transport planning Labs Atrium,

Hatch End Industrial Estate, Middle Aston

NW1 8NZ € 020 7293 0217 info@modetransport.co.uk

The Stables Market, 1 Water Lane,

London,

Transport Addendum 2

Client:Middle Aston LtdJob No:J325597Date:08 February 2022File Name:220208 J325597 TN01 V1.1Prepared by:CHApproved by:CH

1. Introduction

1.1 Context

- 1.1.1 This Technical Note (TN) has been prepared by mode transport planning (mode) on behalf of Middle Aston Ltd as a second Addendum to a Transport Statement (TS) that had accompanied a planning application (ref: 21/01123/F) for the proposed redevelopment of Hatch End Industrial Estate.
- 1.1.2 Since the planning application was submitted to Cherwell District Council (CDC), various feedback was received by consultees at CDC, as well as at other organisations such as Oxfordshire County Council (OCC) and their Transport Development Control Team.
- 1.1.3 A first Addendum to the TS was prepared in response to the above and all transport matters were considered resolved by OCC as a result. This informed a recommendation for approval in the CDC Officers' report presented to the CDC planning committee in December 2021.
- 1.1.4 Notwithstanding the above, the CDC planning committee deferred a decision on the planning application, and this included for further consideration of the following transport matters:
 - Applying employment densities to trip generation calculations
 - Further clarity surrounding mode share and what impact this has on forecast traffic generation
 - The provision of a footway into Steeple Aston on Fir Lane
- 1.1.5 The above has been considered further by the applicant and mode and the following respective sections provide responses to each.



2. Applying Employment Densities to Trip Generation

2.1 Worst-case Employee Numbers and Employee Density

- 2.1.1 The proposed quantum of commercial floor space remains the same at 2,214.87m². Through discussions between representatives of the applicant and the planning case officer at CDC, this has however been scheduled into a more detailed land use allowance, which would be governed by way of condition of planning permission, as follows:
 - Class E(g) (i): <u>No more than</u> 732m² (33%)
 - Class E(g) (ii) and (iii): <u>No more than</u> 862m² (39%)
 - Class B8: 422m² (19%)
 - Ancillary Use (Hub) including toilets and meeting space: 198.81m² (9%)
- 2.1.2 The number of employees that the development proposals may accommodate, at 100% occupation and with the maximum allowable E(g) (i), (ii) and (iii) use classes allowances applied, has been calculated. This also provides for an overall employment density under these worst-case conditions (in terms of the number of employees who would be expected to travel to and from the site).
- 2.1.3 The above has been calculated through application of the employment densities provided in the 'Homes and Communities Agency (HCA) Employment Densities Guide', which is provided for reference in Appendix A.
- 2.1.4 The HCA Employment Density Guide is a recognised guidance document in the UK property, development and planning industry for estimating employment density of land uses with employees. For example, the New London Plan (2021) recommends that developers should apply the values in this guide when considering varying parking requirements for employment land uses.
- 2.1.5 It should also be noted that the corresponding densities may represent a worst-case, whereby densities in urban areas where these densities will typically apply (such as London) will be greater in terms of the number of employees per measure of floor area. Moreover, whilst the HCA Employment Density Guide remains the most up-to-date guidance document published by National Government, this had nevertheless been initially published in 2010, and many occupiers have since placed greater priority on the need to space people in the workplace in response to COVID-19.
- 2.1.6 The calculated maximum number of employees and overall employment density, under the worstcase conditions of 100% occupation and with the maximum allowable E(g) (i), (ii) and (iii) use classes allowances applied, is summarised in Table 2.1.



Table 2.1 Calculated Maximum Number of Employees and Employment Density

Use Classes	Land Uses	Floor Areas and Capping	HCA Employment Density	Maximum Employees
Class E(g)	Offices	Maximum 732m ²	1 per 12m ²	61
			See note 1	
Class E(g) (ii) and (iii)	Research & Development (R&D) and Light Industrial	Maximum of 862m ²	1 per 47m ²	18
			See note 2	
Class B8	Storage and Distribution	422m ² (not capped and dependant on above uptake)	1 per 70m ²	6
			See note 3	
Ancillary Hub	Toilets and Meeting Space etc	Fixed 198.81m ²	N/A (ancillary)	0
	Maximum permissible:	2,214.87m ²	1 per 26m ²	85

Note 1: 'General Office' adopted

Note 2: 'Light Industry (Business Park)' adopted which will also typically include for R&D

Note 3: 'General Warehouse and Distribution' adopted (instead of 'Large Scale High Bay Warehousing')

- 2.1.7 Table 2.1 demonstrates that under the worst-case conditions of 100% occupation and with the maximum allowable E(g) (i), (ii) and (iii) use classes allowances applied, 85 employees would be expected across the development proposals, and this would be equivalent to 1 employee per 26m² of overall floor area.
- 2.1.8 It should be noted that in the event there is a greater extent of occupation by B8 and by virtue reduced E(g) (i), (ii) and (iii) use classes, i.e. less than the maximum allowance for these, then the employee density would be expected to reduce (albeit the ratio increase). For example, if all of the non-ancillary hub space were to be B8, then the number of employees would be expected to be 32 and the employee density to be 1 employee per 70m². There is therefore a band of 32 to 85 employees who may work at the site at 100% occupation, depending on the uptake of B8.

2.2 Employment Densities of TRICS Site Surveys

2.2.1 The TRICS Site Surveys adopted to-date and presented in the submitted Transport Statement and first Addendum include for data confirming the number of employees at each site and at the time the site survey was undertaken.

2.2.2 The above data has been used to calculate the employee density per TRICS site survey, as well as the overall aggregate average of employee density across all of the site surveys (i.e. the total floor area across the sites divided by the total employees across the sites). This has been compared with the land use composition of each of the sites and the aggregate average of these (again on the same basis as an aggregate), which was also presented in the first Addendum. All of this is summarised in Table 2.2.

Table 2.2 Employee Densities and Land Use Composition of TRICS Site Surveys

Site ref	Site Category	Employee Density	Land Use Composition
CA-02-B-03	Science Park	1 per 29m ²	Office (50%), R&D (50%)
DV-02-B-01	Business Park	1 per 29m ²	Office (100%)
EX-02-B-01	Business Park	1 per 25m ²	Office (90%), Light Industry (10%)
EX-02-B-02	Business Park	1 per 38m ²	Office (50%), Light Industry (50%)
HC-02-B-02	Business Park	1 per 20m ²	Office (100%)
LN-02-B-02	Business Park	1 per 48m ²	Office (31%), R&D (40%), Light Industrial (20%)
ST-02-B-04	Business Park	1 per 19m ²	Office (20%), R&D (40%), Light Industrial (20%), General Industrial / Storage and Distribution (20%)
WK-02-B-01	Business/Tech Park	1 per 22m ²	Office (40%), R&D (40%), General Industrial / Storage and Distribution (20%)
WO-02-B-02	Business Park	1 per 15m ²	Office (80%), R&D (10%), General Industrial / Storage and Distribution (10%)
Aggregate A	verage	1 per 24m ²	Office (62%), R&D (19%), Light Industrial (13%), General Industrial / Storage and Distribution (6%)

2.2.3 Table 2.2 demonstrates that the overall employee density of the selected TRICS site surveys is 1 per 24m². This density would essentially allow for more employees per floor area than even the 1 per 26m² calculated for the development proposals when under the worst-case conditions of 100% occupation and with the maximum allowable E(g) (i), (ii) and (iii) use classes allowances applied.

Middle Aston Ltd Hatch End Industrial Estate, Middle Aston Transport Addendum 2



2.2.4 Moreover, Table 2.2 confirms (as per the first Addendum) that the TRICS site surveys allow for 62% office space, 19% R&D and 13% Light Industrial (totalling 94% overall). The development proposals would be capped at 72% of these land uses overall and 33% of office space in particular (which as demonstrated in Table 2.1 has by far the highest employment density). Therefore, the TRICS site surveys represent an even greater worst-case in terms of the land uses adopted.

2.3 Conclusion

- 2.3.1 The above clearly demonstrates that the overall 1 per 24m² employee density of the TRICS site surveys suitably allows for even the worst-case 1 per 26m² calculated for the development proposals when under the worst-case conditions of 100% occupation and with the maximum allowable E(g) (i), (ii) and (iii) use classes allowances applied. Moreover, the TRICS site surveys represent an even greater worst-case in terms of the land uses adopted.
- 2.3.2 On the above basis, the trip generation calculated and presented in the Transport Statement and first Addendum, on the basis of the selected TRICS site surveys, is considered to be highly robust. If anything, the trip generation is likely to be lower in practice, in the event that there is a greater extent of occupation by B8 and by virtue reduced E(g) (i), (ii) and (iii) use classes, less than the maximum allowance for these, and the employee density being expected to reduce (albeit the ratio increase).

3. Mode Share and Impact on Trip Generation

3.1 Clarification on Role of Census Data

- 3.1.1 The forecast traffic generation presented to-date in the Transport Statement and first Addendum had been calculated on the basis of vehicle trip rates from the adopted TRICS data.
- 3.1.2 The Transport Statement also provided an 'interim mode share' to provide an indication of what the modal split of total people trips may be. This provided an input into the submitted Travel Plan in absence of real mode share at the site and until such a time the baseline employee travel questionnaires are undertaken post-occupation.
- 3.1.3 The interim mode share had been based upon the standard approach applied in Transport Statements for the above purpose and for employment land uses, whereby the 'method of travel to work' data had been sourced from the 2011 Census for the most applicable area to the site and development proposals. On this basis, the Cherwell 010 Middle Super Output Area had been selected. This is the most granular area available in the 2011 Census for determining the mode share to and from a place of work. This area is demonstrated on Figure 3.1.





Figure 3.1 Cherwell 010 Middle Super Output Area

- 3.1.4 Figure 3.1 demonstrates that the selected area covers Middle Aston and Steeple Aston and is otherwise a largely rural area of Cherwell District. There are no other locations within this area that would be expected to differ significantly to the site's location in terms of availability of sustainable travel connections. Moreover, the fact that the majority of the area is very rural, the corresponding mode share may mean that, if anything, the overall mode share will provide an underestimation of sustainable travel mode share in Middle Aston / Steeple Aston.
- 3.1.5 The mode share from the above approach is 81.4% being undertaken as part of a single occupier vehicle (SOV), although a further 4.7% would travel as a car passenger, and therefore overall, 86.1% of total people trips would be by car. It is noted that a further circa 1% would be by motorcycle meaning that approximately 87% of trips will be undertaken by motorised vehicles.

- 3.1.6 The above mode share is considered to represent a reasonably significant proportion of trips being undertaken by car and is very likely to represent the worst-case expected at the development proposals. This does not withstand the submitted Travel Plan and agreement between the applicant, CDC and OCC to include for a £40,989 contribution towards the improvement of the S4 bus service, both of which would be be secured by way of a Section 106 legal agreement.
- 3.1.7 Moreover, it is understood that OCC agrees with the above in terms of the appropriateness of the mode share adopted, insofar as this suitably representing the characteristics of the site and development proposals.

3.2 2011 Census Based Trip Generation Sensitivity Test

- 3.2.1 The trip generation presented to-date in the Transport Statement and first Addendum remain what is considered to represent an appropriate prediction of vehicular traffic generation. This is furthermore the case based on the evidence presented in Section 2 of this second Addendum, not least where that has presented a worst-case scenario of 100% occupation and with the maximum allowable E(g) (i), (ii) and (iii) use classes allowances applied.
- 3.2.2 Notwithstanding the above, and with clarification provided on the validity of the 2011 Censusbased mode share for SOV drivers (81.4%), this mode share has been applied to the total people trips of the same TRICS site survey dataset. This provides for a sensitivity test comparison with the TRICS-based prediction of vehicle trips, as presented to-date. This is summarised in Table 3.1, whilst the same net reduction of baseline trips detailed in the Transport Statement has been calculated and summarised in Table 3.2.

	AM (08:00-09:00) Peak Hour			PM (17:00-18:00) Peak Hour		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way
Total People Trip Rates	1.820	0.229	2.049	0.158	1.401	1.559
Total People Trips	40	5	45	3	31	34
TRICS Vehicle Trips	30	3	33	2	22	24
2011 Census Vehicle Trips	33	4	37	3	25	28
Sensitivity Difference	+3	+1	+4	+1	+3	+4

Table 3.1 TRICS Total People Trips and Vehicle Trips Based on 2011 Census



Table 3.2 Sensitivity Difference for Net Traffic Generation

	AM (08:00-09:00) Peak Hour			PM (17:00-18:00) Peak Hour		
	Arrive	Depart	Two-way	Arrive	Depart	Two-way
Baseline Vehicle Trips	12	8	20	6	10	16
TRICS Net Vehicle Trips	+14	-5	+13	-4	+12	+8
2011 Census Net Vehicle Trips	+17	-4	+14	-3	+15	+12

3.2.3 Tables 3.1 and 3.2 demonstrate that if adopting the 2011 Census mode share as a sensitivity test comparison with the TRICS-based vehicle trips, there would be only a single additional vehicle trip in the AM (08:00-09:00) peak hour, and only 3 additional vehicle trips in the PM (17:00-18:00) peak hour. The net vehicle trip impact would remain negligible, being an additional 14 two-way vehicle trips compared to the baseline use in the AM, and 12 two-way trips in the PM. That is equivalent to an average of 1 additional vehicle on Fir Lane every 4 to 5 minutes, which again is considered negligible.

3.3 Conclusion

- 3.3.1 The 2011 Census-based interim mode share of 81.4% SOV trips presented in the Transport Statement and Travel Plan remains subject to baseline employee travel questionnaires to be undertaken post-occupation. It nevertheless provides a standard approach for predicting mode share at the site and for the development proposals at hand based upon the area this represents being reflective of the site. Again, it is noted that this does not cover all trips made by motorised vehicles, with a further 4.7% being passengers and circa 1% travelling by motorcycle.
- 3.3.2 Whilst the TRICS-based vehicle trip rates approach remains an appropriate prediction of vehicular traffic generation, the 2011 Census-based interim mode share has been applied to the total people trip rates of the same TRICS site survey data to provide a sensitivity test comparison with the TRICS-based vehicle trip rates. This demonstrates that the differences would be negligible and that when accounting for the baseline traffic generation, the net traffic generation would remain negligible.
- 3.3.3 It may also be noted that all trip generation calculations presented to-date make no allowance for the impacts of the COVID-19 pandemic and the significant changes to working patterns this has brought about. This is likely to result in at least some continued extent of reduced peak hour travel for commuting to and from places of work (including increased home working as well as peak spreading).



4. Provision of a Footway into Steeple Aston

4.1 Background

- 4.1.1 The applicant has already agreed a package of sustainable travel measures with OCC (in their role as local highway authority), to be secured by planning obligation. In addition to a Travel Plan and £40,989 contribution towards the improvement of the S4 bus service, the proposed site layout makes provision for pedestrian connections onto the existing public footpath, which adjoins Fir Lane midway between the site and Steeple Aston.
- 4.1.2 In terms of the need for further mitigation and this being secured by way of planning obligation, it is important to highlight when planning obligations can be sought by a local planning authority and in order to mitigate the impacts of unacceptable development to make it acceptable in planning terms.
- 4.1.3 Planning obligations may only constitute a reason for granting planning permission if they meet the tests that they are necessary to make the development acceptable in planning terms, as set out as statutory tests in regulation 122 and as policy tests in the National Planning Policy Framework (NPPF). Planning obligations must be:
 - Necessary to make the development acceptable in planning terms;
 - Directly related to the development; and
 - Fairly and reasonably related in scale and kind to the development.

4.2 Applying the Planning Obligation Tests

- 4.2.1 In terms of a planning obligation to require further footway provision into Steeple Aston, it has already been stated that the local highway authority would not require this in order to make the development acceptable in planning terms, and again a package of sustainable travel measures will still be secured by planning obligation (Travel Plan and bus services contribution). This is in context with paragraph 110 of the NPPF which states that it should be ensured that:
 - a) Appropriate opportunities to promote sustainable transport modes can be or have been taken up, given the type of development and its location; and
 - b) Safe and suitable access to the site can be achieved for all users.

- 4.2.2 Appropriate opportunities to promote sustainable transport modes have been taken up, as per the above, which is especially the case for the type of development and its location. Moreover, safe and suitable access to the site can be achieved for pedestrians, which reflects the rural area and no recorded personal injury collisions in anyway related to the movement of pedestrians in proximity to the site (which also already has a baseline employment land use).
- 4.2.3 Notwithstanding the above, it is unclear whether existing traffic impacts at the primary school are being confused with the net traffic generation of the development proposals, and whether a footway is being suggested to help mitigate these existing impacts. Again, with the net traffic impact of the proposals being negligible and representing only 4 to 5 additional vehicles during the peak hours (which in the morning may coincide with the primary school, although many vehicles will avoid this altogether by routeing to and from the north), there are no grounds for such a combined impact to result in a situation whereby "*residual cumulative impacts on the road network would be severe*", as per paragraph 111 of the NPPF.
- 4.2.4 By virtue of the above commentary, it is also not possible to draw a link between further footway provision on Fir Lane and this being directly related to the development.
- 4.2.5 In terms of being fairly and reasonable related in scale and kind to the development, it is very clear from site observations and public highway boundary mapping that the provision of a new footway on Fir Lane may not even be achievable in-principle, given the lack of available width between the carriageway edge and third-party land boundaries. This is compounded by the very steep gradients between these fixed points such that retaining structures would be required, and it is unlikely that these could be constructed without requiring access into and permanent structures introduced within this third-party land.
- 4.2.6 Even if such works were to be buildable, the construction and traffic management costs would be significant and entirely inappropriate and unreasonable in terms of the scale and nature of the development proposals. This must be considered hand-in-hand with the first two tests, whereby these cannot be satisfied either and therefore this further reinforces the third test.

4.3 Further Proposed Improvement Related to the Development Proposals

- 4.3.1 In light of the above, the applicant has considered options for improving conditions on Fir Lane, whilst ensuring that such an improvement could satisfy the planning obligation tests discussed above.
- 4.3.2 It is known that Fir Lane already has existing signage to warn motorists that pedestrians may be present in the carriageway, and this could be aimed at assisting parents and children who may be accessing the primary school.

Middle Aston Ltd Hatch End Industrial Estate, Middle Aston Transport Addendum 2



4.3.3 Again, whilst there is not considered to be a need to mitigate the negligible net traffic generation of the development proposal any further, the existing signage could be improved further to better highlight the presence of pedestrians and reinforce the use of Fir Lane for walking. It is suggested this may take the form of replacement signage, such as an illuminated sign.

5. Summary

- 5.1.1 This second Addendum has provided clarification on the three points made reference to as part of decision on the planning application being deferred by the CDC planning committee. More specifically it has provided evidence of the following:
 - When applying industry recognised guidance for employment densities, the TRICS-based approach presented to-date, including the selected site surveys, remains highly robust, including when allowing for worst-case conditions of 100% occupation and with the maximum allowable E(g) (i), (ii) and (iii) use classes allowances applied.
 - The 2011 Census-based interim mode share of 81.4% SOV trips presented in the Transport Statement and Travel Plan remains subject to baseline employee travel questionnaires to be undertaken post-occupation. It nevertheless provides a standard approach for predicting mode share at the site and for the development proposals at hand, based upon the area this represents being reflective of the site.
 - Whilst the TRICS-based vehicle trip rates approach remains an appropriate prediction of vehicular traffic generation, the 2011 Census-based interim mode share has been applied to the total people trip rates of the same TRICS site survey data to provide a sensitivity test comparison with the TRICS-based vehicle trip rates. This demonstrates that the differences would be negligible and that when accounting for the baseline traffic generation, the net traffic generation would remain negligible.
 - The applicant has already agreed a package of sustainable travel measures with OCC to be secured by planning obligation. In addition to a Travel Plan and £40,989 contribution towards the improvement of the S4 bus service, the proposed site layout makes provision for pedestrian connections onto the existing public footpath which adjoins Fir Lane midway between the site and Steeple Aston.
 - The requirement for a new footway on Fir Lane would not satisfy the statutory tests in regulation 122 and as policy tests in the (NPPF), where it cannot be demonstrated that such works would be necessary to make the development acceptable in planning terms, be directly related to the development and be fairly and reasonably related in scale and kind to the development.
 - Whilst there is not considered to be a need to mitigate the negligible net traffic generation of the development proposal any further, the existing pedestrian warning signage on Fir Lane could be improved further to better highlight the presence of pedestrians and reinforce the use of Fir Lane for walking. It is suggested this may take the form of replacement signage, such as an illuminated sign.





HCA Employment Densities Guide



Employment Densities Guide

2nd Edition | 2010



Drivers Jonas Deloitte.

Contents

1	Introduction	1
Use	e of employment density calculations	1
2	Calculating Employment Densities	2
Em	ployment densities	2
Ave	erage employment density figures	2
Me	asuring floorspace	2
Va	cant space	3
Me	asuring employment	4
Ca	Iculating employment densities for redevelopment projects	5
3	Table of Employment Densities	6
4	Guidance Notes	7
Ave	erage densities	7
De	nsity 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) L	_ength of occupation and type of tenure	14
Ар	opendix 1 – References	15
Ар	ppendix 2 – Floorspace Definitions	16
Gro	oss External Area – GEA	16
Gro	oss Internal Area – GIA	17
Net	t Internal Area – NIA	18
Ар	ppendix 3 – Shift working	19
Ар	ppendix 4 – Definitions of Office Types	20
Ap	ppendix 5 – Use Classes Order	22
Ap	opendix 6 – Differences between the 1 st and 2 nd 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 2nd Edition (the Guide) updates English Partnerships' 2001 Employment Densities Guide (the 1st Edition). The Guide has been authored by Drivers Jonas Deloitte with input from Locum Consulting, IPD and Colin Buchanan. Data and analysis from the 1st 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 m²) 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 1st 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 6th 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.

Example Development:	1,000m ² GIA development of B1 General Office space
Appraisal:	NIA is derived by applying benchmark:
	1,000m² x (100-15)% = 850m² NIA
	OR
	1,000m² x (100-20)% = 800m² NIA
	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%.

Worked Example 1 - Converting GIA to NIA

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

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

- 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 halftime 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)¹ 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).

¹ 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 (m²)	Floor Area Basis	Comment on potential variation
	Industrial				
1	B2	General	36	GIA	Range of 18 - 60 m ²
2	B1(c)	Light Industry (Business Park)	47	NIA	
	Warehous	e & Distribution			
3	B8	General	70	GEA	Range of 25 - 115 m ² The higher the capital intensity of the business, the lower the employment density
4	B8	Large Scale and High Bay Warehousing	80	GEA	Wide variations exist arising from scale and storage duration
	Office				
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	
8	B1(a)	Business Park	10	NIA	A blended rate of the above B1(a) uses where they are found in out of town business park locations
9	B1(a)	Serviced Office	10	NIA	Densities within separately let units are c.7 m ² per <u>workstation</u> but 30% of a facility's total NIA for shared services reduces the overall density
	Retail				·
10	A1	High Street	19	NIA	Town/ City Centre
11	A1	Food Superstores	17	NIA	
12	A1	Other Superstores/ Retail Warehouses	90	NIA	
13	A2	Financial & Professional Services	16	NIA	Includes the back office function area as well as the customer facing areas
14	A3	Restaurants & Cafes	18	NIA	Range of 10 - 30 m ²
	Leisure &	Visitor Attractions			
15	C1	Budget Hotels	1 employee p	oer 3 bedroon	ns plus casual staff
16	C1	General Hotels (3 star)	1 employee p	oer 2 bedroon	าร
17	C1	4/ 5 Star Hotels	1 employee per 1.25 bedrooms		poms
18	D1	Cultural Attractions	36	GIA	Very wide range exists, so use with caution. Excludes external areas
19	D2	Cinemas	90	GIA	Range of 90 - 120 m ²
20	D2*	Amusement & Entertainment Centres	70	GIA	Range of 40 - 100 m ² - excludes external areas
21	D2	Sports centres and Private Clubs	65	GIA	Range of 30 - 100 m ²

*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 25m² to 115m² 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 1st 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 7m² per workstation, the actual employment density of serviced office property is around 10m² 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 'touchdown' '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 10-30m² 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 1st 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

Туре	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 30m² to over 300m² 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%². 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 1st Edition of this Guide is assumed to remain valid.

Cinemas

4.18 A typical cinema of 3,400m² GIA and 10 screens would employ 60 people, with only about a quarter being full-time, giving a density of 90m² per FTE. A sense check with a national operator suggests an employment density of 90-120m² GIA per FTE, with variations within this range caused by the following factors:

² 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 250-300m² GIA might have six staff and a density of 40-50m² GIA per FTE.
 - A small aquarium or zoo of 3,000-4,000m² GIA and 50 staff would have a density of 60-80m² 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 30-100m² 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 1st edition and this 2nd 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.

Example Development:	1,000m ² NIA development of B1 General Office space	
Appraisal:	Apply benchmark of 12m ² per FTE at the workstation to FTE ratio of 1:1	1,000m² ÷ 12m² 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 ² per FTE	83 FTE ÷ 0.8 workstation each = 104 FTE

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

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 m²
Out of Town	11.4 m²

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 m²			
1945 to 1984	12.5 m²			
1985 to 2000	10.3 m²			
2001 to present	11.5 m²			

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 ventilation³ rather than energy intensive air-conditioning as natural ventilation works within the physical constraints of the building, there will be a limit to the

³ 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 www.nomisweb.co.uk)
Annual Survey of Hours and Earnings 2008 (available via www.nomisweb.co.uk)
Labour Force Surveys 2001-2009 (available via www.nomisweb.co.uk)
Annual Business Inquiry (available via www.nomisweb.co.uk)
Land Use Statistics 2008 Dept Communities and Local Government (available via
www.neighbourhood.statistics.gov.uk)
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 6th 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		
General office	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 threfore excluded from this category.		
	Definitions of the types of office included within theis class of office are as follows:		
	HQ Office		
	A Headquarters office is a building where the predominant use is as an organisation, or brand/division headquarters.		
	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.		
	Client-facing Office		
	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).		
	Administrative Office		
	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).		
	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.		
Call centre	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.		
	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.		
	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.		
	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.		

Office Type	Definition			
IT/ data centre	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). 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.			
Business Park	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.			
Serviced office	 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 & comms networking and connectivity) and amenities which may otherwise be unaffordable or uneconomic to purchase. Occupiers of serviced office facilities usually fall into the following categories: 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. 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). 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). 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. Project-based - Clients that have a specific need for office space, based on a specific contract or project. 			

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^{st} and 2^{nd} Editions

The table below compares the employment densities stated within the 1^{st} Edition of the Guide in comparison to densities stated in the current 2^{nd} Edition.

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

	Use Class	Use Туре	Area per workspace (m²) 2001		Area per FTE (m²) 2010	
Î	Industria	al				
1	B2	General	34	GIA	36	GIA
2	B1(c)	Light Industry (Business Park)	32	GIA	47	NIA
	Wareho	use & Distribution				
3	B8	General	50	GEA	70	GEA
4	B8	Large Scale and High Bay Warehousing	80	GEA	80	GEA
	Office					
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
	Retail					
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	4 A3 Restaurants & Cafes		13	GIA	18	NIA
	Leisure	& Visitor Attractions				
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

Middle Aston Ltd Hatch End Industrial Estate, Middle Aston Transport Addendum 2

