with an overall average of 25% of workstations remaining vacant.

### **Retail**

4.11 Discussions with national retailers have emphasised that employment densities within the retail use class are dependent more on turnover than on floor area. This means a retail unit in a good location with high visibility and a high foot fall is likely to have a higher employment density than a retail unit of the same size in a poor location and/or with a low turnover.

### **General restaurants**

4.12 The range of employment density for most types of casual dining-type restaurants is 10-30m<sup>2</sup> per person. Variations within this range are caused by the following factors:

- number of transactions – e.g. turnover rate of covers / customers;
- opening times – e.g. lunchtime only or all day opening;
- seasonal variation – e.g. summer trade greater than remainder of year; and
- brand and business model – e.g. upmarket operation will have higher ratio of staff to covers / customers.

### **Leisure and visitor attractions**

#### **Hotels**

4.13 The types of hotel specified in the table in Section 3 have been retained as the benchmarking approach for consistency with the 1<sup>st</sup> Edition of this Guide. However, an alternative classification of hotel type, which aligns with that used in the hotels industry is shown below.

#### Alternative hotel classification and ratios

Type	Employment density
Limited service	1 employee per 5 bedrooms
Budget	1 employee per 2.5 bedroom
Mid market	1 employee per 1.67 bedroom
Upper class	1 employee per 1.25 bedroom
Luxury	1 employee per 1 to 0.8 bedrooms

4.14 Employment density in hotels is affected by the following factors:

- size of public areas;
- occupation rates and turnover of rooms; and
- ancillary operations i.e. conferencing & catering operations, health club, etc.

#### **Cultural attractions**

4.15 The diverse and heterogeneous nature of the cultural sector makes it impossible to identify a credible 'rule of thumb' for employment density. This use type could cover a huge range of different types of facilities. A sense check with a small number of local museums, galleries, theatres and heritage attractions suggests a very wide range of employment density from about 30m<sup>2</sup> to over 300m<sup>2</sup> GIA per FTE.

4.16 Variations within this range caused by the following factors:

- Facility use/purpose – what are its core and ancillary functions? Examples include the cultural programme, learning/education programmes, research and conservation, catering, retail and/or corporate hire businesses. The employment density for the Restaurants and Cafés Use Type should be applied where relevant.
- Building structure – e.g. whether it is an historic or new modern building, the proportion of the total floor space occupied, and amount of public/circulation space.
- Governance and management – who is the responsible body? E.g. local authority, independent trust or private company. The employment density may need to be adjusted where employees are responsible for more than one site.
- Volunteers can reduce the (paid) employment density by up to 50-80%<sup>2</sup>. However, use of volunteers can be used to demonstrate other benefits of the development in support of sustainable communities.

4.17 This Use Type may well include external areas but this factor has been excluded as it does not form part of the GIA calculation. In the absence of any new data sources, the benchmark from the 1<sup>st</sup> Edition of this Guide is assumed to remain valid.

#### **Cinemas**

4.18 A typical cinema of 3,400m<sup>2</sup> GIA and 10 screens would employ 60 people, with only about a quarter being full-time, giving a density of 90m<sup>2</sup> per FTE. A sense check with a national operator suggests an employment density of 90-120m<sup>2</sup> GIA per FTE, with variations within this range caused by the following factors:

---

<sup>2</sup> The social benefits of volunteering should not be ignored. Well-run volunteer programmes can help people gain and retain skills that are essential for subsequent paid employment, or provide employment that is rewarding or socially useful in itself.

- amount of space;
- turnover/throughput of customers; and
- building age/design e.g. layout, number of floors etc.

### ***Amusement & entertainment centres***

4.19 This is an extremely diverse Use Type, including amusement arcades, zoos & aquaria, science centres and a range of other one-off visitor attractions, which makes it very difficult to identify a benchmark for employment density. Examples include:

- An amusement arcade of 250-300m<sup>2</sup> GIA might have six staff and a density of 40-50m<sup>2</sup> GIA per FTE.
- A small aquarium or zoo of 3,000-4,000m<sup>2</sup> GIA and 50 staff would have a density of 60-80m<sup>2</sup> GIA per FTE.

4.20 Again, this Use Type may well include external areas but this factor has been excluded as it does not form part of the GIA calculation.

### ***Sports centres/private sports clubs***

4.21 This Use Type has a range of 30-100m<sup>2</sup> GIA per FTE where private sports clubs are at the denser end of the spectrum in comparison to a dry fitness club/gym being at the other end.

4.22 Employment density in sports centres and private sports clubs are affected by the following factors:

- whether the sports facility is wet or dry (swimming pools have minimum staff requirements by law);
- location, e.g. whether city centre or out of town; and
- business model e.g. a fitness centre with a clientele which pays for a high level of personal interaction from personal trainers and physiotherapists will have a higher density.

## **b) Changing working practices in offices**

4.23 Changing working practices are manifest in all sectors, but particularly in the office sector. The change in density between the 1<sup>st</sup> edition and this 2<sup>nd</sup> edition of the Guide indicates these practices are delivering higher densities.

### **Home-working**

4.24 Data from the 2001 Census shows that approximately 9% of the UK workforce work mainly at home. This varies by occupation and is not broken down into those 'teleworking' or other categories.

4.25 The proportion working from home has been increasing steadily over the last 10-15 years for the following reasons:

- increasing share of the workforce who are self-employed;
- general increase in flexible working patterns in the workplace; and
- improvements in telecommunications technology (i.e. high speed broadband) enabling working from home or non-workplace locations.

- 4.26 There is only a minor variation in the prevalence of working from home between rural and urban areas. Based on the DEFRA classifications, approximately 10% of the workforce in rural areas are home-workers compared to 8% in mainly urban districts.
- 4.27 A 2005 labour market trends study estimated that home workers had increased to 11% of the workforce, representing annual average increase of 4% since 1997. If we compare this to the long-term average increase in the workforce of 1% per annum and apply these growth rates to 2011, then it can be reasonably assumed that approximately 13% of the workforce will work from home.
- 4.28 Even though some of this employment is generated purely from home working, for the purposes of this Guide, however, only jobs directly linked to employment space (as opposed to residential space) should be estimated, so that double counting is avoided.

**Hot-desking**

- 4.29 Hot-desking has become increasingly prevalent within the office sector. This is particularly the case in city centre locations where rents are higher. For the purposes of this Guide, the Office density measurements assume a ‘workstation:FTE’ ratio of 1:1.
- 4.30 In practice, however, organisations look to accommodate staff at varying workstation:FTE ratios. These can vary from a 1:1 ratio down to a ratio of 7:10. It is likely that as pressures on space efficiencies increase (for instance, to reduce both costs and carbon emissions) a tighter hot-desking policy is likely to be introduced and implemented. In effect, the lower the workstation:FTE ratio, the higher the employment density.

Worked Example 3 – Calculating employment density for hot-desking offices

<b>Example Development:</b>	<b>1,000m<sup>2</sup> NIA development of B1 General Office space</b>	
<b>Appraisal:</b>	Apply benchmark of 12m <sup>2</sup> per FTE at the workstation to FTE ratio of 1:1	1,000m <sup>2</sup> ÷ 12m <sup>2</sup> per FTE = 83 FTE 83 FTE ÷ 1 workstation each = 83 FTE
	But: applying workstation to FTE ratio of 8:10  This gives a revised employment density of 9.6m <sup>2</sup> per FTE	83 FTE ÷ 0.8 workstation each = 104 FTE

**Residents and local jobs**

- 4.31 Research by GLA Economics for Greater London investigated the relationship between population density and employment in areas of low accessibility (i.e. avoiding central London and other key centres). It is clear that where there is more housing there will be greater demand for local goods and services, e.g. leisure facilities, schools, cinemas, cafes, bakeries etc., and in turn this will generate employment. The research was intended to identify interactions between residents and jobs that are essentially local and to inform the use of ‘job:residents’ ratios in planning housing developments in areas of high and low accessibility.

- 4.32 The paper concludes by noting that land used for housing will have associated employment growth in the locality. Taking the coefficient of employment density regressed alone on population density in areas of low accessibility, it can be deduced that an increase to the resident population of, say, 1,000 will on average have the potential to give rise to a further 230 jobs in the locality.
- 4.33 This study was undertaken for London where higher earnings in the central area support lower wage services in outer London. Based on earning differentials between London and the rest of the UK we suggest that a figure of **150 jobs per 1,000 increase in population** is more applicable outside London.

**This employment density assumption should only be used for purely residential developments.**

- 4.34 Where the development is mixed use, employment densities should be calculated from the commercial aspect of the development and not the residential. This will avoid double counting employment figures.

**c) Density variance through size of premises**

- 4.35 A common thread apparent in the research for this guidance has found that smaller buildings generally have higher densities than larger buildings for all Use Types.

**d) Density variance through location**

- 4.36 One of the factors affecting density is the location of a development in terms of its accessibility and proximity to a town or city.
- 4.37 The main information on location variances is from the office sector (see table below). Suburban and out of town business park locations tend have the higher densities than city and town centre locations, which is surprising given town centre occupancy costs. This may be explained by the greater presence of meeting spaces and boardrooms in a city location and the propensity for call centre and high density administration functions to be located out of town.

Location	Area per FTE (general office)
In Town	11.9 m <sup>2</sup>
Out of Town	11.4 m <sup>2</sup>

**e) Density variances amongst English regions**

- 4.38 There is a lack of regional data by Use Type with which to provide any benchmark figures. However, it is recognised that there will be differences across the country, e.g. between the North and South and between London and the South East and other regions. There are unlikely to be significant differences between North East and North West regions, or parts of the South East and Eastern regions.

## f) Density variances over economic cycles

- 4.39 Employment densities fluctuate over time for any given building. During times of economic buoyancy when businesses are expanding, and taking on more staff, densities increase. Conversely, during periods of economic instability or recession, companies may reduce the number of employees or rationalise accommodation, which may have the effect of reducing employment density.
- 4.40 It is difficult to identify the correlation between economic activity and changes in employment density due to the time lag between property acquisitions and disposals and economic activity. Regional variations in the economic cycle also complicate the assessment of employment densities.
- 4.41 When considering employment density it is important to take account of:
- the prevailing economic context, e.g. is it an economically buoyant or depressed period;
  - property prices; and
  - how profitable is the sector in question, i.e. the impact of a downturn will be cushioned in a highly profitable sector.

## g) Density variance through building age

- 4.42 In general, lower densities occur in older buildings, often reflecting the less efficient use of space in such buildings, when compared to purpose-designed modern accommodation. As older buildings are refurbished and modernised, densities will, on average, increase and therefore density can be considered to be increasing over time as older building stock is refurbished.
- 4.43 The table below shows the variance in employment densities within general office buildings and how these might vary according to the age of the building. The reduction in employment density in the '2001 to present' bracket could be due to increased energy awareness as well as the increased provision of breakout and collaborative working spaces.

Age of construction	Area per FTE (general office)
Pre 1945	15.6 m <sup>2</sup>
1945 to 1984	12.5 m <sup>2</sup>
1985 to 2000	10.3 m <sup>2</sup>
2001 to present	11.5 m <sup>2</sup>

## h) Density variance through energy efficiency

- 4.44 Sustainable design attempts to reduce energy consumption (amongst other things). The two energy efficiency measures that may affect employment density are:
- Using natural ventilation<sup>3</sup> rather than energy intensive air-conditioning – as natural ventilation works within the physical constraints of the building, there will be a limit to the

<sup>3</sup> internal and external air currents and the thermal properties of certain building materials are used to provide cool fresh air to occupants



number of occupants that naturally ventilated space can support. This may mean that low energy buildings require lower employment densities to keep heat gain from occupants and their associated equipment within operable limits.

- The provision of as much natural daylight as possible to minimise lighting loads – this may affect the amount of glazing, the layout of workstations and the depth of floor plates.

4.45 It is worth noting, therefore, that increased use of natural ventilation and daylight may limit the overall floorspace achievable on a development site.

### **i) Changing technologies in industrial, warehouse and distribution sectors**

4.46 The increased automation of functions in these uses is another factor affecting employment density. Where there is a high degree of automation the employment densities are likely to be less than the benchmark figure.

### **j) Length of occupation and type of tenure**

4.47 The length of occupation can have an impact on the employment density of a building. Occupiers who hold their workspace on a freehold or long leasehold basis have less impetus to relocate than those holding under a short leasehold basis. A recently purchased freehold property is likely to have a lower employment density as owners may have taken more space initially, to allow for future expansion. Conversely, an occupier who has been in a property for a number of years may have higher employment densities due to expansion. It is likely that the more flexible the structure of occupation, i.e. short-term occupation with a leasehold tenure, the closer the employment density will be to the benchmark figures and to an occupier's own target employment density.

# Appendix 1 – References

Source
London Employment Sites Database, GLA Economics, 2005
Use of Business Space and Changing Working Practices in the South East, DTZ, 2004
Floor Space and Employment Survey: City of Sydney Local Government Area. Summary Report, 2001
The UK Serviced Office Market, Actium Consult, Instant Offices & City University Business School, 2001
Mayor of London, Industrial and Warehousing Land Demand in London, August 2004
Employment Market Report 2009 - Colindale Borough Council, 2009
Camden: Employment Land Review, June 2008
Industrial and Warehousing Land Demand in London, Mayor of London, August 2004
South Oxfordshire DC Employment Land Review August 2007
CSW Sub Region Employment Land Study June 2007
Background Paper 3, South East Plan, 2004
Employment Land Requirement in the London Fringe, SEERA, 2005
Worthing: Employment Land Study, October 2005
Wiltshire Workspace and Employment Land Strategy, 2009
Central Hertfordshire Employment Land Review, February 2007
Cambridge City and South Cambridgeshire: Employment Land Review, July 2008
Cambridge Employment Land Review, July 08
Kettering Borough Employment Land Requirements 2008
Nottingham City Region: Employment Land Study, January 2007
Leicester and Leicestershire: Employment Land Study, October 2008
Scarborough Employment land Review, May 2006
Richmondshire Joint Employment Land Review, January 2007
Greater Manchester: Employment Land Position Statement, August 2009
Liverpool: Employment Land Study, March 2009
Employment Land Requirements in Barnsley to 2016
Future trends in the Demand for Warehouse Property, King Sturge, Cranfield School of Management, April 2003
Black Country Consortium, Floorspace Requirements and Land Density Assumptions, Drivers Jonas, 2005
CSW Sub Region Employment Land Study, June 07
Not Just Stacking Shelves, ProLogis, January 2006
Employment Land Requirement in the London Fringe, SEERA, 2005
IPD Occupiers Database
Census area statistics 2001 (available via <a href="http://www.nomisweb.co.uk">www.nomisweb.co.uk</a> )
Annual Survey of Hours and Earnings 2008 (available via <a href="http://www.nomisweb.co.uk">www.nomisweb.co.uk</a> )
Labour Force Surveys 2001-2009 (available via <a href="http://www.nomisweb.co.uk">www.nomisweb.co.uk</a> )
Annual Business Inquiry (available via <a href="http://www.nomisweb.co.uk">www.nomisweb.co.uk</a> )
Land Use Statistics 2008 Dept Communities and Local Government (available via <a href="http://www.neighbourhood.statistics.gov.uk">www.neighbourhood.statistics.gov.uk</a> )
Home-based working using communication technologies"; National Statistics Feature in Labour Market Trends October 2005
'Changes in working trends over the past decade' National Statistics Feature in Labour Market Trends January 2004
'More residents, more jobs? The relationship between population, employment and accessibility in London'; GLA Economics Report January 2005
Consultations
A range of in-house Locum Consulting/Colliers International information and expert opinion.
Consultations with a small number of operators of hotels, leisure, visitor attractions and cultural venues.
Consultations with a small number of operators within the retail and industrial sectors.

# Appendix 2 – Floorspace Definitions

The Royal Institution of Chartered Surveyors (RICS) defines floorspace in its 6<sup>th</sup> Edition ‘Code of Measuring Practice: A Guide for Surveyors and Valuers’. These definitions are set out within the following tables:

## Gross External Area – GEA

**Gross External Area is the area of a building measured externally at each floor level**

Including	Excluding
Perimeter wall thickness and external projections	External open-sided balconies, covered ways and fire escapes
Areas occupied by internal walls and partitions	Canopies
Columns, piers, chimney breasts, stairwells, lift-wells, and the like	Open vehicle parking areas, roof terraces, and the like
Atria and entrance halls, with clear height above, measured at base level only	Voids over or under structural, raked or stepped floors
Internal balconies	Greenhouses, garden stores, fuel stores, and the like in residential property
Structural, raked or stepped floors are to be treated as a level floor measured horizontally	
Horizontal floors, whether accessible or not, below structural, raked or stepped floors	
Mezzanine areas intended for use with permanent access	
Lift rooms, plant rooms, fuel stores, tank rooms which are housed in a covered structure of a permanent nature	
Outbuildings which share at least one wall with the main building	
Loading bays	
Areas with a headroom of less than 1.5m	
Pavement vaults	
Garages	
Conservatories	

## Gross Internal Area – GIA

**Gross Internal Area is the area of a building measured to the internal face of the perimeter walls at each floor level**

Including	Excluding
Areas occupied by internal walls and partitions	Perimeter wall thicknesses and external projections
Columns, piers, chimney breasts, stairwells, lift-wells, other internal projections, vertical ducts, and the like	External open-sided balconies, covered ways and fire escapes
Atria and entrance halls, with clear height above, measured at base level only	Canopies
Internal open-sided balconies, walkways, and the like	Voids over or under structural, raked or stepped floors
Structural, raked or stepped floors are property to be treated as a level floor measured horizontally	Greenhouses, garden stores, fuel stores, and the like in residential
Horizontal floors, with permanent access, below structural, raked or stepped floors	
Corridors of a permanent essential nature (e.g. fire corridors, smoke lobbies)	
Mezzanine floor areas with permanent access	
Lift rooms, plant rooms, fuel stores, tank rooms which are housed in a covered structure of a permanent nature, whether or not above the main roof level	
Service accommodation such as toilets, toilet lobbies, bathrooms, showers, changing rooms, cleaners' rooms, and the like	
Projection rooms	
Voids over stairwells and lift shafts on upper floors	
Loading bays	
Areas with a headroom of less than 1.5m	
Pavement vaults	
Garages	
Conservatories	

## Net Internal Area – NIA

**Net Internal Area is the *usable* area within a building measured to the internal face of the perimeter walls at each floor level.**

Including	Excluding
Atria with clear height above, measured at base level only	Those parts of entrance halls, atria, landings and balconies used in common
Entrance halls	Toilets, toilet lobbies, bathrooms, cleaners' rooms, and the like
Notional lift lobbies and notional fire corridors	Lift rooms, plant rooms, tank rooms (other than those of a trade process nature), fuel stores, and the like
Kitchens	Stairwells, lift-wells and permanent lift lobbies
Built-in units, cupboards, and the like occupying usable areas	Corridors and other circulation areas where used in common with other occupiers
Ramps, sloping areas and steps within usable areas	Permanent circulation areas, corridors and thresholds/recesses associated with access, but not those parts that are usable areas
Areas occupied by ventilation/heating grilles	Areas under the control of service or other external authorities including meter cupboards and statutory service supply points
Areas occupied by skirting and perimeter trunking	Internal structural walls, walls enclosing excluded areas, columns, piers, chimney breasts, other projections, vertical ducts, walls separating tenancies and the like
Areas occupied by non-structural walls subdividing accommodation in sole occupancy	The space occupied by permanent and continuous air-conditioning, heating or cooling apparatus, and ducting in so far as the space it occupies is rendered substantially unusable
Pavement vaults	The space occupied by permanent, intermittent air-conditioning, heating or cooling apparatus protruding 0.25m or more into the usable area
	Areas with a headroom of less than 1.5m
	Areas rendered substantially unusable by virtue of having a dimension between opposite faces of less than 0.25m
	Vehicle parking areas (the number and type of spaces noted)

# Appendix 3 – Shift working

The extent to which shift working takes place will alter the employment density. For example, a retail job may be filled by a combination of full-time and part-time employees over the course of a working day.

The 2008 Labour Force Survey (LFS) indicates that on average, 13% of those in employment work shifts (in addition to 3% working shifts 'occasionally'). The most common type of shift work by far is the two-shift system, with its share remaining fairly constant since 1998. There has also been little change in the type of shifts worked over the past ten years.

There is a no recent data on the proportion of shift working by industry sector. A study by the Office of National Statistics (ONS) assessing the change in working patterns between 1993 and 2003 found that shift working in both office and retail employment had increased over the ten year period:

- Transport and communication industry had the most common use of shift work with circa 25%+.
- Retail (UK SIC(92) industrial group 5) shift working rose from circa 10 - 15%.
- Office jobs (UK SIC(92) industrial group 7) rose from 2.5% in 1993 to circa 5% in 2003.

Shift patterns can be seen to vary significantly across all use types and will be dependent on local working practices. Suggested shift patterns that could be used as a rule of thumb are:

Use Class	Number of shifts in a working day
A1 (Retail)	1.5
B1 (General Offices)	1
B1 (Call Centre)	1.5
B1 (R&D/Hi-Tech)	2
B2	2
B8	1

**N.B. All figures within Section 3 of this Guide are assumed to be based on a single shift.**

# Appendix 4 – Definitions of Office Types

Definition	
<b>General office</b>	<p>This category is inclusive of all mixed use or undefined use including HQ offices, client-facing offices and other administrative offices. Other varieties of office which are separately identified below (i.e. Call Centres, IT/Data Centres, Business Park and Serviced Offices are therefore excluded from this category.</p> <p>Definitions of the types of office included within this class of office are as follows:</p> <p><b>HQ Office</b></p> <p>A Headquarters office is a building where the predominant use is as an organisation, or brand/division headquarters.</p> <p>Headquarters offices typically fall into two distinct types: those which offer a relatively small amount of accommodation, predominantly for the senior management team and their support, and those larger buildings which centralise much more of the central management and policy-making. For public sector organisations the organisational or departmental headquarters should be included in this definition.</p> <p><b>Client-facing Office</b></p> <p>A client-facing office (or “front office”) is a building predominantly dedicated to client or customer-facing activities. This will typically be the key driver for the building’s location (i.e. readily accessible by clients or near to the customer base served) and will also influence the style (higher proportions of “front of house” and meeting spaces) and standard of accommodation (higher standard front of house services).</p> <p><b>Administrative Office</b></p> <p>An administrative office (or “back office”) is a building predominantly dedicated to non-client or customer facing activities in support of the operation of the business. Included are “middle office” functions - departments of a financial services company that manage position-keeping (i.e. control representation of transactions within transaction-registering system of a company).</p> <p>A back office is where tasks dedicated to running the company itself take place. Examples of back-office tasks include IT departments that keep the phones and computers running (operations architecture), accounting, and human resources.</p>
<b>Call centre</b>	<p>A call centre is a building where the predominant use is as a call centre or contact centre. These buildings may be either converted standard office space (typically open-plan), converted, or purpose-built warehouse-type space.</p> <p>A call centre or call centre is a centralised office used for the purpose of receiving and transmitting a large volume of requests by telephone.</p> <p>A call centre is operated by a company to administer incoming product support or information inquiries from consumers/customers. Outgoing calls for telemarketing, clientele, and debt collection are also made. In addition to a call centre, collective handling of letters, faxes, and e-mails at one location is known as a contact centre.</p> <p>Call-centres use a wide variety of different technologies to allow them to manage large volumes of work. These technologies facilitate queuing and processing of calls, maintaining consistent work flow for agents and creating other business cost savings.</p>

Office Type	Definition
<b>IT/ data centre</b>	<p>A data centre or computer centre is a building predominantly allocated to house computer systems. Exclude offices which have significant data centre functions within them (e.g. trading floors or call-centres).</p> <p>A data centre is a facility used to house computer systems and associated components, such as telecommunications and storage systems. It generally includes redundant or backup power supplies, redundant data communications connections, environmental controls (e.g. air-conditioning, fire suppression), and special security devices.</p>
<b>Business Park</b>	<p>This category is different to all other office types as it is based solely on the nature of location as opposed to nature of occupier. The reason for the inclusion of this category as a separate office type is to capture the average density for all B1 office types defined within this table (save for serviced offices) usually found in this out of town building type, particularly as business parks often feature in the developments and regeneration schemes this Guide is designed to cater for.</p>
<b>Serviced office</b>	<p>A serviced office is an office or office building that is fully equipped and managed by a facility management company, which then rents individual (and often furnished) offices or floors to other companies. Serviced offices, which are also referred to as managed offices, business centres, incubator centres or executive suites, often allow tenants to share reception services, business machines and other resources, providing reduced costs and access to equipment, services (e.g. IT &amp; comms networking and connectivity) and amenities which may otherwise be unaffordable or uneconomic to purchase.</p> <p>Occupiers of serviced office facilities usually fall into the following categories:</p> <ul style="list-style-type: none"> <li>▪ New Market / Locational - Businesses which are typically headquartered abroad or in another region of the country which require a business presence in the area of operation of the business centre.</li> <li>▪ Startup Companies / Entrepreneurial - Small to medium businesses or enterprises which don't want to make a financial commitment to a longer term lease. This class of client likely also benefits from not having to add administrative and support personnel to payroll, with all the pursuant HR costs (benefits, insurance, recruitment).</li> <li>▪ Overflow - Typically a large company experiencing growth, with traditional leased space in the area which it has outgrown. These can be short-term requirements (3–6 months) for large number of users (as many as 40-50).</li> <li>▪ Interim - Clients that are in the process of moving from one space to another, and may be facing delays in the completion of the new space.</li> <li>▪ Project-based - Clients that have a specific need for office space, based on a specific contract or project.</li> </ul>



# Appendix 5 – Use Classes Order

The Use Classes as defined by the Town and Country Planning (Use Classes) Order 1987 (as amended) are shown below:

Use Class	Use
A1 (Shops)	Sale of goods and cold food, retail warehouses, hairdressers, travel and ticket agencies, post offices, domestic hire shops, funeral directors, dry cleaners, internet cafés
A2 (Financial and Professional Services)	Professional (excluding health and medical services) and financial services (banks and building societies); other services appropriate in a shopping area where the services are provided principally to visiting members of the public
A3 (Restaurants and cafes)	Sale of food and drink for consumption on premises, e.g. in restaurants, cafes
A4 (Drinking establishments)	Public house, wine bar or other drinking establishment
A5 (Hot food take aways)	Sale of hot food for consumption off the premises
B1 (Business)	(a) Offices other than financial and professional services providing for the visiting members of the public (b) Research and development (c) Other industrial processes appropriate in a residential area
B2 (General industrial)	General industry, not within B1
B8 (Storage or Distribution)	Storage or distribution centres
C1 (Hotels)	Hotels, boarding and guest houses, provided that care is not provided
C2 (Residential Institutions)	Residential accommodation for provision of care (e.g. old age homes); residential schools and colleges and training centres; hospitals and nursing homes
C2A (Secure residential accommodation)	Prison; young offenders institutions; detention centres; secure training centres; custody centres; short-term holding centres; secure hospitals; secure local authority accommodation; military barracks
C3 (Dwellinghouses)	Dwelling houses for individuals, families and up to six individuals living as a single household
C4 (Houses in multiple occupation)	Use of a dwelling house by not more than six residents as a house in multiple occupation
D1 (Non-residential institutions)	Clinics, health centres, crèches, day nurseries, day centres, consulting rooms (not attached to doctor's house); museums, libraries, art galleries, public and exhibition halls; non-residential schools, colleges and other educational centres; public worship or religious instruction; law courts
D2 (Assembly and leisure)	Cinemas, dance and concert halls; swimming pools, skating rinks, gymnasiums; other indoor and outdoor sports and leisure uses, bingo halls
Sui Generis	Launderettes, taxi businesses, car hire businesses, filling stations, scrap yards, shops selling or displaying motor vehicles for sale, retail warehouse clubs, hostels, theatres, amusement arcades and centres, fun fairs, nightclubs, casinos

# Appendix 6 – Differences between the 1<sup>st</sup> and 2<sup>nd</sup> Editions

The table below compares the employment densities stated within the 1<sup>st</sup> Edition of the Guide in comparison to densities stated in the current 2<sup>nd</sup> Edition.

N.B. To bring this Guide in line with current practice, the 2<sup>nd</sup> Edition uses different bases of floor area measurement, principally in the use of NIA as opposed to GIA.

	Use Class	Use Type	Area per workspace (m <sup>2</sup> )		Area per FTE (m <sup>2</sup> )	
			2001		2010	
<b>Industrial</b>						
1	B2	General	34	GIA	36	GIA
2	B1(c)	Light Industry (Business Park)	32	GIA	47	NIA
<b>Warehouse &amp; Distribution</b>						
3	B8	General	50	GEA	70	GEA
4	B8	Large Scale and High Bay Warehousing	80	GEA	80	GEA
<b>Office</b>						
5	B1(a)	General Office	19	GIA	12	NIA
6	B1(a)	Call Centres	13	GIA	8	NIA
7	B1(a)	IT/ Data Centres	-	-	47	NIA
8	B1(a)	Business Park	16	GIA	10	NIA
9	B1(a)	Serviced Office	20	GIA	10	NIA
<b>Retail</b>						
10	A1	High Street	20	NIA	19	NIA
11	A1	Food Superstores	19	NIA	17	NIA
12	A1	Other Superstores/ Retail Warehouses	90	GIA	90	NIA
13	A2	Financial & Professional Services	-	-	16	NIA
14	A3	Restaurants & Cafes	13	GIA	18	NIA
<b>Leisure &amp; Visitor Attractions</b>						
15	C1	Budget Hotels	1 employee per 3 bedrooms		1 employee per 3 bedrooms	
16	C1	General Hotels (3 star)	1 employee per 2 bedrooms		1 employee per 2 bedrooms	
17	C1	4/ 5 Star Hotels	1 employee per 1.25 bedrooms		1 employee per 1.25 bedrooms	
18	D1	Cultural Attractions	36	GIA	36	GIA
19	D2	Cinemas	90	GIA	90	GIA
20	D2*	Amusement & Entertainment Centres	40	GIA	70	GIA
21	D2	Sports centres and Private Clubs	90/ 55	GIA	65	GIA

\*some 'Sui Generis' Use Classes are applicable for this Use Type. See Appendix 5 for a list of Sui Generis uses.

If you have any questions on this Guide please contact:

***simon.dancer@hca.gsx.gov.uk***