East Midlands Strategic Distribution Study

A report prepared for *emda*

MDS Transmodal Ltd, Roger Tym & Parners and Savills

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East Midlands Strategic Distribution Study

Prepared for East Midlands Development Agency

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Final Report

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EXECUTIVE SUMMARY

The following provides a brief summary of the main findings from the study. The main document sections and relevant Appendicies should also be consulted as they contain the detailed analysis undertaken and background information.

Section 2 – Logistics and the Regional Economy

ES1. We have examined the economic contribution of the logistics sector in many dimensions, using a variety of sources. Some key findings are as follows:

- A sizeable management literature recognised logistics as an important source of competitive advantage for business, and by extension for national and regional economies.
- This importance is probably growing with the progress of globalisation, tougher competition and rising consumer expectations.
- Logistics is also characterised by rapid progress, both technological and organisational, as companies restructure supply chain to take advantage of economies of scale in warehousing and dramatic improvements in ICT.
- Logistics, as we have defined it, accounts for an estimated 9% of both jobs and output (GVA) in the East Midlands – a higher share than in any other region.
- We estimate that the broad Distribution and Transport sector, which includes logistics, in 2003 contributed £13 billion to the region's GVA. Logistics itself contributed an estimated £5.4 billion.
- The industry's employment in the region since 1998 has grown faster than both total employment in the East Midlands and logistics employment nationally.
- The employment profile of the larger Distribution and Transport sector, of which logistics forms part, is characterised by high proportions of males, full-time workers, elementary occupations, management occupations and low-qualified workers compared to all-sector averages.
- In this, Distribution and Transport is similar to manufacturing, suggesting that it can provide alternative opportunities for workers who lose their jobs in the continuing decline of manufacturing employment.
- The available evidence, including our survey of Magna Park suggests that floor space per worker in strategic warehousing averages around 80-90 square metres.
- Individual warehouses vary widely around this average. In the Magna Park survey, for example, the lowest floor space per worker is 40 metres and the highest is 336 metres.

- Anecdotally, the survey suggests that these variations do not relate to the size or functions of distribution units, but they do relate to the speed of throughput of goods. The faster-moving the goods, the lower is floor space per head.
- Perishable goods need to move fast and hence are associated with low floor space per worker. But it seems that, in many cases, goods which are not physically perishable also move fast, presumably due to business practices such as just-in-time manufacturing.
- We estimate that labour productivity and earnings in logistics are above economy-wide average and above averages for the service sector, though below those for manufacturing.

Section 3 – Analysis of Future Warehouse Demand.

ES2. The table below presents the total (gross) warehouse new build which can be expected in the region up to 2026 together with the associated land requirements.

Executive Summary Table 1: Forecast Total (Gross) New Warehouse Build and Associated Land Requirements* up to 2026

Year	Forecast Base Case	Forecast Scenario 1	Forecast Scenario 2	Forecast Scenario 3
		000s Sq m		
Up to 2016				
Total new build floor space	***2,444***	***2,123***	***2,762***	***2,603***
of which:				
Replacement of existing capacity	1,903	1,903	1,903	1,903
Accommodate traffic growth	541	220	859	700
Up to 2026				
Total new build floor space	***4,888***	***4,200***	***5,562***	***5,223***
of which:				
Replacement of existing capacity	3,844	3,844	3,844	3,844
Accommodate traffic growth	1,044	356	1,718	1,379
		Hectares*		
Up to 2016	611	531	691	651
Up to 2026	1,222	1,050	1,391	1,306

**On the basis that all new build floor space will locate on new sites and warehouse floor space occupies 40% of a plot footprint*
Source: MDS Transmodal GBFM and Savills market data

Base Case: 4.4 million square metres of new build floor space on rail connected sites nationally by 2026, of which 500,000 square metres is located in the East Midlands.
Scenario 1: No new build floor space on rail connected sites in the East Midlands; In other regions, new build floor space on rail connected sites in line with the Base Case (3.96 million square metres by 2026).
Scenario 2: In East Midlands, new build floor space on rail connected sites in line with the Base Case; No new build floor space on rail connected sites in other regions.
Scenario 3: In East Midlands, new build floor space on rail connected sites in line with the Base Case; New build floor space on rail connected sites in other regions at half level in Base Case (2.1 million square metres by 2026).

ES3. It is important to understand that in many cases new build floor space will not 'fit' onto existing plots at general industrial sites or on 'recycled' brownfield land. In addition, the policy of encouraging new warehousing on rail linked sites (national policy and Regional Freight Strategy) also implies a requirement for new sites, given that existing

sites are located either away from railway lines or are unsuitable for rail connection. As a result, new 'strategic logistics sites' will be required for a significant proportion of the forecast gross new build warehousing. The study concluded that new strategic logistics sites (or large plots on existing sites) will be required for future warehouse developments in the region which are greater than 25,000m^2.

ES4. Consequently, the study estimated the proportion of the gross new build demand up to 2016 and 2026 which is likely to be in units over 25,000m^2 in size, taking into account recent trends in the size of new units built in the East Midlands (Appendix 3). This is shown in the table below.

Executive Summary Table 2: Forecast Demand for New Build Units >25,000m^2 up to 2016 and 2026 and Land Requirements*

Floor Space Demand	**000s Sq m**			
	Base Case	**Scenario 1**	**Scenario 2**	**Scenario 3**
New floor space in units >25,000sqm (61%)				
Up to 2016	1,491	1,295	1,685	1,588
Up to 2026	2,982	2,562	3,393	3,186
New floor space in units <25,000sqm				
Up to 2016	953	828	1,077	1,015
Up to 2026	1,906	1,638	2,169	2,037
Land Requirements	**Hectares***			
	Base Case	**Scenario 1**	**Scenario 2**	**Scenario 3**
Land required for units >25,000sqm				
Up to 2016	373	324	421	397
Up to 2026	745	640	848	797
Land required for units <25,000sqm				
Up to 2016	238	207	269	254
Up to 2026	477	409	542	509

**On the basis that all new build floor space will locate on new sites and warehouse floor space occupies 40% of a plot footprint*

ES5. The analysis has also estimated the proportion of the future market which can be expected to locate at rail linked sites in the region. Two options have been considered, namely:

- Option 1: A continuation of recent market trends – 11% new units greater than 25,000m^2 have been developed on rail linked sites between 1997 and 2004; and
- Option 2: The amount of new floor space needed in order to deliver the Regional Freight Strategy policy target of an additional 30 freight trains per day – 1.64 million square metres up to 2026.

ES6. The results of this analysis for the Base Case Scenario are shown in the table below.

Executive Summary Table 3: Forecast Demand for New Build Units >25,000m^2 up to 2016 and 2026 at Rail and Non-Rail Linked Sites

Base Case	Gross Demand >25,000m^2 at Rail Linked Sites		Gross Demand >25,000m^2 at Non-rail Linked Sites		% Rail linked
	000s sq m	ha*	000s sq m	ha*	
Up to 2016					
Option 1	164	41	1,327	332	11%
Option 2	820	205	671	168	55%
Up to 2026					
Option 1	328	82	2,654	663	11%
Option 2	1,640	410	1,342	335	55%

**On the basis that all new build floor space will locate on new sites and warehouse floor space occupies 40% of a plot footprint*

Section 4: Analysis of Current Land Supply and Future Land Requirements

ES7. The results of these forecasts does not imply that the region will need to allocate an additional 640-848 hectares of land up to 2026 for new strategic logistics sites. There are large plots available at existing B8 sites and at strategic sites in the pipeline (both rail and non-rail connected). The study has therefore considered the quantity and quality of current land supply in the region.

ES8. The Regional Spatial Strategy Annual Monitoring Report (AMR) shows that the total supply of employment land in the East Midlands, comprising all development sites

identified for employment uses, stood at 2,833 hectares in April 2005. It would appear that this level of supply should be adequate to meet the forecast demand in the region for smaller scale units.

ES9. However, the AMR figure is not helpful to this study because it does not separate out sites suitable for large-scale B8 uses or those sites which are rail linked (or capable of being rail linked). Savills and Roger Tym & Partners therefore prepared a separate list of sites suitable for large scale B8 uses i.e. existing B8 sites or strategic sites in the pipeline with planning consent for B8 which provide at least 5ha of developable land. This is summarised in the table below at a regional level.

Executive Summary Table 4: Total Land Supply at Existing Sites or Sites in the Pipeline – Rail and Non-rail Connected.

	Hectares
Land at rail linked sites meeting criteria	102
of which:	
Castle Donington	53.8
DIRFT Phase 2	48.6
Other Sites	455
Total Land Supply	**557**

ES10. However, around 198 hectares of existing site supply is located in sub-regions which do not meet the broad sub-regional criteria developed during the course of this study (Section 5). As a result, the study estimates that there is currently 359 hectares of suitable land available in appropriate broad sub-regional areas, of which 102 hectares is located on suitable rail linked sites. These supply figures have consequently been applied to the forecast (gross) land requirement up to 2026 for units greater than 25,000m^2, for the Base Case scenario Option 2. This is shown in the table below.

Executive Summary Table 5: Gross Land Requirement for Units >25,000m^2 and Land Supply in Appropriate Sub-regions

Base Case to 2026	Hectares		
	Rail Linked	Non-rail Linked	Total
Gross Requirement to 2026	410	335	745
Current Land Supply	102	257	359
Land Required	**308**	**78**	**386**
Additional Rail Linked Sites Required			
Mean size - 50ha	6		
Mean size - 75ha	4		
Mean Size - 100ha	3		

ES11. The demand and supply analysis therefore concluded that:

- For the Base Case forecast scenario, in order to meet the Regional Freight Strategy target of 30 additional freight trains in the region around 308 hectares of additional land at appropriate rail connected strategic logistics sites will need to be brought forward over the life of the next RSS (to 2026) in the identified sub-regions (Section 6.2). This equates to 4 new rail linked sites at a mean of 75 hectares per site; and
- For the Base Case forecast scenario, around 78 hectares of additional land at non-rail connected strategic logistics sites will need to be brought forward over the life of the next RSS (to 2026) in the identified sub-regions.

ES12. However, the analysis also suggests that the existing supply at non-rail linked sites is likely to be adequate for the early years of the next RSS (existing supply meets around 75% of non-rail linked demand for Option 2), meaning that new non-rail linked sites will not have to be brought forward until the later years of the RSS. Clearly the priority will be to bring forward land for new rail linked strategic logistics sites.

ES13. Other schemes in the region which are currently being promoted by developers have been considered. We are currently aware of only two such schemes in the region, located at Corby and Burnaston Cross. These two schemes combined could potentially contribute around 135ha to the overall regional requirement for an

additional 308ha of rail connected land. However, both schemes have not been subject to a planning application.

ES14. Suitable sites which have the potential to be rail linked strategic logistics sites are large (at least 50 hectares), have good quality highway links and are also adjacent to a railway line with a generous loading gauge and available freight capacity. Such sites, by their very nature, are often greenfield. This is the policy implication of the Regional Freight Strategy in land use terms. The policy target of 30 additional trains, which was introduced in order to encourage more sustainable distribution in the region, will almost certainly require new strategic logistics sites to be located on greenfield land if the policy target is to be achieved.

Section 5: Development of Robust Site Selection Criteria

ES15. Selecting new sites which are suitable for hosting competitive logistics facilities is a two stage process:

- Firstly, general broad locations are identified which are appropriate for hosting large scale distribution activity; and
- Secondly, appropriate individual sites within these broad locations are identified and selected.

ES16. Consequently, a criteria based approach to identifying and selecting sites appropriate for hosting large scale logistics activity must reflect this two stage process. In developing both sets of criteria, the study considered a number of issues relating to:

- National and regional policy with respect to the location, form and structure of strategic distribution sites; and
- The qualities and characteristics an individual site must posses in order to be commercially attractive to the logistics market.

ES16. The study concluded that the criteria to be used in identifying general broad locations which are appropriate for hosting strategic logistics sites are:

i) A need for logistics facilities as a result of demand from the logistics market which cannot be met in the medium to long term by existing capacity, and is well located in relation to the origins and destinations of cargo;

ii) Good quality access to the railway network. 'Good quality access' is defined in terms of a generous loading gauge which is capable of accommodating intermodal units on standard platform wagons and available capacity to run freight train services;
iii) Good quality access to the highway network. Good quality access is defined as being served by the national motorway network or major non-motorway routes; and
iv) Good access to labour.

ES17. The study concluded that the criteria to be used in identifying and selecting individual sites which are appropriate for hosting large scale logistics activity are as follows:

A commercially attractive strategic logistics site must have:

i) At least 50 Hectares of development land available;
ii) Good rail access. Good quality access is defined in terms of a generous loading gauge which is capable of accommodating intermodal units on standard platform wagons, the ability to handle full length trains, available capacity to run freight train services and permits full operational flexibility;
iii) Has good quality access to the highway network. Good quality access is defined as being served by the national motorway network or major non-motorway routes;
iv) A suitable configuration which allows large scale high bay warehousing, intermodal terminal facilities, appropriate railway wagon reception facilities and parking facilities for all goods vehicles both those based on the site and visiting the site;
v) A need for such facilities due to demand from the logistics market which cannot be met in the medium to long term by existing capacity;
vi) Located away from incompatible neighbours, thereby allowing 24 hour operations and no restrictions on vehicle movements, and minimising the impact on the local environment; and
vii) Has good access to labour.

Section 6: Future Location of Sites in the East Midlands

ES19. The study sub-divided the East Midlands region into a number of broad sub-regions. These sub-regions, which have been defined solely for the purposes of this study, are based around the Housing Market Areas (HMA) but with some alterations to reflect to reflect transport corridors in the region. The sub-regions were subsequently assessed, using the developed criteria, and recommendations made as to which are appropriate for hosting large scale logistics activity i.e. the sub-regional areas where

the region's planners will need to make provision for new 'strategic' B8 sites. The table in Appendix 7 summarises the assessment of each sub-region against the four criteria.

ES20. Given a 'flexible' application of the criteria and accounting for the loading gauge and capacity upgrades being implemented, seven sub-regions will fully meet all four criteria to a reasonable standard and can therefore be considered appropriate for hosting large scale logistics activity. These are shown in Map 6 in Appendix 1.

1. INTRODUCTION

1.1 The Regional Economic Strategy (RES), 'A Flourishing Region', was published by the East Midlands Development Agency (EMDA) in July 2006. It recognises transport and logistics as a 'Strategic Priority' for the sustainable economic development of the Region, with the Region's central location making it an attractive location for distribution activity. EMDA is keen to harness the growth potential of the sector in a sustainable way. A regional priority is also to improve the provision of intermodal freight facilities and rail loading gauge clearance for modern container traffic.

1.2 A new draft Regional Spatial Strategy (RSS), referred to as the East Midlands Regional Plan, was published by the East Midlands Regional Assembly in September 2006. The plan contains the following in relation to the future of logistics activity in the region:

- Promoting opportunities for modal shift
- Northern Coalfields sub-area – develop new opportunities for local jobs in the distribution sector
- Three Cities sub-area – develop opportunities for modal switch away from road based transport in the manufacturing, retail and freight distribution sectors
- Southern sub-area – develop opportunities for modal switch away from road based transport in the nationally important freight distribution sectors

1.3 The Regional Plan will be tested at an 'Examination in Public' (EIP) during 2007. Taking into account any recommendations emerging from the EIP, the document will eventually form the new RSS up to 2026.

1.4 In order to form a better understanding of the region's logistics sector today and in the foreseeable future, MDS Transmodal Ltd, in association with Roger Tym & Partners and Savills, were commissioned by EMDA in July 2006 to conduct the East Midlands Strategic Distribution Study. Briefly, the Terms of Reference required the consultant team to address the following issues:

- An analysis of the importance of logistics to the regional economy
- An understanding of the land requirements for logistics firms and the anticipated demand for sites within the East Midlands in the short, medium and long term.
- An assessment of the current supply of sites taking into account their size and availability

- The development of robust site selection criteria with recommendations as to the number, size and broad location of sites that the region should make provision for.

1.5 This Final Report presents our conclusions with regards to the issues outlined above. Given the content of the study brief, the future needs of the logistics market were an important consideration. However the overarching RSS policy background and other relevant national/regional policies have also been accounted for.

1.6 This Final Report has the status of a 'technical document' which will help inform the development of Regional and local land use policy as well as increasing the understanding of the sector and its contribution to the East Midlands economy. The views expressed in this report, therefore, are those of the consultants and should not be interpreted as the policies of EMDA or other regional bodies.

1.7 The study was managed throughout by EMDA. The East Midlands Regional Assembly, the East Midlands Regional Freight Group, property developers and logistics operators were consulted during the course of the study.

SECTION 2. LOGISTICS AND THE REGIONAL ECONOMY

Section 2.1 Introduction

2.1 In this Section, we consider the contribution of logistics to the regional economy from two angles: the employment it provides and the wealth it generates. In relation to employment, we aim to assess the number and quality of jobs in the industry and employment densities – the relationship between jobs and space. With regard to wealth creation, we gauge the sector's contribution to output, productivity and competitiveness.

2.2 The analysis below is in two parts. Sub-section 2.2 comprises analysis of economic and property market statistics, relating to both wealth creation and employment. Sub-section 2.3 is entirely about employment. It reports a survey of employment at Magna Park, one of the region's principal strategic logistics sites. *Appendix 6* presents background information regarding the logistics market, including the views of industry practitioners and management experts about the contribution of logistics to business performance, and hence wealth creation and efficiency. It also includes a number of interesting case studies which illustrate the importance of logistics to business.

2.3 Throughout this document, the words 'logistics' and distribution' are used interchangeably, to refer to 'the process of planning, implementing, and controlling the flow and storage of goods, services, and related information from point of origin to point of consumption for the purpose of conforming to customer requirements'. Strategic distribution is more difficult to define. The term refers loosely to distribution that uses large-scale specialist warehousing to store and deliver goods over large geographical areas.

2.4 Our analysis relates solely to output, productivity and jobs. It does not touch on transport and traffic generation, which are also major considerations in planning for warehousing development.

2.5 We are grateful to the many stakeholders who contributed to this study, and especially to Gazeley for managing the Magna Park survey and to Prologis for sharing valuable data.

Section 2.2 Economic Statistics

Defining the Sector

2.6 Before analysing the logistics sector, we need to define it. This is difficult, because logistics activities are scattered across many parts of the official industrial classification. At the level of broad sectors, logistics forms part of Sections G and I of the Standard Industrial Classifications (SIC). This is a broad approximation, since it includes many activities other than logistics, such as retail and telecommunications. Wherever possible, therefore, we have used a finer definition of logistics activities based on smaller SIC categories called Classes and Divisions. The table below shows both the broad and fine definitions of warehouse sectors.

Table 1: Distribution and Warehouse Industrial Sectors

Broad Definition *SIC Section* G: Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods I: Transport, storage and communication
Fine Definition *SIC 1992 class (4 digit)* 6024 : Freight transport by road 6311 : Cargo handling 6312 : Storage and warehousing 6321 : Other supporting land transport activity 6411 : National post activities 6412 : Courier activities 7482 : Packaging activities *SIC 1992 division (2 digit)* 51 : Wholesale trade/commission trade, etc

2.7 In the analysis that follows, for brevity we refer to the broad sector definition as 'Distribution and Transport' and the narrow definition as 'logistics'.

2.8 To define the kinds of workers who are likely to work in logistics, and specifically in warehousing, we use a broad definition from Standard Occupational Classifications (SOC) sub-major group as shown in the table below, and, where data permits, a better refined definition using four digit SOC unit groups. These rely on our expected profile

of 'typical' logistics related jobs, however, like in all sectors, there will be other occupational groups such as management and administration working alongside.

Table 2: Distribution and Warehouse Occupations

Broad Definition
SOC 2000 sub-major groups
81 : Process, Plant and Machine Operatives
82 : Transport and Mobile Machine Drivers and Operatives
91 : Elementary Trades, Plant and Storage Related Occupations

Fine Definition
SOC 2000 unit groups
811 : Process Operatives
812 : Plant And Machine Operatives
813 : Assemblers And Routine Operatives
821 : Transport Drivers And Operatives
822 : Mobile Machine Drivers And Operatives
116 : Managers In Distribution, Storage And Retailing
351 : Transport Associate Professionals
914 : Elementary Goods Storage Occupations

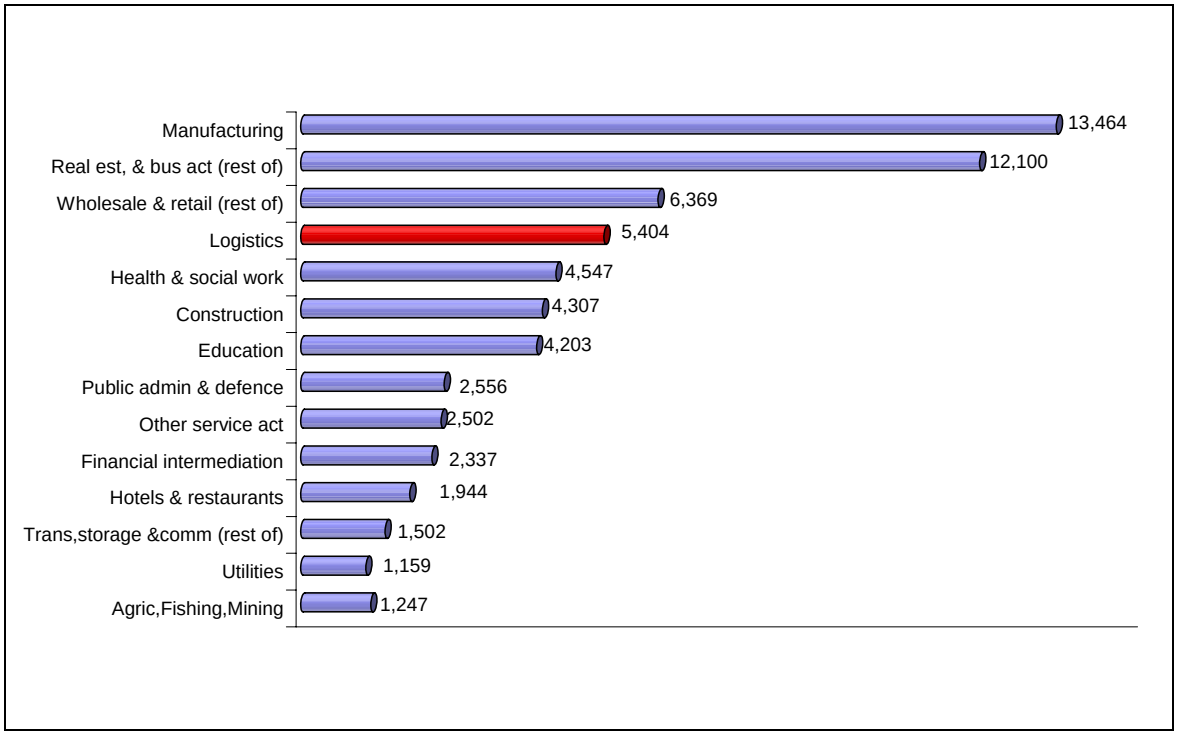
2.9 It is not possible in official statistics to distinguish strategic logistics from logistics in general.

Output and Productivity

Regional Output

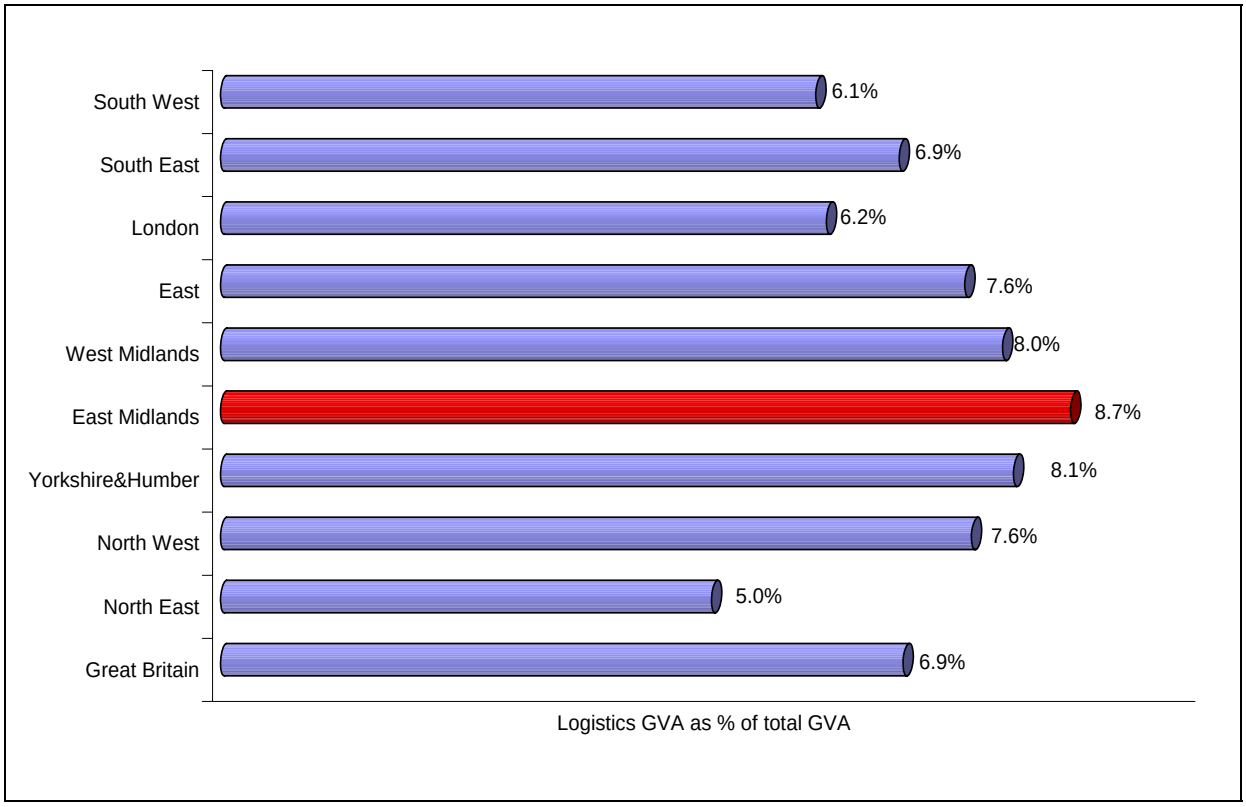
2.10 ONS data show that the broad Distribution and Transport sector in 2003 generated more than £13 billion in gross value added (GVA) to the East Midlands. GVA data for logistics on its own are not available, but we have estimated the sector's contribution to GVA from its share of employment in the wider sector (sub-section 2.2.2). This calculation suggests that that logistics in 2003 generated some £5.4 billion in gross value added to the East Midlands economy. This is shown in the graph below along with other sectors.

Graph 1: Workplace GVA by Sector in the East Midlands, 2003 (£ million)



2.11 On these estimates, logistics contributes 9% of GVA in the East Midlands, a higher proportion than in any other region. This is shown in the graph below.

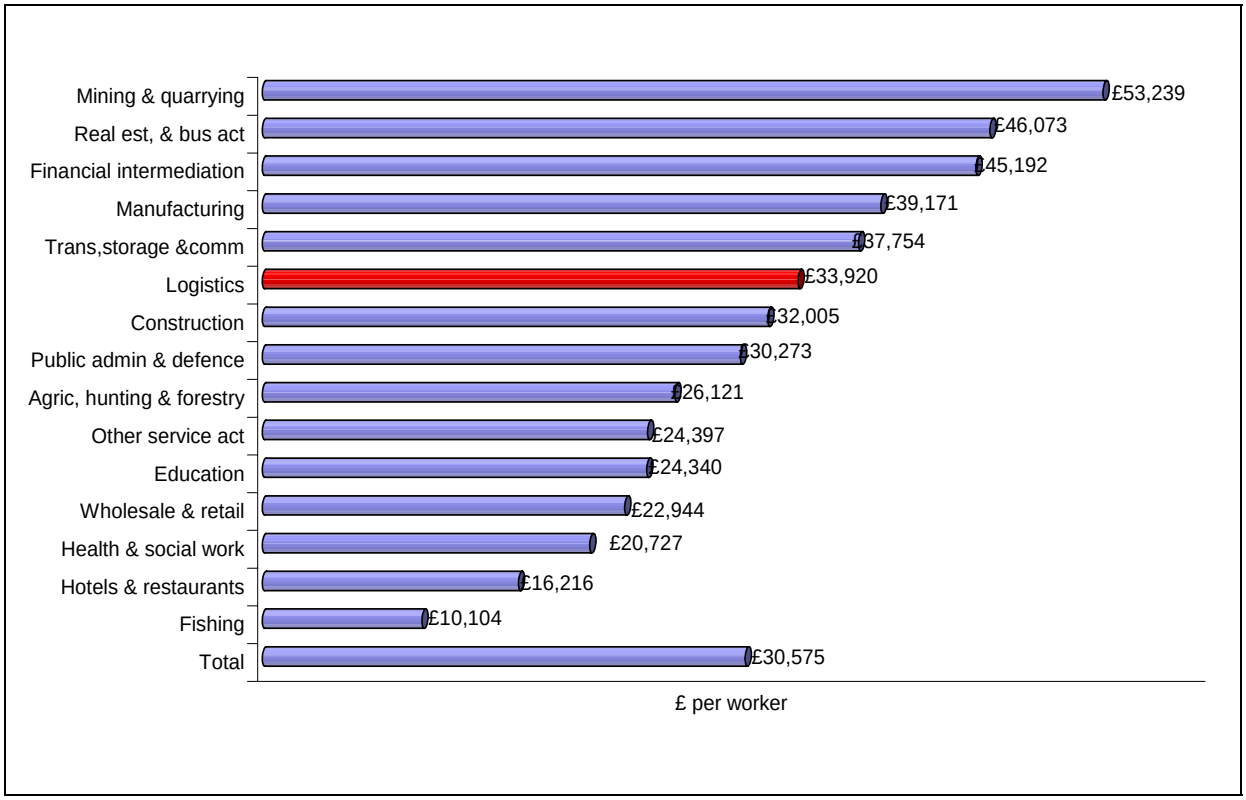
Graph 2: Share of Logistics in GVA by Region, 2003



Productivity

2.12 No data on productivity in logistics is available. We have derived an estimate based on the shares of logistics activity in larger sectors. On this basis, we estimate that logistics generates around £33,900 in value added per worker compared with £30,500 for all sectors - an uplift of 11%. This is shown in the graph below.

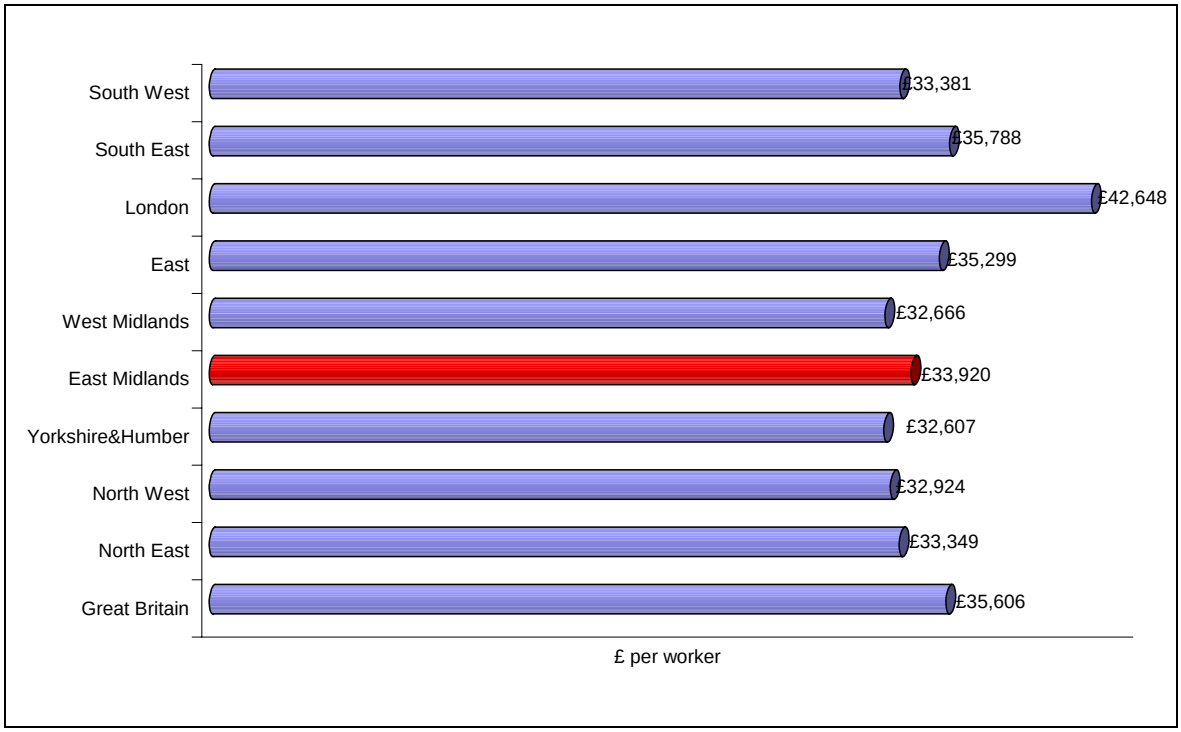
Graph 3: GVA per Employee by Sector, East Midlands, 2003



Source: ONS; ABI; RTP

2.13 The graph below shows GVA per worker in logistics by region.

Graph 4: GVA per Employee in Logistics by Region, 2003



Source: ONS; ABI; RTP

Employment in Logistics

Total Employment

2.14 The first step in our employment analysis is to examine the number of jobs that logistics provides in the region. This is shown in the tables below.

Table 3: Warehousing and Distribution Jobs in the East Midlands, 2004 – Broad Definition

Definition	No. of Jobs
Broad Definition – Distribution and Transport	
G : Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	345,500
I : Transport, storage and communication	102,500
Total	**448,000**

Source: ABI 2004

Table 4: Warehousing and Distribution Jobs in the East Midlands, 2004 – Fine Definition

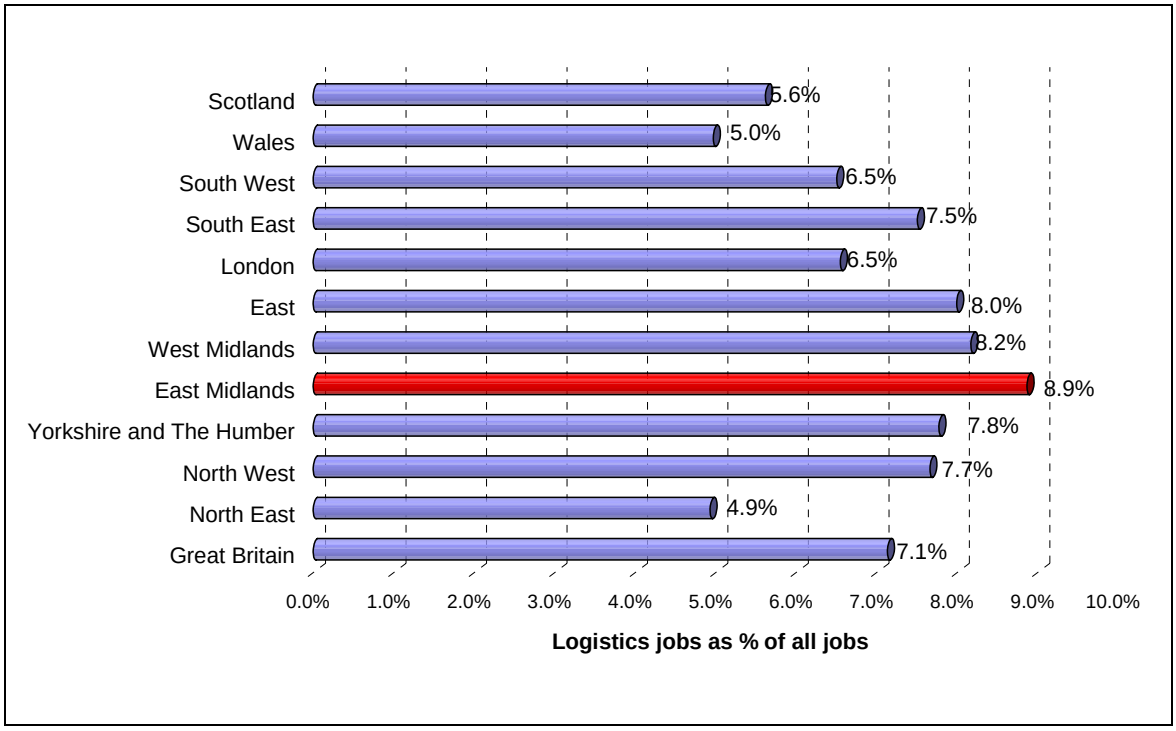
Fine Definition - Logistics	
6024 : Freight transport by road	27,400
6311 : Cargo handling	**
6312 : Storage and warehousing	17,700
6321 : Other supporting land transport activities	4,000
6411 : National post activities	13,300
6412 : Courier activities other than national post activities	7,100
7482 : Packaging activities	3,400
51 : Wholesale trade and commission trade, except of motor vehicles and motorcycles	86,700
Total	**160,000**

***Owing to data restrictions we are unable to show the number of Cargo Handling jobs. Source: ABI 2004*

2.15 There are 450,000 jobs in Distribution and Transport in the East Midlands, of which 160,000, about one third, are in the logistics sector as defined in our analysis. In this

'narrow' definition, logistics accounts for 9% of the region's jobs – a higher share than in any other region. This is demonstrated in the graph below.

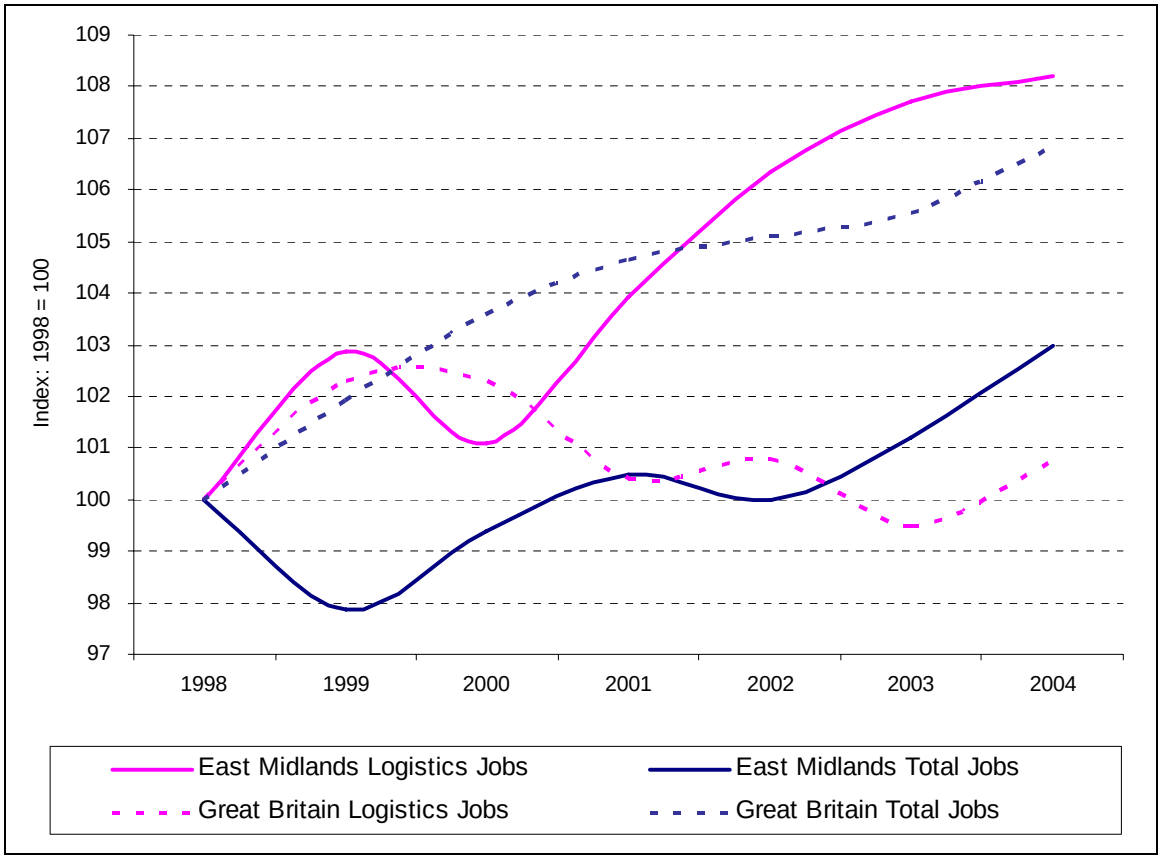
Graph 5: Share of Jobs in Logistics Sectors 2004 by Region



Source: ABI 2004

2.16 Since 1998, the number of logistics jobs in the East Midlands increased by 12,000 jobs, or 8% - faster than the region's total employment, which increased by 3%. By contrast, in GB as a whole employment in logistics was almost unchanged, while total employment increased by 7%, faster than in the East Midlands, as shown in the graph below.

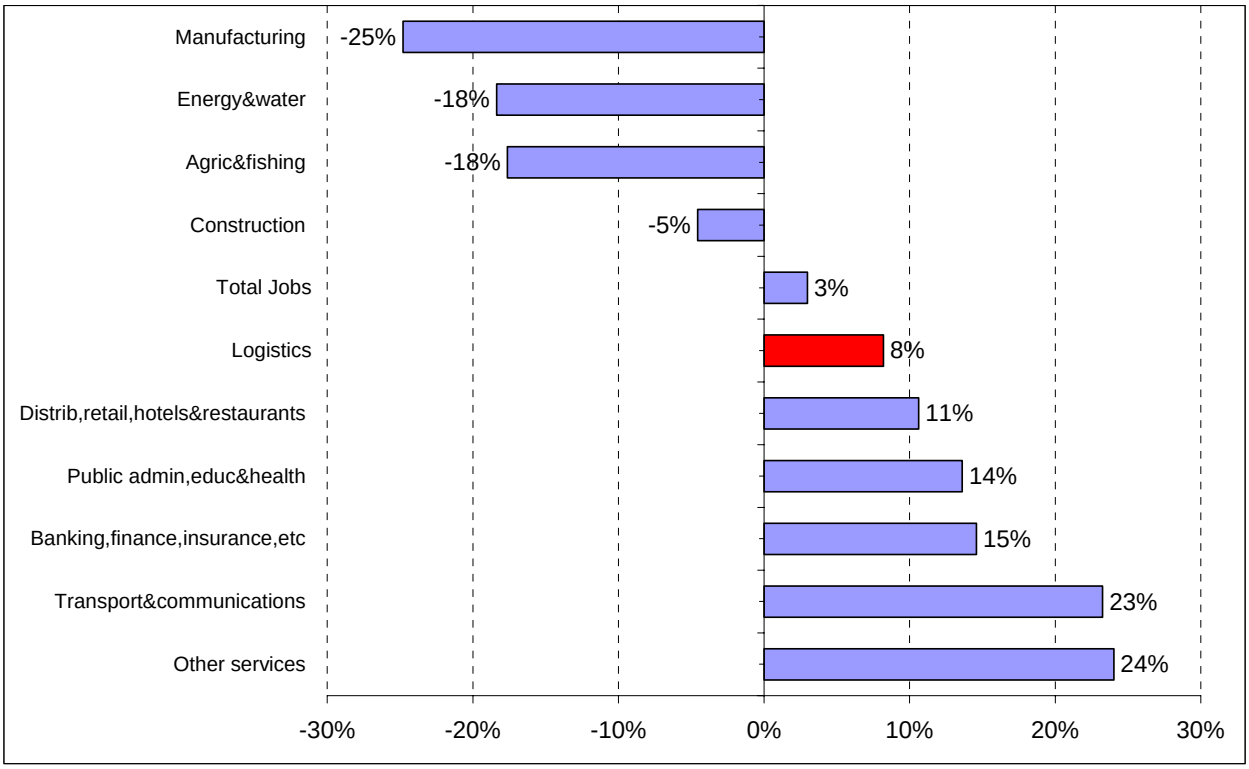
Graph 6: Employment Change, East Midlands and Great Britain, 1998-2004



Source: ABI

2.17 The next graph shows more detailed statistics for the East Midlands, analysing employment change by broad sector. Manufacturing, construction and primary industries lost jobs, while employment in services increased. At this broad level of analysis, all service sectors show higher growth than logistics.

Graph 7: Employment Change by Sector, East Midlands, 1998 -2004



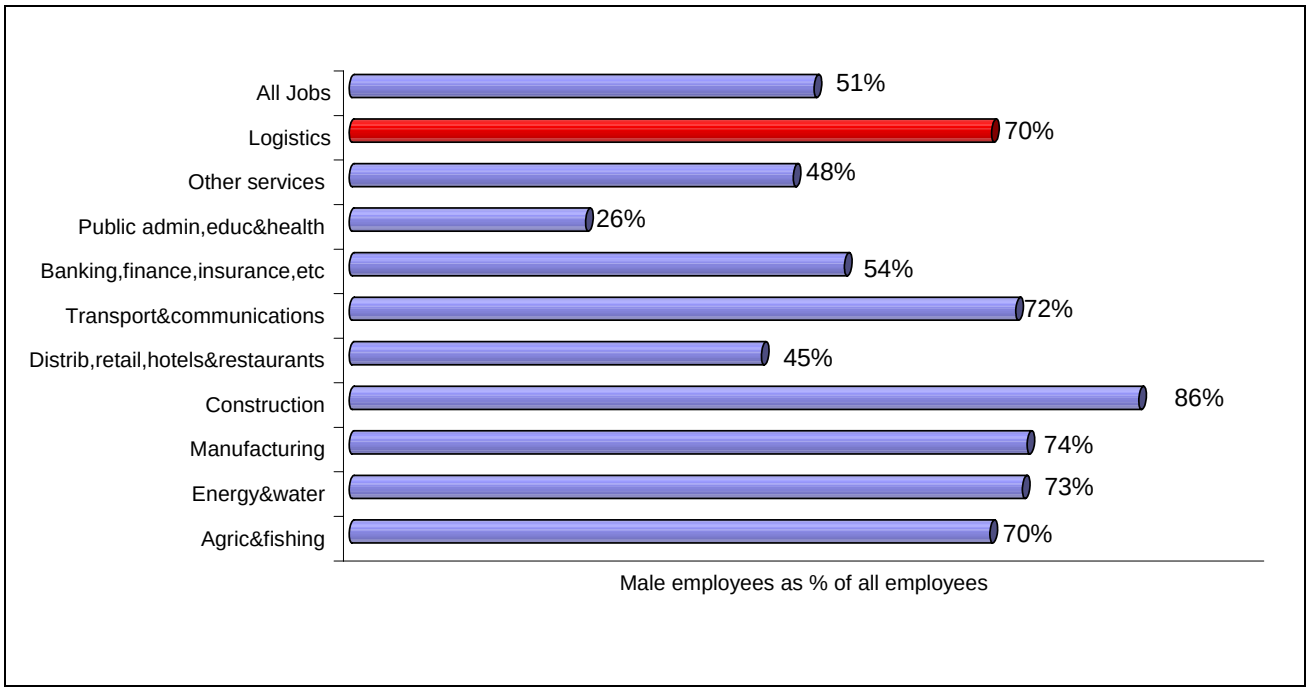
Source: ABI

2.18 Could the growth of logistics help replace jobs lost in manufacturing? To answer this question, we need to look at similarities and differences in the sectors' employment profiles, for example in terms of full-time/part-time jobs, gender and occupations.

Employment by Gender

2.19 The data reveals that 70% of logistics workers in the region are male, as shown in the graph below. Other sectors with similarly high levels of male employment are manufacturing, construction and utilities.

Graph 8: Share of Male Workers by Sector, East Midlands, 2004

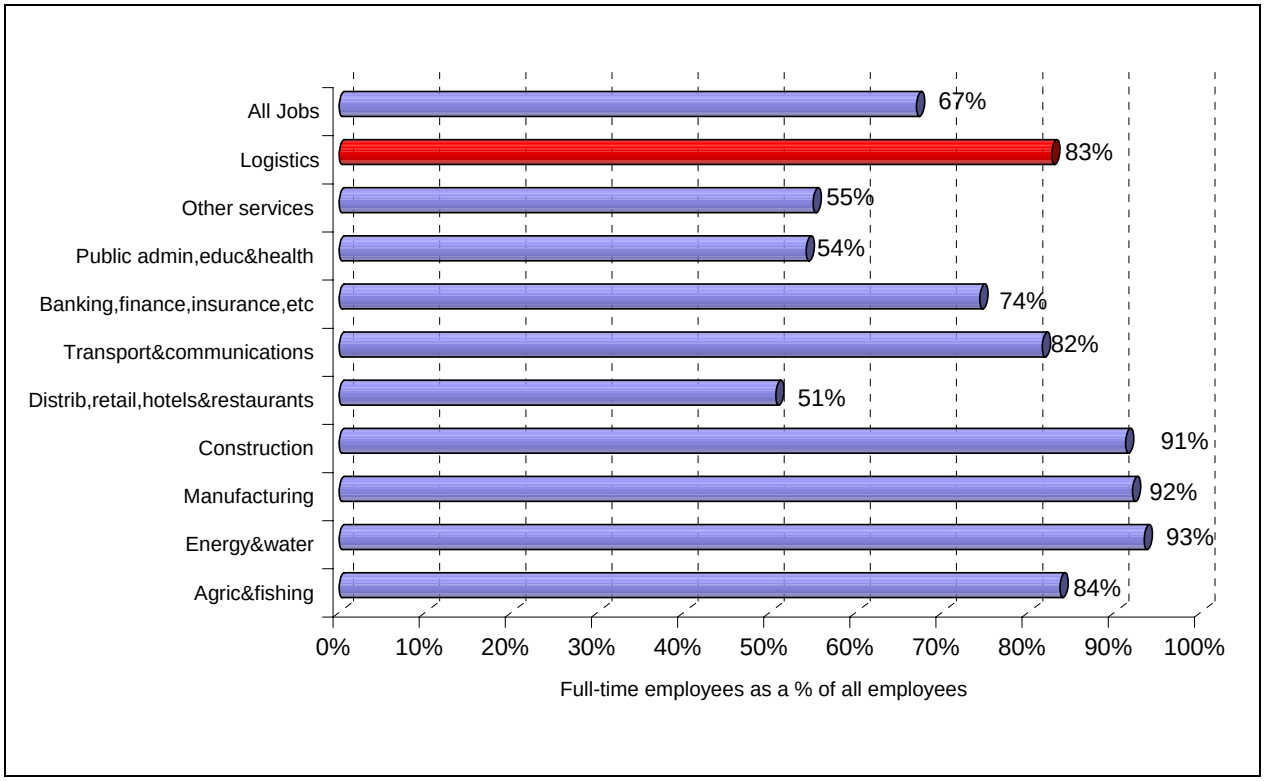


Source: ABI

Full and Part-time Employment

2.20 The data also shows that 83% of logistics jobs in the East Midlands are full time, compared to just 67% of all jobs. This is demonstrated in the graph below. In Banking, finance and insurance, etc, full-time employment only accounts for 74% and in public administration and other services it is 54%, but in manufacturing 92% of workers are in full time jobs. As we see later, a higher share of full-time employment in logistics in comparison to other sectors has resulted in higher earnings per job.

Graph 9: Share of Full-Time Workers in East Midlands by Sector, 2004

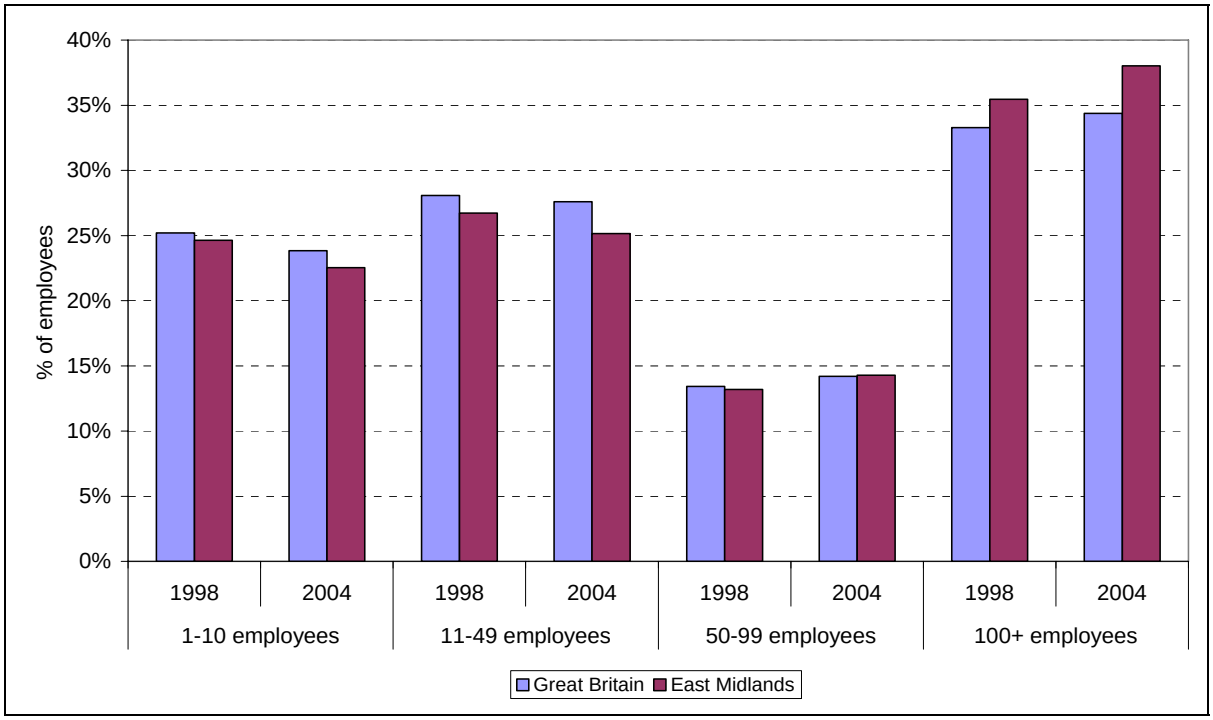


Source: ABI

Unit Size

2.21 The graph below examines the proportion of logistics employees working in business units (establishments) of different sizes. In the East Midlands, the proportion in units that employ 100 people or more is above the national norm, and the difference has been growing.

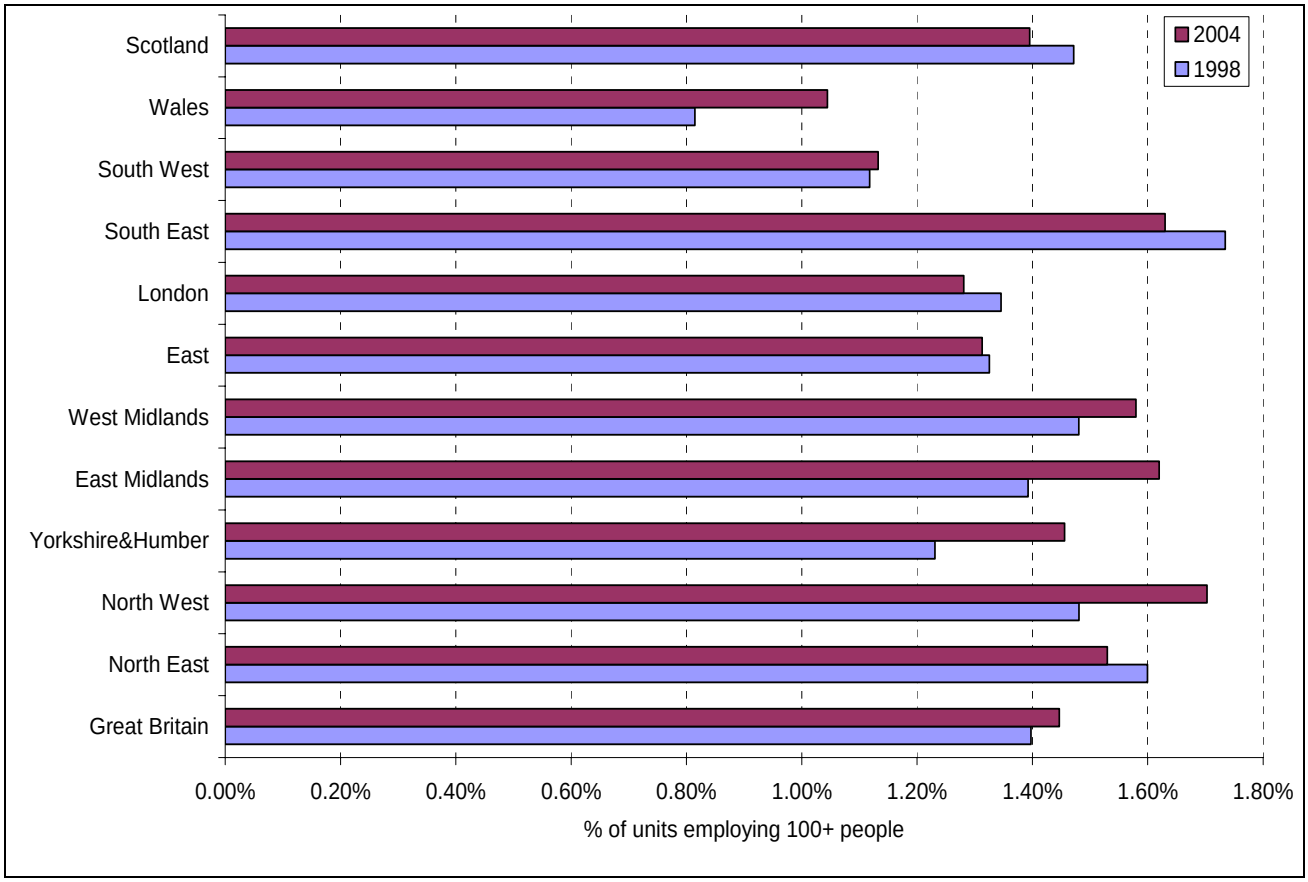
Graph 10: Logistics Employees by Unit Size, 2004



Source: ABI

2.22 There are 250 logistics units in the East Midlands employing 100 people or more. This represents just 1.6% of all the region's logistics units, as shown in the graph below. This proportional share is the third highest of any region – an indication of the importance of strategic distribution in the East Midlands – but even so it is a tiny share. The vast majority of logistics units, in the East Midlands and elsewhere, employ fewer than 100 people.

Graph 11: Logistics Units with 100+ Employees, 2001



Source: ABI

Occupations

2.23 The data in the table below, taken from Census data, considers the occupational mix of jobs. Unfortunately, the information is only available for the broad Distribution and Transport sector, which as noted earlier lumps together all wholesale and retail distribution, transport, storage and communications. As one would expect, many jobs in Distribution and Transport are in elementary occupations. Sales and customer services also account for a large share, which may be due to retail and tourism. At the other end there is a very high proportion of managers and senior officials – almost as many as elementary occupations.

Table 5: Occupation by Broad Sector in the East Midlands, 2001

	All Sectors	Distribution and Transport	Manufacturing
Managers and Senior Officials	14%	18%	18%
Professional Occupations	13%	1%	7%
Associate Prof & Tech Occupations	14%	5%	8%
Administrative and Secretarial Occupations	13%	9%	9%
Skilled Trades Occupations	5%	8%	22%
Personal Service Occups	11%	1%	0%
Sales and Customer Service Occupations	10%	22%	2%
Process, Plant and Machine Operatives	6%	13%	24%
Elementary occupations	15%	22%	11%

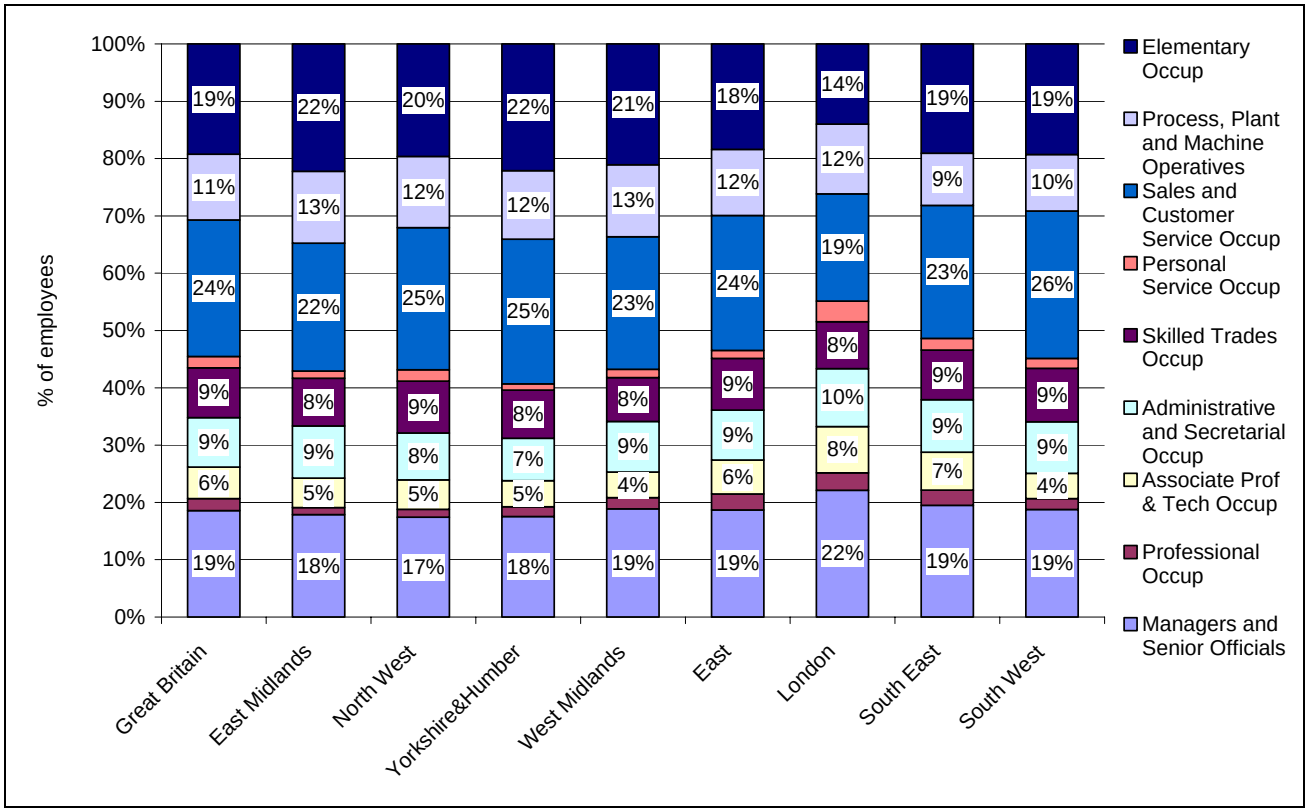
Source: Census 2001

2.24 The national occupational profile of Distribution and Transport differs from the economy as a whole: it has proportionally more people in elementary and management occupations, and fewer in professional and administrative occupations.

Qualifications

2.25 The graph below compares the occupational breakdown for logistics jobs with other regions and national norms. This shows little variation between regions. However the East Midlands does have the highest proportion of elementary or process operative positions and marginally fewer managers, professional and technical occupations.

Graph 12: Occupations in Distribution and Transport by Region, 2001

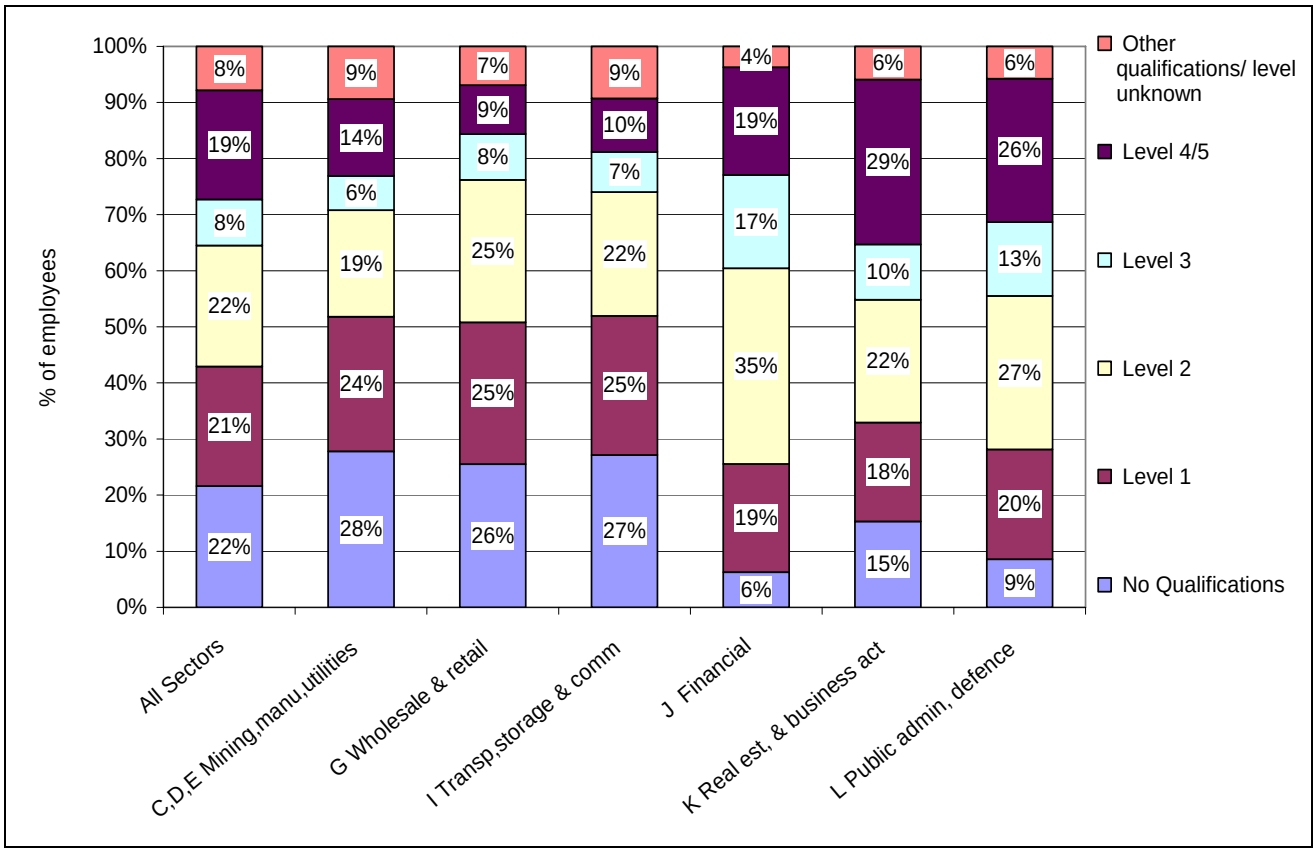


Source: Census 2001

2.26 In addition to occupational groupings, the Census provides worker qualifications by broad industrial sectors. This is shown in the graph below. The Census 2001 qualifications categories (Level 1, Level 2 etc) have been translated into the more widely used NVQ or equivalent categories based on the following conversions:

- No Qualification = No qualifications;
- Level 1 = NVQ 1, or equivalent;
- Level 2 = NVQ 2, or equivalent;
- Level 3 = NVQ 3, or equivalent; and
- Level 4/5 = NVQ 4/5, or equivalent

Graph 13: Qualifications by Selected Industries in the East Midlands, 2001



Source: Census 2001

2.27 The graph shows that, compared with other sectors and the all-sector total, Distribution and Transport tends to have lower qualified employees. With a marginally higher share

of level 2 and 3 qualifications and lower shares with no qualifications or very high qualifications (Level 4/5), the sector's workforce qualifications are roughly on par with those in mining, manufacturing and utilities.

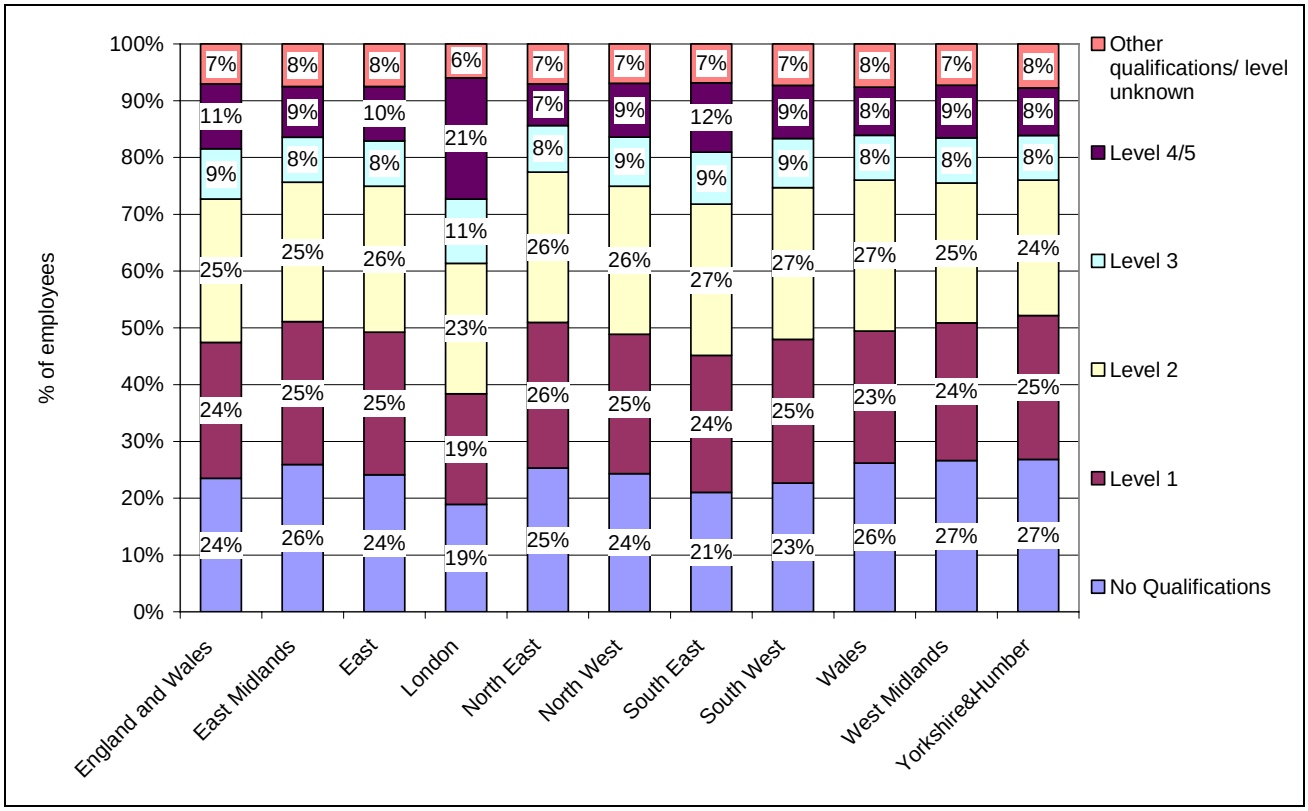
2.28 Within the logistics sector, practical skills may be more important than formal qualifications. In the graph, the share of other qualifications and unknown qualifications is shown to be higher in Distribution and Transport than in mining/manufacturing. This probably reflects accreditations such as HGV and forklift truck licenses, which are particularly relevant to the logistics industry. In addition, the needs for IT skills for automated stacking systems, tracking and monitoring goods in and out of sites, logistical planning, etc probably result in considerable on-site training and the need for an adaptable workforce. Discussion with stakeholders indicates that road haulage firms, from which modern logistics operators are descended, have traditionally recruited people without qualifications at the bottom of the hierarchy and trained them in-house, filling senior jobs through internal promotion. The statistics suggest that this tradition lives on.

2.29 A skills survey undertaken by Freight Transport Association in 2003 found that internal promotion within companies was common, so that those coming into lower occupation positions have a good chance of uplifting their skill levels. For instance, 77% of freight companies surveyed said that they recruit more than half of their transport management staff from internal promotions, with 54% reporting that they promote more than three quarters. 68% of companies that promote internally said that they promote drivers to transport management positions. And 83% of companies that promote transport management staff from internal positions provide management training.

2.30 Interestingly, the skills survey found that the availability of graduate schemes for transport management positions depended on the size of the company. Only companies operating more than 100 vehicles offered graduate schemes. It is reasonable to expect that larger companies are more likely to have formal recruitment arrangements and campaigns. If that is the case, strategic distribution centres, which are more likely to be occupied by large companies, are likely to provide more training than smaller-scale logistics units.

2.31 The graph below compares Distribution and Transport qualification levels in East Midlands with other regions and the national average. Except in London, where qualification levels are much higher (this also skews the national average), there is little regional difference.

Graph 14: Qualifications in Distribution and Transport, 2001

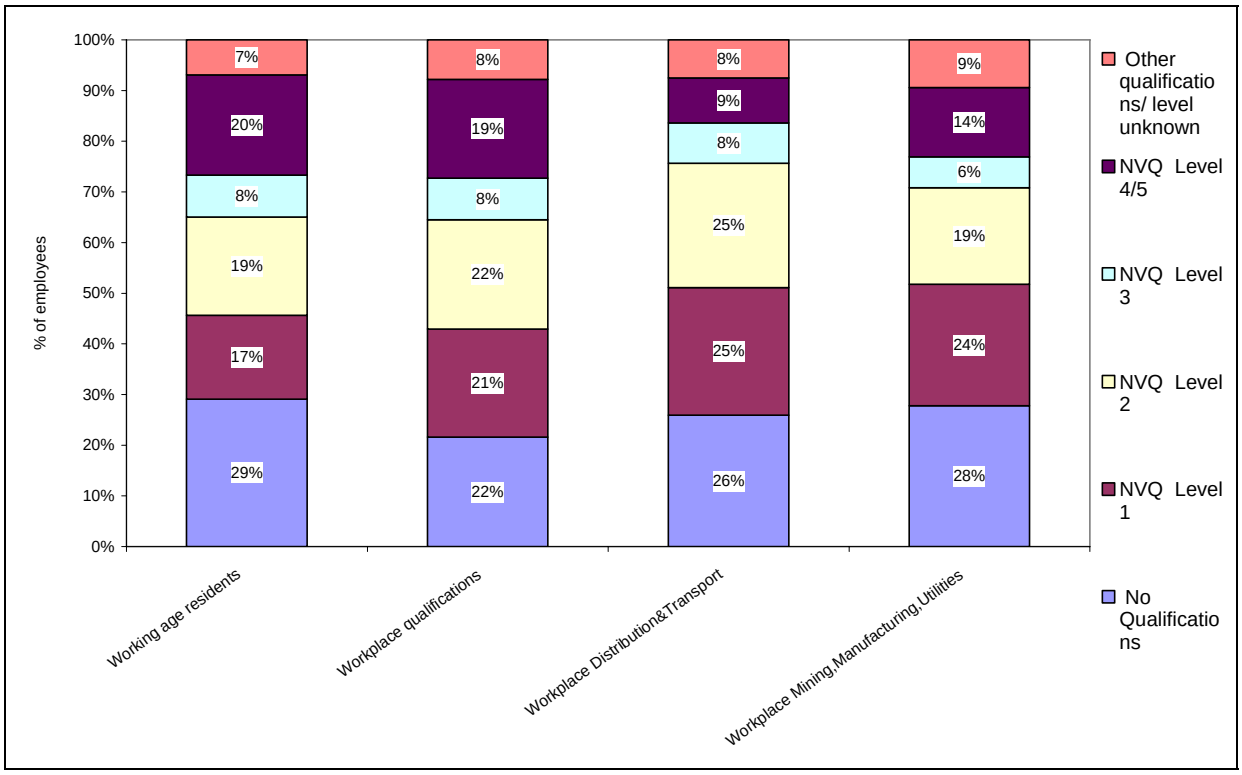


Source: Census 2001

2.32 The graph below measures the match between logistics jobs and labour force skills, by comparing the qualifications profile of workplace jobs in the East Midlands with the profile of the region's working-age residents. Some 29% of the East Midlands working-age residents are without qualifications, while only 22% of workplace jobs in the region are held by people with no qualifications. In other words, workers without qualifications face a shortage of jobs in the region. In Distribution and Transport, the proportion of workplace jobs held by workers with no qualifications is 26% - more than the all-sector average, though still less than the proportion of resident workers without qualifications. In other words, Distribution and Transport disproportionately provides

opportunities for those workers that face a shortage of employment opportunities. In this, the sector is similar to manufacturing, which has a similar qualifications profile. This is important, because manufacturing is in decline, so those workers who loose their jobs may find they have suitable entry level qualifications in logistics, thus smoothing manufacturing workers transition back into the workplace.

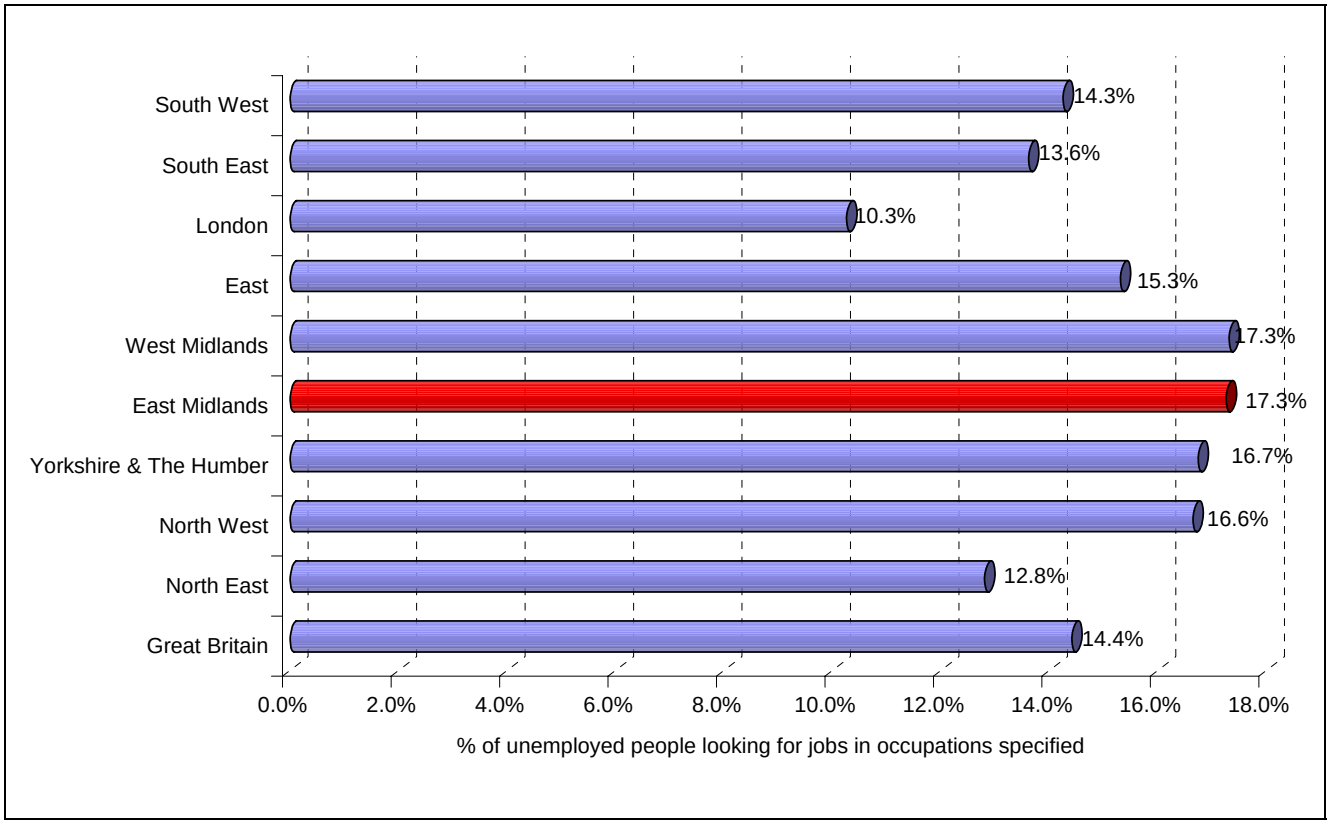
Graph 15: Resident and Workplace Qualifications, 2001



Source: Census 2001

2.33 According to ONS Claimant Count, 17% of unemployed residents in the East Midlands are looking for logistics related occupations. This figure is higher in the East Midlands and West Midlands than in other regions, as show in the graph below.

Graph 16: Regional Unemployed Seeking Jobs in Warehousing/Distribution Occupations



Source: Claimant Count, July 2006

Earnings

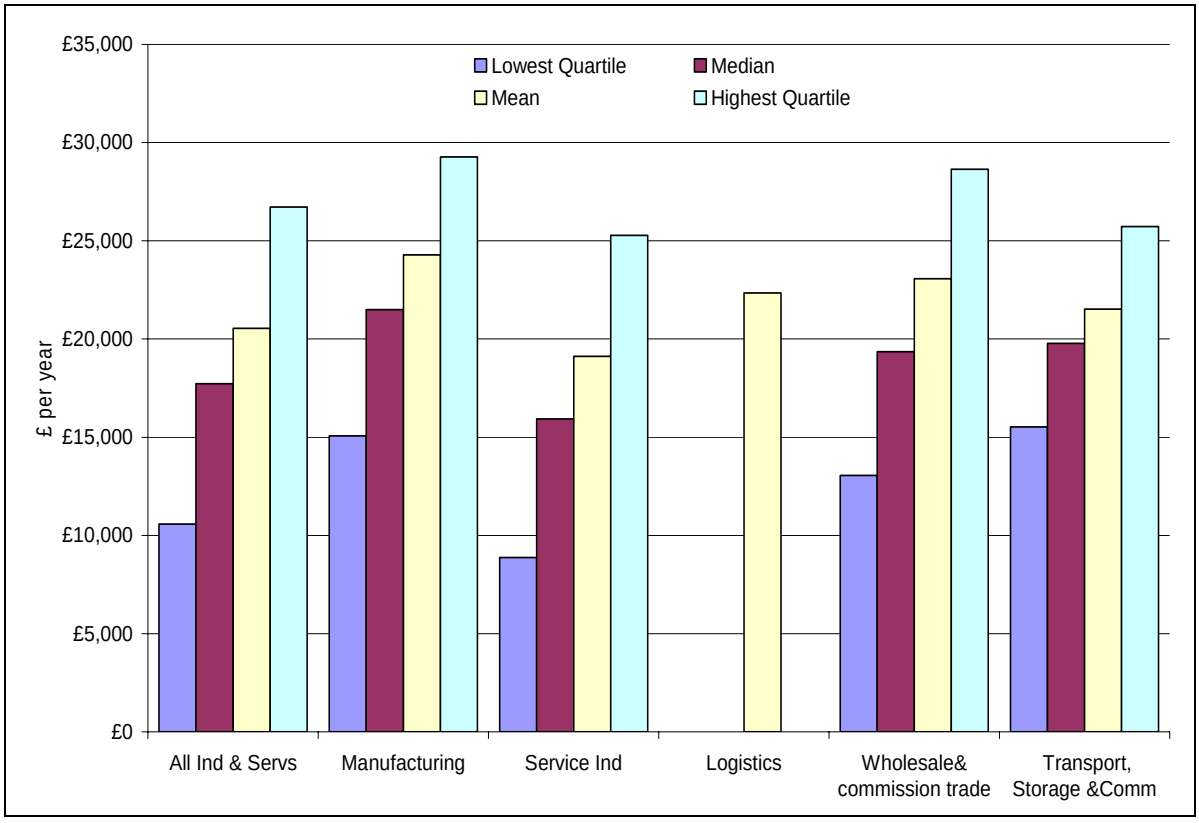
2.34 According to the Annual Survey of Hours and Earnings (ASHE), average earnings in logistics are higher than the average across all industries and services, as illustrated in the graph below. They are 17% above earnings in all service industries and 8% less than in manufacturing industries. This correlates with our above findings on labour productivity.

2.35 Looking at the spread of earnings, and using the broad sector definition, because fine-grained data are not available[1], we find that the lowest earning quartile group in Distribution and Transport earn significantly more than the corresponding quartile in the service sector.

2.36 At the other end the gap closes for the highest earning quartile groupings, but still the logistics sector performs better.

2.37 The higher earning levels in logistics compared with service sector jobs in general may be due to the greater share of full time jobs, in addition to higher productivity as shown above. This is even more so the case in manufacturing.

Graph 17: Spread of Gross Earnings by Sector, East Midlands, 2005

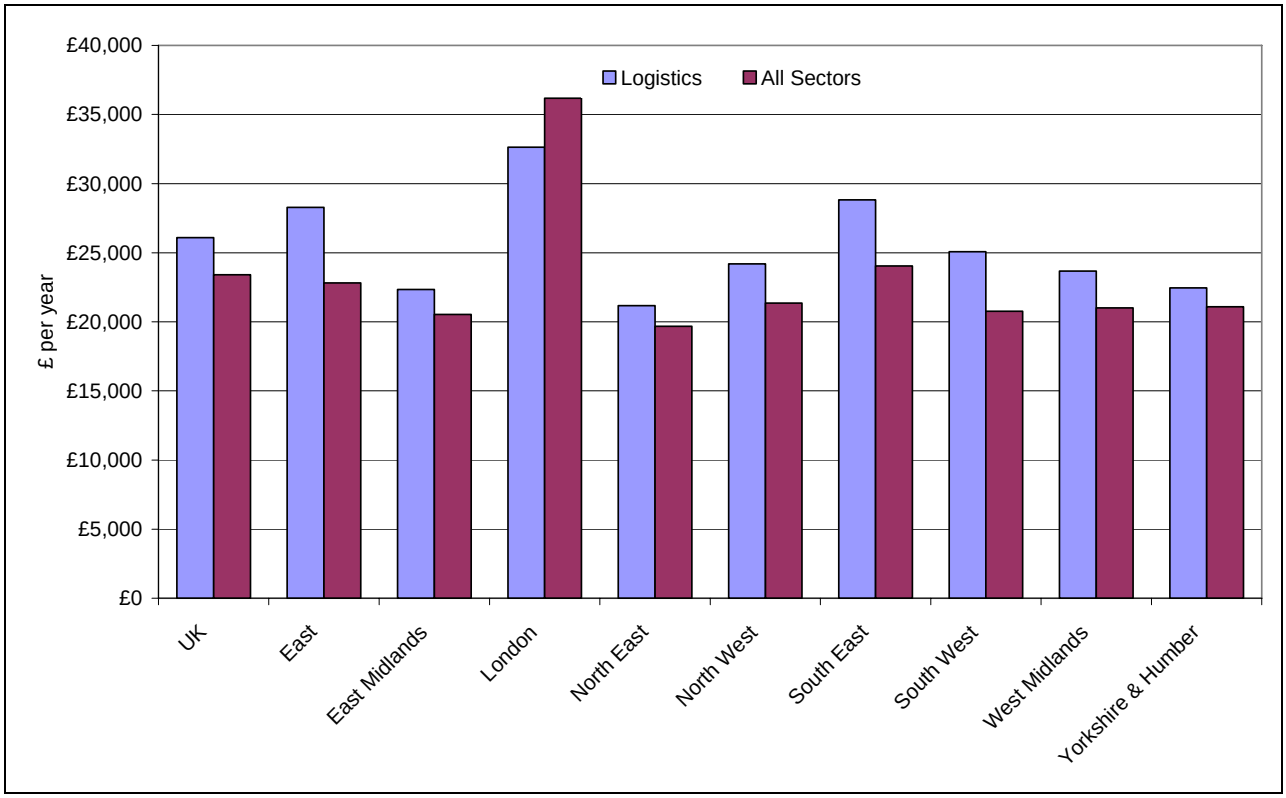


Source: ASHE, 2005

[1] Because of the lack of fine-grained data, with regard to the narrowly defined logistics sector we do not know earning by quartile, but only mean (average) earnings. We have included this average figure in the graph for comparison.

2.38 The graph below shows the East Midlands performing below the UK average for both earnings in logistics and average earning for all sectors. In all regions, bar London, logistics in each region achieves higher earnings than the average in all sectors, with the largest difference in the South East and East regions.

Graph 18: Regional and UK Average Gross Earnings, 2005



Source: ASHE, 2005

Employment and Floor Space

2.39 The DCLG's Commercial and Industrial Floor Space Statistics records the stock of industrial and commercial floor space by type in the East Midlands. This is summarised in the table below. Factories are the largest land use sector and warehousing accounts for the second highest share, followed by retail and then offices.

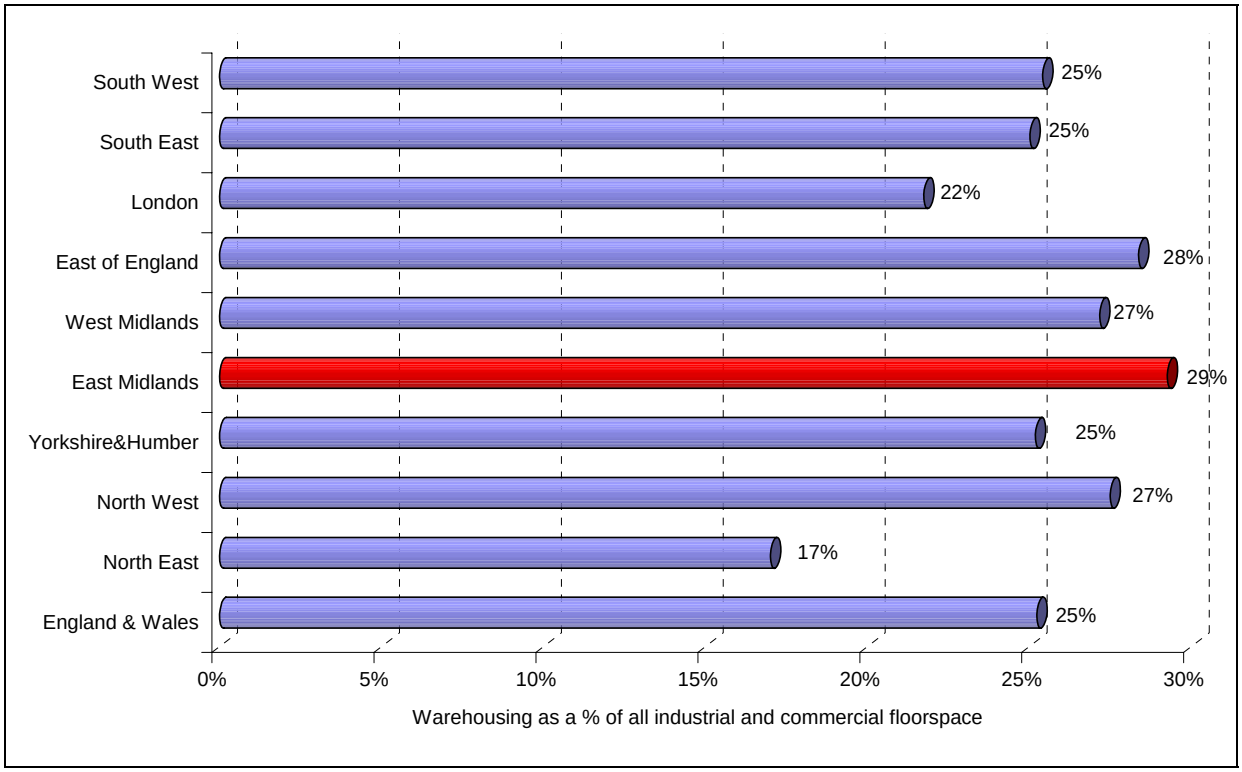
Table 6: Floor Space Stock by Type, 2005

	Floor Space (000s sq m)	Floor Space Proportion
Retail	7,517	14%
Offices	5,127	9%
Factory	24,334	44%
Warehousing	**16,047**	**29%**
Other Bulk Premises	1,815	3%
All Bulk Class uses*	54,840	100%

** Includes other types of floor space like health centres.*
Source: DCLG Commercial and Industrial Floor Space Statistics, 2005

2.40 The graph below compares the share of warehousing space, as recorded by the DCLG Statistics, by region for England and Wales. As we found for logistics jobs, the highest proportion of floor space used for logistics is in the East Midlands. Nationally warehousing accounts for a quarter of total floor space.

Graph 19: Proportion of Warehousing Floor Space by Region



2.41 The table below shows the change in warehousing floor space, as recorded in the DCLG Floor Space Statistics, by region over the period 1998 to 2005. Floor space has increased in all regions, averaging 14% across England & Wales. Growth varies considerably by region, with the West Midlands experiencing the highest growth at 24% closely followed by the East Midlands with 22%. At the other extreme, London and the North East show growth of just 5% over the seven years.

Table 7: Changes in Warehousing Floor Space, 1998 to 2005

	000 sq m		Change	
	1998	2005	Sq m	%
England & Wales	130,333	149,007	18,674	14%
North East	4,828	5,058	230	5%
North West	20,923	23,660	2,737	13%
Yorkshire and The Humber	15,034	16,684	1,650	11%
East Midlands	**13,160**	**16,047**	**2,887**	**22%**
West Midlands	15,742	19,581	3,839	24%
East of England	13,781	15,742	1,961	14%
London	15,062	15,756	694	5%
South East	15,801	18,143	2,342	15%
South West	10,551	12,181	1,630	15%

Source: DCLG Commercial and Industrial Floor Space Statistics 2005

2.42 Comparing warehousing floor space, as recorded by the DCLG, and employment (see above) suggests that there are currently around 100 square metres of floor space per employee. This density, which covers all warehousing space, is a little higher than the figures suggested by other figures on employment densities in *large* warehouses only – which, as shown below, range broadly from 80-95 sq m per worker. This is surprising, because all the evidence suggests that large warehouses, above 10,000 sq m or so, have more floor space per worker than smaller ones. However, a 'health warning' must be attached to the DCLG data, as it overstates warehousing floor space. Notes to the Floor Space Statistics indicate that the figures cover all floor space which is used to 'store goods', including spaces like retail stock rooms and even car showrooms, which in planning terms are not warehouses.

2.43 Comparing the change in warehousing floor space to the change in logistics jobs over the period 1998 to 2004 (the longest period for which data is available), it would appear that the growth in warehousing floor space outpaced the growth in jobs by a factor of more than two (i.e. 20% growth in floor space to 8% growth in jobs). The likely

explanation is that strategic distribution centres with relatively low employment densities are replacing older warehousing stock which was occupied at higher densities. But it is still likely that the growth in strategic distribution centres has contributed to the increase in employment.

2.44 The traffic analysis and forecasts presented in Section 3 and Appendix 1 suggest that there is currently around 5 million square metres of floor space in the region in units greater than 10,000 square metres and this will increase to just over 6 million square metres by 2026. The DCLG statistics provide no information on floor space per worker in these large warehouses, as distinct from warehouses in general. For this information, we need to look to a variety of ad hoc surveys.

2.45 A study by Arup Economic and Planning for English Partnerships provides standard employment densities for different types of land use The Arup study brings together the findings of may separate surveys. A summary is shown in the table below.

Table 8: Standard Employment Densities by Use Type

Use Type	Sq m per Worker
Offices (general, net internal floor space)	19
High-tech/R&D (non science park)	29
Manufacturing (general)	34
Warehousing (general)	50
Warehousing (large scale high bay)	80

Source: English Partnerships, 2001

2.46 The Arup review found that warehousing has the lowest employment density of all business land uses. It also found that warehousing densities are likely to be lower in larger units, changing from an average of 50 square metres per jobs to 80 square metres per job.

2.47 More recently, smaller studies looking at employment densities in large warehousing units have been undertaken by Kings Sturge and Savills, and by RTP using data kindly provided by Prologis. King Sturge surveyed 45 strategic distribution units of more than 10,000 square metres and found an average weighted employment density of *95 square metres per worker*. Savills researched employment densities for 100 warehouses in the West Midlands, and found employment densities for all size of units averaging at *84 square metres per worker*. Data provided to us by Prologis, relating to

32 occupied units of more 10,000 square metres shows an average density of *95 square metres per worker*, the same as Kings Sturge's research.

2.48 We tested this further by identifying strategic distribution parks and allocating them to middle layer strategic output areas, which allowed us to then obtain a summed amount of warehousing floor space and warehousing jobs using DCLG Commercial Floor Space Statistics and the Annual Business Survey (ABI). Using data from these sources we were able to devise an approximate employment density for six strategic distribution parks, shown in the table below. This provided an estimated employment density estimate of *88 square metres per worker*.

Table 9: Estimation of Employment Densities in Strategic Distribution Parks

Distribution Park	Floor Space (000s sq m)	Number Employees	Sq m per Worker
The Garden Shed	46,000	1,600	**28**
Oliver Road and Prologis Park	364,000	4,600	**79**
Euro Hub Freight Park	394,000	4,600	**85**
Dove Valley Park	45,000	700	**69**
Interlink	100,000	1,350	**74**
DIRFT Logistics Park	210,000	1,500	**140**
Total	**1,264,000**	**14,385**	**88**

Source: RTP; DCLG Commercial and Industrial Floor Space Statistics 2005; ABI 2004

2.49 On average, it seems clear that employment densities in large-scale warehouses are lower than in other business uses. However, there is considerable variation, as is clear from the figures above and confirmed by the Magna Park survey in sub-section 2.3 below.

Office Activity

2.50 Using data provided by Prologis on the use of floor space in their 49 strategic distribution centres, and data provided by Gazeley showing floor space for 38 strategic distribution units either built or planned on Magna Park, we have estimated that office space on average accounts for 4.4% of the total floor space used in large scale strategic distribution centres. The maximum office content was 12%. At the other extreme, in many units there were no allocations for offices. This fits with research by

Cranfield University and King Sturge[2], which found some 5 to 10% of strategic warehousing and distribution space is used for offices.

2.51 If we convert this share of office space into jobs based on the employment density shown earlier, the evidence suggests roughly 22% of jobs in strategic distribution activities are office workers. This also fits with data provided to us by Prologis that identifies the employee profiles in 32 strategic distribution centres, producing an estimate of 22% of employees working in offices.

2.52 However, the proportion of office jobs varies considerably by unit. Using Prologis data, the share of offices jobs in strategic distribution centres was found to vary from 0 to 93% (with a standard deviation of 25% and the median average of 16%. This variation was less so for office floor space where the share of office floor space in strategic warehousing and distribution units ranged from 0% to 12%, with a median (and mean) average of 5%.

Section 2.3 The Magna Park Employment Survey

2.53 As part of the study, we carried out a questionnaire survey of employment and Magna Park in Leicestershire. Magna Park is probably the first 'new-generation' dedicated strategic logistics site to be developed in the UK, and remains one of the largest. It provides some 760,000 sq m (8.1m sq ft) of floor space, occupied by 27 business units (establishments) of which 15 participated in the survey – a response rate of 55%

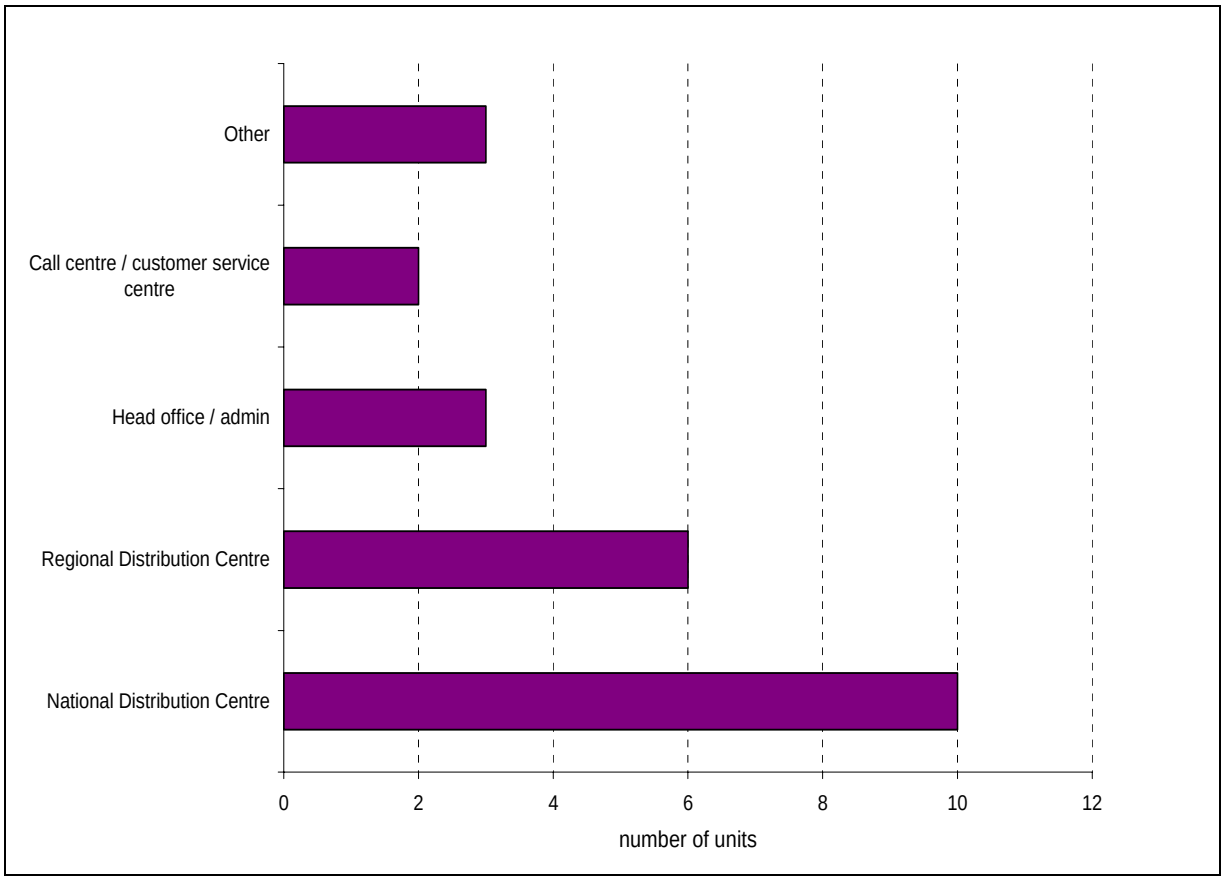
2.54 The survey was administered through a paper questionnaire, completed by senior managers at each unit in September/October 2006. Gazeley, who developed and manage the Park, managed the survey fieldwork, distributing the questionnaire, encouraging occupiers to participate and collecting the completed questionnaires. The RTP consultants team drafted the questionnaire and analysed the results. The questions investigated the nature of activity at the site, employment densities (floor space per head) and the mix of jobs provided in terms of occupations and skill levels. Individual replies and the names of companies who participated are confidential.

Site Activity

[2] Cranfield University School of Management and King Sturge *Future Trends in the Demand for Warehouse Property*, , April 2003

2.55 We asked survey respondents to describe the functions of their unit at Magna Park. The largest number, 10 units, are National Distribution Centres (NDCs). Five units are Regional Distribution Centres (RDCs). Smaller numbers perform other functions, including three which operate as head offices and administration centres for their companies. The graph below shows the breakdown of units by function.

Graph 20: Site Activity



2.56 Only two of the 15 units perform a single function. National and regional distribution centres are typically co-located with head office/admin functions or with each other.

Employment and Job Densities

2.57 We asked survey respondents to provide a count of all the people working at their Magna Park site, including all employees based at the site, whether full or part-time, and any temporary, casual, agency or freelance workers whose main job is based at the site.

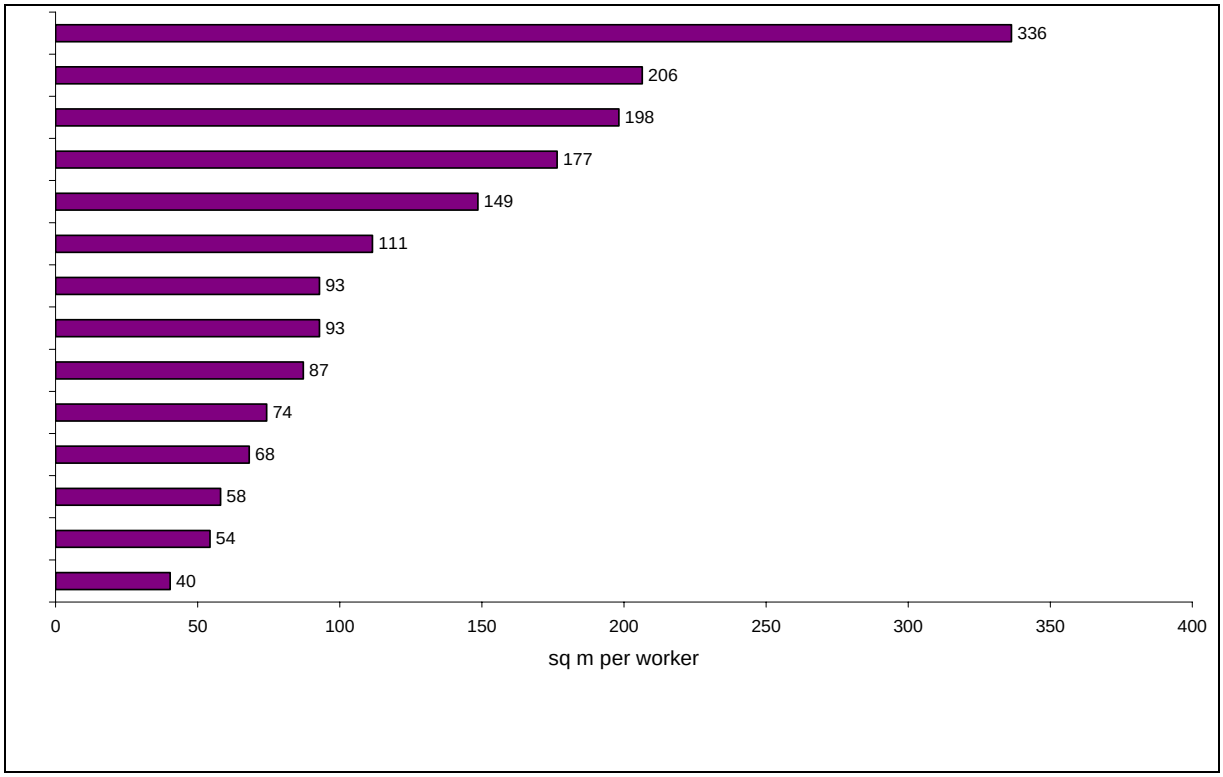
2.58 The units covered by the survey have floor space between 10,000 and 40,000 square metres (approx). The table below shows that 9 out of the 15 employ 200 people or more.

Table 10: Numbers Employed

Respondent No	No. of employees
1	950
2	770
3	650
4	320
5	300
6	250
7	250
8	209
9	200
10	150
11	150
12	110
13	75
14	58
15	45

2.59 The above figures, and all the other survey data, relate to 'normal' employment - the average employed by each unit over the year. Two thirds of respondents experience seasonal variations in employment. Floor space per worker (Figure 4.2) varies widely, from 40 to 336 square metres. The weighted mean job density is 83 sq m per head and the median is 93 square metres per head. The distribution of floor space per head is shown in the graph below.

Graph 21: Floor Space per Head



2.60 One of the most interesting questions for this study is what determines job densities in warehousing. Unfortunately, we cannot answer this question through formal analysis, because the sample size of the Magna Park survey is too small. However, detailed examination of the reply does suggest some answers:

- Within this category – large warehouses providing more than 10,000 sq m - there is no indication that larger warehouses use more floor space per head. On the contrary, some of the largest units have some of the smallest floor space per head. Overall, statistical tests suggest that unit size is entirely unrelated to floor space per head.

- Nor does the presence of non-warehousing activities, such as head office administration, call centres or customer service centres, seem to result systematically in higher employment densities (lower floor space per head). The apparent reason is that, while these office-based activities do occupy space at higher densities than jobs

based in the actual warehouses, the scale of these office activities is too small to have a significant impact on overall densities.

- The data do suggest that floor space per head relates to the speed of throughput – how long goods spend in the warehouse.

- Thus, low to average floor space per head is associated fast-moving goods, which naturally include fresh food. But fast throughput is not only related to the physical characteristics of goods. Some goods which are physically durable are also associated with low to average floor space per head, suggesting that they move fast for business reasons. Where goods are delivered to manufacturers, these business reasons may equate to just-in-time operations. In other cases, the recipients are retailers, and the fast throughput of goods may relate to their policies for minimising stock and saving space.

- At the other extreme, above-average levels of floor space per head are invariable found in warehouses that handle durable goods, such as electronics/IT products, wooden products and frozen foods.

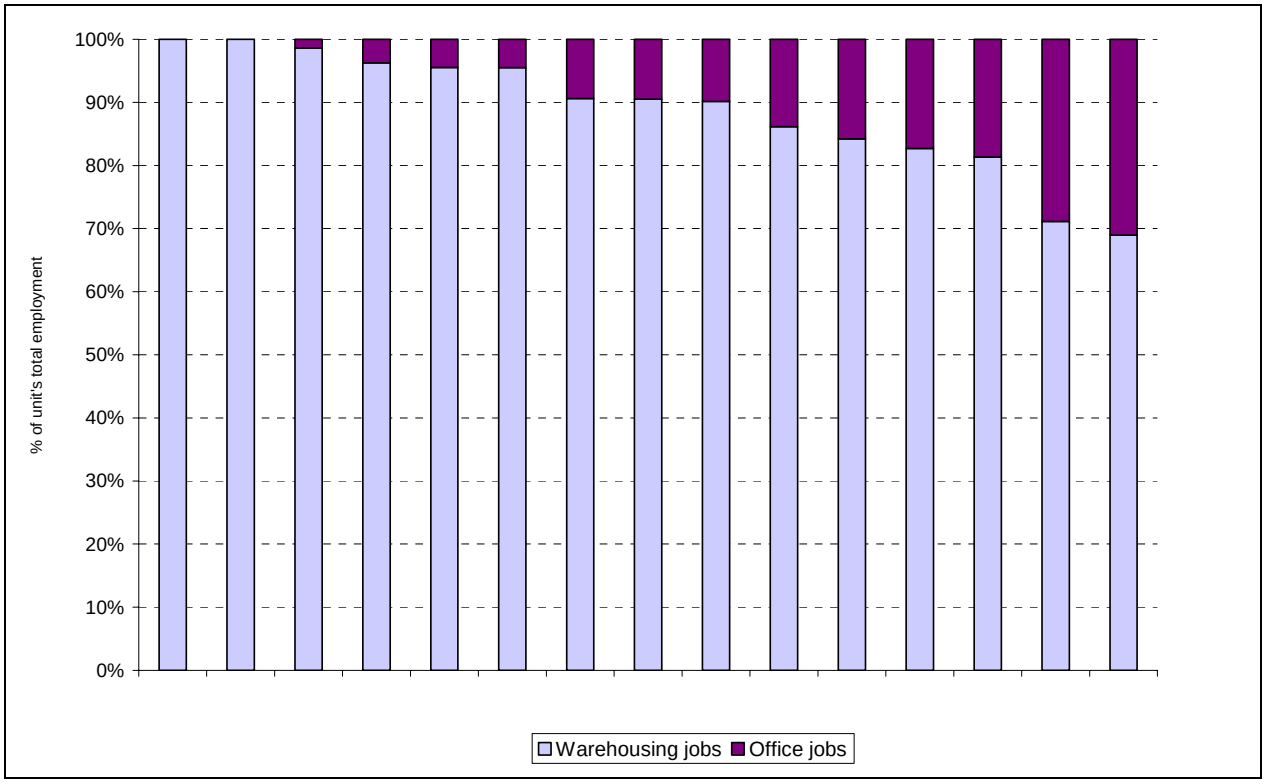
2.61 Thus, in summary, it seems that the distribution of physically perishable goods is necessarily associated with low floor space per head, because it has to be turned round fast. But physically durable goods may be associated with either low or high floor space per head, depending on the policies of their owners or distributors, who may choose either slow or fast throughput for their goods.

2.62 These findings remain tentative. Because of small sample size and large variation in densities, they are not statistically significant and not conclusive.

Employment Profile

2.63 The profile and operational organisation of the companies operating on the site is diverse. Overall, as one would expect, warehousing jobs far outweigh office activities. Some companies primarily use their units for warehousing and storage and have no office jobs on site. At the other end of the spectrum, some have a comparatively large presence of office workers reaching about 30% of the workforce. 11% of all workers in the sample are office workers. This is shown in the graph below, which illustrates the split between office and warehousing jobs on the Park.

Graph 22: Office and Warehousing Jobs as a Proportion of Total Employment.



2.64 We have searched the survey data closely for explanations of the varying share of office work. Yet again, the sample is too small for formal analysis or definitive conclusions, but the data do suggest that the decisive factor behind high shares of office workers is the presence of call centre or customer service activities on site. The presence of head office/admin activities has less impact, seemingly because these activities employ relatively few people. Yet again, these generalisations are highly tentative.

2.65 In terms of occupations, by far the largest category, accounting for nearly two thirds of workers, comprises warehouse operatives. Drivers come second, accounting for 17% of jobs. Secretarial/clerical staff, managers, supervisors and professional/technical staff account for 3-4% of the total each. This is illustrated in the table below.

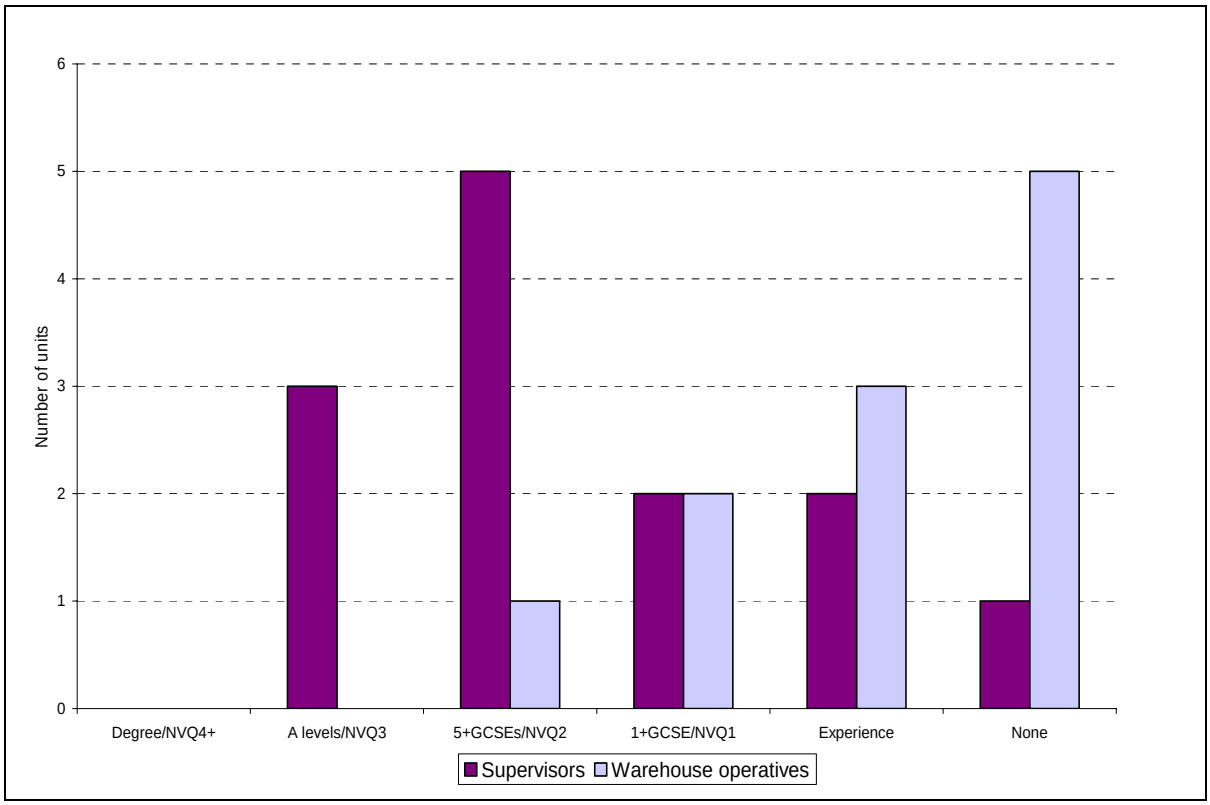
Table 11: Occupation Structure

	Workers	% of Total
Warehouse operatives	2,679	65%
Drivers	706	17%
Secretarial / clerical	177	4%
Managers	176	4%
Supervisors	142	3%
Professional / technical	139	3%
Call centre operatives	82	2%
Warehouse administrators	10	0%
Other	2	0%
Total workers in units surveyed	**4,113**	**100%**

Qualifications and Experience

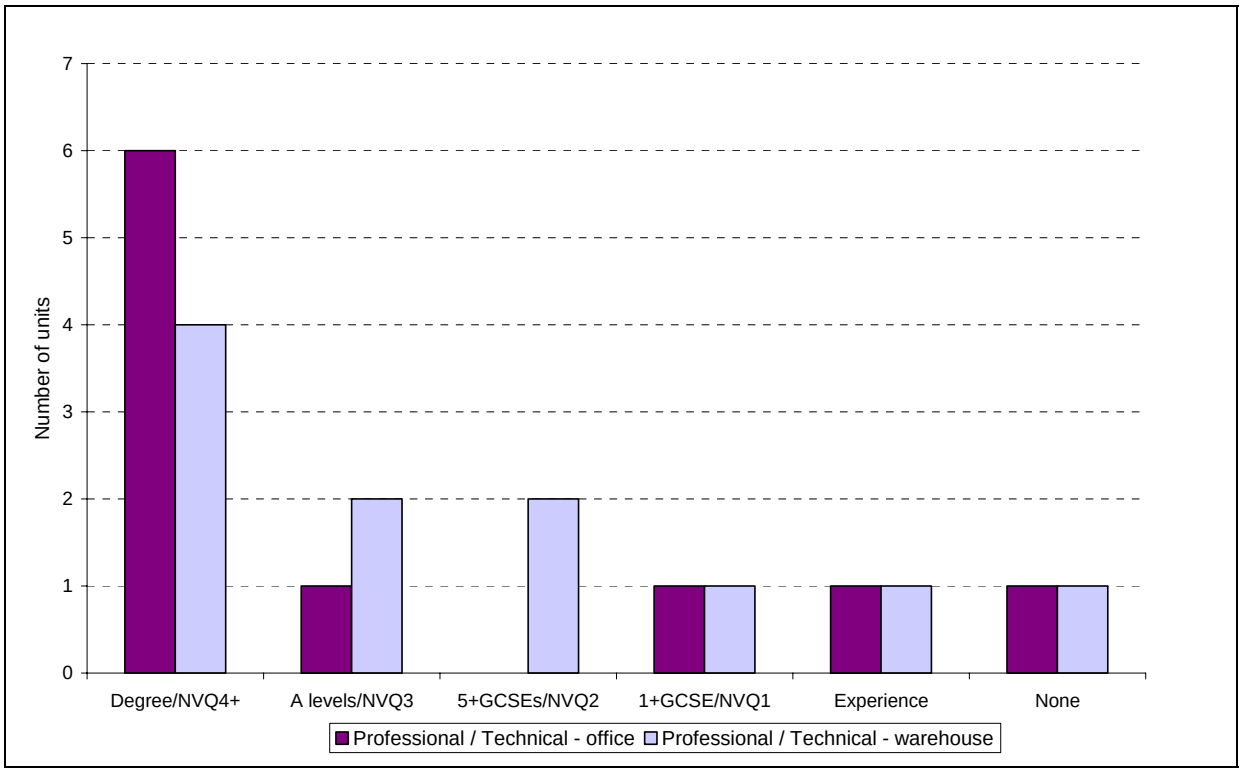
2.66 Finally, we asked survey respondents about the qualifications and experience they typically required for each type of employee. The graphs below illustrate the answers to questions regarding qualifications for different positions. The numbers on the vertical axis represent the count of business units providing each answer.

Graph 23: Requirements for Supervisors and Warehouse Operatives



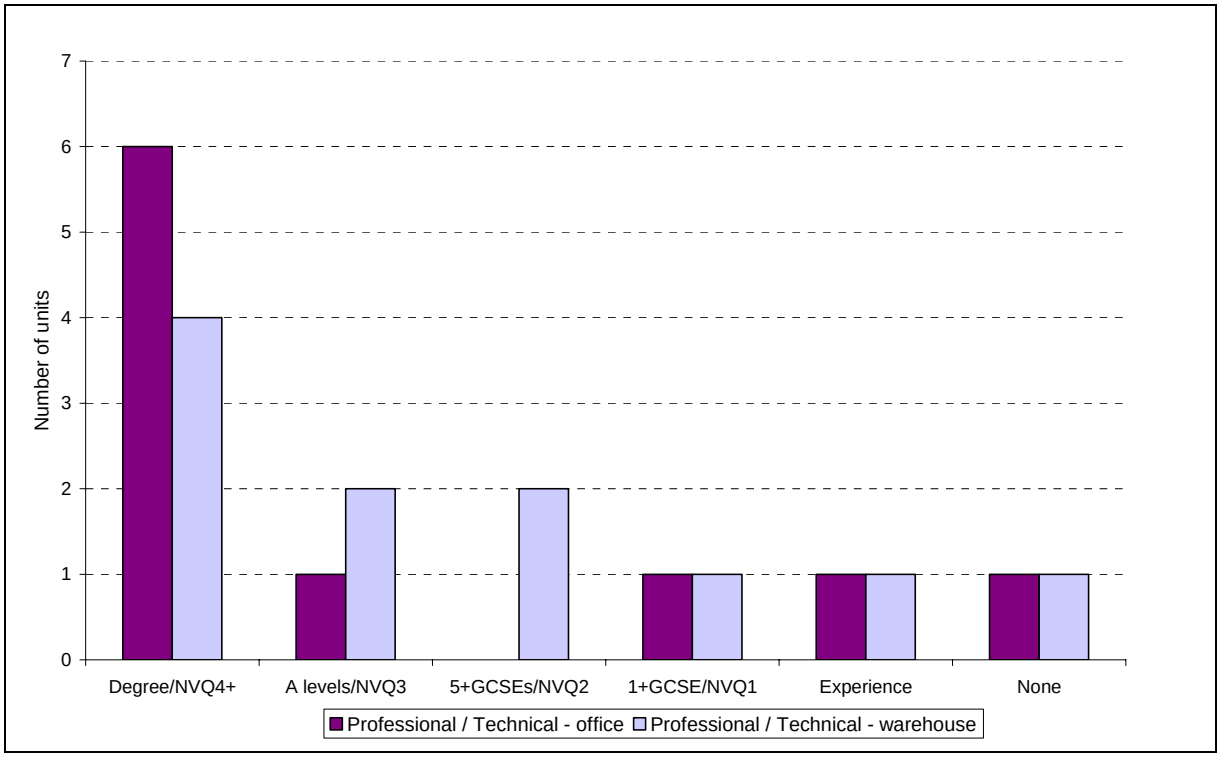
2.67 Of the 11 business unit that employ warehouse operatives, five require no particular qualifications, and a further three require experience only rather than any particular education or training. For supervisors, requirements are quite broad and experience is important suggesting the position can be achieved by internal promotion and on-the-job training as well as by formal education.

Graph 24: Requirements for Managers



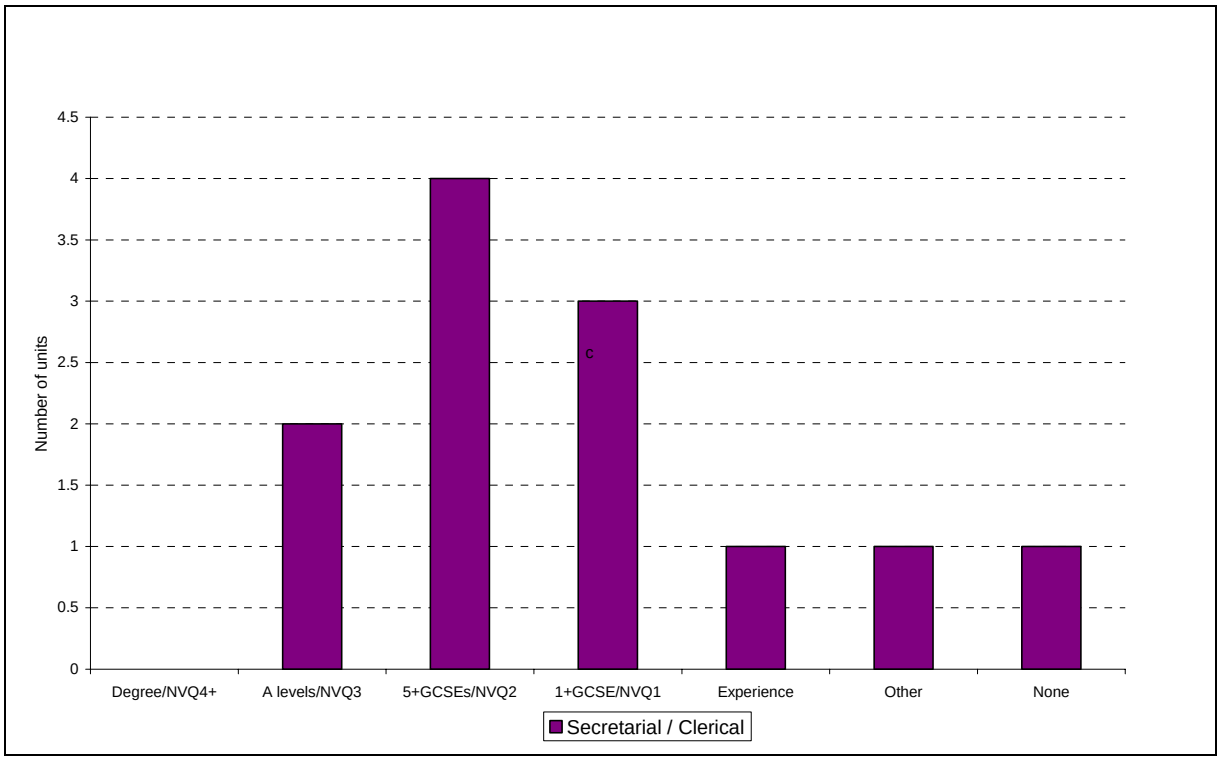
2.68 Office managers and warehouse managers have a different profile. For office managers, NVQ4+ or a degree is the most often mentioned. For warehouse managers, requirements tend to be slightly lower (NVQ2 or NVQ3) but experience is more important. This probably reflects the fact that warehouse managers tend to reach their position through internal promotion after years of experience and through progressive job-related training.

Graph 25: Requirements for Professional/Technical Staff



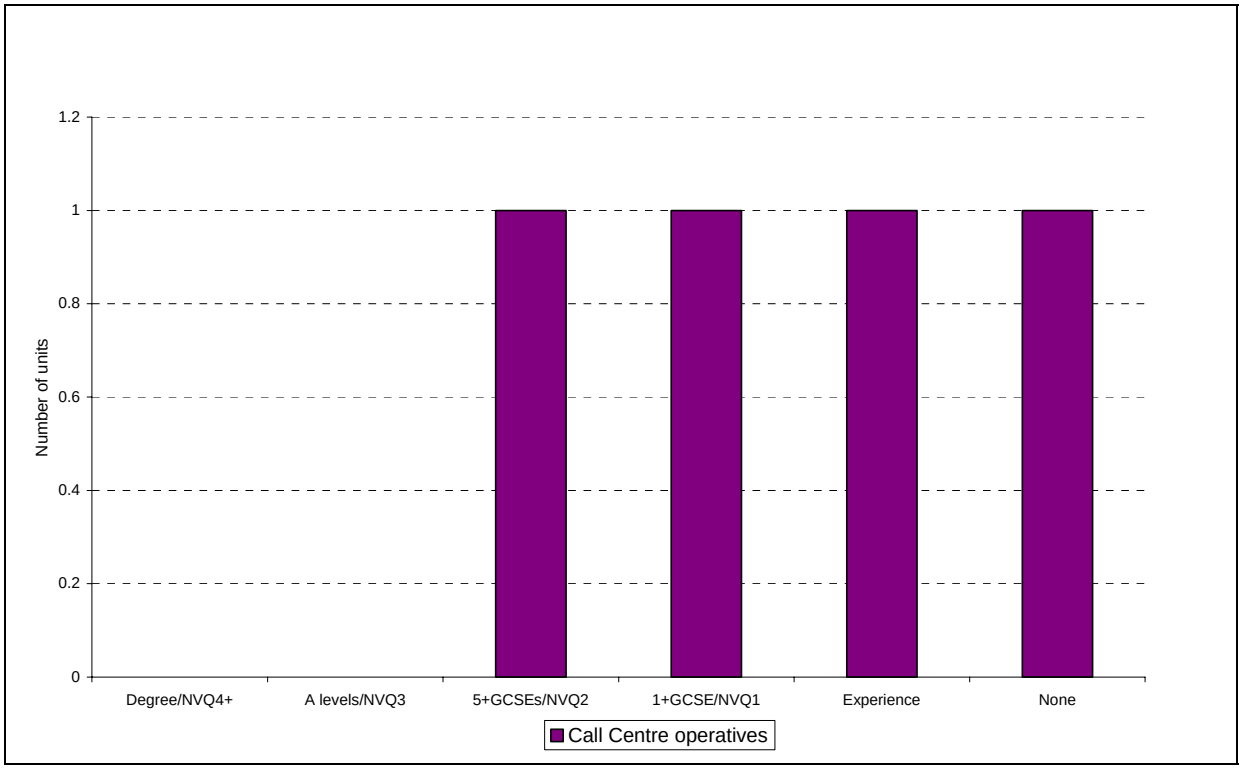
2.69 In offices, professional/technical staff tend to have a similar profile to managers. In warehouses, degree/NVQ4+ qualifications are more important for professional/technical positions than for managers.

Graph 26: Requirements for Secretarial/Clerical Staff



2.70 Qualification requirements for secretarial/clerical posts seem to vary widely from one firm to the next, ranging from NVQ1 to NVQ3, probably depending on the levels of responsibility and the breadth of the position.

Graph 27: Requirements for Call Centre Operatives



2.71 Finally, only four units employ call centre operatives, and all have different requirements of this staff, varying from none to NVQ2.

SECTION 3. ANALYSIS OF FUTURE WAREHOUSE DEMAND

3.1 The main aim of this section of the report is to analyse the future demand in the East Midlands up to 2026 for strategic distribution warehousing. The analysis is derived from a modelled traffic forecasting exercise using the MDS Transmodal Great Britain Freight Model (GBFM) together with market data provided by Savills. The analysis therefore accounts for the nation's changing patterns of production, consumption and trade.

Section 3.1 Demand for New Warehouse Floor Space

3.2 A forecasting exercise has estimated the total (gross) warehouse new build which can be expected in the region up to 2026 together with the associated land requirements. This has taken into account future freight flows to the region and recent trends in warehouse new build.

3.3 In total, four different forecast scenarios have been undertaken for the years 2016 and 2026 (reflecting the timescales of the East Midlands Regional Plan). Each forecast scenario is consistent with the national rail and national port forecasts recently undertaken by MDS Transmodal for the DfT. Each scenario therefore includes the same underlying baseline assumptions in terms of market conditions, modal costs and infrastructure enhancements.

3.4 The four forecast scenarios, and the assumptions which have been applied to each scenario individually in addition to the baseline assumptions, are described below.

Base Case: 2016 and 2026

- 2.2 million square metres of new build rail connected floor space nationally by 2016, of which 250,000 square metres is located in the East Midlands; and
- 4.4 million square metres of new build rail connected floor nationally by 2026, of which 500,000 square metres is located in the East Midlands.

Scenario 1: 2016 and 2026

- No new build rail connected floor space in the East Midlands;
- In other regions, new build rail connected floor space in line with the Base Case scenario (1.98 million square metres by 2016);and
- In other regions, new build rail connected floor space in line with the Base Case scenario (3.96 million square metres by 2026).

Scenario 2: 2016 and 2026

- In East Midlands, new build rail connected floor space in line with the Base Case scenario (250,000 square metres by 2016);
- In East Midlands, new build rail connected floor space in line with the Base Case scenario (500,000 square metres by 2026); and
- No new build rail connected floor space in other regions.

Scenario 3: 2016 and 2026

- In East Midlands, new build rail connected floor space in line with the Base Case scenario (250,000 square metres by 2016);
- In East Midlands, new build rail connected floor space in line with the Base Case scenario (500,000 square metres by 2026); and
- New build rail connected floor space in other regions at half level in Base Case (1.2 million square metres by 2016 and 2.1 million square metres by 2026).

3.5 The *Base Case* reflects each region's warehouse stock and new build rates continuing in line with current trends and market share. The amount of rail connected floor space per region is the same as that allocated to each region in the national rail freight forecasts recently produced for the Rail Freight Group (RFG) and the Freight Transport Association (FTA) by MDS Transmodal. It is estimated that approximately 20% of new build warehousing nationally will be on rail connected sites by 2026 (4.4 million square metres nationally). In effect, therefore, this scenario reflects all regions in Britain continuing to attract unitised traffic in line with current trends and market share (on the basis that economic activity, including warehousing, generates traffic).

3.6 The other scenarios reflect the East Midlands losing or gaining market share in terms of warehouse stock and new build rates. Scenario 1 assumes that the East Midlands does not build any new warehousing on rail connected sites. However, every other region of Britain will build new warehousing on rail connected sites, with the amount per region being the same as that allocated to each region in the Base Case. Scenario 2, the reverse position to Scenario 1, assumes that the East Midlands does build new warehousing on rail connected sites but with other regions not developing any rail linked facilities.

3.7 Scenario 3 is based on the East Midlands building new warehousing on rail connected sites, the amount of new floor space being the same as that allocated to the region in the Base Case. Every other region builds new warehousing on rail connected sites, but only at half the amount allocated to each region in the Base Case.

3.8 The full methodology adopted for the forecasting exercise, the forecast traffic volumes for each scenario and the consequent floor space calculations undertaken are presented in full in Appendix 2. The table below presents the total (gross) warehouse new build which can be expected in the region up to 2026 together with the associated land requirements corresponding to the traffic forecasts.

Table 12: Forecast Total (Gross) New Warehouse Build and Land Requirements* up to 2026

	000s Sq m			
Year	Forecast Base Case	Forecast Scenario 1	Forecast Scenario 2	Forecast Scenario 3
Up to 2016				
Total new build floor space	***2,444***	***2,123***	***2,762***	***2,603***
of which:				
Replacement of existing capacity	1,903	1,903	1,903	1,903
Accommodate traffic growth	541	220	859	700
Up to 2026				
Total new build floor space	***4,888***	***4,200***	***5,562***	***5,223***
of which:				
Replacement of existing capacity	3,844	3,844	3,844	3,844
Accommodate traffic growth	1,044	356	1,718	1,379
	Hectares*			
Up to 2016	611	531	691	651
Up to 2026	1,222	1,050	1,391	1,306

**On the basis that all new build floor space will locate on new sites and warehouse floor space occupies 40% of a plot footprint*
Source: MDS Transmodal GBFM and Savills market data

3.9 The forecasts estimate that the total (gross) warehouse new build in the region up to 2026 will be between 4.20 million square metres and 5.56 million square metres. The central Base Case estimates that the total (gross) warehouse new build in the region up to 2026 will be around 4.88 million square metres.

3.10 Should all of the new build locate on new sites, the future land requirement up to 2026 will be between 1,050 and 1,391 hectares on the basis that warehouse floor space

occupies 40% of a plot footprint (1,222 hectares for the central Base Case). This will not be the case, though, as there is already an existing supply of B8 sites with consents, general employment land and 'recycled' brownfield land which will be suitable for accommodating a proportion of the future forecast demand.

3.11 However, it is important to understand that in many cases new build floor space will not 'fit' onto existing plots at general industrial sites or on 'recycled' brownfield land. Essentially the size and configuration of existing sites will be unsuitable for the large buildings increasingly demanded by the market (see Appendix 3). This is particularly the case when a large new building is replacing two or more smaller facilities. In addition, the policy of encouraging new warehousing to be rail linked (national policy and Regional Freight Strategy) also implies a requirement for new sites, given that existing sites are located either away from railway lines or are unsuitable for rail connection (e.g. insufficient loading gauge, lack of capacity, size of site too small). As a result, new rail linked B8 sites with large plots will be required for a significant proportion of the forecast gross new build warehousing. Such sites are termed 'strategic logistics sites' from here onwards.

3.12 In our view, new strategic logistics sites (or large plots on existing sites) will be required for future warehouse developments in the region which are greater than 25,000m^2. This view takes into account the following:

- Distribution centres greater than 25,000m^2 will require the large plot sizes offered at new strategic logistics sites. Our analysis of recent new buildings in the region (Appendix 3) indicates that the market is increasingly demanding facilities in excess of 50,000m^2 (12.5ha plot) and up to 100,000m^2 (25ha plot). Plots of this size are generally not available at existing general industrial sites or on 'recycled' brownfield land, meaning that new strategic logistics sites will be required.
- It is warehousing above 25,000m^2 that will benefit from or be of a nature to be attracted to rail terminal facilities. This is demonstrated by the size of facilities which have located at the only major rail linked 'strategic logistics site' in the region - seven of the new distribution centres at DIRFT are greater than 25,000m^2. Existing sites are located either away from railway lines or are unsuitable for rail linkage. A substantial increase in the amount of warehousing which is rail connected will therefore require the provision of new sites at locations adjacent to suitable railway lines.

3.13 At this stage of the analysis, therefore, the forecast demand needs to be differentiated, identifying and quantifying the proportion of the future market likely to require plots at new strategic logistics sites. The proportion of the gross new build demand up to 2016 and 2026 which is likely to be in units over 25,000m^2 in size has therefore been estimated. This has been undertaken by considering the recent trends in the size of new units built in the East Midlands (Appendix 3). Taking the 1997-2005 time period, around 61% of all new build floor space in the region was in units over 25,000m^2. This figure has subsequently been applied to the total forecast new build demand. This is shown in the table below, with the proportion of the future market likely to demand plots at new strategic logistics sites (or large plots on existing sites) highlighted.

Table 13: Forecast Demand for New Build Units >25,000m^2 up to 2016 and 2026 and Land Requirements*

Floor Space Demand	**000s Sq m**			
	Base Case	**Scenario 1**	**Scenario 2**	**Scenario 3**
New floor space in units >25,000sqm (61%)				
Up to 2016	1,491	1,295	1,685	1,588
Up to 2026	2,982	2,562	3,393	3,186
New floor space in units <25,000sqm				
Up to 2016	953	828	1,077	1,015
Up to 2026	1,906	1,638	2,169	2,037
Land Requirements	**Hectares***			
	Base Case	**Scenario 1**	**Scenario 2**	**Scenario 3**
Land required for units >25,000sqm				
Up to 2016	373	324	421	397
Up to 2026	745	640	848	797
Land required for units <25,000sqm				
Up to 2016	238	207	269	254
Up to 2026	477	409	542	509

**On the basis that all new build floor space will locate on new sites and warehouse floor space occupies 40% of a plot footprint*

3.14 The forecasts estimate that the total (gross) warehouse new build in the region up to 2026 for units greater than 25,000m^2 will be between 2.56 million and 3.39 million square metres. The central Base Case estimates that around 2.98 million square metres of new warehouse build will be in units greater than 25,000m^2. On the basis that all new buildings greater than 25,000m^2 will require plots at new strategic logistics sites, between 640 and 848 hectares of land will be required in the East Midlands up to 2026 (745 hectares for the Base Case).

3.15 However, the results of these forecasts does not imply that the region will need to allocate an additional 640-848 hectares of land up to 2026 for new strategic logistics sites. There are large plots available at existing B8 sites and at strategic sites in the pipeline. The following Section of this report (Section 4) considers the current supply of suitable B8 sites and the future supply at strategic sites in the pipeline with consents (rail and non-rail linked). This will subsequently determine how much additional land the region will need to make provision for over the time frame of the next RSS.

3.16 Similarly, the Base Case forecast estimates that the total (gross) warehouse new build in the region up to 2026 for smaller scale units will be 1.91 million square metres (units less than 25,000m^2). This equates to a land requirement of 477 hectares up to 2026. Section 4 will also consider the current supply of 'employment' land, as such sites are likely be suitable for accommodating smaller scale units less than 25,000m^2.

Section 3.2 Rail Linked Sites

3.17 On the basis that all future new buildings greater than 25,000m^2 were required to locate on rail linked sites, for the Base Case forecast this would suggest a need for 13 new strategic rail connected logistics sites in the East Midlands up to 2026 (at a mean of 50ha per site). While there is no harm in maximising the proportion of floor space which is located on rail linked sites (generating modal shift is only possible when warehouses are rail linked), requiring all new floor space to be rail linked is clearly not practical. There are existing planning consents and there is need to provide the market with a choice of sites, in terms of location in the region and modal connectivity. The next stage of the analysis has therefore estimated the proportion of the forecast demand for warehouses over 25,000m^2 which can be expected to locate at rail linked sites in the region, together with the associated land requirements. This assessment has taken into account the following:

- Both national and regional policy encourages new warehousing to be located at sites with suitable access to the railway network;
- The Regional Freight Strategy policy of attracting an additional 30 freight trains per day to the region
- Nationally intermodal rail freight volumes are forecast to grow substantially resulting from, among other factors, increases in the relative costs of road haulage and growing levels of imports (containerised) at the expense of domestically produced goods; and
- Existing sites in the region are located either away from railway lines or are unsuitable for rail connection.

3.18 Consequently, two alternative options have been considered, namely:

- Option 1: A continuation of recent market trends in terms of the proportion of new floor space in the region above 25,000m^2 which has been developed on rail linked sites; and

- Option 2: The amount of new floor space which will need to be developed in the region on rail linked sites in order to deliver the Regional Freight Strategy policy target of an additional 30 freight trains per day. Effectively this provides for a higher proportion of warehouses, compared to existing trends, locating on rail linked sites, but also takes into account existing planning consents and the need to ensure market choice.

Option 1: Continuation of Existing Trends

3.19 This option considers a continuation of recent market trends in terms of the proportion of new floor space which has been developed on rail linked sites in the East Midlands. To date, the only major rail linked logistics site (defined as 'on site' rail facilities rather than developments close to rail terminals) to be developed in the region is DIRFT. This option therefore takes into account the locational decisions the market has made in the past, given that a limited supply of plots on rail linked sites have been available, but with other non-rail linked sites also being available.

3.20 Our analysis (see Appendix 3) shows that the floor space developed at DIRFT accounts for only 11% of all new units built in the region between 1997 and 2005. We have subsequently applied this percentage to the forecast demand for warehouses over 25,000m^2 up to 2026 (i.e. 11% of 2.6 million to 3.4 million square metres). The

table below presents the results of this option. On the basis of recent locational trends, between 70 and 93 hectares of land will be required in the East Midlands for rail linked sites up to 2026 (82 hectares for the central Base Case).

Table 14: Option 1 – Continuation of Existing Trends+

	Gross Demand >25,000m^2 at Rail Linked Sites		Gross Demand >25,000m^2 at Non-rail Linked Sites	
	000s sq m	ha*	000s sq m	ha*
Up to 2016				
Base Case	164	41	1,327	332
Scenario 1	142	36	1,152	288
Scenario 2	185	46	1,500	375
Scenario 3	175	44	1,413	353
Up to 2026				
Base Case	328	82	2,654	663
Scenario 1	282	70	2,280	570
Scenario 2	373	93	3,020	755
Scenario 3	350	88	2,836	709

+11% of future demand for units greater than 25,000m^2 locating at rail linked sites
**On the basis that all new build floor space will locate on new sites and warehouse floor space occupies 40% of a plot footprint*

Option 2: Meeting the Regional Freight Strategy Target of 30 Additional Trains per day

3.21 The Regional Freight Strategy includes a target of an additional 30 trains per day originating or terminating in the region. Given that most other cargo flows to/from the region which are suitable for movement by rail (e.g. aggregates) are already moving by rail, this implies that the target will have to be primarily met from the non-bulk sector i.e. consumer goods passing via warehouses in the region.

3.22 Section 5 of this report demonstrates that the crucial factor in rendering rail freight cost competitive against other modes in the non-bulk sector is the ability to locate distribution centres on the same sites as rail terminal facilities. As a result, generating modal shift is only possible when warehouses are rail linked. Where a warehouse is not located at a rail linked site, a road haul is required between a rail terminal and the warehouse. Even over short distances of a few kilometres, this can add around £100 per unit to the overall door to door transport costs.

3.23 At a rail linked site, however, use of the public highway is avoided and the road-rail transfer costs are consequently significantly lower. Where the rail connection is by means of an intermodal terminal, yard-tractors operating on rebated diesel and driven by non-HGV qualified drivers (drivers with a standard car licence rather than HGV qualified) can undertake the transfer of goods in intermodal units between rail terminal and RDC/NDC. In this case, 'rail linked' can also mean two separate sites less than 1km apart. Under Revenue and Customs regulations, yard-tractors using rebated diesel can use the public highway to move between two private sites which are less than 1km from each other.

3.24 Consequently the development of warehousing on rail linked sites is crucial to meeting the policy target of increasing rail freight traffic. The traffic forecasts (Appendix 2) show that increasing the amount of new warehousing nationally which is built on rail linked sites results in higher forecast rail freight volumes

3.25 However, from a planning and market choice perspective, a position where all new build warehousing above 25,000m^2 is 'forced' to locate on rail linked sites may be regarded unrealistic. While there is growing market demand for access to rail linked facilities and a policy need to increase the proportion of warehousing on rail linked sites, other factors need to be considered, namely:

- There is an existing supply of land with consents.
- Locational flexibility is important to satisfy individual operator requirements. A choice of sites in terms of regional location and modal connectivity will need to be made available to achieve this flexibility.
- Sections of the East Midlands railway network are currently unsuitable for accommodating rail linked distribution facilities (loading gauge and capacity issues).

3.26 We have therefore considered a second option based on developing a higher proportion of warehousing on rail linked sites compared with existing trends, in order to encourage modal shift, but also accounting for these other factors.

3.27 In terms of the level of this higher proportion, we have calculated the amount of new floor space which will need to be developed in the East Midlands on rail linked sites in order to meet the Regional Freight Strategy policy of an additional 30 freight trains per day. Essentially, we have quantified the cargo generated by 30 trains and calculated

the amount of floor space required to handle this cargo. This calculation takes into account the relationships which exist between tonnage throughput and warehouse floor space and assuming that rail can attract 45% of inbound traffic. This is shown in the table below.

Table 15: Floor Space Required to Generate 30 Additional Daily Trains

Rail Linked Floor Space	**1,640,000**	**sq m**
Pallets stored at any one time	1,394,000	pallets (1 per sq m and 85% of capacity)
Number pallets inbound pa	16,728,000	pallets (12 stock turns pa)
Unit loads inbound pa	697,000	(24 per unit load)
Unit loads inbound by rail pa	313,650	(45% by rail)
Unit loads inbound by rail per day	1,255	(250 days pa)
Number trains per day	30	(42 units per train)

3.28 The amount of new rail linked floor space require to meet the policy target is 1.64 million square metres. This figure has subsequently been applied to the other scenarios. For the Base Case forecast, this equates to 55% of all units in excess of 25,000m^2 being located on rail linked sites. This is shown in the table below.

Table 16: Option 2 – Meeting the Regional Freight Strategy Policy of 30 Additional Trains per day

	Gross Demand >25,000m^2 at Rail Linked Sites		Gross Demand >25,000m^2 at Non-rail Linked Sites		% Rail linked
	000s sq m	ha*	000s sq m	ha*	
Up to 2016					
Base Case	820	205	671	168	55%
Scenario 1	820	205	475	119	63%
Scenario 2	820	205	865	216	49%
Scenario 3	820	205	768	192	52%
Up to 2026					
Base Case	1,640	410	1,342	335	55%
Scenario 1	1,640	410	922	230	64%
Scenario 2	1,640	410	1,753	438	48%
Scenario 3	1,640	410	1,546	387	51%

**On the basis that all new build floor space will locate on new sites and warehouse floor space occupies 40% of a plot footprint*

SECTION 4. ANALYSIS OF CURRENT SITE SUPPLY AND FUTURE LAND REQUIREMENTS

4.1 The Base Case forecast in the previous section estimates that the total (gross) new build up to 2026 for large and rail linked warehouses will be around 2.98 million square metres. This equates to a land requirement of 745 hectares, on the basis that all of the forecast demand will require plots on new strategic logistics sites. However, this is the gross requirement and it does not identify and quantify the amount of additional land which will need to be allocated up to 2026, as it has not taken into account land remaining at suitable existing sites or at strategic sites in the 'pipeline' with consents (whether rail or non-rail linked). The next stage of the analysis, therefore, has considered the quantity and quality of current land supply in the region. From this analysis, it will be possible to identify and quantify the amount of additional land which will need come forward over the life of the RSS for strategic logistics sites.

Section 4.1 Total Supply of Land

4.2 The Regional Spatial Strategy Annual Monitoring Report (AMR) shows the total supply of employment land in the East Midlands, comprising all development sites identified for employment uses. This total supply at 1 April 2005 stood at 2,833 hectares. It would appear that this level of supply should be adequate to meet the forecast demand in the region for smaller scale units, given that such facilities will not require large plots or rail connections i.e. units less than 25,000m^2. The Base Case forecast up to 2026 estimates a land requirement of 477 hectares for smaller scale units.

4.3 However, the AMR figure is not helpful to this study because it does not separate out sites suitable for large scale B8 uses – defined in this study as units of 25,000m^2 or above and requiring at least 5ha of land – or those sites which are rail linked (or capable of being rail linked). The previous section noted that, in many cases, large scale developments will not 'fit' onto existing plots at general employment sites or will demand a rail linked site. Savills and Roger Tym & Partners have therefore prepared a separate list of available sites suitable for large scale B8 uses, covering:

- Total supply of land remaining at existing development sites which are allocated or permitted for employment, are being marketed as suitable for large distribution warehouses and provide at least 5 hectares of developable land (i.e. sites which have been partially developed but vacant plots are available for B8 uses); and

- The supply of land at strategic logistics sites in the 'pipeline' and provide at least 5 hectares of developable land (i.e. sites which are allocated or have received planning consent for large scale B8 use but which have yet to be developed e.g. Castle Donington).

4.4 Table 40 in Appendix 4 provides a full list of existing development sites and sites in the pipeline which provide at least 5 hectares of developable land. Map 7 in Appendix 1 illustrates the geographic spread of these sites across the region.

4.5 The total land area identified in the East Midlands is 557 hectares, which at a development density of 40% (4,000 sq m per hectare) could accommodate around 2.23 million square metres of new warehouse space. The tables below break down existing/pipeline site supply by sub-region and into broad size brackets. In this case, the sub-regions are broad sub-regional areas which have been defined solely for the purposes of this study. A brief description of each sub-region's delimitation is described in Section 6.1 and they are defined spatially in Map 1 in Appendix 1.

Table 17: Total Land Supply at Existing Sites* or Sites in the Pipeline by Sub-region**

Sub-region	ha
Sub-region 1	0
Sub-region 2	81
Sub-region 3	117
Sub-region 4	0
Sub-region 5	0
Sub-region 6	56
Sub-region 7	8
Sub-region 8	0
Sub-region 9	6
Sub-region 10	65
Sub-region 11	0
Sub-region 12	0
Sub-region 13	63
Sub-region 14	161
Total East Midlands	**557**

Source: Savills and RTP.
**For definition see paragraph 4.3, first bullet point*
*** For definition, see paragraph 4.3, second bullet point*

Table 18: Total Land Supply at Existing Sites* or Sites in the Pipeline by Size**

Size Band	Number	Ha
Sites >50ha	4	297
Sites 25-49ha	2	73
Sites 10-24ha	10	141
Sites 5-9ha	8	47
Total East Midlands	**24**	**557**

Source: Savills and RTP
**For definition see paragraph 4.3, first bullet point*
*** For definition, see paragraph 4.3, second bullet point*

4.6 Most of the supply is to be found along the M1 corridor. Sub-region 14, centred on Northampton, has the most supply (161ha) followed by Sub-region 3 (Bassetlaw and Newark – 117ha). Sub-regions 1, 4, 5, 8, 11 and 12 have no suitable existing sites (5ha or larger) or sites in the pipeline. There are 4 sites greater than 50ha in size, contributing 297ha of land to the overall total available. There are only 2 sites between 25ha and 49ha. Most of the available sites are between 5ha and 24ha (18).

4.7 Only two sites, Castle Donington and DIRFT Phase 2, meet the requirements of the site selection criteria developed for this study (Section 5). On this basis, we estimate that there is currently 102 hectares of land available at existing rail linked sites or on suitable rail linked sites the pipeline (meaning that 455 hectares is currently available at existing non-rail linked sites or sites in the pipeline). This is shown in the table below.

Table 19: Total Land Supply at Existing Sites* or Sites in the Pipeline – Rail and Non-rail Connected.**

	Hectares
Land at rail linked sites meeting criteria	102
of which:	
Castle Donington	53.8
DIRFT Phase 2	48.6
Other Sites	455
Total Land Supply	**557**

Source: Savills and RTP
**For definition see paragraph 4.3, first bullet point*
*** For definition, see paragraph 4.3, second bullet point*

Section 4.2 Land Supply, Future Demand and Additional Land Required

4.8 The above supply figures have consequently been applied to the forecast gross land requirement up to 2026 for units greater than 25,000m^2, for the Base Case scenario Option 2 i.e. meeting the Regional Freight Strategy of 30 additional trains. This is shown in the table below.

Table 20: Gross Land Requirement for Units >25,000m^2 and Land Supply for Option 2

Base Case to 2026 Option 2	**Hectares**	
	Rail Linked	Non-rail Linked
Gross Requirement to 2026	410	335
Current Land Supply	102	455
Additional Land Required	**308**	**-119**
Additional Rail Linked Sites Required		
Mean size - 50ha	6	
Mean size - 75ha	4	
Mean Size - 100ha	3	

Source: MDS Transmodal GBFM, Savills and RTP

4.9 On this basis, it would appear that:

- Around 308ha of additional land at appropriate rail connected strategic logistics sites will need to be brought forward over the life of the next RSS (to 2026). This equates to 4 new rail linked sites at a mean of 75ha per site; and
- The supply of land at non-rail connected sites should be adequate to meet the forecast demand.

4.10 However, we need to consider the quantum of existing site supply (and sites in the pipeline) which is located in areas appropriate for hosting large scale logistics activity. Section 5 of this report also develops a set of criteria to be used in identifying general broad locations which are suitable for accommodating strategic logistics sites. These have subsequently been used to assess 14 broad sub-regions, and recommendations made as to which sub-regional areas provision for new strategic logistics sites will need to be made (Section 6). The next stage of the analysis, therefore, has identified and quantified existing site supply and 'pipeline' sites in those sub-regions which meet the criteria, on the basis that the criteria were applied in a 'flexible' manner and accounting for future railway upgrades (Network Rail has published proposals to enhance the Peterborough-Leicester-Nuneaton line to W10 and the installation of new signalling to increase the existing capacity – see Appendix 6). This is shown in the table below.

Table 21: Total Land Supply at Existing Sites* or Sites in the Pipeline in Appropriate Sub-regions**

	Hectares
Sub-region 6	56
Sub-region 7	8
Sub-region 9	6
Sub-region 10	65
Sub-region 12	0
Sub-region 13	63
Sub-region 14	161
Total	**359**
of which:	
Land at rail linked sites meeting criteria	102
Land at non-rail linked sites	257

Source: Savills and RTP
**For definition see paragraph 4.3, first bullet point*
*** For definition, see paragraph 4.3, second bullet point*

4.11 On this basis, there is currently 359 hectares of land available in the region in the appropriate broad sub-regional areas, of which 102 hectares is located on suitable rail linked sites. Consequently, around 198 hectares of existing site supply is located in sub-regions which do not meet the broad sub-regional criteria. These supply figures have consequently been applied to the forecast gross land requirement up to 2026 for units greater than 25,000m^2, for the Base Case scenario Option 2. This is shown in the table below.

Table 22: Gross Land Requirement for Units >25,000m^2 and Land Supply in Appropriate Sub-regions for Option 2

Base Case to 2026	Hectares		
	Rail Linked	Non-rail Linked	Total
Gross Requirement to 2026	410	335	745
Current Land Supply	102	257	359
Land Required	**308**	**78**	**386**
Additional Rail Linked Sites Required			
Mean size - 50ha	6		
Mean size - 75ha	4		
Mean Size - 100ha	3		

4.12 Given this position, we can therefore conclude that:

- For the Base Case forecast scenario, in order to meet the Regional Freight Strategy target of 30 additional freight trains in the region around 308 hectares of additional land at appropriate rail connected strategic logistics sites will need to be brought forward over the life of the next RSS (to 2026) in the identified sub-regions (Section 6.2). This equates to 4 new rail linked sites at a mean of 75 hectares per site; and
- For the Base Case forecast scenario, around 78 hectares of additional land at non-rail connected strategic logistics sites will need to be brought forward over the life of the next RSS (to 2026) in the identified sub-regions.

4.13 The analysis also suggests that the existing supply at non-rail linked sites is likely to be adequate for the early years of the next RSS (existing supply meets around 75% of non-rail linked demand for Option 2), meaning that new non-rail linked sites are unlikely to be required until the later years of the RSS. Clearly the priority should be allocating land for new rail linked strategic logistics sites so that the 30 additional trains policy target can be achieved.

Section 4.3 Additional Land Required – Implications

4.14 Freight policy and land use policy are inexplicably linked. The development of one leads to implications for the other. The demand and supply analysis has concluded that to meet the Regional Freight Strategy policy target of 30 additional freight trains originating or terminating in the region, around 308 hectares of additional land at appropriate rail connected strategic logistics sites will need to be brought forward over the life of the next RSS (to 2026) in the identified sub-regions (Section 6.2). This takes into account land in the pipeline at Castle Donington and DIRFT Phase 2.

4.15 In terms of meeting this forecast land requirement, we have considered whether there are other schemes in the region which are currently being promoted by developers and which meet the requirements of the site selection criteria developed for this study (Section 5).

4.16 We are currently aware of only two such schemes in the region (i.e. there may be other schemes we are currently not aware of), namely:

- Astral Developments have proposed a large rail linked development at Corby (Stanion Lane). We understand that there is around 80 hectares of rail connected land potentially available at this site. Given the proposed upgrade to the Peterborough-Nuneaton line proceeding, this proposed site should be able to accommodate intermodal rail freight.
- Landform Development have proposed a rail linked development at Burnaston Cross, near Derby. This site is located adjacent to the A38/A50 junction and close to the Toyota car factory (a 'base load' cargo is therefore potentially available). We understand that around 35 hectares of land are potentially available at this site. In addition, a further 20 hectares may be available at an adjacent site on the opposite side of the B5008. Burnaston Cross is able to connect with the Birmingham to Derby line which is currently gauge cleared to W8.

4.17 Toton rail sidings near Nottingham has been proposed at various times in the past as a possible location for intermodal terminal facilities and warehousing. However this site does not meet the requirements of the site selection criteria, namely:

- Road access to the site is currently very poor, and the preferred route for a new access road is from Toton Lane and passes a school;

- The loading gauge to the south is below the minimum requirement for an intermodal terminal (W7);
- The size of the site is considerably below the 50 hectare threshold (22ha currently available within the railway lands), meaning that the requisite amount of floor space required to generate a range of full train length services cannot be developed on the site along with an intermodal terminal; and
- It is located close to a residential area i.e. incompatible neighbours.

4.18 Potentially, both the Corby and Burnaston Cross schemes could contribute around 135ha to the overall regional requirement for an additional 308ha of rail connected land. However, both schemes have not been subject to a planning application, meaning they have no status in planning terms, and their suitability has yet to be tested through the planning process.

4.19 Section 5 of this study develops a set of criteria for use in identifying and assessing sites which are suitable for hosting strategic logistics facilities. In brief, the criteria defines an appropriate site as:

- A large site – at least 50 hectares;
- With good quality highway links (motorway junction or a main trunk route);
- Is also adjacent to a railway line with a generous loading gauge and available freight capacity; and
- Located away from residential areas.

4.20 Such sites, by their very nature, are often greenfield and occupy 'out of town' locations, given that previously developed land is normally not large enough to accommodate the large buildings required by the market and/or do not have suitable rail linkages. This, in a 'nut shell', is the policy implication of the Regional Freight Strategy in land use terms. The policy target of 30 additional trains, which was introduced in order to encourage more sustainable distribution in the region, will almost certainly require new strategic logistics sites to be located on greenfield land if the policy target is to be achieved.

SECTION 5. DEVELOPMENT OF ROBUST SITE SELECTION CRITERIA

5.1 Section 4 of this report reached conclusions concerning the total amount of land required for strategic logistics sites which will need to come forward over the life of the next RSS. The aim of this section of the report is to develop robust criteria for identifying and selecting suitable strategic logistics sites. These will subsequently be used to make recommendations as to where, in broad locational terms, additional land will need to be allocated up to 2026. When property developers and warehouse occupiers are selecting new sites for competitive logistics facilities, they essentially undertake a two stage process:

- Firstly, general broad locations are identified which are appropriate for hosting large scale distribution activity; and
- Secondly, appropriate individual sites within these broad locations are identified and selected.

5.2 Consequently, a criteria based approach to identifying and selecting sites appropriate for hosting large scale logistics activity must reflect this two stage process. It is therefore important that an initial set of criteria is developed which can be used to identify appropriate general broad locations, and that a second set of criteria is then developed which is concerned with identifying suitable individual sites within these broad locations.

5.3 The broad locational criteria should essentially be concerned with identifying broad locations which are suitable for accommodating at least one major strategic logistics site. Consequently the criteria must set out the basic qualities/characteristics those broad locations must possess. They are not concerned with assessing the quality and suitability of individual sites within the broad location, which are covered by the second set of criteria. As a result, some of the individual criteria will be common to both sets, while other individual criteria will be site specific in nature.

5.4 In order to develop both sets of criteria, it is necessary to set out in detail a number of issues relating to:

- National and regional policy with respect to the location, form and structure of strategic distribution sites; and
- The qualities and characteristics an individual site must posses in order to be commercially attractive to the logistics market.

Section 5.1 National and Regional Policy

5.5 It is important that the development of a broad location and site specific selection criteria is undertaken against the background of current planning policy and other relevant guidance. The most relevant documents and policies are summarised below. On the basis that EMDA are fully informed with regards to regional policy and planning guidance, additional detail is presented for the national transport policy documents in Appendix 5.

Regional Policy and Strategy

5.6 RSS8: Regional Spatial Strategy for the East Midlands to 2021

- A regional core objective to promote and improve economic prosperity, employment opportunities and regional competitiveness and the promotion of the prudent use of resources through patterns of development that make efficient and effective use of existing infrastructure.
- A sequential approach to the selection of land for development recognising the need to make the best use of land and optimise the development of suitable previously developed land in urban areas.
- A structural weakness of the East Midlands region being a lack of accessibility due to poor infrastructure and public transport inhibiting the labour market and the movement of goods.
- Constraints for modal shift away from road based transport due to a lack of inter-modal freight terminals within the region, the lack of main routes cleared to carry 2.9m/9'6" containers and a number of capacity pinch points on the existing rail network.
- Recognition that infrastructure enhancements alone will not secure a more sustainable efficient distribution industry and that the majority of freight will still need to be moved by road.
- The need for more details policies to promote a more sustainable and efficient distribution industry in the East Midlands and contribute to a significant modal shift of freight from road to rail.

5.7 A review of RSS8, referred to as the *East Midlands Regional Plan* has recently been published for consultation. This will be consequently be tested at an 'Examination in Public' (EIP). Taking into account any recommendations emerging from the EIP, the document will eventually form the new RSS up to 2026. There is little in the document

directly concerning the development of new distribution facilities in the region, apart from the following:

- A reference to the need to promote opportunities for modal shift and generate renewable energy in the policy on regional priorities for employment land
- Northern Coalfields sub-area – develop new opportunities for local jobs in the distribution sector
- Three Cities sub-area – develop opportunities for modal switch away from road based transport in the manufacturing, retail and freight distribution sectors
- Southern sub-area – develop opportunities for modal switch away from road based transport in the nationally important freight distribution sectors

5.8 The document does not cover the quantum of land/sites the region can be expected to allocate up to 2026 for new distribution developments. Neither does the document include any guidance covering the location, form and structure of new logistics developments (e.g. type of sites and developments the region should encourage). It is understood that the conclusions and recommendations from this study will form part of EMDA's submission to the EIP.

5.9 A Flourishing Region – Regional Economic Strategy for the East Midlands

- By 2020, the East Midlands will be a flourishing region - with growing and innovative businesses, skilled people in good quality jobs, participating in healthy, inclusive communities and living in thriving and attractive places.
- To raise the Region's productivity while ensuring sustainability and achieving equality
- Priority Theme 'Transport and Logistics' – To improve the quality of regional infrastructure to enable better connectivity within and outside the region.
- To protect and enhance the region's environment through sustainable economic growth.
- To ensure that the quality and supply of development land, and balance between competing land uses, contributes towards sustainable growth of the regional economy.
- A regional priority is to improve provision of inter-modal freight facilities and rail gauge clearance for modern container traffic

5.10 East Midlands Regional Freight Strategy

- Regional and local partners to work together to identify and promote opportunities to achieve a significant shift from road to rail freight
- An extra 30 trains per day originating or terminating in the region

- Encourage, through the Regional Spatial Strategy, distribution locations in the Northern Coalfields sub-region and in areas where best use can be made of existing high quality transport infrastructure

Planning Guidance

5.11 PPG4: Industrial and Commercial Development in Small Firms

- Sites for distribution development could be best located away from the urban areas and wherever possible should be capable of access by rail and water transport.

5.12 PPG13: Transport

- Locating developments generating substantial freight movements such as distribution and warehousing, particularly of bulk goods, away from congested central areas and residential areas and ensure adequate access to trunk roads.
- Promoting opportunities for freight generating development to be served by rail or waterways by influencing the location of development and, where appropriate, protecting realistic opportunities for rail or waterway connections to existing manufacturing, distribution and warehousing sites close to the rail network, waterways or coastal/estuarial ports.

National Transport Policy

5.13 Part of the thrust of regional and national guidance relates to exploring the opportunities for a modal shift from road to rail for the movement of freight. A number of national documents have been produced in this respect and are summarised below.

5.14 The Future of Transport White Paper

- General broad support for 'modal shift' and the development of new rail linked distribution facilities

5.16 Sustainable Distribution, A Strategy

- Specific measures to promote sustainable transport of goods, and encouraged the use of rail freight
- Local Authorities are expected to protect, where appropriate, rail connections and allocate new sites for suitable new developments which can be served by rail.

5.16 Strategic Rail Freight Interchange Policy

- States that Strategic RFIs are large distribution parks, comprising intermodal facilities serving distribution centres located within the park and others in the wider region (essentially large scale distribution parks which happen to be rail linked, and not simply rail freight terminals)
- States that Strategic RFIs will be at least 40 hectares in size, and will be located with good access to the primary road network, and with high quality links to the rail network
- States that Regional planning policy should identify suitable areas where strategic RFIs could or should be developed

5.17 In summary, both national and regional policy recognise the specific requirements of the distribution sector and encourages development at locations with good accessibility to both road and rail infrastructure. Whilst a movement from road to rail freight is encouraged, it is accepted that the largest proportion of freight movement will continue to be by road. Accordingly, new sites, where possible, should have the potential for rail freight. It is acknowledged that where new distribution facilities can be located on rail linked sites, that this would encourage a modal shift from road to rail. However, where rail served plots or sites are not available, large sites with good accessibility to the trunk road network located near to rail freight sites, could still make a valuable contribution towards modal shift.

Section 5.2 Commercially Attractive Logistics Sites

5.18 New strategic logistics sites developed in the region must be commercially attractive to the logistics market. The provision of commercially attractive sites will play a key role in meeting the future needs of the logistics market, while at the same time maintain and enhance the competitive position of the East Midlands in the logistics sector.

5.19 Given this position, the following sub-sections considers those various factors which are fundamental to sites being commercially attractive to the logistics market over the medium to long term, namely:

- Highway links
- Modal choice
- Rail connectivity
- Site size
- Labour

Highway Links

5.20 Road transport will remain the dominant mode as for most goods flows it will remain the most practical and cost effective form of transport. This means that the majority of cargo arriving and departing distribution centres located on rail connected logistics sites will be by road transport. At a rail linked NDC, if rail freight services work to their full potential, around 50% of inbound goods can be expected to arrive by rail (balance by road), and around 25% depart by rail. At an RDC, the comparative figures are 25% of inbound goods arrive by rail (balance by road), and all departing goods leave by road. For a rail connected logistics site comprising 200,000m^2 of NDC floor space, this would equate to around 330 outbound HGV road trips per day. Sites containing RDC floor space will generate additional road traffic movements due to the faster turnover of stock at such facilities. In addition to this, any intermodal terminal facility will also be serving manufacturers and distribution activities located off site by road.

5.21 For this reason, a commercially attractive site for NDCs/RDCs and intermodal terminal facilities must have good access to the highway network. However simply being served by good quality motorway or trunk roads is only part of the equation. Highway congestion, particularly during the off-peak hours, is an important issue for the logistics industry. Good quality road access should therefore be also seen in terms of the level of highway congestion, in addition to the type of road serving a location.

Modal Choice

5.22 Road haulage is the dominant mode of transport to and from distribution facilities in the general cargo and Fast Moving Consumer Goods (FMCG) markets. The road haulage industry has provided the cost efficiency, quality and flexibility required by the logistics market, primarily a result of road haulage being an open, competitive private sector industry.

5.23 Recent developments within the general cargo and FMCG sector, however, suggests a trend towards operators seeking rail freight solutions for some of their transport requirements. On a practical basis, this means logistics operators continuing to use road haulage as the main mode of transport, as it will remain the most practical and cost effective form of transport for most flows of goods, but with the ability to utilise rail freight for some flows from the same location, when it provides the most practical and cost effective option i.e. modal choice.

5.24 Evidence for this trend is provided by the maritime container sector, which has seen large growth rates over the past decade in the use of rail for the inland clearance of containers from ports, particularly to the Midlands (DIRFT) and north of England. A number of the major retail chains, including Tesco and Asda, have also begun to contract daily train services for some of their distribution requirements. The freight forecasting described in the previous section and detailed in Appendix 2 suggests a continuation of these trends.

5.25 A number of factors are driving this trend. Firstly, the relative costs of transporting goods by road has been increasing, and this trend is likely to continue over the medium to long term. This is due to a combination of EU/Government policy initiatives and other factors, including:

- Rising oil prices
- Increasing levels of highway congestion
- Shortages of qualified HGV drivers
- Working Time Directive and other social legislation
- In the longer term, distance based road charging which takes into account congestion and the wider environmental costs of road transport

5.26 Logistics operators serving the general cargo/FMCG sectors will need to adopt more cost effective transport solutions in order to remain competitive, and in most cases this means contracting rail freight services for some transport requirements.

5.27 Secondly, the changing nature of the origins of goods is also an important contributory factor driving the trend described above. Essentially greater volumes of goods are originating from fewer locations. Increasing levels of imports at the expense of domestic production (import substitution) is resulting in greater volumes of goods being concentrated at a handful of ports on the south and east coasts of England. In terms of imports from the Far East, this essentially means the major deep sea ports at Felixstowe, Tilbury, Thamesport and Southampton. For imports from the EU, this implies Dover (including Channel Tunnel), the Thames, the Haven ports and the Humber. Similarly, trends within the retail sector towards greater consolidating of goods collected ex-works (also known as factory gate pricing) at 'consolidation centres' should also result in a further concentration of goods at fewer locations.

5.28 The concentration of goods at fewer locations provides more opportunities to utilise rail freight solutions. This is because rail freight operates at its most economic when

goods are moved in full length trains, and the increasing concentration of imported goods at ports and at consolidation centres should generate the required volumes to operate full length train services. As a large proportion of rail freight's costs are fixed, the costs per unit moved are consequently lower on a full length train compared to shorter trains. The ability to operate full length trains therefore enhances the rail mode's cost competitive position compared with road transport. Also, container traffics are ideally suited to the rail mode (ease of transfer between road, rail and ship), and all the deep sea container ports in the south east are rail connected.

5.29 Given this position, locating at sites which offer 'access to rail facilities' (i.e. modal choice) is likely to become a key commercial requirement for logistics operators over the medium to long term. However, the crucial factor in rendering rail freight cost competitive against other modes, and thereby creating the genuine modal choice required by the market, is the ability to locate distribution centres on the same sites as rail terminal facilities. Consequently, 'access to rail facilities' essentially means locating at rail linked sites. This can be demonstrated through comparing the costs of moving a standard unit load by road and intermodal rail freight over varying distances under different operating scenarios. These cost comparisons show that, as a general rule of thumb, rail freight moved in full trainload quantities, including grant funding, is cost competitive with road haulage in the following circumstances:

- For flows from a non rail connected origin to a non rail connected distribution centre (a road haul is required at both ends of the journey), rail freight becomes cost competitive at distances over 400km
- For flows from a rail connected origin e.g. container port, to a non rail connected distribution centre (eliminating one road haul), rail freight becomes cost competitive with road transport at distances over 200km
- For flows from a rail connected origin e.g. container port, to a rail connected distribution centre (no road hauls), rail freight generally is always cost competitive compared to road transport over any given distance given adequate volume to fill a daily train.

5.30 On this basis, intermodal rail flows from Magna Park via DIRFT (12km by road) are only economic to other non-rail linked facilities over 400km, effectively only Scotland (e.g. Asda train), while flows direct from DIRFT could be cost competitive to non-rail linked facilities in other English regions such as the North East. Essentially, providing access to rail facilities by means of locating logistics facilities on the same site as a rail terminal facilities eliminates 'road hauls', which consequently removes costs from the

supply chain, thereby enhancing rail's competitive position and creating modal choice. Where a warehouse is not located at a rail linked site, a road haul is required between a rail terminal and the warehouse. Even over short distances of a few kilometres, this can add around £100 per unit to the overall door to door transport costs.

5.31 At a rail linked site, however, use of the public highway is avoided and the road-rail transfer costs are consequently significantly lower. Where the rail connection is by means of an intermodal terminal, yard-tractors operating on rebated diesel and driven by non-HGV qualified drivers (drivers with a standard car licence rather than HGV qualified) can undertake the transfer of goods between rail terminal and RDC/NDC. In this case, 'rail linked' can also mean two separate sites less than 1km apart. Under Revenue and Customs regulations, yard-tractors using rebated diesel can use the public highway to move between two private sites which are less than 1km from each other.

5.32 On this basis, a commercially attractive site will be one where distribution warehousing and rail terminal facilities are brought together at the same site (or within 1km of each other).

Rail Connectivity

5.33 Commercially attractive logistics sites over the medium to long term will be those which offer modal choice i.e. both road and rail access. However, simple access to the railway network is only part of the equation, and there are a number of other rail connectivity issues to consider which will impact on the competitiveness and viability of individual sites. Essentially not all sites with a rail connection will be appropriate i.e. competitive.

5.34 Commercially attractive rail linked sites will be those which provide:

- Intermodal terminal facilities
- Access to a route which offers a generous loading gauge. The W8 loading gauge is the minimum gauge which should be considered for rail linked logistics sites, however sites with rail access at W9, W10 and W12 will be more attractive commercially as wagons to convey high cube boxes (2.9m/9'6") are cheaper to operate
- Access to a route with available freight train capacity
- Direct rail access, without the need to reverse or use a circuitous route

5.35 Appendix 6 provides background information covering railway connectivity, and discusses the rationale behind the necessary characteristics of a competitive rail linked site.

Site Size and Configuration

5.36 The size of a site and its configuration is an important factor for two main reasons:

- It contributes towards the viability of rail freight services to and from that site; and
- Sites need to be big enough to accommodate the large scale distribution centres that are be required by the market, together with a number of other support activities.

5.37 A commercially attractive rail linked site is considered to be one which is large enough and flexible in its configuration to provide the following:

- An intermodal terminal
- Distribution warehousing, with at least 200,000m^2 of floor space in total, and individual plots allowing very large units. Our analysis of recent new buildings in the region (Appendix 3) indicates that the market is increasingly demanding facilities in excess of 50,000m^2 (12.5ha plot) and up to 100,000m^2 (25ha plot).
- Internal rail reception sidings capable of receiving trains up to 750m trailing length
- An appropriate estate road layout together with parking facilities to accommodate visiting HGVs

5.38 The above sub-sections and Appendix 6 clearly demonstrates the requirement for distribution warehousing and intermodal terminals on the same site.

5.39 In addition to the cost of rail freight compared to road haulage, rail as a mode will only be attractive to the occupiers of the distribution buildings on a logistics site if the site is able attract frequent full length rail freight services to/from a wide range of locations. As a minimum, this means at least a daily train service to/from 5 different locations, with twice daily services to/from some locations (around 8 train services in total). Essentially a 'critical mass' in terms of site size exists, above which the logistics site will generate the requisite number of daily train services. This critical mass is in the region of 200,000m^2 of floor space, as demonstrated in the tables presented in Appendix 6. This implies sites should be at least 50 hectares (ha) in size, on the basis that warehouse floor space occupies 40% of a site footprint.

5.40 Table 41 (in Appendix 6) shows generally accepted figures in terms of the relationships that exist between site size and floor space, and between floor space, warehouse throughput and road and rail modal splits (high bay type warehousing). These relationships form the basis upon which the calculations in Table 42 (in Appendix 6) were undertaken, which demonstrates the relationship between site size and the number of train services.

5.41 In Table 42, Site 1 is an example of a site 10ha size. This equates to around 40,000m^2 of floor space, say allocated to NDCs. The calculation shows that it will probably generate less than 2 inbound train services per day, and less than 1 daily outbound train service. Site 2 is 50ha in size and is able to accommodate around 200,000m^2 of distribution centre floor space, again comprising NDCs. The calculation shows that on this 50ha site, the distribution centres alone would be able to generate around 7 inbound trains per day. While the former site could not offer a comprehensive range of rail fed destinations, the latter could.

5.42 An appropriate site is also one which is able to accommodate very large individual warehouses of at least 50,000m^2 floor space, though recent trends in the retail sector suggests that units up to 100,000m^2 are being increasingly demanded by the logistics market. This can be deduced by considering the analysis of recent warehouse take-up in the East Midlands presented in Appendix 4.

5.43 The ability to accommodate r*eception sidings* is also an important feature of a competitive logistics site. Reception sidings effectively act as a place to 'park' trains off the mainline before and after cargo handling at an intermodal terminal or rail connected warehouse. Reception sidings are required at a rail freight terminal for four main reasons:

- Due to pathing and timetabling constraints, trains will normally arrive at a rail freight terminal well before they are required for cargo handling. Hence they require somewhere to 'park' while they await their turn in the actual cargo handling part of the rail terminal.
- Once a train has been loaded/unloaded and is ready for departure, it requires somewhere to await the arrival of a mainline locomotive. Completion of cargo handling can be well before the mainline locomotive arrives,
- The cargo handling sidings, either at the intermodal terminal or rail connected warehouse, are unlikely to be long enough to accommodate the whole train. The

emerging standard on the rail network for intermodal trains is 30 wagons x 20.3 to 20.6m per wagon. This results in a trailing train length of between 609m and 618m. In the longer term, the aspiration is for 750m trailing length intermodal trains. Trains will therefore need to be 'sectioned' at some point before they can be accommodated in cargo handling sidings if the intermodal terminal sidings are less than 609-618m long.

- As a reception siding would not normally belong to Network Rail, the terminal operator is not reliant on mainline locomotive traction providers to undertake shunting or sectioning of trains, and can undertake these operations themselves by employing the use of their own 'off mainline' shunting equipment. This improves the efficiency and throughput capacity of a terminal.

5.44 Distribution centres generally operate 'time window' systems for the inward delivery of goods. A vehicle delivering to such a facility will be allocated a time slot during which the goods must be delivered, and in many cases the time slot can be as tight as plus or minus 10 minutes. If a haulier misses the allocated time slot, deliveries can be rejected or the vehicle may have to wait a considerable period of time before the load will be handled. In view of journey time un-reliability issues, many hauliers consequently allocate additional time into their operating schedules in order to ensure that vehicles do arrive on time and meet the allotted time slot. As a result, vehicles often arrive early for deliveries. Consequently there is a need for drivers to park their vehicles and wait until allotted delivery times. Commercially attractive logistics sites will therefore be sites which are designed with an appropriate road layout and parking facilities so that they can handle all generated HGV traffic in an environmentally sensitive manner (i.e. avoid the need for HGVs to park on the internal road network, causing possible congestion or queuing onto the public road network).

Neighbouring Land Uses

5.45 Distribution activity needs to operate 24 hours per day, seven days per week. However there are noise and visual impacts associated with distribution. Where possible, deliveries by HGV are normally undertaken during the night when traffic congestion is minimal. Distribution centres therefore need to be accessed during night time hours. Rail freight facilities, parking areas for road trailers or areas where containers are stacked need to be illuminated during the hours of darkness for both practical and safety reasons. Large flood lights therefore need to be erected. Many freight trains also run at night when conflicts with passenger services are minimised. Rail freight facilities at a logistics site will therefore need to receive, despatch and

handle trains at night time. All of these activities, and others which occur, cause noise and visual pollution. Commercially attractive logistics sites are therefore located away from residential areas, for the above given reasons, so that 24 hour operation is possible.

Labour Supply

5.46 Distribution activity is labour intensive. Despite the automation of many logistics functions, most distribution warehouses still rely on manual labour for many of their activities. These include:

- Using a forklift truck to move pallets of cargo from an inbound HGV/railway wagon to pallet racks in the correct storage area in the warehouse
- Inputting data covering inbound cargo into the warehouse's inventory management systems (often undertaken using hand held barcode reading devices)
- Picking goods from storage to the correct order and consolidating them with other goods ready for loading to outbound HGVs/railway wagons
- Recording the outbound movement of goods on the inventory management system
- Loading pallets onto outbound HGVs/railway wagons

5.47 In addition to these tasks, there are the usual administrative jobs associated with large labour intensive industries e.g. Payroll, Human Resources. Drivers for the delivery HGVs based at the warehouse will also be required. Intermodal terminals require gantry crane operators, yard tractor drivers, HGV drivers and security staff. As a general rule of thumb, a NDC normally requires 10 staff per 1,000 square metres of floor space. Therefore a logistics site incorporating 200,000m^2 of distribution floor space will require up to 2,000 staff just for the warehousing, plus HGV drivers and employees for the intermodal terminal.

5.48 Consequently a commercially attractive logistics site will be one which is located with a good quality labour supply within a reasonable 'travel to work' distance. Ideally, sites should be located:

- In or near areas of ‘employment need’
- In areas with below average wage rates
- Where labour is available with the required qualifications
- Fairly short travel to work distances

Section 5.3 Selection Criteria for Broad Locations

5.49 Taking into account policy with respect to the location of distribution sites and the various factors which make specific sites commercially attractive to the logistics market, it is possible to deduce a set of criteria which can be used in identifying general broad locations which are appropriate for hosting strategic logistics sites.

i) A need for logistics facilities as a result of demand from the logistics market which cannot be met in the medium to long term by existing capacity, and is well located in relation to the origins and destinations of cargo;
ii) Good quality access to the railway network. 'Good quality access' is defined in terms of a generous loading gauge which is capable of accommodating intermodal units on standard platform wagons and available capacity to run freight train services;
iii) Good quality access to the highway network. Good quality access is defined as being served by the national motorway network or major non-motorway routes; and
iv) Good access to labour.

Section 5.4 Selection Criteria for Specific Sites

5.50 Again from the above analysis, it is possible to deduce a set of criteria which can be used in identifying 'commercially attractive' individual sites. A commercially attractive strategic logistics site must have:

i) At least 50 Hectares of development land available;
ii) Good rail access. Good quality access is defined in terms of a generous loading gauge which is capable of accommodating intermodal units on standard platform wagons, the ability to handle full length trains, available capacity to run freight train services and permits full operational flexibility;
iii) Has good quality access to the highway network. Good quality access is defined as being served by the national motorway network or major non-motorway routes;
iv) A suitable configuration which allows large scale high bay warehousing, intermodal terminal facilities, appropriate railway wagon reception facilities and parking facilities for all goods vehicles both those based on the site and visiting the site;
v) A need for such facilities due to demand from the logistics market which cannot be met in the medium to long term by existing capacity;

vi) Located away from incompatible neighbours, thereby allowing 24 hour operations and no restrictions on vehicle movements, and minimising the impact on the local environment; and

vii) Has good access to labour.

SECTION 6. FUTURE LOCATION OF SITES IN EAST MIDLANDS

6.1 Section 5 noted that identifying and selecting suitable sites for logistics facilities is essentially a two stage process:

- Firstly, identifying general broad locations which are appropriate for hosting large scale logistics activity; and
- Secondly, identifying 'commercially attractive' individual sites within these broad locations.

6.2 The robust criteria subsequently developed reflect this two stage process; a recommended initial set of criteria to be used in identifying appropriate general broad locations, and a recommended second set of criteria to identify suitable individual sites within these broad locations. This section of the report, therefore, analyses a number of broad sub-regional locations within the East Midlands, using the developed criteria, and recommends those which are appropriate for hosting strategic logistics sites i.e. the sub-regional areas where the region's planners will need to make provision for new 'strategic' B8 sites. In line with the study terms of reference, the report does not assess or recommend specific sites.

Section 6.1 Identifying Sub-Regions

6.3 The first task was to divide the East Midlands region into a number of broad sub-regions. The sub-regions, which have been defined solely for the purposes of this study, are based around the Housing Market Areas (HMA) as proposed in the RSS Options for Change document, but with some alterations to reflect to reflect transport corridors in the region. The 14 sub-regions are displayed in Map 1 in Appendix 1.

6.4 It needs to be appreciated that the logistics market, in making locational choices, has no regard for local government administrative boundaries (they are not included in the developed criteria). However, two major factors which drive the locational decisions of the market are road and railway geography, and these in turn have also developed independent of existing administrative boundaries. Consequently, the sub-regional structure defined for this study has to reflect the transport networks and subsequent current concentrations of logistics activity in the region, while at the same time having regard for the acknowledged internal divisions/boundaries.

6.5 The following is a brief description of each sub-region's delimitation (and variation from the Housing Market Areas where applicable).

Sub-region 1: *High Peak and Derbyshire Dales*
Covers the administrative authorities of High Peak, Derbyshire Dales and the Peak District national park (as per HMA)
Sub-region 2: *Chesterfield and North East Derbyshire*.
Covers the administrative authorities of Chesterfield, North East Derbyshire, Bolsover and Mansfield (as per HMA except that it excludes Bassetlaw but includes Mansfield. In transport terms, Bassetlaw does not fit well with the other authorities in this grouping, which are served by the M1 and the Midland Mainline. Bessetlaw is located on the A1 and East Coast Mainline corridors).
Sub-region 3: *North Nottinghamshire*.
Covers the administrative authorities of Bassetlaw and Newark & Sherwood (as per HMA except that Ashfield and Mansfield have been excluded but includes Bassetlaw. Bassetlaw has a better fit with Newark in transport terms as the A1 and East Coast Mainline pass through both authorities on a broad north-south axis)
Sub-region 4: *North West Lincolnshire*.
Covers the administrative authorities of West Lindsey, Lincoln and North Kesteven (as per HMA)
Sub-region 5: *North East Lincolnshire*.
Covers the administrative authorities of East Lindsey and Boston (as per HMA)
Sub-region 6: *Amber Valley and West Nottinghamshire*.
Covers the administrative authorities of Amber Valley, Ashfield, Broxtowe and Erewash (Amber Valley (from Derby HMA has a better fit in transport terms with Ashfield, Broxtowe and Erewash. The M1 and the Midland Mainline pass through the centre of this grouping on a broad north-south axis).
Sub-region 7: Nottingham and South Nottinghamshire.
Covers the administrative authorities of Nottingham, Gedling and Rushcliffe (Nottingham HMA minus Erewash and Broxtowe)
Sub-region 8: *South Lincolnshire*.
Covers the administrative authorities of South Holland and south Kesteven (Peterborough HMA minus Rutland)
Sub-region 9: South Derbyshire.
Covers the administrative authorities of South Derbyshire and Derby (Derby HMA minus Amber Valley, which has a better fit in transport terms with the other authorities along the M1 corridor)

Sub-region 10: North Leicestershire.
Covers the administrative authorities of North West Leicestershire and Charnwood (the Leicester HMA split into two areas on a north-south basis - other half is sub-region 12)
Sub-region 11: Melton and Rutland.
Covers the administrative authorities of Melton and Rutland (in transport terms Melton and Rutland combine well as the Peterborough to Leicester railway line and the A47 pass through the centre of this grouping)
Sub-region 12: South Leicestershire.
Covers the administrative authorities of Leicester, Blaby, Wigston, Harborough and Hinckley and Bosworth (Leicester HMA split into two on a north-south basis - other half is sub-region 10)
Sub-region 13: North East Northants.
Covers the administrative authorities of Corby, Kettering, Wellingborough and East Northants (as per HMA).
Sub-region 14: South West Northants.
Covers the administrative authorities of Northampton, Daventry and South Northants (as per HMA).

Section 6.2 Assessment of Sub-Regions – Recommended Sub-regional Areas

6.6 Each sub-region has been assessed against the recommended broad locational criteria. The assessment has been undertaken at a fairly high level, using both qualitative and quantitative approaches.

6.7 The assessment of the sub-regions in relation to Criteria 1 (Market Demand and Central Location to Markets) has taken into account the following two factors:

- The logistics market's preferred locations for large scale warehousing i.e. sub-regions where there is strong demand for sites; and
- A maximum of 4.5 hours drivetime from the main deep sea container ports (Southampton, Tilbury, Thamesport and Felixstowe) and major areas of production/consumption in other regions. A goods vehicle driver is limited to 9 hours driving per shift (but can be extended to 10 hours twice per week). The 'optimum location' for NDCs is therefore within 4.5 hours drivetime of the deep sea ports (origin of goods) and other main regions (origin of domestically sourced goods and the destination of RDCs or retail outlets), meaning that a vehicle can 'round trip' in a driver's shift.

6.8 Only those sub-regions exhibiting strong demand from the logistics market and are located within the 4.5 hours drivetime 'optimum location' were considered to have met this particular criteria fully. Market demand has been assessed on the basis of recent past trends in warehouse location in the region (analysis in Appendix 3) and where future demand is anticipated (based on the views of developers consulted during the course of this study).

6.9 The 4.5 hours drivetime 'optimum location' has been defined in spatial terms using routing software. As a result, it has been possible to identify those sub-regions in the East Midlands which are located within it. Map 2 in Appendix 1 shows a drivetime analysis from a number of origins and destinations. The Blue line shows 4.5 hours drivetime from Felixstowe, while the Red line shows 4.5 hours drivetime from Southampton. The Green line illustrates 4.5 hours driving from Teesside (popular location for North East region RDCs). The 'optimum location' is therefore in the area roughly between Milton Keynes in the south (Green line), Mansfield in the north (Blue/Red lines) and Birmingham in the west (Blue line).

6.10 The assessment of the sub-regions in relation to Criteria 2 (Good Quality Railway Access) has taken into account the following two factors:

i. The loading Gauge of the railway network serving each sub-region. Map 3 in Appendix 1 shows the East Midlands railway network by loading gauge (source: Network Rail Route Directory). Map 3 has been used to assess the railway network of each sub-region in terms of the loading gauge available. The W8 loading gauge is effectively the minimum gauge which should be considered for rail linked logistics locations. Terminals or sites with access to a W8 loading gauge are able to standard handle maritime containers on standard platform wagons, albeit supplemented by the use of low level wagons for some intermodal units (9'6" containers). However the W9 gauge is the minimum gauge which can accommodate the full range of intermodal units on standard platform wagons, and without the need to use the cost inefficient and operationally inflexible low deck height wagons in large numbers. It is logistics locations with rail access at W9, W10 and W12 (or lines earmarked for enhancement to W10/W12) which will be more attractive commercially compared to other sites with a less generous loading gauge.

ii. The availability of freight capacity. This has been assessed at a fairly high level using both the WCML Strategy document (Appendix 3 of that document provides details on path availability following the completion of the route modernisation works) and Route Utilisation Strategies (RUS) as a general guide to the availability of freight paths. It should

be noted, however, that a more definitive assessment of rail capacity, using the working timetable information and pathing software, would be required when assessing individual sites.

6.11 Only those sub-regions with rail access at W10/W12 loading gauge and with available freight capacity were considered to have 'Good quality rail access'. Sub-regions with rail access at W8 loading gauge (and freight capacity) have been classed as having 'Moderate quality rail access'.

6.12 The assessment of the sub-regions in relation to Criteria 3 (Good Quality Road Access) consisted of establishing the type and quality of roads serving each sub-region i.e. motorway, dual carriageway, single lane etc. Those sub-regions served by motorways, dual carriageways and high quality singe carriageway roads were considered to have 'Good quality road access'. The assessment of the sub-regions in relation to Criteria 4 (Access to Labour) has taken into account each sub-region's location relative to the major centres of population in the East Midlands.

6.13 Appendix 7 presents the assessment of each sub-region against the four criteria. Taking into account the above factors, only one sub-region fully meets all four criteria to the highest standard i.e. market demand and central location, good quality rail access, good quality road access and good access to labour, and can therefore be considered appropriate for hosting strategic logistics sites, namely:

- Sub-region 14: South West Northants.

6.14 This sub-region is shaded on Map 4 in Appendix 1.

6.15 Given the need for a substantial expansion in the amount of floor space which is located on rail linked sites (market demand and policy requirements), the overall assessment has concluded that a number of sub-regions which are currently popular locations for distribution activity do not fully meet the criteria (current poor rail access). This includes Sub-region 12 – South Leicestershire (Magna Park) and Sub-region 13 – North East Northants (Corby and Kettering). Sub-regions served by the East Coast Mainline were classed as having 'poor quality rail access' on the basis that the line has no further freight path capacity available.

6.16 Due to this position, we have considered a more 'flexible' application of the criteria, on the basis that the recommended broad locations are concentrated to the extreme south of the region. This was undertaken on the following basis:

- The W8 loading gauge is able to handle standard handle maritime containers on standard platform wagons, albeit supplemented by the use of low level wagons for some intermodal units (2.9m/9'6" tall containers). Those sub-regions having 'Moderate quality rail access' were subsequently considered to have met the criteria.

- While there is a clear market and policy need to increase the proportion of warehousing on rail linked sites, a position where all new build warehousing is 'forced' to locate at rail linked sites is unrealistic. A geographic choice of sites will need to be made available to satisfy individual operator requirements, and this includes providing a spread of both rail and non-rail linked sites. This more flexible approach therefore takes into account a proportion of future demand not requiring rail terminal facilities.

6.17 On this basis, four sub-regions currently fully meet all four criteria to a reasonable standard and can therefore be considered appropriate for hosting large scale logistics activity, namely (in no particular hierarchical order):

- Sub-region 14: South West Northants,
- Sub-region 9: South Derbyshire
- Sub-region 6: Amber Valley and West Nottinghamshire, and
- Sub-region 7: Nottingham and South Nottinghamshire.

6.18 These sub-regions are shaded on Map 5 in Appendix 1.

6.19 This above assessment, however, has not considered future developments to the road and railway network in the region, particularly the proposed loading gauge and capacity upgrades. Given that this study's timeframe is up to 2026, such upgrades should be taken into account.

6.20 Network Rail published in September 2006 the Freight Route Utilisation Strategy (Freight RUS) as a draft for consultation. The document recommends a loading gauge and capacity upgrade of the Peterborough-Leicester-Nuneaton line, with implementation by 2014/2015. The route would be cleared to W10 standard and new signalling installed to increase the existing capacity. The total scheme would cost

around £133.3 million. A business case is currently being developed to support a Transport Innovation Fund grant application. The scheme is being developed primarily to generate extra capacity to accommodate forecast freight growth and additional passenger train paths into London (Crossrail). However, a 'spin-off' of the scheme will be to render significant parts of the East Midlands suitable for rail connected strategic logistics developments.

6.21 The sub-regional assessment was therefore re-run on the basis that the Peterborough-Leicester-Nuneaton railway line, the branch to Corby and possibly the MML from Syston Junction to Trent Junctions are upgraded to W10 standard. On this basis, a further three sub-regions fully meet all four criteria to the highest standard and can therefore be considered appropriate for strategic logistics sites (Sub-regions 10, 12 and 13).

6.22 Given a more 'flexible' application of the criteria and accounting for the loading gauge and capacity upgrades being implemented, from 2015 seven sub-regions will fully meet all four criteria to a reasonable or high standard and can therefore be considered appropriate for hosting strategic logistics sites, namely (in no particular hierarchical order):

- Sub-region 14: South West Northants,
- Sub-region 13: North East Northants,
- Sub-region 12: South Leicestershire,
- Sub-region 10: North Leicestershire,
- Sub-region 9: South Derbyshire
- Sub-region 6: Amber Valley and West Nottinghamshire, and
- Sub-region 7: Nottingham and South Nottinghamshire.

6.23 These sub-regions are shaded on Map 6 in Appendix 1.

Ranking of Sub-regions

6.24 In terms of ranking the sub-regions in a hierarchical order, currently we can group the identified sub-regions into two groups, namely:

Best Sub-region:

- Sub-region 14 : South West Northants

Good Sub-regions:

- Sub-region 9: South Derbyshire
- Sub-region 6: Amber Valley and West Nottinghamshire; and
- Sub-region 7: Nottingham and South Nottinghamshire

6.25 The basis for this ranking is that currently, only one sub-region (14) fully meets all four criteria to the highest standard. The other sub-regions, as discussed above, currently meet the criteria to a lesser standard, primarily due to their lower quality rail access (W8 rather than W10 loading gauge).

6.26 From 2015 onwards, or following the gauge/capacity enhancements to the Peterborough-Leicester-Nuneaton railway line, the identified sub-regions can be ranked into the following two groups, namely:

Best Sub-regions:

- Sub-region 10: North Leicestershire
- Sub-region 12: South Leicestershire
- Sub-region 13: North East Northants

Good Sub-regions:

- Sub-region 7: Nottingham and South Nottinghamshire
- Sub-region 6: Amber Valley and West Nottinghamshire
- Sub-region 9: South Derbyshire
- Sub-region 14: South West Northants

6.27 Again, sub-regions 6,7 and 9 would still meet the criteria to a lesser standard due to their lower quality rail access (W8 rather than W10 loading gauge). However, they would fall within the 'best' category should the proposed loading gauge enhancement be extended into these sub-regions. From 2015 onwards, it is likely that freight path availability via the WCML and London will be reaching capacity. This means that those sub-regions which will be able to access the Haven ports and Southampton via W10 cleared routes and without the need to operate via the WCML and London will become more commercially attractive to the logistics market. On this basis, the competitive position of sub-region 14 is likely to diminish.

SECTION 7. CONCLUSIONS AND POLICY ADVICE

7.1 The main aim of this section of the report is to summarise the main findings of the study, in terms of the net land requirement for strategic logistics sites and broad recommended locations, and to advise how these findings can be 'translated' into future RSS policy.

Section 7.1 Conclusions – Summary

7.2 In summary, this study has concluded that:

- Logistics plays a major role in the regional economy of the East Midlands, accounting for an estimated 9% of both employment and output (GVA) – a higher share than in any other region. The industry's employment in the region since 1998 has grown faster than both total employment in the East Midlands and logistics employment nationally.
- The central Base Case forecast estimates that total (gross) warehouse new build in the region up to 2026 will be around 4.88 million square metres. Out of this total, around 2.98 million square metres of new warehouse build will be in units greater than 25,000m^2 (61% of total new build).
- New 'strategic logistics sites' (or large plots on existing sites) will be required for future warehouse developments in the region which are greater than 25,000m^2. On this basis, the gross land requirement in the East Midlands up to 2026 for new buildings greater than 25,000m^2 will be in the order of 745 hectares for the Base Case forecast.
- In order to meet the Regional Freight Strategy target of 30 additional freight trains, 1.64 million square metres or 55% of the forecast new build greater than 25,000m^2 will need to be located on rail linked sites.
- Taking into account the supply of large plots on existing sites and at strategic sites in the pipeline, 308 hectares of additional land at appropriate rail connected strategic logistics sites and 78 hectares of additional land at suitable non-rail connected sites will need to be brought forward over the life of the next RSS (to 2026).
- It is recommended that the additional land for new strategic logistics sites should be brought forward in seven identified sub-regions (using criteria developed during the course of this study).

Section 7.2 Policy Advice – Introduction

7.3 In order to advise on how the study's findings can be reflected in future RSS policy, it is essential in the first instance to appreciate the existing relevant overarching RSS policy background to comply with the broader objectives of RSS. The relevant policies are identified within Section 5.1 (and Appendix 5) of this report and are paraphrased below: -

7.4 RSS8: Regional Spatial Strategy for the East Midlands to 2021

- To promote and improve economic prosperity, employment opportunities and regional competitiveness
- A sequential approach to the selection of land for development
- A structural weakness of the East Midlands being a lack of accessibility due to poor infrastructure and public transport inhibiting the labour market and the movement of goods
- Constraints for modal shift away from road based transport due to lack of intermodal freight terminals
- The need for more detailed policies to promote a more efficient distribution industry and contribute towards a significant modal shift of freight from road to rail

7.5 The East Midlands Regional Plan (Draft)

- Promoting opportunities for modal shift
- Northern Coalfields sub-area – develop new opportunities for local jobs in the distribution sector
- Three Cities sub-area – develop opportunities for modal switch away from road based transport in the manufacturing, retail and freight distribution sectors
- Southern sub-area – develop opportunities for modal switch away from road based transport in the nationally important freight distribution sectors

7.6 Regional Economic Strategy

- A regional priority to improve provision of inter-modal freight facilities and rail gauge clearance for modern container traffic

7.7 East Midlands Regional Freight Strategy

- Regional and local partners to work together to identify and promote opportunities to achieve a significant shift from road to rail freight
- An extra 30 trains per day originating or terminating in the region by 2016

7.8 It is evident from the earlier sections of this report that 30 trains per day will not be reached by 2016. In order to try and achieve this during the RSS period to 2026, more prescriptive policy to promote rail freight will be required, which can then be used at a local level within the preparation of Local Development Frameworks (LDFs).

7.9 There is a need for a robust policy in order that the most suitable strategic logistics sites can be identified and safeguarded in accordance with the anticipated demand profile presented in Section 4. This section seeks to explore the objectives for RSS policy and then provides commentary on the key considerations, including:

- Identification of sites
- Safeguarding sites
- Control of strategic logistics sites

Section 7.3 Policy Objectives

7.10 Providing a concise RSS policy framework for the identification, delivery, safeguard and control of strategic logistics sites within the region.

7.11 A set of policies which set out a clear framework, which can work towards the objectives of the East Midlands Regional Freight Strategy.

Section 7.4 Strategic Logistics Sites Identification Policy

7.12 Based upon the conclusions within Section 5, strategic logistics sites must have: -

i) At least 50 Hectares of development land available;
ii) Good rail access – generous loading gauge, the ability to handle full length trains, available capacity and full operational flexibility;
iii) Good quality access to the highway network – served by the national motorway network or major non-motorway routes;
iv) A suitable configuration which allows large scale high bay warehousing, intermodal terminal facilities, appropriate railway wagon reception facilities and parking facilities for all goods vehicles;
v) A need for such facilities due to demand from the logistics market;
vi) Located away from incompatible neighbours, thereby allowing 24 hour operations; and
vii) Good access to labour.

Supply and Phasing

7.13 The conclusions within this study relating the quantum of land required for strategic logistics sites should be used as a pre-cursor to any policy. Estimates on the supply and take-up must be considered as minimums to ensure that there is a choice of suitable sites, but not to the detriment of strategic sites failing to achieve a critical mass for intermodal facilities. In identifying suitable locations for strategic logistics sites, it may be beneficial to phase the supply to ensure that the best sites can be progressed first. It would therefore seem beneficial to address these scenarios within the relevant policies to inform future development.

7.14 It is important that local authorities are encouraged to work together on a sub-regional basis to determine priorities for site allocation and development. The criteria developed in this study and the application of other relevant policies would provide a sound platform to determine which sites to allocate through the LDF process. Key considerations would include previously developed land, infrastructure phasing and delivery and the ability to meet objectives with the minimal amount of impact on the surrounding area.

7.15 In order to ensure that there is a sufficient pipeline of strategic logistics sites it will be necessary to consider (in order):

- The extension of existing strategic logistics sites, where there is capacity available at the on-site intermodal terminal;
- In circumstances where sites cannot be extended, local authorities (or groups of authorities at a sub-regional level) should consider satellite sites (which shall be previously developed land close to an existing strategic logistics site), which meet the size criteria and could utilise the existing intermodal terminal infrastructure which has available capacity. Satellite sites should be located within a 1km adopted road journey, in order to be considered as a rail connected site. This would enable the cost advantages of rebated diesel and the use of yard-tractors for the movement of containers between the warehouses and the rail facilities. These must be prerequisites for them to be considered; and
- Identifying suitable new strategic logistics sites to provide supply a number of years hence to allow for infrastructure lead-in periods. Previously developed land should be considered ahead of greenfield opportunities.

7.16 Satellite sites could be afforded the same expansion opportunities as existing strategic logistics sites, providing that there is remaining rail capacity and that the location of the 'expansion' does not preclude the use of rebated diesel etc.

7.17 Accordingly, it is recommended that policies should identify a hierarchy for the location/type of sites that should be developed first, to avoid an over supply of strategic logistics sites and make best use of existing rail terminal infrastructure. In order to consider the extension of existing sites favourable, it is a prerequisite that the existing site should not have suitable plots available and can demonstrate that the existing rail terminal has available capacity.

7.18 The hierarchy of the recommended sub-regions was identified in Section 6, namely:

From 2006-2015:

Best Sub-region:

- Sub-region 14: South West Northants

Good Sub-regions:

- Sub-region 9: South Derbyshire
- Sub-region 6: Amber Valley and West Nottinghamshire; and
- Sub-region 7: Nottingham and South Nottinghamshire

From 2016 onwards (or following infrastructure improvements to the Peterborough-Leicester-Nuneaton railway line):

Best Sub-regions:

- Sub-region 10: North Leicestershire
- Sub-region 12: South Leicestershire
- Sub-region 13: North East Northants

Good Sub-regions:

- Sub-region 9: South Derbyshire
- Sub-region 6: Amber Valley and West Nottinghamshire; and
- Sub-region 7: Nottingham and South Nottinghamshire
- Sub-region 14: South West Northants

7.19 The region's planners should consider any existing strategic logistics sites and the potential for new strategic logistics sites within each of the sub-regions within the 'best' category before considering locations in the 'good' category.

7.20 Existing strategic logistics sites that could be considered for extension/satellite sites (subject to available rail terminal capacity) could include sites similar to:

- DIRFT Phase 2
- Castle Donington

7.20 From the conclusions within Section 4 it would be beneficial if at least 15ha of land with a geographical spread and variety of plot size were available for development per annum. This may mean that up to 30ha per annum might need to be available to ensure that the region is able to offer a choice of strategic sites for occupiers. The conclusions within Section 4 also identify a demand for 78ha of non-rail linked sites. These should be located within the 'best' and 'good' Sub-regions for the latter half of the RSS period (2016-2026).

7.21 Local Authorities and regional bodies should be aware of the lead-in time for infrastructure delivery on sites before accounting for their supply. From the outset it will be essential to undertake an assessment of existing strategic logistics sites expansion opportunities and suitable previously developed land satellite sites that could utilise rail freight capacity at nearby intermodal facilities. These will provide the supply of strategic logistics sites in the initial period of the RSS review. Thereafter it will be necessary to identify new strategic logistics sites to be progressed at an appropriate time to be capable of development (with completed infrastructure) in time to meet anticipated shortfalls in strategic logistics sites land supply (as the expanded existing and satellite sites are developed). New strategic logistics sites infrastructure requirements should be identified within RSS transportation policies.

7.22 Flexibility within the policies could allow for new strategic logistics sites in suitable Sub-regions to be brought forward ahead of the expansion of existing sites and satellite sites, where a series of criteria could be met. These might include:

i. A significant occupier deal. Significant would be deemed to include those requirements in excess of c.45,000m^2 for a single user:

- Enabling the delivery of the major infrastructure;

- Will require the use of the rail terminal;
- That has confirmed the strategic logistics site as its preferred location;
- The site meets the strategic logistics sites criteria in all respects;
- The site is the most suitable within the sub-region; and
- The site has been assembled by a single party/JV/consortium with a development agreement in place;

ii. The delivery of an international facility and rail freight handling capabilities.

7.23 Site allocation outside of the sub-regional hierarchy (previously developed land only) should only be considered as part of an RSS review in consultation with local authority groups. These sites and the suitability of their sub-regions should have regard to the conclusions of this report. It is considered that additional sites in less favourable areas are unlikely to accord as well with the criteria herewith and would not be able to fulfil the objectives of a strategic logistics sites.

7.24 As part of this process, Local Authorities should work together to ensure a co-ordinated approach to strategic logistics sites continues.

Supply and Phasing Summary

7.25 More detailed policies for the supply of strategic logistics sites should consider:-

- A hierarchy for the phased supply of land;
- Providing sufficient supply to allow choice;
- Being aware of lead-in times for sites when reviewing availability.
- Considering the expansion of existing sites with rail capacity and/or the identification of satellite sites;
- Promoting sufficient land within the 'best' sub-regions before considering 'good' opportunities unless there is a significant occupier deal and/or the guaranteed delivery of rail infrastructure;
- In identifying new strategic logistics sites, councils should have regard to the lead-in requirements for new sites to enable the completion of necessary infrastructure, including rail/freight facilities;
- Sites outside the sub-region hierarchy could only be progressed as part of an RSS review. The criteria approach and the availability of land within the sub-regional hierarchy should be used to determine the suitability of such sites outside the hierarchy;

- These guidelines do not prevent non-logistics employment opportunities on large sites being progressed in the normal way but large footprint buildings in particular would be encouraged, (where possible) to locate on strategic logistics sites.

Safeguarding

Use

7.26 To enable the potential of strategic logistics sites to be realised and in order to meet the overriding objectives for the region, it will be necessary to safeguard strategic logistics sites against their use for:

- B1 uses (unless ancillary)
- B2 General industrial
- Un-related smaller units.

7.28 B1 (a) uses will not be acceptable on strategic logistics sites. However, ancillary offices to a warehouse should not be precluded. There are also likely to be more suitable sites available for the location B1 (b), B1 (c) and some B2 uses.

7.29 While it is acknowledged that the principal use of strategic logistics sites will be for B8 uses, `just in time' production and processing units with substantial elements of storage and distribution should be considered. It is also relevant that there are many more large units which have B2 and B8 activities being undertaken within a single building which also offer a significant number of employment opportunities. There can also be significant benefits for this type of use to utilise rail freight. It is recommended that only those B2 units in excess of 10,000m^2 should normally be considered to be located at strategic logistics sites. Other uses will not be acceptable on strategic logistics sites where they would conflict with strategic logistics site objectives.

Size

7.30 One of the functions of strategic logistics sites will be the ability to offer larger plot sizes to be able to accommodate large footprint buildings. It would therefore conflict with the strategic logistics site objectives if smaller units were developed which compromised the size of available plots. It is therefore recommended that a minimum unit size of 10,000m^2 be imposed to address this.

7.31 There may be exceptional circumstances when some flexibility is required but this should only be considered for which can demonstrate significant potential for rail freight, or as below (Related expansion). These units should also only be accommodated, where possible, on smaller plots or as in-fills following other larger development and plots have been completed. It is unlikely that units less than 4,500m² would be suitable for strategic logistics sites.

Related Expansion

7.32 There may be occasions when the existing occupants of a strategic logistics site need to expand in order to stay at the site, which might not always be possible within the curtilage or as an extension of their existing premises. In circumstances where it can be demonstrated that additional space is required and relates/relies upon the proximity of the existing facility, then there should be flexibility for these to be accommodated particularly if they are close to 10,000m² in size or can utilise rail freight. It would also be beneficial if the sitting of these types of units could be located to minimise the impact upon the remaining plots and the strategic logistics site objectives.

Safeguarding Summary

7.33 Policies safeguarding strategic logistics sites should consider:

- A presumption against B1 uses (unless ancillary to a warehouse).
- Only accepting B2 uses for units in excess of 10,000m², with either rail potential of significant elements of B8 uses within the same building.
- Sites would not normally be acceptable for warehouse less than 10,000m² in size.
- Units for B8 use between 4,500-10,000m² would only acceptable as:
    - Infill plots after much larger development has been completed.
    - Represent a use that is closely related to an existing use and needs to be located nearby.
    - Can demonstrate significant rail freight potential which serves to underpin the success of the site.
    - Accords with the wider objectives of strategic logistics sites.

Control

7.34 In order to complement the safeguarding policies above and working towards the strategic logistics site objectives, it would be beneficial for policy to identify the characteristics and expectations for strategic logistics sites to inform developers/occupiers. These should include references to peripheral landscaping, infrastructure requirements etc but should also identify the flexibility offered by strategic logistics sites. This should avoid uncertainty for developer/occupiers about the suitability of strategic logistics sites, by identifying: -

- 24/7 unrestricted operating hours;
- Good road and rail freight access;
- Acceptable internal heights of buildings up to 15m;
- Consider Higher bay plots for part automated warehouses (25-30m in height) available in less sensitive parts of the site where there is an occupier specific requirement;
- Acceptable plot and building sizes;
- Stance on renewable energy generation;
- Servicing requirements and parking standards;
- Phasing of infrastructure and periphery landscaping requirements;
- S106 expectations;
- Green transport initiatives;
- Public transport expectations; and
- Noise/lighting expectations.

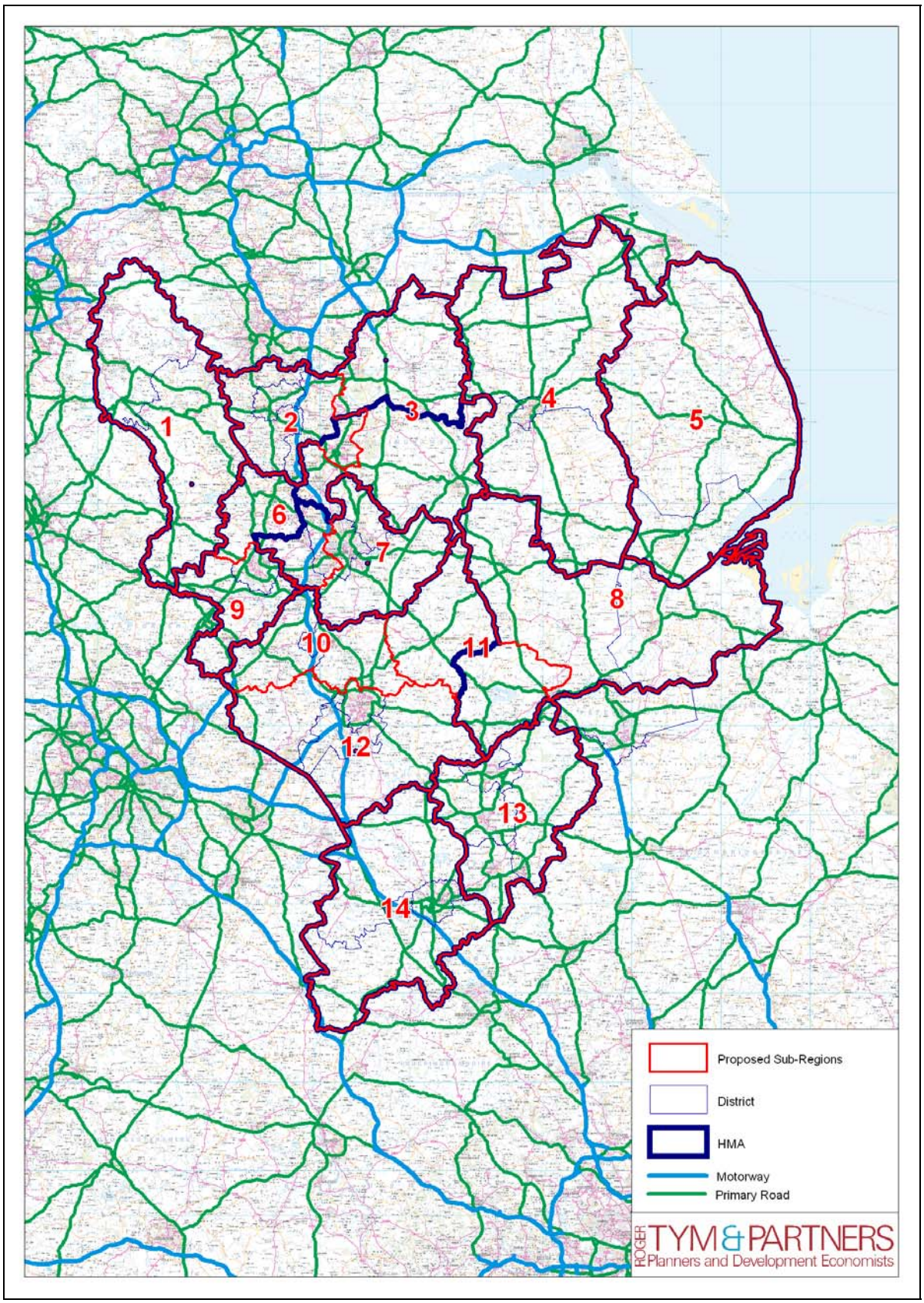
Conclusion

There is clearly significant potential for strategic logistics sites to be promoted by more detailed policies at a regional and local level. If the region is to maintain/enhance its market share as a leading location for logistics warehousing it is imperative that a transparent detailed policy framework, which balances policy and market objectives to realise the potential for the foreseeable future.

APPENDIX 1

MAPS

Map 1: East Midlands Sub-Regions Defined for Purposes of Study



Map 2: Central Location in Relation to Traffic Origins and Destinations (4.5 hours Drivetime from Deep Sea Ports and RDCs)

4.5 hours drivetime from Felixstowe (1)

4.5 hours drivetime from Southampton (2)

4.5 hours drivetime from Teesside (3)

4.5 hours drivetime from Mansfield (4)

Map 3: East Midlands Railway Network by Loading Gauge

W6

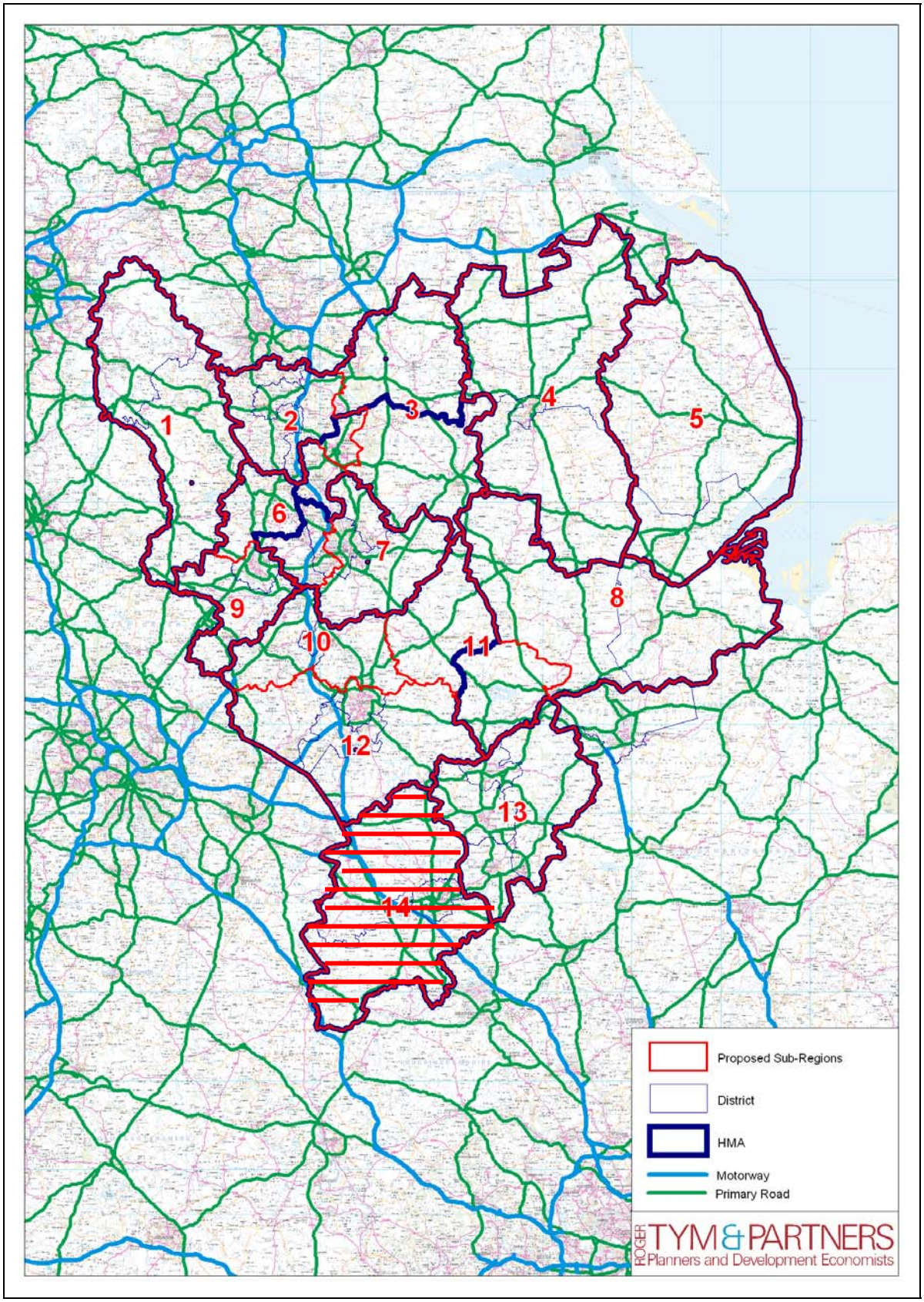
W7

W8

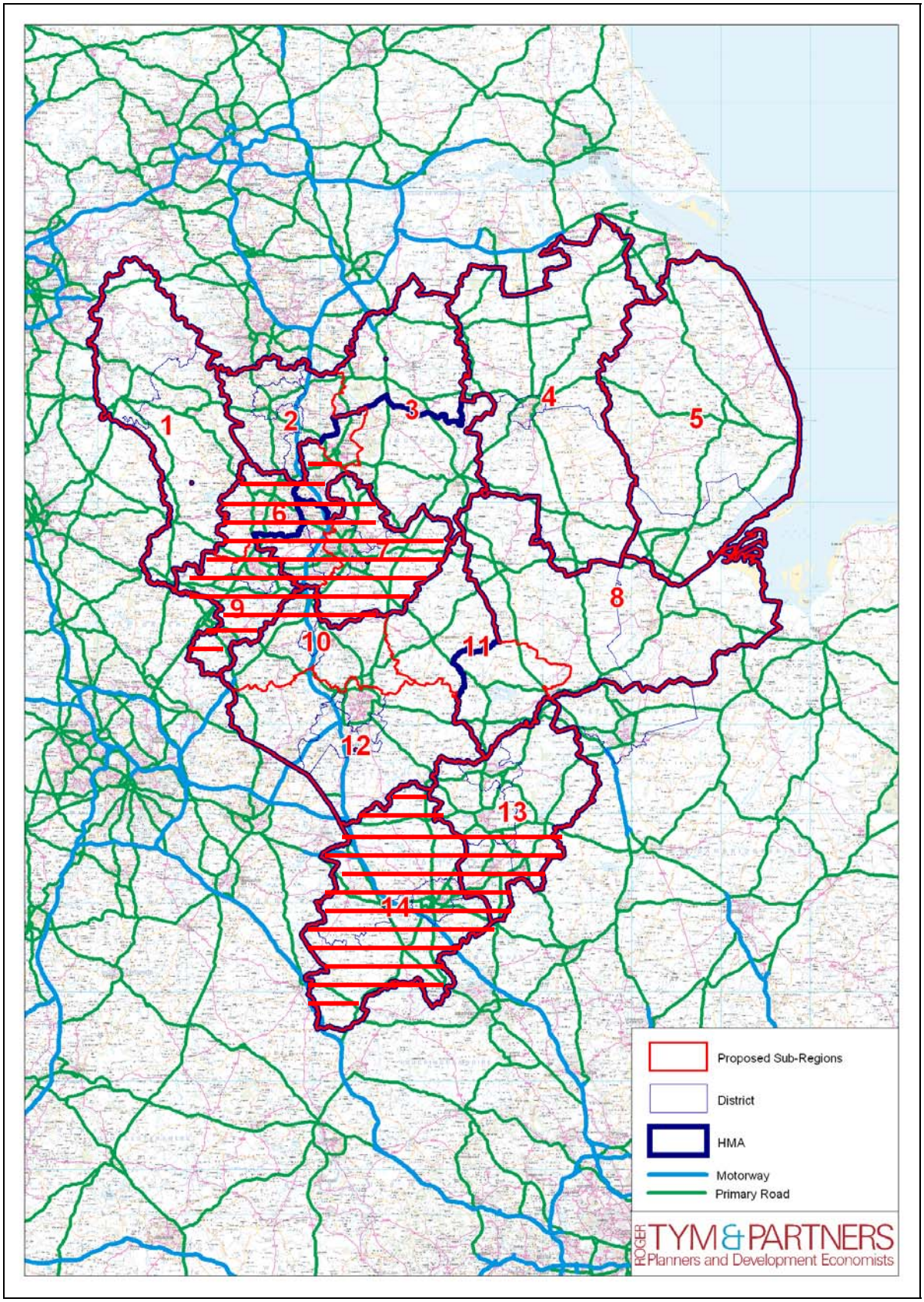
W9

W10

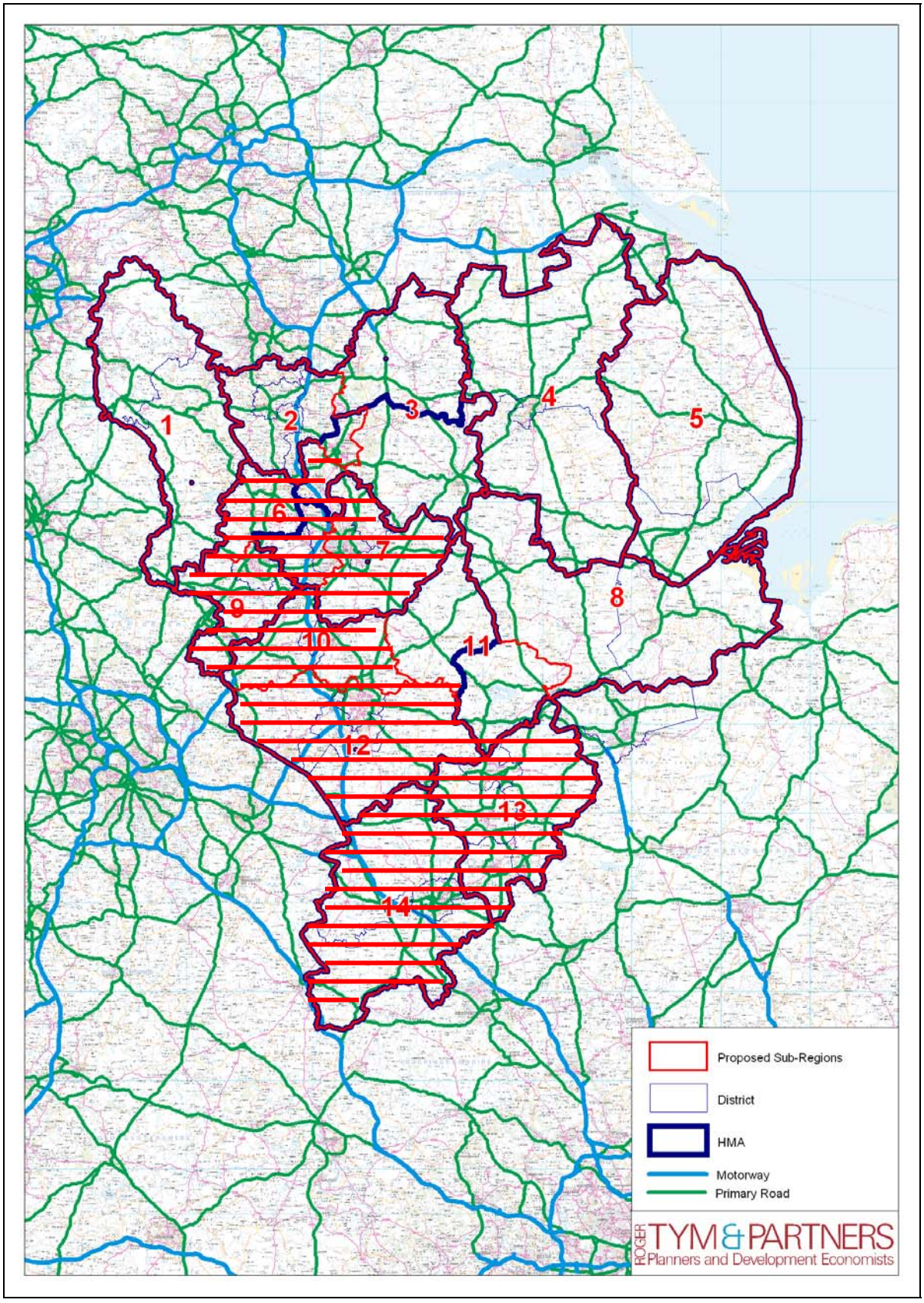
Map 4: Appropriate Sub-regions – Fully Meet Criteria



Map 5: Appropriate Sub-regions – Flexible Approach to Criteria

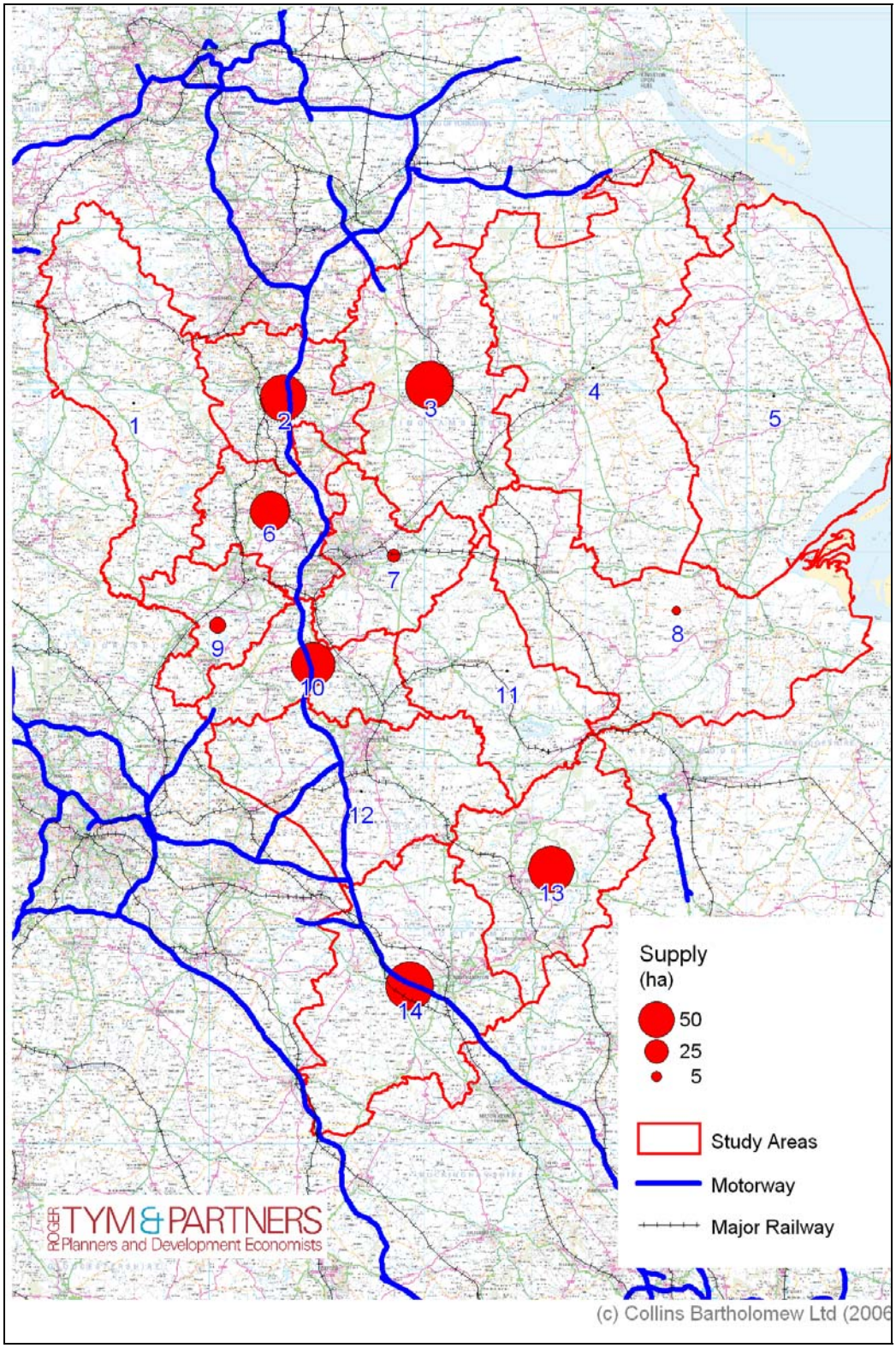


Map 6: Appropriate Sub-regions – Flexible Approach to Criteria and Railway Upgrades



Map 7: Supply of Committed Development Sites - Large-Scale Warehousing

(The Numbers identify the sub-regions defined for purposes of this study – Section 6.1)



APPENDIX 2

LAND REQUIREMENT METHODOLOGY AND CALCULATIONS

APPENDIX 2: LAND REQUIREMENT METHODOLOGY AND CALCULATIONS

The land requirement forecasts have been undertaken on the basis that demand for warehouse floor space is linked to cargo volume. This in turn is driven by the changing patterns of production, consumption and trade. Even taking into account future efficiency gains, in terms of tonnes handled per square metre of floor space, future growth in traffic volumes will lead to increasing demand for distribution centre floor space. The analysis, however, has also accounted for new warehousing developments which are replacements for existing distribution centre capacity.

Given this position, the starting point of the land requirement forecasting exercise was an analysis of current and future traffic flows in the East Midlands. The MDS Transmodal Great Britain Freight Model (GBFM) as been utilised to undertaken this analysis.

A2.1 Current Freight Flows

The first task was to:

- Establish the current volume of goods delivered in the East Midlands region, for both road and rail freight; and
- Establish the current volume of goods delivered directly to distribution centres in the East Midlands region.

Given that goods delivered to a warehouse are eventually despatched from a warehouse, the analysis has concentrated on inward flows to the region. The outputs from the GBFM can be divided into different commodity groups. Recognising that some types of goods are not handled at distribution centres, the volume of goods delivered in the East Midlands (tonnes lifted) for those commodities which at some stage in the supply chain will pass through a warehouse were identified and quantified. Commodities such as food, beverages and manufactured goods have been included in the analysis. Goods which are not handled at distribution centres, such as coal, aggregates and waste, were consequently excluded from the analysis.

The table below summarises the current (2005) volume of goods destined for the East Midlands by region of origin (Government Office regions) for those commodities which at some stage in the supply chain will pass through a warehouse (from here onwards called 'unitised goods').

Table 23: Volume of Unitised Goods Delivered in the East Midlands 2005

	000s Tonnes Lifted		
Origin Region	Road	Rail	**Total**
East Midlands	34,615	0	34,615
East of England	6,741	132	6,873
Greater London	1,703	12	1,715
North East	821	1	821
North West	4,117	21	4,138
Scotland	763	0	763
South East	3,720	253	3,973
South West	1,334	1	1,335
Wales	829	0	829
West Midlands	5,014	0	5,014
Yorks&Humb	5,884	1	5,886
Total	**65,541**	**422**	**65,962**
%	99%	1%	

Source: MDS Transmodal GB Freight Model

This analysis, however, does not establish the volume of unitised goods which are delivered directly to distribution centres in the East Midlands. The GBFM's baseline data for road transport flows is derived from the DfT's Continuing Survey of Road Goods Transport (CSRGT). The CSRGT effectively records goods two or three times over as they pass from manufacturer/port to distribution centre to retail outlet. The total volume of unitised goods delivered in the East Midlands, as described in the table above, is therefore sum of the following types of freight flows:

- Factory to factory
- Factory/port to distribution centre (NDC or RDC)
- NDC to RDC
- NDC or RDC to retail outlet (end user)

In order to establish the current volume of unitised goods being delivered directly to distribution centres in the region, a further 'filter' has been applied to the current road traffic flow data to eliminate the double/triple counting.

The CSRGT collates road transport flows on a county to county basis. However, the GBFM disaggregates this data further down to Postcode District (PCD) level. One of the variables used to undertake this disaggregation is the number of employees by employment type in each PCD. The model is essentially using employment type as a proxy for land use type. As a result, goods destined for PCDs showing high levels of employment in transport services or warehousing are likely to be deliveries direct to a distribution centre. Conversely deliveries to PCDs with high levels of manufacturing employment will be inter-factory deliveries.

Consequently the road freight flow data was interrogated further, and unitised traffic flows by road transport destined for PCDs exhibiting employment in transport services or warehousing were extracted. On this basis, around 29.5 million tonnes of unitised cargo delivered in the East Midlands by road transport are inward flows directly to distribution centres. This equates to around 45% by volume of all unitised tonnes delivered in the region i.e. 29.5 million tonnes out of 66 million tonnes.

The inward rail freight flows to the East Midlands in the commodity categories selected are exclusively containerised imports or domestic intermodal flows. Given the nature of this traffic, it is reasonable to assume that 100% of these flows will be direct to a distribution centre, either on the same site as the rail terminal (DIRFT) or via a road haul.

On this basis, the table below summarises the current (2005) volume of unitised goods destined for the East Midlands together with the proportion of those goods which are being delivered directly to distribution centres in the region.

Table 24: Unitised Goods Delivered in the East Midlands 2005

	000s Tonnes		
	Total Delivered to East Midlands	Total Delivered Directly to Distribution Centres	%
Road	65,541	29,493	45%
Rail	422	422	100%
Total	**65,962**	**29,915**	45%

Source: MDS Transmodal GB Freight Model

A2.2 Forecast Freight Flows

The next stage of the analysis was to:

- Forecast future volumes of unitised goods delivered in the East Midlands region, for both road and rail freight; and
- Establish the proportion of forecast traffic which are likely to be delivered directly to distribution centres in the East Midlands region.

In total, four different forecast scenarios have been undertaken for the years 2016 and 2026 (reflecting the timescales of the East Midlands Regional Plan). Each forecast scenario is consistent with the national rail and national port forecasts recently undertaken by MDS Transmodal for the DfT. They therefore include the same underlying baseline assumptions in terms of market conditions, modal costs and infrastructure enhancements. The baseline assumptions which have been applied to each scenario include:

- Good vehicle driver wages will increase by 2% per annum;
- Intermodal terminal costs reducing by £5 per lift;
- No increase in mean train length or other productivity gains;
- The rail freight grant scheme for maritime containers is reduced by £9 million per annum (no grant over 400km); and
- A reduction in Channel Tunnel charges.

The four forecast scenarios, and the assumptions which have been applied to each scenario individually in addition to the baseline assumptions, are described below.

Base Case: 2016 and 2026

- 2.2 million square metres of new build rail connected floor space nationally by 2016, of which 250,000 square metres is located in the East Midlands; and
- 4.4 million square metres of new build rail connected floor nationally by 2026, of which 500,000 square metres is located in the East Midlands.

Scenario 1: 2016 and 2026

- No new build rail connected floor space in the East Midlands;
- In other regions, new build rail connected floor space in line with the Base Case scenario (1.98 million square metres by 2016);and
- In other regions, new build rail connected floor space in line with the Base Case scenario (3.96 million square metres by 2026).

Scenario 2: 2016 and 2026

- In East Midlands, new build rail connected floor space in line with the Base Case scenario (250,000 square metres by 2016);
- In East Midlands, new build rail connected floor space in line with the Base Case scenario (500,000 square metres by 2026); and
- No new build rail connected floor space in other regions.

Scenario 3: 2016 and 2026

- In East Midlands, new build rail connected floor space in line with the Base Case scenario (250,000 square metres by 2016);
- In East Midlands, new build rail connected floor space in line with the Base Case scenario (500,000 square metres by 2026); and
- New build rail connected floor space in other regions at half level in Base Case (1.2 million square metres by 2016 and 2.1 million square metres by 2026).

The tables below summarise the forecast volumes of unitised goods delivered in the East Midlands for 2016 and 2026 for each of the four scenarios.

Table 25: Forecast Unitised Goods Delivered in East Midlands: Forecast Years 2016 and 2026 and Current 2005

		000s Tonnes			
		Forecast Base Case	Forecast Scenario 1	Forecast Scenario 2	Forecast Scenario 3
2016	Road	70,186	68,519	72,717	71,256
	Rail	1,644	1,343	1,060	1,544
	Total	**71,830**	**69,863**	**73,777**	**72,800**
2026	Road	74,213	71,114	79,759	76,685
	Rail	2,909	1,797	1,489	2,488
	Total	**77,122**	**72,912**	**81,249**	**79,174**
2005	Road	65,541			
	Rail	422			
	Total	**65,962**			

Table 26: Growth in Unitised Goods Delivered in East Midlands v Current 2005

		000s Tonnes			
		Forecast Base Case	Forecast Scenario 1	Forecast Scenario 2	Forecast Scenario 3
2016	Road	4,645	2,979	7,176	5,716
	Rail	1,223	922	638	1,122
	Total	**5,868**	**3,900**	**7,814**	**6,838**
	% of growth by rail	21%	24%	8%	16%
2026	Road	8,672	5,574	14,219	11,145
	Rail	2,488	1,376	1,068	2,067
	Total	**11,160**	**6,949**	**15,286**	**13,211**
	% of growth by rail	22%	20%	7%	16%

Source: MDS Transmodal GB Freight Model

The *Base Case* assumes that each region's warehouse stock and new build rates will continue in line with current trends and market share. Consequently, each region will continue to attract unitised traffic in line with current trends and market share. The amount of rail connected floor space per region is the same as that allocated to each region in the national rail freight forecasts recently produced for the Rail Freight Group (RFG) and the Freight Transport Association (FTA) by MDS Transmodal. It is anticipated that approximately 20% of new build warehousing will be on rail connected sites by 2026 (4.4 million square metres nationally).

Scenario 1 reflects the East Midlands losing warehouse market share, and this results in lower levels of forecast traffic (compared with Base Case). In effect other regions, particularly competing neighbour regions, develop new warehousing at a faster rate and consequently gain market share. This attracts traffic away from the East Midlands to these regions. The development of new warehousing on large rail connected logistics sites in other regions, such as the East of England (e.g. Alconbury), will mean these regions becoming more competitive locations for distribution, given the inability of the East Midlands to bring forward its own rail linked logistics sites.

Conversely, Scenarios 2 and 3 reflect the East Midlands gaining warehouse market share, and this results in higher levels of forecast traffic (compared with Base Case). This enhances the region's competitive position and consequently it attracts greater levels of

unitised traffic. It is also important to note that increasing the amount of new warehousing which is built on rail linked sites results in higher forecast rail freight volumes.

Again, this analysis, does not establish forecast volumes of unitised goods delivered directly to a distribution centre in the East Midlands. This, again, is 'corrected' further below.

A2.3 Demand for New Build Warehousing

Savills market data records new build warehouse take-up rates in the East Midlands for units greater than 10,000 square metres (Appendix 3). Analysis of this data shows that between 1997 and 2005, a total of 2.2 million square metres of new distribution centre floor space (in units greater than 10,000 square metres) was built in the region. This equates to a mean new build rate of 244,400 square metres per annum. The data in this analysis includes units both speculatively developed and purpose built. The table below summarises the results of this trend analysis. It is important to note that these figures reflect 'gross new build' and not the 'net change' in the region's total warehouse stock. They also account for new warehousing being built in the East Midlands to replace existing stock in other regions, and visa versa.

Table 27: New Build Take-up in the East Midlands 1997-2005 (units greater than 10,000sqm)

Year	sq m
1997	200,868
1998	156,410
1999	240,751
2000	184,484
2001	206,731
2002	224,849
2003	171,794
2004	438,430
2005	375,391
2006 (to date)	272,665
Total Take-up 1997-2005	**2,199,709**
Mean Take-up pa 1997-2005	**244,412**

Source: Savills

Taking a continuation of the 1997-2005 trend rates (in terms of mean build per annum) and projecting forwards on a straight line basis, we would expect the total (gross) warehouse new build in the region to be around 4.9 million square metres up to 2026 (units larger than 10,000 square metres). This is summarised in the table below. The land requirement figure has been calculated on the basis that all of this new warehousing will be built on new sites, and that the floor space of a warehouse is approximately 40% of a total plot footprint.

Table 28: Estimated New (Gross) Warehouse Build in the East Midlands up to 2016 and 2026 in Units Greater than 10,000m^2 at 1996-2003 Trend Rates

Mean Build per annum	244,400 sq m
Total (gross) new build 2007-2016 (10 years)	2,444,000 sq m
Land required*	611 ha
Total (gross) new build 2007-2026 (20 years)	4,888,000 sq m
Land required*	1,222 ha

** On the basis that all new warehouse build will be on new sites*

It should be noted that these figures are the 'gross new build' and not the 'net growth' in floor space. This is because new warehouse building is a result of two factors:

- The replacement of existing floor space capacity
- Additional floor space which is required to handle growth in traffic volumes (growth build)

Research by the Cranfield Institute found that 60% of strategic distribution centres built since 1995 have replaced other warehousing/distribution warehouses, which subsequently closed. Therefore, a proportion of the 4.9 million square metres of gross new floor space expected to be built in the East Midlands up to 2026 will simply be to 'stand still' (i.e. will be built anyway regardless of traffic growth), with the balance being built to handle growth in traffic volumes. Logistics operators will replace existing floor space for a number of reasons. This will include existing facilities becoming 'life expired' (many developers, including ProLogis, write down their warehouse stock over a 25 year economic life) and 'economies of scale' gains which can be achieved through merging operations based at multiple sites at one new location. For example, an operator may have two operations based at 'old' warehouses in the region of 20,000m^2 and 30,000m^2, which are combined at a new facility of 60,000m^2.

The total gross new floor space built is 60,000m^2, of which 50,000m^2 is 'standstill' new build while 10,000m^2 is growth build (net growth).

It is important to understand that in many cases replacement floor space will not ‘fit’ onto existing plots at general industrial sites or on 'recycled' brownfield land (due to size and configuration). This is particularly the case when large new buildings are replacing two or more smaller facilities. In the example above the growth build element (net growth) is only 10,000m^2 (2.5ha), however a new plot capable of accommodating 60,000m^2 (15ha) will be required. As a result, new specialist B8 sites, strategic logistics sites, will be required for much of the 'standstill' build. In addition, the policy of encouraging new warehousing on rail linked sites also implies a requirement for new sites, given that existing sites are located away from railway lines (in order to achieve the Regional Freight Strategy Target of 30 additional trains in the region will require new terminal facilities, probably intermodal terminals on the same sites as distribution centres).

The Base Case traffic forecast has been undertaken on the basis that each region's warehouse stock and new build rates will continue in line with current trends and market share. The Base Case, therefore, reflects a continuation of the 1997-2005 new build trend rates identified in the table above. Taking this into account, we would expect the proportion of goods being delivered directly to distribution centres in the East Midlands in 2016 and 2026 to be the same as the 2005 percentage, given that the region will not be gaining or losing traffic market share.

On this basis, it is possible to establish the volume of unitised goods delivered directly to warehouses in the region for the 2016 and 2026 Base Case forecast, and consequently calculate the growth in unitised traffic delivered directly to warehouses compared to 2005. From this figure, the amount of additional floor space which will be required in the region to handle the growth in unitised goods can be calculated i.e. the 'growth build' element of total gross new build. This is done using the following relationships which exist between tonnage throughput and warehouse floor space:

- Mean of 0.6 tonnes of goods per 1 pallet
- Mean of 1 pallet per square metre of floor space
- Mean of 12 stock turns per annum (i.e. mean dwell time of 4 weeks)
- The amount of cargo in storage at anyone time will occupy 85% of the floor space available (over-flow allowance to handle additional cargo in peak times)

These figures reflect cargo throughput at National Distribution Centres, which are the dominant type of warehouse in the East Midlands. Regional Distribution Centres have a greater throughput rate (mean dwell time of 2 weeks). The table below shows the growth in total unitised goods delivered in the East Midlands, the growth in the tonnage directly to distribution centres in the region together with the amount of floor space required to handle the growth in unitised traffic (the 'growth build' element), for 2016 and 2026.

Table 29: Base Case – Growth in Unitised Goods Delivered in Region and Estimated 'Growth Build' Floor Space

	000s Tonnes		
Base Case: 2016	Total Delivered to East Midlands	Total Delivered to Warehouse+	%
Road	70,186	31,583	45%
Rail	1,644	1,644	100%
Total	**71,830**	**33,228**	46%
Growth in total tonnes to East Mids v 2005	5,868		
Growth in tonnes to warehouses v 2005	3,313		
Floor space required to accommodate traffic growth*	**541,322**	**sq m**	
Growth tonnes per growth floor space	6		
	000s Tonnes		
Base Case: 2026	Total Delivered to East Midlands	Total Delivered to Warehouse	%
Road	74,213	33,396	45%
Rail	2,909	2,909	100%
Total	**77,122**	**36,305**	47%
Growth total tonnes to East Mids v 2005	11,160		
Growth tonnes to warehouse v 2005	6,390		
Floor space required to accommodate traffic growth*	**1,044,144**	sq m	
Growth tonnes per growth floor space	6		

+ 2005 percentage delivered direct to warehouse

** 0.6 tonnes per pallet, 1 pallets per sq m and 12 stock turns pa*

Having established the total (gross) warehouse new build up to 2026 (from existing trends) and the 'growth build' element for the Base Case (from traffic forecasts), it is therefore possible to calculate the replacement or 'standstill' proportion of the total new build (i.e. total gross new build minus 'growth build' element). This is shown in the table below.

Table 30: Base Case – Forecast New Build up to 2016 and 2026 and Land Required

East Midlands Region - Base Case		
2007-2016		
Estimated new build floor space**	2,444,000	sq m
of which:		
Replacement of existing floor space	1,902,678	sq m
To handle traffic growth	541,322	sq m
Land requirement+	611	ha
2007-2026		
Estimated new build floor space**	4,888,000	
of which:		
Replacement of existing floor space	3,843,856	
To handle traffic growth	1,044,144	
Land requirement+	1,222	ha

*** 1997-2005 trend projected forward*
+ On the basis that all new build floor space, including replacement capacity, will locate on new sites and warehouse floor space occupies 40% of a plot footprint

Under the Base case scenario therefore, we would expect the total (gross) warehouse new build in the East Midlands up to 2026 to be in the order of 4.9 million square metres. Out of this total, around 3.8 million square metres of new floor space will be replacement for existing facilities while around 1.1 million square metres of floor space will be 'growth build'. On the basis that all of this new warehousing will be built on new sites, this equates to a 'gross' land requirement of around 1,222ha by 2026. This is on the basis that the floor space of a warehouse is approximately 40% of a total plot footprint.

The useful life of a modern warehouse is around 25 years. Taking into account current unitised traffic volumes delivered to a warehouse in the region and the relationships between tonnage throughput and warehouse floor space, it is estimated that currently around 5 million square metres of floor space in distribution centres over 10,000m^2 exists in the region. On

this basis, around 75% of current floor space will be replaced over the next 20 years with a further 1.1 million square metres constructed as 'growth build', taking the region's total warehouse stock to just over 6 million square metres.

The ‘constant’ figure consequently derived from the above analysis, which can be applied to the remaining Scenarios, is the replacement or 'standstill' proportion of the total new build demand up to 2016 and 2026. This effectively equates to the amount of floor space which would be built in the East Midlands up to 2026 even if there was no growth in traffic to distribution centres in the region. Therefore, by calculating the traffic growth to distribution centres for Scenarios 1, 2 and 3, and equating these figures as ‘growth build’ floor space on the same basis as above, it is possible to calculate the total (gross) new warehouse build in the region for these Scenarios (given we know the ‘constant’ replacement floor space).

However, Scenarios 1, 2 and 3 are both based on the East Midlands’ market share of new build warehouses varying from the continuation of current trends and market share identified above and used in the Base Case. Scenario 1 is based on the region not delivering any new warehousing on rail connected floor space. Hence it would lose market share to other regions under this scenario. Scenarios 2 and 3 are based on the region delivering new warehouses on rail connected sites at a greater rate than other regions, thus it would be gaining market share. As a consequence, the proportion of goods being delivered to distribution centres will also change for each scenario, compared to the current proportion and that applied to the calculations in the Base Case. As the East Midlands’ market share of floor space increases, we would expect the proportion of goods being delivered in the region to distribution centres to also increase (and vice versa). The volume of goods being delivered to distribution centres in Scenarios 1, 2 and 3 has been calculated on the following basis:

- In Scenario 1, the fall in total road and rail tonnes delivered compared to the Base Case equates to the volume of goods ‘lost’ from East Midlands distribution centres. These figures have therefore been subtracted from the Base Case tonnage delivered to warehouses to calculate the tonnage of goods delivered directly to distribution centres; and
- In Scenarios 2 and 3, the increase in total road and rail tonnes delivered compared to the Base Case equates to the volume of goods ‘gained’ by East Midlands distribution centres and ‘lost’ from distribution centres in other regions. These figures have therefore been added to the Base Case tonnage delivered to warehouses to calculate the tonnage of goods delivered directly to distribution centres

The traffic growth to warehouses in the region for Scenarios1, 2 and 3, compared to 2005, has consequently been equated as 'growth build' floor space on the same basis as above. Adding these figures to the replacement/standstill build figure allows the calculation of new build floor space by 2026. This is shown in the tables below.

Table 31: Scenario 1 – Growth in Unitised Goods Delivered in Region and Estimated 'Growth Build' Floor Space

Scenario 1: Fall in total tonnes delivered v base case is equal to traffic lost from warehouses in region

	000s Tonnes		
	2016	**2026**	
Fall in total road traffic v base case	-1,666	-3,099	
Fall in total rail traffic v base case	-301	-1,112	
Fall in total traffic v base case	**-1,967**	**-4,211**	
	000s Tonnes		
Scenario 1: 2016	Total Delivered to East Midlands	Total Delivered to Warehouse	%
Road	68,519	29,917	44%
Rail	1,343	1,343	100%
Total	**69,863**	**31,261**	45%
Growth in total tonnes to East Mids v 2005	3,900		
Growth in tonnes to warehouse v 2005	1,346		
Floor space required to accommodate traffic growth*	**219,885 sq m**		
Growth tonnes per growth floor space	6		
	000s Tonnes		
Scenario 1: 2026	Total Delivered to East Midlands	Total Delivered to Warehouse	%
Road	71,114	30,297	43%
Rail	1,797	1,797	100%
Total	**72,912**	**32,095**	44%
Growth in total tonnes to East Mids v 2005	6,949		
Growth in tonnes to warehouse v 2005	2,180		
Floor space required to accommodate traffic growth*	**356,137 sq m**		
Growth tonnes per growth floor space	6		

** 0.6 tonnes per pallet, 1 pallets per sq m and 12 stock turns pa*

Table 32: Scenario 1 – Forecast New Build up to 2016 and 2026 and Land Required

East Midlands Region - Scenario 1		
2007-2016		
Estimated new build floor space	2,122,563	sq m
of which:		
Replacement of existing floor space	1,902,678	sq m
To handle traffic growth	219,885	sq m
Land requirement+	531	ha
2007-2026		
Estimated new build floor space	4,199,992	sq m
of which:		
Replacement of existing floor space	3,843,856	sq m
To handle traffic growth	356,137	sq m
Land requirement+	1,050	ha

+ On the basis that all new build floor space, including replacement capacity, will locate on new sites and warehouse floor space occupies 40% of a plot footprint

Table 33: Scenario 2 – Growth in Unitised Goods Delivered in Region and Estimated 'Growth Build' Floor Space

Scenario 2: Increase in total tonnes delivered v base case is equal to traffic gained by warehouses in region

	000s Tonnes		
	2016	**2026**	
Increase in road traffic v base case	2,531	5,547	
Increase in rail traffic v base case	-585	-1,420	
Increase in total traffic v base case	**1,947**	**4,127**	
	000s Tonnes		
Scenario 2: 2016	Total Delivered to East Midlands	Total Delivered to Warehouse	%
Road	72,717	34,115	47%
Rail	1,060	1,060	100%
Total	**73,777**	**35,175**	48%
Growth in total tonnes to East Mids v 2005	7,814		
Growth in tonnes to warehouse v 2005	5,260		
Floor space required to accommodate traffic growth*	**859,418 sq m**		
Growth tonnes per growth floor space	6		
	000s Tonnes		
Scenario 2: 2026	Total Delivered to East Midlands	Total Delivered to Warehouse	%
Road	79,759	38,942	49%
Rail	1,489	1,489	100%
Total	**81,249**	**40,432**	50%
Growth in total tonnes to East Mids v 2005	15,286		
Growth in tonnes to warehouse v 2005	10,517		
Floor space required to accommodate traffic growth*	**1,718,426 sq m**		
Growth tonnes per growth floor space	6		

** 0.6 tonnes per pallet, 1 pallets per sq m and 12 stock turns pa*

Table 34: Scenario 2 – Forecast New Build up to 2016 and 2026 and Land Required

East Midlands Region - Scenario 2		
2007-2016		
Estimated new build floor space	2,762,096	sq m
of which:		
Replacement of existing floor space	1,902,678	sq m
To handle traffic growth	859,418	sq m
Land requirement+	691	ha
2007-2026		
Estimated new build floor space	5,562,282	sq m
of which:		
Replacement of existing floor space	3,843,856	sq m
To handle traffic growth	1,718,426	sq m
Land requirement+	1,391	ha

+ On the basis that all new build floor space, including replacement capacity, will locate on new sites and warehouse floor space occupies 40% of a plot footprint

Table 35: Scenario 3 – Growth in Unitised Goods Delivered in Region and Estimated 'Growth Build' Floor Space

Scenario 3: Increase in total tonnes delivered v base case is equal to traffic gained by warehouses in region

	000s Tonnes		
	2016	**2026**	
Increase in road traffic v base case	1,071	2,472	
Increase in rail traffic v base case	-100	-421	
Increase in total traffic v base case	**970**	**2,051**	
	000s Tonnes		
Scenario 3: 2016	Total Delivered to East Midlands	Total Delivered to Warehouse	%
Road	71,256	32,654	46%
Rail	1,544	1,544	100%
Total	**72,800**	**34,198**	47%
Growth in total tonnes to East Mids v 2005	6,838		
Growth in tonnes to warehouse v 2005	4,283		
Floor space required to accommodate traffic growth*	**699,850 sq m**		
Growth tonnes per growth floor space	6		
	000s Tonnes		
Scenario 3: 2026	Total Delivered to East Midlands	Total Delivered to Warehouse	%
Road	76,685	35,868	47%
Rail	2,488	2,488	100%
Total	**79,174**	**38,357**	48%
Growth in total tonnes to East Mids v 2005	13,211		
Growth in tonnes to warehouse v 2005	8,442		
Floor space required to accommodate traffic growth*	**1,379,337 sq m**		
Growth tonnes per growth floor space	6		

** 0.6 tonnes per pallet, 1 pallets per sq m and 12 stock turns pa*

Table 36: Scenario 3 – Forecast New Build up to 2016 and 2026 and Land Required

East Midlands Region - Scenario 3		
2007-2016		
Estimated new build floor space	2,602,529	sq m
of which:		
Replacement of existing floor space	1,902,678	sq m
To handle traffic growth	699,850	sq m
Land requirement+	651	ha
2007-2026		
Estimated new build floor space	5,223,193	sq m
of which:		
Replacement of existing floor space	3,843,856	sq m
To handle traffic growth	1,379,337	sq m
Land requirement+	1,306	ha

+ On the basis that all new build floor space, including replacement capacity, will locate on new sites and warehouse floor space occupies 40% of a plot footprint

APPENDIX 3

WAREHOUSE TAKE-UP ANALYSIS

APPENDIX 3: WAREHOUSE TAKE-UP ANALYSIS

Market data held by Savills records new build warehouse take-up rates for units greater than 10,000 square metres by floor space size and location. This Appendix contains an analysis of warehouse developments in the East Midlands region from 1997 to 2005. Reference should be made to the Sub-regions map in Appendix 1.

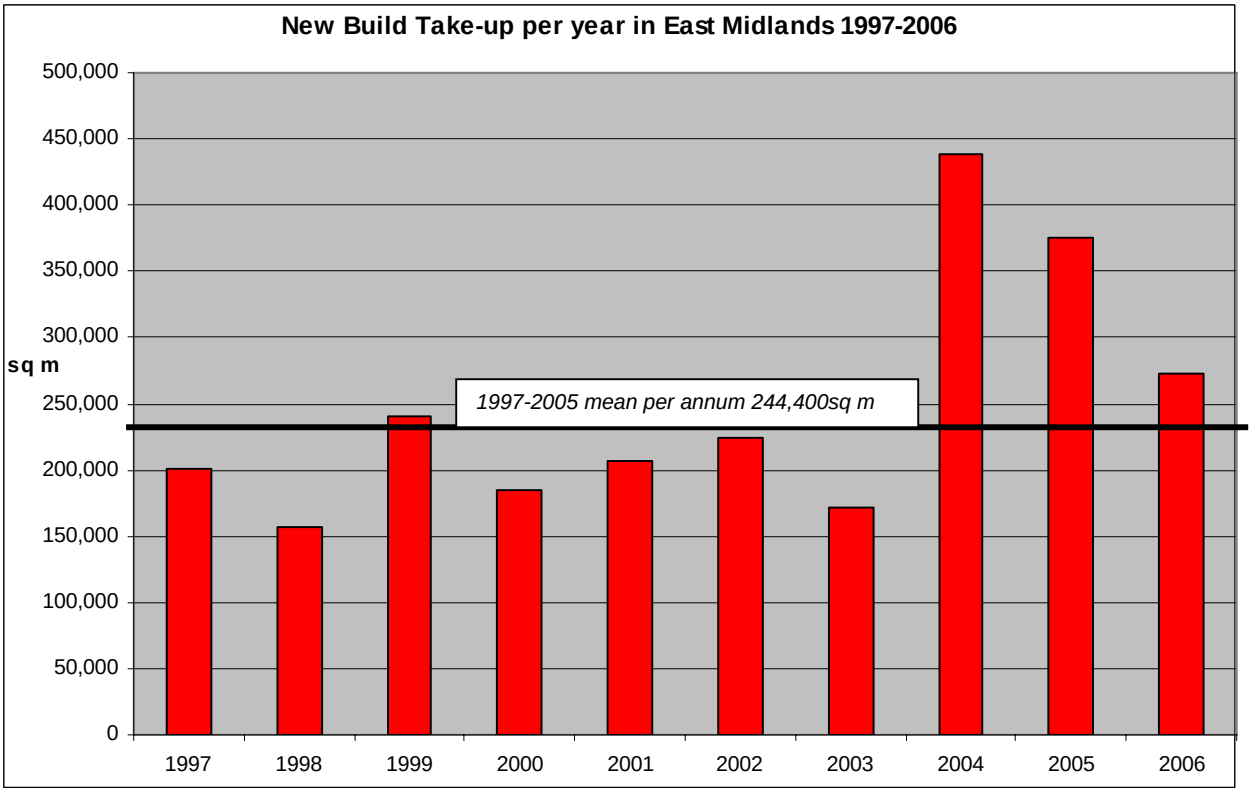
Between 1997 and 2005, a total of 2.2 million square metres of new distribution centre floor space (in units greater than 10,000 square metres) was built in the region. This equates to a mean new build rate of 244,400 square metres per annum. The data in this analysis includes units both speculatively developed and purpose built. The table and graph below summarises the results of this trend analysis. It is important to note that these figures reflect 'gross new build' and not the 'net change' in the region's total warehouse stock.

Table 37: New Build Take-up in the East Midlands 1997-2005 (units greater than 10,000sqm)

Year	sq m
1997	200,868
1998	156,410
1999	240,751
2000	184,484
2001	206,731
2002	224,849
2003	171,794
2004	438,430
2005	375,391
2006 (to date)	272,665
Total Take-up 1997-2005	**2,199,709**
Mean Take-up pa 1997-2005	**244,412**

Source: Savills

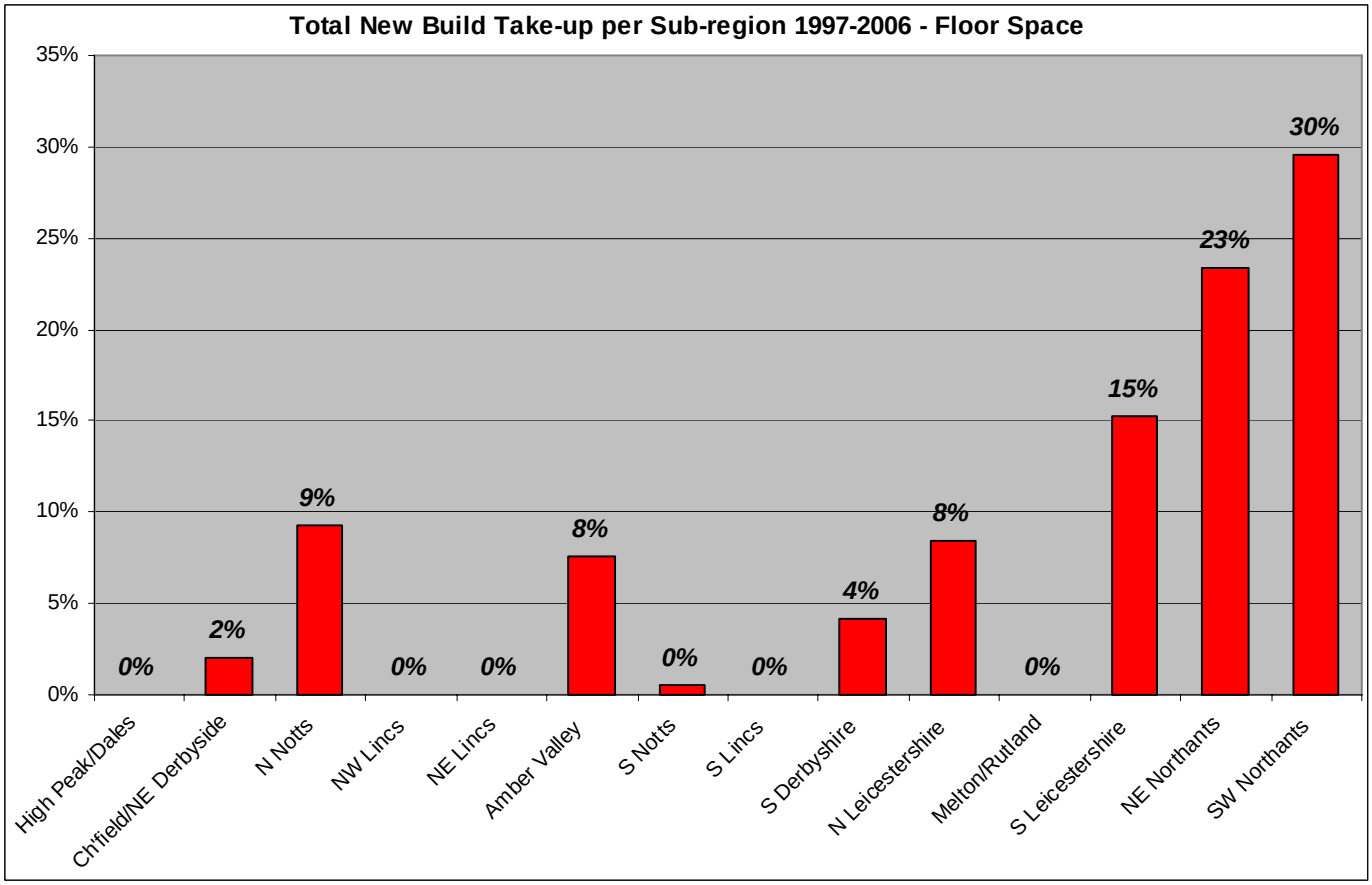
Graph 28: New Build Take-up in the East Midlands 1997-2005 (units greater than 10,000sqm)



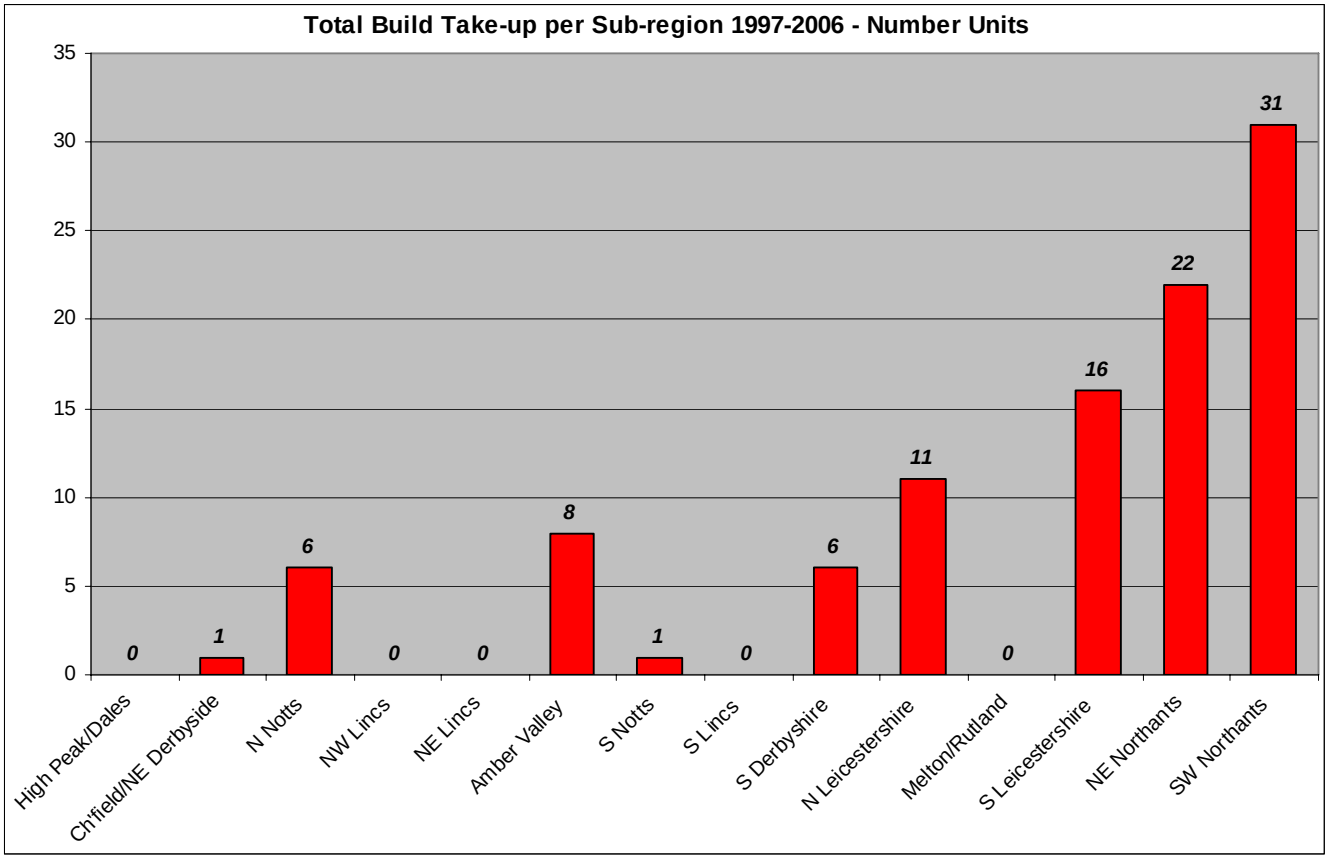
It is interesting to note that the years 1997 to 2003 were fairly 'flat', while 2004 and 2005 were significantly ahead of the per annum mean for the time period considered.

The graph below shows new build take-up rates, in terms of floor space and number of units, for each of the sub-regions defined for the purpose of this study.

Graph 29: New Build Take-up Rates per Sub-Region by Floor Space 1997-2005 (Units greater than 10,000 sq m)



Graph 30: New Build Take-up Rates per Sub-Region by Number Units 1997-2005 (Units greater than 10,000 sq m)



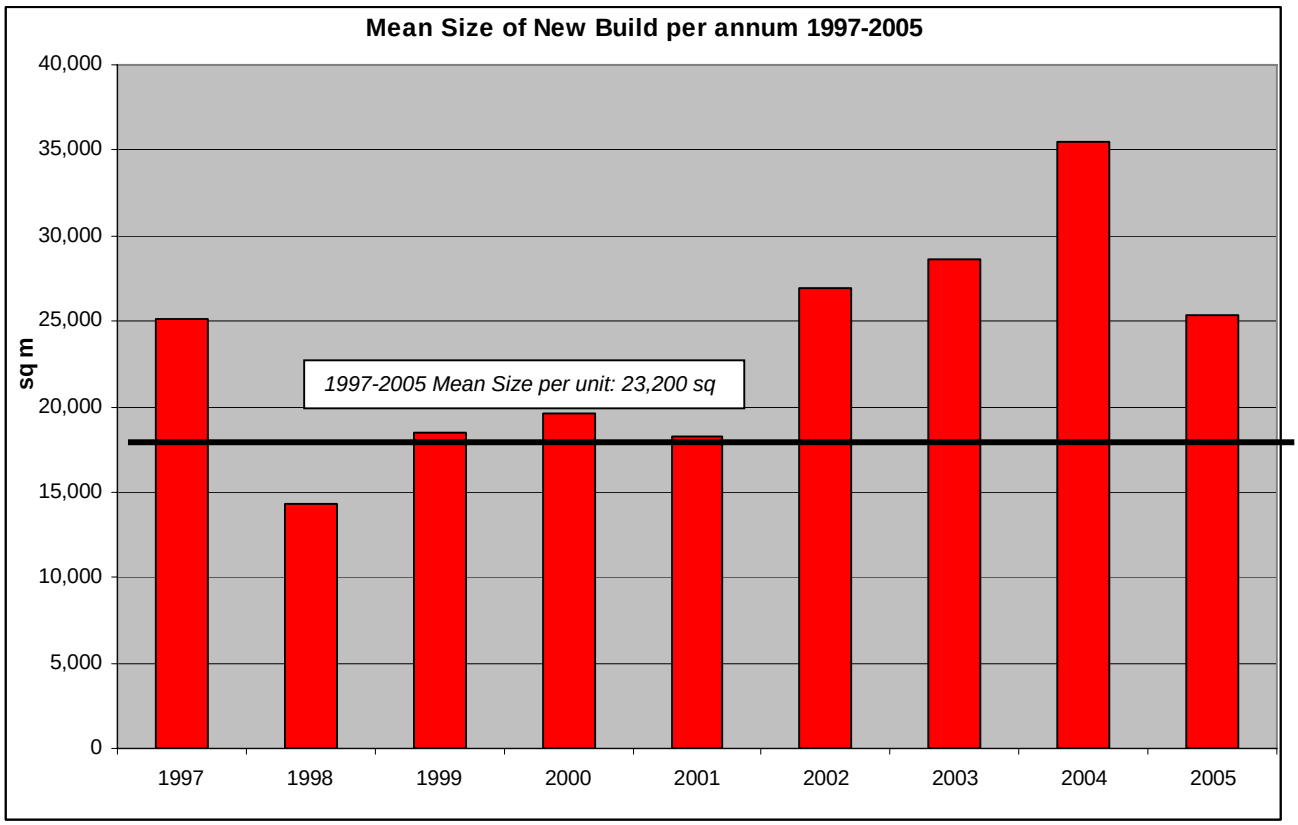
The graphs shows that 68% of new floor space built in the region between 1997 and 2005 was constructed in the three southern-most sub-regions (South Leicestershire and the two Northamptonshire sub-regions). In total 69 units (out of a total of 102) were built in these three sub-regions. This clearly shows strong demand from the logistics market for warehouse capacity along the M1 corridor south of Leicester and along the A14 east of Rugby. The remaining areas of demand are also located along the M1 corridor.

The table and graph below shows 1997-2005 warehouse take-up in the East Midlands in terms of mean floor space size per unit.

Table 38: Mean Size of Floor Space in New Build Warehousing

	sq m
Mean Size New Build 1997-2005	23,184
Mean Size New Build 1997-2000	18,826
Mean Size New Build 2001-2005	26,471

Graph 31: Mean Size of New Build Units per annum 1997-2005



The table and graph clearly demonstrates that the logistics market is demanding much larger distribution centres. Between 1997-2005, the mean floor space area per new build unit was around 23,200m^2. For the 1997-2000 time period, the mean floor space area per new build unit was approximately 18,800m^2. However for the 2001-2005 time period, the mean floor space area per new build unit was much larger at around 26,500m^2.

The table below shows new build take-up rates for units greater than 25,000 square metres.

Table 39: New Build Units 1997-2005 Greater 25,000m^2

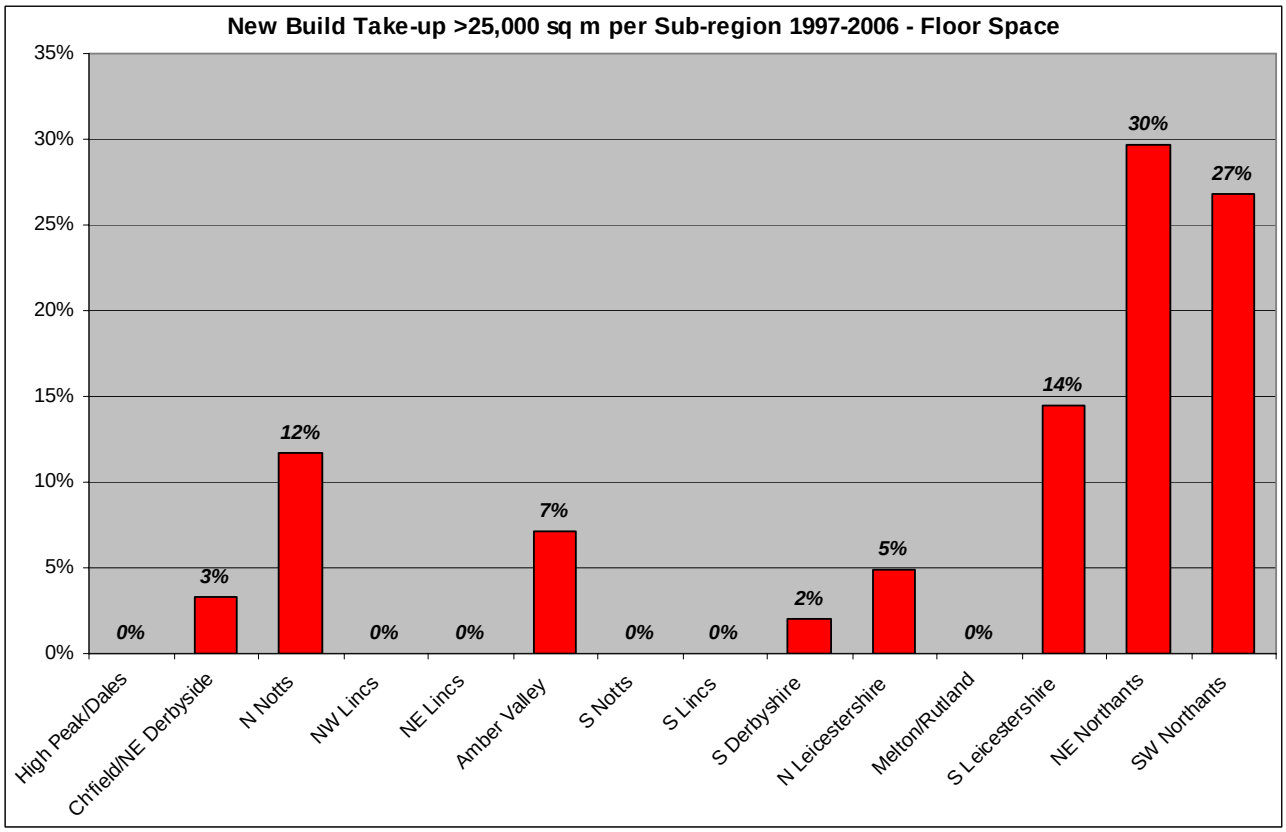
New floor space in units >25,000sq m	1,406,897 sq m
% New floor space in units >25,000sq m 1997-2005	61%
% New floor space in units >25,000sq m 1997-2000	42%
% New floor space in units >25,000sq m 2001-2005	71%

Number new builds >25,000sq m	34
of which	
Built 1997-2000	10
Built 2001-2005	24

Over the 1997-2005 time period, 61% of new floor space was in units greater than 25,000m^2. However, 71% of new floor space built from 2001-2005 was in units greater than 25,000m^2. The analysis indicates that the market is increasingly demanding facilities in excess of 50,000m^2 and up to 100,000m^2. Out of a total of 102 units built between 1997-2005, 11 were larger than 50,000m^2 (1 unit was over 100,000m^2 and a further 3 were over 70,000 sq m). Out of these 11 units, 10 were built between 2001 and 2005.

The graph below shows new build take-up rates for units greater than 25,000m^2, in terms of floor space, for each of the sub-regions defined for the purpose of this study.

Graph 32: New Build take-up for Units Greater 25,000 sq m by Sub-region 1997-2005



The graphs shows that 71% of new floor space in units greater than 25,000m^2 was constructed in the three southern-most sub-regions (South Leicestershire and Northamptonshire).

To date, the only major rail linked logistics park (defined as 'on site' rail facilities rather than developments close by to rail terminals) to be developed in the region is DIRFT. The analysis shows that 261,000m^2 of floor space has been developed at DIRFT. This accounts for only 11% of all new units built in the region between 1997 and 2005.

APPENDIX 4
EXISTING B8 SITE SUPPLY DATA

APPENDIX 4: EXISTING B8 SITE SUPPLY DATA

Table 40: Land Remaining at Existing B8 Sites or Sites in the Pipeline

Site	ha
Area 2	
Markham Vale	81
Sub-total	*81*
Area 3	
Bevercotes Colliery	81
G Park, Newark	16
Cavendish Park, Mansfield	20
Sub-total	*117*
Area 6	
Gateway 28	5
Eastwood Business Park	24
Denby Hall (Sladen)	15
Bolsover Distribution Park	12
Sub-total	*56*
Area 7	
Blenheim Park, Nottingham	8
Sub-total	*8*
Area 9	
Dove Valley Park Land	6
Sub-total	*6*
Area 10	
Westminster Ind Estate, Measham	5
Ivanhoe Business Park, Ashby	12
EMDC	49
Sub-total	*65*
Area 13	
Phoenix parkway, Corby	16
Former Universal Salvage land, Corby	11
DC3 D&B, Prologis park Wellingborough	10
Triangle site (Parlison)	5
PLOT 3, Warth Park, Raunds	5
Magnetic Park, Desborough	16
Sub-total	*63*

Table 40 Continued: Land Remaining at Existing B8 Sites or Sites in the Pipeline

Site	ha
Area 14	
Pineham	81
Potential	5
Milton Ham	8
Coca Cola expansion land	13
Phase 2 Land, DIRFT Logistics Park	54
Sub-total	*161*
Total East Midlands	**557**

APPENDIX 5
NATIONAL TRANSPORT POLICY BACKGROUND

APPENDIX 5: NATIONAL TRANSPORT POLICY BACKGROUND

Various national transport policy documents provide support for an increase in the amount of freight that is moved by rail in general, and in particular sets out policy with respect to new rail linked distribution facilities in terms of their location and form/structure.

Published by the Department for Transport (DfT) in July 2004, *The Future of Transport* White Paper set out a long term strategy for a modern, efficient and sustainable transport system backed up by sustained high levels of investment. The White Paper looks at the factors that will shape travel and transport over the next thirty years and sets out how the Government will respond to the increasing demand for travel, maximising the benefits of transport while minimising the negative impact on people and the environment. The document superseded the *New Deal for Transport* White Paper published on 1998. There is little in the document directly concerning the location and form/structure of new distribution facilities beyond general broad support for 'modal shift' i.e. support for rail linked sites. The Government will continue to encourage freight traffic to be shifted from road to rail where feasible and where appropriate financial support will be offered. The document states that sustainable freight transport should focus on approaches which offer the best outcomes for our economy, society and the environment.

Sustainable Distribution, A Strategy (1999) was one of the 'daughter' papers to the New Deal for Transport White Paper, and it remains official national policy with regards to sustainable distribution. It describes the Government strategy to secure the sustainable distribution of freight in the United Kingdom. The key points include:

- Specific measures to promote sustainable transport of goods, generally through fiscal measures,
- Greater emphasis on planning for freight distribution at both regional and local levels and revised planning guidance to encourage the shipment of more goods by rail and waterborne transport.
- Encouraging the use of rail freight by providing incentives through grant schemes such as FFG and by setting up the SRA, which would have a duty to promote rail freight.
- Encourage the use of waterborne freight, particularly by extending the FFG scheme to coastal and short sea shipping.

Chapter 5 of the Paper deals specifically with planning and its role in promoting sustainable distribution. Again the Paper states that it is the Government's intention to issue revised planning guidance to support an integrated transport policy. The purpose of this is to:

- Encourage more freight to be carried by rail. Local authorities in preparing development plans will be expected to consider, and where appropriate protect, opportunities for rail connection to existing manufacturing, distribution and warehousing sites and allocate new sites for suitable new developments which can be served by rail; and

- Encourage local authorities through their development plans to give better protection to those sites and routes (both existing and potential) which could be critical in developing infrastructure to widen transport choices, such as interchange facilities allowing road to rail transfer (Para 5.2).

The key phrases stated in the above documents above are ‘where appropriate’, 'where feasible' and ‘suitable new developments’. Policy is not expecting all new distribution developments to be served by rail links, only those developments where a rail connection would be appropriate.

As a result of the changes to the railway industry resulting from the Railways Act 2005, the Secretary of State for Transport (Alistair Darling) made a statement to Parliament in July 2005. Mr Darling confirmed that *"with the repeal of Section 206 of the Transport Act 2000, the SRA's 2001 Rail Freight Strategy will cease to be in force"*. The purpose of the statement was therefore to re-state clearly the Government’s objectives for rail freight. Given this position, the statement can therefore be considered as the Government’s current policy in terms of rail freight.

There was little in the statement directly concerning the location and form/structure of new distribution facilities. However, Mr Darling stated that the Government wanted to see private sector investment in major rail freight facilities, such as intermodal terminals, continue. While it is not appropriate for the Government to promote individual schemes, the Government will act to ensure decision makers are better informed, particularly in the application of planning guidance. The Government would consider changes to planning guidance where required. The Government will work to ensure that regional and local planning decisions reflect Government priorities relating to the sustainable movement of goods.

Even though the SRA has now been abolished (early 2006) and the SRA's *Rail Freight Strategy*, published in 2001, is no longer Government policy, the DfT issued an open letter in October 2005 stating that much of the *Strategic Rail Freight Interchange Policy* (published in 2004) still remains relevant with respect to the location and form of new rail linked distribution facilities:

> *"The SRA will cease to exist from early 2006 and has already relinquished its role in the planning process. This renders parts of the document (Strategic RFIs) technically out of date. However, the interchange policy was based on the Government's existing policies for transport, planning, sustainable development and economic growth, and much of the material contained in chapters 4, 5, 6, and 7, is still relevant. For this reason we will retain the document on our website as a source of advice and guidance.2*

The *Strategic Rail Freight Interchange Policy* set out to inform relevant stakeholders of the need for, role, function and operating characteristics of Strategic Rail Freight Interchanges (RFIs). While all rail freight interchanges are important in supporting rail freight flows (e.g. private siding and single commodity facilities), this policy is aimed at developing strategic facilities which will achieve growth in the general cargo/logistics market.

Section 4 of the policy document defined what the SRA viewed as Strategic RFIs. RFIs are large distribution parks, comprising intermodal facilities serving distribution centres located within the park and others in the wider region. The warehouses located at RFIs could also be directly rail served, enabling goods to be transferred directly to storage from rail wagons. Strategic RFIs will be the locations for national and regional distribution centres, and consequently they will be occupied by large logistics service providers, manufacturers and retailers. It is therefore acknowledged that road will remain the dominant mode of transport to/from RFIs, particularly for the onward distribution to end users. Strategic RFIs are therefore seen as large scale distribution activity which happens to be rail linked, and not simply a rail freight terminal.

Section 4 also details the scale and locational requirements for strategic RFIs. In terms of size, a RFI will be at least 40 hectares, and a valuable characteristic of each site will be the ability to accommodate expansion. They also need to be large enough to handle full length 775m trains with appropriately configured on-site rail infrastructure and layout. As strategic RFIs will focus on distributing goods to major urban centres, they need to be located relative to the markets they will serve. However, as they will generally be 24 hour operations, they should be located away from areas which may be sensitive to noise. In terms of transport links, RFIs should be located with good access to the primary road network, and 'high quality links to the rail network are essential' (para 4.23). This means that the railway line serving a RFI must have available capacity to run train services, the ability to handle full length trains and a loading gauge able to accommodate intermodal units on standard platform wagons.

Section 7 considers the delivery of strategic RFIs. The document states that Regional Planning Policy and Regional Transport Policy must set the policy context for the guidance of local level polices for RFIs. Regional planning policy should identify suitable areas where

strategic RFIs could or should be developed. Key factors in considering sites should include:

- Suitable road and rail access – available capacity, adequate loading gauge, good motorway access
- Ability for 24/7 working
- Expansion potential
- Proximity to workforce
- Proximity to markets
- Ability to contribute to identified areas of gaps in provision
- Fit with SRA strategies

APPENDIX 6
LOGISTICS MARKET BACKGROUND INFORMATION AND RAILWAY CONNECTIVITY ISSUES

APPENDIX 6: LOGISTICS MARKET BACKGROUND INFORMATION AND RAILWAY CONNECTIVITY ISSUES

A6.1 The Logistics Market: Background and East Midlands Context

The logistics and distribution market essentially consists of four different types of organisation. These are:

- Manufacturers/producers – these organisations manufacture semi-finished goods for input into another production process, and finished goods for sale to either a retailer or supplier
- Suppliers – these organisations essentially buy semi-finished and finished goods before selling them on to other producers/manufactures or retailers. Increasingly, suppliers are often the UK distribution arm of an overseas manufacturer/producer.
- Retailers – organisations that sell goods to the general public either purchased direct from a manufacturer/producer or from a supplier
- Logistics operators – the organisations who undertake the movement and handling of goods on behalf of the above three organisations

Linking the first three organisations is the fact that they actually own the goods they ship out or receive in. Logistics operators are simply 'custodians' of goods while they are being moved and handled on behalf of the other three organisations.

The 'hub' of most medium to large sized logistics operations is the distribution centre, of which there are basically two types. *National Distribution Centres (NDC)* act as inventory holding points for imported and nationally sourced goods, before re-distribution to other stages in the supply chain. They are termed 'national' because they serve the whole of the UK from the one site. They are normally associated with suppliers to the retail industry, particularly importers of consumer goods e.g. electrical goods, beers/wines/spirits and clothing, who require facilities to consolidate goods from multiple origins (increasingly deep sea container ports) before re-distribution to either a Regional Distribution Centre (RDC) or direct to an end user (retail outlet).

Regional Distribution Centres (RDC) are similar to NDCs in that they receive, hold and then re-distribute goods to other stages in the supply chain, normally multiple retail outlets. However there are a number of important differences. They have a regional hinterland e.g. Midlands. More importantly their primary role is to consolidate and re-distribute goods in shorter periods of time, rather than acting as inventory holding locations. Consequently dwell times are much shorter at an RDC. Normally, goods are received in 'bulk' from

suppliers' NDCs or direct from manufacturers, and then split into smaller consignments for re-distribution in mixed loads i.e. with other smaller consignments, often within 24-48 hours. This is a process commonly called 'cross docking'. RDCs will therefore receive inward goods from a larger number of origins, where as a NDC will generally have fewer sources of supply. They are therefore normally associated with retailers. Some retailers will also have NDCs alongside a network of RDCs. A NDC associated with a retailer is generally holding slower moving lines (seasonal items such as garden furniture, Christmas trees etc.) or goods with long supply lead times (such as DVD players manufactured in Taiwan).

These differences have been driven by the changing nature of logistics over the past 20 years, in particular the move towards 'Just in Time' (JIT) logistics and reduced stock holding levels. However this trend has been more dramatic in the retail industry. Goods are now ordered by retailers from manufacturers and suppliers on a JIT basis when required rather than in anticipation of demand. Two factors have enabled this trend. Firstly, the development of an extensive motorway network means goods can now be moved around the country in hours rather than days. Secondly, the emergence of retailers with large purchasing powers driven by sophisticated IT systems (e.g. EPOS). Consequently the responsibility of holding inventory to ensure product supply has been placed firmly in the hands of manufacturers and suppliers (occupiers of NDCs) rather than the retailers (occupiers of RDCs). Due to these different roles, inventory dwell times at NDCs and RDCs consequently differ. Dwell times at a RDC average 2 weeks where as the corresponding figure at a NDC is around 4 weeks.

The ability to hold, consolidate and distribute goods in HGV size loads from one location is actually the most efficient method of organising supply chains, hence the development of distribution centres of both types. This is not only in terms of pure costs. The ability to consolidate and distribute 'mixed loads' results in fewer HGV journeys being required, resulting in environmental benefits.

Both NDCs and RDCs are generally associated with suppliers and retailers. Manufacturers located in Britain are more likely to store and distribute goods to suppliers or retailers direct from a production site. However some manufacturers do occupy distribution centres. Where a manufacturer is located on a site with limited space for holding inventory, they would store goods at an off-site warehouse before re-distribution to the next stage in the supply chain. Also, where a manufacturer has a number of factories, they may decide to consolidate their goods at one centrally located distribution centre before transport to the next stage in the supply chain. In addition, some manufacturers have decided to locate their storage facilities close to their customers, in order to meet their strict JIT delivery arrangements. This is particularly so in the Automotive industry.

The important point to note however is that we would expect demand for distribution warehousing in the East Midlands, to be mainly National Distribution Centres associated with suppliers and retailers (or their appointed logistics providers) i.e. those companies bringing goods into the region.

The management of a distribution centre can either be undertaken 'in house' by the supplier/retailer (so called own account), or out-sourced to a third party logistics operator. Normally such out-sourcing involves a logistics operator providing a package of supply chain services, covering the actual operation of the distribution centre, inventory monitoring, any other 'added value' activities (packaging, labelling) and the associated transport operations. The contracting supplier/retailer will often retain overall strategic control of the supply chain, including overall strategic planning (the structure of the supply chain, number/location of distribution centres and modal choice etc.), controlling inventory levels and purchasing policies. However in many large supply chains, particularly those associated with retailers, some distribution centres are retained in house in order to 'benchmark' the performance of those managed by third partly logistics operators.

There is no standard model in terms of the lease/ownership of the actual warehouse building. Suppliers/retailers will often lease/own the actual warehouse building, with the actual management of the distribution centres subsequently out-sourced to a logistics operator . However in other cases, the provision of a suitable distribution building will be an integral part of the out-sourcing contract.

A fifth organisation which can be added to the list of those involved in the distribution market is the property developer. Property developers, such as ProLogis, play a key role in the provision of distribution centres. These are the organisations who buy land and construct warehouses on either a bespoke or speculative basis, which are leased or sold to shippers or logistics providers. A property developer will want to maximise the returns gained from leasing or selling a distribution centre. While overall returns will be driven by a number of variables, in general, sites in the most competitive locations will attract a premium. Consequently it is in the property developer's interest to gain an understanding of the logistics market, particularly in terms of the future requirements of the logistics market, such as the size of new facilities likely to be demanded and preferred locations.

A6.2 Business Views

'Our focus is on markets and brands, but without an effective supply chain, we cannot even begin to compete'
Chairman, Unilever

'While superior quality and value remain critical factors for success in the marketplace, the ability to attract and keep customers increasingly depends upon outstanding service. At 3M... we've made large investments in more efficient ordering, warehousing, delivery and billing systems. We continue to make it even easier for customers to do business with us.'
L D DeSimone, Chairman of the Board and Chief Executive Officer, 3M Corporation

The Contribution of Logistics: Stakeholder's Comments

- Warehousing employment is not comparable to the 'McJobs' offered by some types of catering and some call centres. Warehousing provides good, solid blue-collar jobs that can maintain a family.
- Because the sector is growing, it also provides relatively secure employment.
- Employers in the sector are providing quality training to upskill their workforces.
- The industry invests heavily in state-of-the-art buildings, equipment and technology. Examples of major investments in strategic warehousing include Asda's Integrated National Distribution Centre at Magna Park (£27m, 2003), George's new warehouses at Brackmills, Northampton (£10m, 2000) and Washington, Tyne & Wear (2005) and John Lewis Partnership's semi automated National Distribution Centre currently under construction in Milton Keynes.(£35m).
- Logistics provides secure employment in the UK. Unlike many other jobs, it cannot be 'off-shored' to India or other emerging countries.
- Strategic distribution workers are provided with transferable skills, particularly in IT, which is ever more widespread and more sophisticated.
- There is a close connection between strategic distribution and office functions, as demonstrated by George which have an office building on Magna Park because of its distribution side.
- The UK economy needs a growing amount of warehousing, because more goods are being sourced overseas, requiring more storage at the destination end

.

A6.3 Logistics, Competitive Advantage and Technological Progress

Since the 1990s or earlier, there has evolved a management literature in which industry practitioners and academic experts stress the role of logistics as an important and growing factor in business competitiveness. Typically, K N Gourdin, in a textbook on Global Logistics Management, argues:

> *'Managers are increasingly becoming aware that a well-run logistics system can provide the organisation with sustainable competitive advantage. However, this appreciation for logistics is a relatively recent phenomenon. Traditional sources of advantage centred around factors such as low labour costs, natural resources, large captive markets, or some unique technological expertise. Unfortunately, while still critically important to corporate success, these elements are declining in importance as sustainable advantages. New technologies are shrinking direct labour costs as a percentage of total costs, many nations with historically low labour costs are finding that emerging countries can undercut them; the rate of advancement in some industries seems to make technological developments obsolete as soon as new products reach the marketplace. Finally, the availability of natural resources and inexpensive components has become increasingly global, largely eliminating access to them as an advantage.'*

With reference to the 'value chain' described in Michael Porter's *Competitive Advantage of Nations*, Gourdin notes that competitive advantage can come either from low cost – producing more cheaply than competitors – or from differentiation – offering superior consumer value, which commands a premium price. Efficient logistics can generate either low cost or differentiation, depending on customer requirements. Thus, sophisticated, affluent consumers produce a growing demand for faster delivery, continuous tracking and electronic transfer: Federal Express advertises that it can tell you where your package is at any time, and UPS promises to bring forward some early morning deliveries in US cities from 8.30 to 8.00. Conversely, in less developed or emerging markets, customers may prefer not to pay a premium for speed, and the key to competitive advantage may be reliable deliveries at reasonable cost.

Gourdin lists seven changes in the international business environment which in recent years have increased the importance of logistics for firms operating globally:

Trends in global trade

Supply chains are lengthening as trade grows and the traditional industrialised countries both sell more to emerging markets, such as Eastern Europe and China, and source more imports from these markets, including manufactured goods. Exploiting these opportunities will require new and more sophisticated logistics.

Customers are demanding greater value

As discussed earlier, customers in different markets define value in different ways. Global companies need to accommodate these differences. Desired levels of value tend to rise as the less demanding customers catch up. Thus, some years ago, Elcint, an Israeli maker of medical equipment, dealt with customers in Eastern Europe, who had virtually no service expectations. Most were happy to see a field technician within six weeks of a problem arising. Now they expect a response within two weeks, which is till behind the US standard of 24-48 hours, but not as much as it used to be.

Transport privatisation and liberalisation

Deregulation and increased competition in freight transport should lead to better service and lower prices, but also produce more complex logistics, as operators must now deal with an ever-changing array of cost and service options.

Environmental Concerns

Air, water and noise pollution, solid waste disposal, energy conservation and product-safety issues are public costs of meeting rising consumer requirements. The challenge for logistics operators is to satisfy the customer while minimising adverse impact of the environment.

Changing view of inventory

As competition has intensified, firms have become increasingly aware that holding too much inventory costs money, both by incurring interest and using space. On the other hand, if inventory is too low the risk of stock-out increases and customer service deteriorates. As globalisation lengthens supply chains, inventory management becomes more difficult, because goods traded over long distances are subject to long lead times and so need to be stocked near the point of consumption. The growing variety and choice of retail goods and the shortening of product lifecycle also add to inventory requirements. As the task of managing stocks becomes more challenging, the competitive advantage of getting it right increases.

Electronic commerce

As e-commerce takes hold, firms have had to reassess their logistics systems to ensure that customers are served efficiently. Logistics is an essential element of a successful e-commerce venture.

Continuing advances in information and communications technology (ICT)

Dramatic technological progress over the last 20 years has transformed logistics. As computing power has grown and prices have dropped, sophisticated resources have

become available to even the smallest operators. Electronic Data Interchange (EDI) can provide fully automated distribution, theoretically without human intervention and virtually without waiting time. Global Positioning Systems (GPS) monitors vehicles and cargo in real time, so that customers can be told where their goods are at any given moment, and ships can be rerouted immediately should the need arise.

The applications of ICT to logistics are discussed further in a research review carried out at the Cranfield School of Management under the Government's *Foresight Project*. The paper notes that ICT can serve both to increase the effectiveness of individual companies' supply chains and to integrate these chains with those of trading partners.

In the first category, the planning systems on offer include material requirements planning (MRP) or enterprise resource planning (ERP), capacity planning, production scheduling, sales planning, demand planning, transportation planning, and distribution requirements planning (DRP). Many other technologies may be used to help plan and control supply chains, such as bar codes, electronic data interchange (EDI), quick response, RFID and web services.

ICT is also important in facilitating the integration between different systems and collaboration with trading partners. Systems used for this purpose include Vendor Managed Inventory (VMI), Supplier Management Systems (SMS) and Customer Relationship Management (CMS). Today, supply-chain collaboration is often done over the Internet, which is less expensive, more global and more open than earlier methods.

Finally, the Foresight paper notes that a number of ICT developments are creating new opportunities for logistics applications. Thus, technologies such as RFID, GPS and GSM/3D allow physical objects to be traced at all times. New information systems infrastructures known as eHubs integrate information systems and flows of data between different organisations in the supply chain. Logistics, like so many other areas of human activity, stands to benefit vastly from the new mobile and wireless technologies.

A6.4 Case Studies

Trade journals and management literature alike provide case studies to illustrate the importance of logistics, the range of options for more efficient, more advanced logistics, and the resulting benefits. We summarise some examples below.

Zara, a global clothing manufacturer and retailer, is noted for its fast and profitable growth from 1980 onwards, appealing to fashion-conscious young women without any advertising.

Zara's competitive advantage lies in its short product runs and fast reaction times, which in turn depend in part on advanced logistics management. The average sales period for most fashions is just 17-20 days, so that customers know that they will always find something new and fashionable in store and they are unlikely to meet others wearing the same outfit. Store managers send customer feedback to in-house designers via hand-held electronic devices, so that design can respond instantly to customers' tastes. Distribution is centralised at a 400,000 square metre depot in Galicia, Spain, one of the largest and most automated in the world. With these supply-chain innovations, Zara brings 12,000 new fashions to market each year; it can deliver these new styles in days or weeks, while competitors take months.

A 2002 INSEAD case study compares Zara with ***Marks & Spencer (M&S)***, who was experiencing falling market share and financial difficulties at the time. Informed comment suggested that M&S was failing to adapt to consumer trends favouring more informal clothing and faster turnaround of new fashions, and blamed poor forecasting of consumer requirements, combined with slow response. Thus, M&S expected the fashion colours for the 1998/99 winter season to be black and grey. Because of the long lead times built into the company's 'traditional' supply chain, this judgment had to be made and acted upon a whole year ahead. It turned out to be wrong, resulting in large amount of unsold stock and the largest out-of-season sale in the company' history. In 1999, pre-tax profit fell by 45% and share price by 50%.

In March 2003, Marks & Spencer announced that, following a year-long review of its logistics operations, it had awarded the management of 11 of its warehouses to Exel. The announcement states that 'this new contract highlights the growing, strategic importance of the supply chain for major companies such as Marks & Spencer will be better placed to respond to marketplace changes quickly and effectively, maintaining a high level of service to customers'.

Tesco in the late 1990s and early 2000s aimed to take £100 million out of its supply chain cost base principally through further enhancements of its reordering system, category management and better handling techniques at its distribution centres and stores. Like other retailers, at that time it adopted an inventory-management initiative known as Efficient Consumer Response (ECR) that aims to see retailers and their supply chains work more closely together through cross-docking (to eliminate traditional 'storage' of goods), sharing sales data gathered at the checkout, and transmitting orders electronically.
A fire in a factory that produced semi-conductors for mobile phones in March 2000 had a major effect on the supply of these parts. ***Nokia*** and ***Ericsson*** at the time had a market share of 40% between them. On 20 March, Nokia's even management information system alerted them to supply problems. Nokia managers quickly contracted with other suppliers

and secured the available semi-conductors. Ericsson did not respond until early April, by which time supplies were not available. The consequences for Ericsson were lost sales of some US$400 million and cessation of the manufacture of mobile phones.

Becton Dickinson, an American manufacturer and supplier of medical diagnostic equipment, had built a network of national distribution centres as its European business expanded in the early 1990s. But it found that efficiency was compromised by high inventory costs, write-offs due to time-expired products, poor stock availability and high distribution costs. Accordingly, the company restructured it distribution system, to close national distribution centres in Sweden, France, Germany and Belgium and centralise operations at a single, purpose-built, fully automated facility at Temse in Belgium. I less than a year, stocks were down by 45%, write-offs by 65% and stock-outs by 75% .

Hewlett Packard (HP) had difficulty forecasting demand for its printers country-by country across Europe. 'The Germans would order more than expected, the Italians would order less.' Italian machines could not be taken to Germany, because different countries needed different power supplies, different language manuals and different machine configurations. Consequently, HP suffered the worst of both worlds – both high inventory and frequent stock-outs. It decided to modularise its product, setting up a network of distribution centres that received generic printers and configured them to specific markets in response to order received. This approach eliminated the stock-out/high inventory problem.

Of the different ways to restructure and modernise logistics, the one that impacts most directly on property is the centralisation of distribution into fewer, larger warehouses. The efficiency gain from such restructuring is a recurrent theme in the management literature. Thus, in a recent presentation on the benefits of re-engineering the supply chain by one of the UK's leading logistics consultants, six of the seven case studies include some kind of consolidation, into new regional or European distribution centres. Expert comment on European distribution in suggests that the centralisation trend will continue for the foreseeable future, as operators take advantage of economies of scale and transport remains comparatively cheap and congestion manageable .

A6.5 Rail Linked Distribution Centres

Bringing together distribution warehousing and rail terminal facilities at the same site can be achieved in two ways. Firstly, warehousing can be located on the same site as an intermodal terminal (intermodal freight being goods moved in some form of large 'box', such as a maritime container, which can be moved by different modes of transport – water borne vessels, road and rail freight. Transfer between rail and other modes occurs at an

intermodal terminal). Goods arriving in an intermodal unit (e.g. container) at the intermodal terminal by rail are transferred to the NDCs/RDCs on the same site via internal road shunts. By avoiding the need to use the public highway the road-rail transfer costs are significantly lower, as non drivers and licensed yard-tractors operating on low duty 'red diesel' can undertake the movement. Also there is no requirement to build in any 'buffer time' for congestion to ensure JIT time slots are made, which further adds to costs, as the goods are already on site.

Secondly, NDCs/RDCs can be directly rail linked through the provision of a siding along one side of a warehouse. This type of rail connectivity relies on the use of conventional box wagons. Box wagons are shunted into the warehouse siding, and the goods then transferred directly from the wagons to storage by forklift truck equipment, again avoiding the need for a local road haul. The provision of a rail link by means of an intermodal terminal option, however, is by far the more important form of rail connectivity that is demanded by the market. This is driven by two main factors: operational flexibility and the growth of imports.

Operational Flexibility

Conventional box wagon rail services have three main disadvantages. Firstly, they require dedicated rail connected facilities at both ends of the journey, consequently they are operationally inflexible. Secondly, the operator is unlikely to find backloads and the wagons are usually repositioned empty back to the shipper. The shipper therefore has to pay for a round trip, with the return leg of the journey being empty. Thirdly, to operate box wagons economically, they need to be run in full train lengths. As a result, they are only suitable when large volumes need to be moved between two rail connected warehouses. Generally, general cargo/FMCG related supply chains are based around despatching and receiving smaller but more frequent shipments. Consequently the use of box wagons is fairly niche in nature, and in the retail sector suitable cargoes are essentially limited to 'bulky' commodities moved in large quantities, such as bottled mineral water or white goods.

These disadvantages are overcome with intermodal rail freight. It allows non rail connected shippers to utilise rail freight as a transport mode for undertaking long distance overland trunk hauls. Initial collection and/or final delivery can be undertaken by road transport. When a sea leg is part of the overall journey, intermodal units can be transferred quickly and efficiently between train and ship. As intermodal units are designed for general cargo, the transport operator has the ability to reposition the empty intermodal unit after delivery and seek a return load. Consequently the shipper has to pay one way only and utilisation is significantly better than conventional rail freight. In addition, many intermodal train services

are run on a liner basis, whereby shippers book individual slots on the train rather than contracting a full train. This means that intermodal is generally more suited to the small frequent shipments associated with retail supply chains. The afore mentioned train services contracted by Tesco and Asda are intermodal rather than box wagons.

Growing Imports

As mentioned in the main report, goods held and re-distributed from both NDCs and RDCs are increasingly being sourced from international markets. The growing level of international trade is due to globalisation, the EU single market and the relocation/concentration of manufacturing activity to cost efficient production areas. This trend is likely to continue as a result of the eastward expansion of the EU and as trade barriers are further removed. Official statistics show that deep sea maritime container imports through GB ports grew from 1.4 million units in 1994 to 2.4 million units in 2004, a total growth of 69%, and a mean year to year growth rate of 5.1%. Roll on-roll off imports to Britain from mainland Europe grew from 1.8 million trailers in 1994 to 2.4 million trailers in 2004. However over the same period of time, domestic manufacturing output has only grown by 4%, a mean year to year growth rate of 0.4%. The clear conclusion to be drawn is that increasing retail sales (mean growth rate of over 5% in the non food sector) are being fed by imports, particularly imports from the Far East. Therefore an increasing proportion of a retailer's product lines are arriving at a port in some form of unit load, particularly maritime containers i.e. intermodal. Further evidence is provided by the rail freight forecasts undertaken for this report (see Section 4.4) which estimates that intermodal (containers) will by far form the largest part of future rail freight growth in the region up to 2014.

Recent logistics sites developments further illustrate the importance of intermodal terminal facilities. At ProLogis Park in Coventry, direct rail linkage to the warehouses has been made available, but only for conventional box wagon traffics. However no train services currently operate to/from the site. Rail alignments were reserved to the distribution centres at Corby Eurohub (e.g. Wincanton), however rail links have to date not been installed. This situation contrasts with both Daventry and Hams Hall, where intermodal terminals have been built on the same site as distribution warehousing. Daventry now receives 9 trains per day and Hams Hall is reaching 6 trains per day. Hams Hall has recently announced capacity expansion. Clearly, intermodal terminals are essential to attract rail volumes to a site.

Consequently, the type of rail linked distribution facilities the logistics market will require over the medium to long term will be those which include NDCs/RDCs and intermodal terminal facilities on the same site. However logistics sites which also provide the means whereby

individual buildings can be rail linked for conventional wagons if the occupier requires this service will gain additional advantages.

A6.6 Railway Loading Gauge, Capacity and Operational Flexibility

A6.6.1 Network Rail Loading Gauges

The physical definition of the maximum height and width in cross section of a railway line is called its *loading gauge*. The size of the loading gauge of a particular section of track will determine the size of rail freight wagon (or combination of intermodal platform wagon plus intermodal unit) that can be conveyed on that section of line. The size of the loading gauge is determined by lineside features such as overbridges, tunnels, overhead power lines, signal gantries and platform edges. The physical dimensions of a rail freight wagon or intermodal wagon/intermodal unit combination must be within the loading gauge profile to ensure that it will not collide with any of these lineside features. Obviously the higher the bridges and tunnels etc. the larger the freight wagon that can be conveyed.

There are six different sizes of loading gauge on the British railway network. These are listed below (from smallest to most generous) together with the dimensions of each loading gauge profile in terms of above rail height at the top left and right corners and width at station platform level.

- W6 gauge (smallest) – above rail height 3.40m, width 2.50m
- W7 gauge – above rail height 3.47m, width 2.50m
- W8 gauge – above rail height 3.62m, width 2.50m
- W9 gauge – above rail height 3.72m, width 2.60m
- W10 gauge – above rail height 3.90m, width 2.50m
- W12 gauge (largest and not yet available) – height 3.90m, width 2.60m

Intermodal Unit Dimensions

In general there four common types of intermodal unit. These are:

- *ISO maritime containers*: the standard intermodal unit developed in the 1960s by shipping lines – height 2.59m (8'6"), width 2.44m (8') and length 12.19m (40') and 6.10m (20')
- *ISO 'high cube' containers*: the additional height over a standard container provides a greater loading capacity. The deep sea shipping lines are progressively replacing standard containers with high cubes containers. Consequently they are likely to

dominate deep sea container shipping in the near future – height 2.90m (9'6"), width 2.44m (8') and length 12.19m (40')

- *Swap Bodies*: a variety of sizes but the most common being the 'Channel Tunnel' swap body – height 2.77m, width 2.55m and length 13.6m
- *'Piggyback' trailers*: a variety of sizes, the most common being a standard semi-trailer used in road transport operation – height 4.00m, width 2.5m (2.6 reefer) and length 13.6m

Intermodal Platform Wagons Used on Network Rail

The main types of intermodal platform wagons used on the British network are shown in the table below. The 'Freightliner' platform wagon (deck height of 0.98m) is the most common type in use on the network today and the company has recently expanded its fleet. GBRf has also recently purchased a fleet of platform wagons with a similar deck height. Both Megafret and Multifret wagons, a standard European wagon design, are also in general use with EWS and GBRf. Freightliner, Multifret and Megafret wagons can together be considered 'standard intermodal wagons'. The Lowliner and 'Well' wagons are specially designed wagons with a lower deck height so that they can convey 2.90m (9'6") high cube containers on W8 cleared routes. However they are available in fewer numbers compared to the other wagons.

Wagon Type	Deck Height	Capacity	Comment
Freightliner	980mm	3 TEU i.e. 1x40ft + 1x20ft or 3x20ft	Standard British platform that can operate on the British network only i.e. not through the Channel Tunnel
Multifret	945mm	4 TEU i.e. 2x40ft or 4x20ft 2 x 13.6m swap body	Standard European platform that can operate in Britain and through the Channel Tunnel
Megafret	825mm	4 TEU i.e. 2x40ft or 4x20ft 2 x 13.6m swap body	Standard European platform that can operate in Britain and through the Channel Tunnel
Lowliner	720mm	2 TEU i.e. 1x40ft	Low deck height wagon. Can only be used on the British network i.e. not through the Channel Tunnel
'Well' Wagon	712mm	2 TEU i.e. 1x40ft	Low deck height wagon. Can only be used on the British network i.e. not through the Channel Tunnel

For example, a 2.59m tall ISO maritime container on a Freightliner platform wagon of deck height 0.980m would have an overall height of 3.57m, meaning such a combination could be accommodated on a W8 loading gauge or above. A 2.90m tall high cube maritime container on the same wagon (combined height 3.87m) can only be accommodated on a W10/W12 clear route.

Loading Gauge and Intermodal Unit/Platform Wagon Combinations

Two factors will determine whether an intermodal unit/platform wagon combination will 'fit through' a particular loading gauge profile;

- the height and width of the intermodal unit
- the deck height of the platform wagon being used to convey the intermodal unit

Taking into account the dimensions of intermodal units, intermodal platform wagon heights and loading gauge profiles shown above, the table below summarises the loading gauges available on the British network and the intermodal units they can accommodate.

Loading Gauge	Intermodal Units and Wagon Combinations Accommodated
W6	8'6" standard maritime containers on Lowliner or 'Well' wagons only
W7	8'6" standard maritime containers on Megafret, Lowliner or 'Well' wagons only
W8	8'6" standard maritime containers on all wagons 9'6" high cube containers on Lowliner or 'Well' wagons
W9	8'6" standard maritime containers on all wagons 9'6" high cube containers on Megafret, Lowliner or 'Well' wagons Channel Tunnel swap body on Megafret or Multifret wagons
W10	8'6" standard maritime containers on all wagons 9'6" high cube containers on all wagons Channel Tunnel swap body on Megafret or Multifret wagons
W12	8'6" standard maritime containers on all wagons 9'6" high cube containers on all wagons Channel Tunnel swap body on all wagons

The table shows that the only intermodal unit that can be carried within the W6 loading gauge are standard 2.59m/8'6" maritime containers, and only then on the specially designed low deck height 'Lowliner' or ‘well’ wagons. Swap bodies and 2.90m/9’6” high cube containers cannot be conveyed at this gauge. This is particularly important as high cube containers are increasing in popularity, and are likely to become the dominant size unit over the next decade.

Operating experience to date suggests that there are a number of issues regarding 'Lowliner' and ‘well’ wagons in terms of:

- Reliability – small wheels have been employed to lower the deck height. This has resulted on poor reliability
- Cost – their poor reliability has resulted in high maintenance cost. Their reduced carrying capacity compared to other wagons e.g. 2 TEU compared to 3 TEU on a Freightliner wagon despite the fact that the wagon is at least as long. This one third reduction in capacity further raises operating costs per unit.
- Availability – all the Lowliner Wagons are on a long term lease to Freightliner, and therefore not available to other intermodal operators
- Operating flexibility – in the case of the 'Well' wagon, units can only be ‘top lifted’, which restricts the wagon to ISO maritime containers only. They are also restricted to the British network and not certificated to operate through the Channel Tunnel to mainland Europe. This means that they cannot be used for international intermodal operations.

In comparison, Freightliner, Megafret and Multifret wagons are more reliable, have lower lease and operating costs, are available in large numbers and have larger carrying capacities, resulting in much lower operating costs. Consequently low deck height wagons not the 'wagon of choice' of intermodal operators. The cost implications of the 'Lowliner' and ‘well’ wagons means they cannot be considered economic for large traffic volumes (i.e. conveying a full range of intermodal units) which are anticipated on major corridors such as the Scotland – North West – Midlands – South East axis.

In terms of rail connectivity therefore, the **W8 loading gauge** is effectively the minimum gauge which should be considered for rail linked sites. Terminals or sites with access to a W8 loading gauge are able to handle standard maritime containers (2.59m/8'6") on standard platform wagons (i.e. Freightliner, Multifret and Megafret wagons), albeit supplemented by the use of low level wagons for some intermodal units (2.9m/9’6” containers).

However, the information provided above clearly shows that the **W9 loading gauge** is the minimum gauge which can accommodate the full range of intermodal units on standard platform wagons (2.9m/9'6" containers on Megafret wagons), and without the need to use the cost inefficient or operationally inflexible low deck height wagons in large numbers. The **W10/W12 loading gauges** can accommodate the full range of units on all standard platform wagons with a deck height up to 1.0m i.e. Freightliner, Multifret and Megafret wagons. An appropriate site is therefore one where the adjoining railway lines and the approach routes are gauge cleared to at least **W9,** and preferably to **W10 and W12** (or lines earmarked for

enhancement to W10/W12). It is around such sites that rail freight operators will develop their own service strategies, and property developers will wish to develop rail linked distribution parks.

Map 3 in Appendix 1 (Source: Network Rail Route Directory) shows the loading gauge of the East Midlands railway network. The map shows that the only route in the East Midlands currently gauge cleared to W10 is the West Coast Mainline (WCML). The East Coast Mainline is cleared to W9, though freight path capacity on this route is currently in short supply. Significant sections of the network are cleared to W8, including the Birmingham to Derby line and the MML north of Derby. However, a number of other routes are cleared only to W6 and W6, including the Peterborough-Nuneaton line.

Network Rail published in September 2006 the Freight Route Utilisation Strategy (Freight RUS) as a draft for consultation. The document recommends a loading gauge and capacity upgrade of the Peterborough-Leicester-Nuneaton line, with implementation by 2014/2015. The route would be cleared to W10 standard and new signalling installed to increase the existing capacity. The total scheme would cost around £133.3 million. A business case is currently being developed to support a Transport Innovation Fund grant application. The scheme is being developed primarily to generate extra capacity to accommodate forecast freight growth and additional passenger train paths into London (Crossrail). However, a 'spin-off' of the scheme will be to render significant parts of the East Midlands suitable for rail connected logistics developments.

A6.6.2 Available Capacity

Route capacity is a key issue, particularly where passenger train growth could potentially squeeze out surplus capacity which could be utilised by freight. The WCML Strategy and the Route Utilisation Strategies (RUSs) have attempted to address the issue of capacity. Clearly there has to be sufficient train path capacity available so that freight train service providers can operate trains to serve rail freight terminals. This includes available capacity on the final access from the mainline into the terminal (and vice versa) and the approach routes utilised from the main trunk rail routes. Clearly commercially attractive sites will be those which are able to provide sufficient freight train path capacity. The availability of at least one freight path per off-peak hour per direction would be regarded as offering sufficient freight train path capacity.

A6.6.3 Railway Operational Flexibility

Train operations to/from a rail freight terminal ideally should be direct in all directions, both in terms of the final access from the mainline into the terminal (and vice versa) and the approach routes utilised from the main trunk rail routes, such as the WCML. Similar to some motorway interchanges, access between different railway lines at junctions can be restricted to certain directions due to the layout/alignment of the tracks together with the number/type of crossovers and chords installed at the junction. If direct access is not possible, it results in freight trains having to pass a junction and then change direction (by means of a locomotive 'run round') so that they can enter the junction in the right direction. Alternatively a train could take a long diversionary or circuitous route so that the junction is approached in the right direction. These add both time and costs to a rail freight service and, in addition there are also capacity issues if a main line has to be used for a locomotive run round. Those sites able to offer direct rail access, without the need to reverse or use a circuitous route will gain competitive advantages compared to other sites.

A6.7 Rail Connectivity and Site Size Issues

Table 41: Floor Space and Volume Throughput Relationships at NDCs

Pallets per sq m	1.0
Tonnes per pallet	0.6
Annual stock turns NDC	12
Annual stock turns RDC	26
Inbound by rail NDC	50%
Outbound by rail NDC	25%
Floor space % of footprint	40%
Pallets per unit load	22
Units per train	30
Operating days pa	250

Table 42: Site Size and Number of Train Services

Site 1		**Site 2**	
Hectares	10	Hectares	50
NDC - sq m	***40,000***	***NDC - sq m***	***200,000***
Pallet capacity	40,000	Pallet capacity	200,000
Pallet throughput pa	480,000	Pallet throughput pa	2,400,000
Unit loads inbound pa	21,818	Unit loads inbound pa	109,091
Unit loads outbound pa	21,818	Unit loads outbound pa	109,091
Unit loads inbound road	10,909	Unit loads inbound road	54,545
Unit loads outbound road	16,364	Unit loads outbound road	81,818
Unit loads inbound rail	10,909	Unit loads inbound rail	54,545
Unit loads outbound rail	5,455	Unit loads outbound rail	27,273
Trains inward per day	1.5	Trains inward per day	7.3
Trains outward per day	0.7	Trains outward per day	3.6

APPENDIX 7
ASSESSMENT OF SUB-REGIONAL AREAS

APPENDIX 7: ASSESSMENT OF SUB-REGIONAL AREAS

Broad Sub-Region	Criteria 1: Market Demand and Central Location to Markets	Criteria 2: Good Quality Rail Access	Criteria 3: Good Quality Road Access	Criteria 4: Access to Labour
1. High Peak/Derbyshire Dales	Peripheral location – more than 4.5 hours drivetime from deep sea container ports and RDCs in other regions. Low market demand. ***Overall assessment: Does not meet criteria***	Sub-region is served by the Matlock-Derby line (connects with MML at Ambergate). • *Loading gauge*: Inadequate loading gauge (W6) • *Capacity:* Sufficient freight capacity ***Overall assessment: Poor quality rail access***	Poor standard of highway network serving the sub-region, mainly single carriageway rural routes (poor alignment, slow vehicle speeds). Main highway links are: • A6 • A52 • A623 ***Overall assessment: Poor quality road access***	***Overall assessment: Poor access to labour***
2. Chesterfield/NE Derbyshire	Peripheral location – more than 4.5 hours drivetime from deep sea container ports and RDCs in other regions. Low market demand. ***Overall assessment: Does not meet criteria***	Sub-region is served by the MML (connects with routes to Birmingham/south coast at Derby and Trent Jct). • *Loading gauge*: Reasonable loading gauge (W8) • *Capacity:* Sufficient freight capacity ***Overall assessment: Moderate quality rail access***	Good network of motorways and dual carriageways serving the sub-region, of which the main highway links are: • M1 • A617 ***Overall assessment: Good quality road access***	***Overall assessment: Good access to labour***

Broad Sub-Region	Criteria 1: Market Demand and Central Location to Markets	Criteria 2: Good Quality Rail Access	Criteria 3: Good Quality Road Access	Criteria 4: Access to Labour
3. North Nottinghamshire	Peripheral location – more than 4.5 hours drivetime from deep sea container ports and RDCs in other regions. Moderate market demand. ***Overall assessment: Does not meet criteria***	Sub-region is served by the ECML and various branch lines serving former coalfield areas. • *Loading gauge*: Generous loading gauge on ECML (W9) but inadequate loading gauge on other routes (W6) • *Capacity*: Insufficient freight capacity on ECML ***Overall assessment: Poor quality rail access***	Moderate-good highway network serving the sub-region, of which the main highway links are: • A1 • A57 • A46 ***Overall assessment: Moderate-good quality road access***	***Overall assessment: Good access to labour***
4. North West Lincolnshire	Peripheral location – more than 4.5 hours drivetime from deep sea container ports and RDCs in other regions. Low market demand. ***Overall assessment: Does not meet criteria***	Sub-region is served by the Gainsborough-Lincoln-Newark line (connects with ECML at Newark). • *Loading Gauge:* Reasonable loading gauge(W8) • *Capacity:* Insufficient freight capacity (on ECML) ***Overall assessment: Poor quality rail access***	Poor standard of highway network serving the sub-region, mainly single carriageway rural routes (poor alignment, slow vehicle speeds). Main highway links are: • A15 • A57 • A631 ***Overall assessment: Poor quality road access***	***Overall assessment: Poor access to labour***

Broad Sub-Region	Criteria 1: Market Demand and Central Location to Markets	Criteria 2: Good Quality Rail Access	Criteria 3: Good Quality Road Access	Criteria 4: Access to Labour
5. North East Lincolnshire	Peripheral location – more than 4.5 hours drivetime from deep sea container ports and RDCs in other regions. Low market demand. ***Overall assessment: Does not meet criteria***	Sub-region is served by the Skegness-Boston-Nottingham line (connects with ECML at Grantham). • *Loading gauge*: Insufficient loading gauge (W6) • *Capacity:* Insufficient freight capacity (on ECML) ***Overall assessment: Poor quality rail access***	Poor standard of highway network serving the sub-region, mainly single carriageway rural routes (poor alignment, slow vehicle speeds). Main highway links are: • A16 • A518 ***Overall assessment: Poor quality road access***	***Overall assessment: Poor access to labour***
6. Amber Valley/West Nottinghamshire	Central location – less than 4.5 hours drivetime from deep sea container ports and RDCs in other regions. Market demand. ***Overall assessment: Meets criteria***	Sub-region is served by the MML (connects with routes to Birmingham/south coast at Derby and Trent Jct). • *Loading gauge*: Reasonable loading gauge north of Trent Jct/Derby and routes to Birmingham (W8) • *Capacity:* Sufficient freight capacity ***Overall assessment: Moderate quality rail access***	Good network of motorways and dual carriageways serving the sub-region, of which the main highway links are: • M1 • A38 ***Overall assessment: Good quality road access***	***Overall assessment: Good access to labour***

Broad Sub-Region	Criteria 1: Market Demand and Central Location to Markets	Criteria 2: Good Quality Rail Access	Criteria 3: Good Quality Road Access	Criteria 4: Access to Labour
7. Nottingham & South Nottinghamshire	Central location – less than 4.5 hours drivetime from deep sea container ports and RDCs in other regions. Market demand. ***Overall assessment: Meets criteria***	Sub-region is served by the MML and Derby-Nottingham-Grantham line (connects with ECML at Grantham). • *Loading gauge*: Reasonable loading gauge on Derby-Nottingham-Grantham line (W8) • *Capacity:* Sufficient freight capacity (except on ECML) ***Overall assessment: Moderate quality rail access***	Good network of motorways and dual carriageways serving the sub-region, of which the main highway links are: • M1 • A52 • A45 • A43 ***Overall assessment: Good quality road access***	***Overall assessment: Good access to labour***
8. South Lincolnshire	Peripheral location – more than 4.5 hours drivetime from deep sea container ports and RDCs in other regions. Low market demand. **Overall assessment: Does not meet criteria**	Sub-region is served by the ECML, Peterborough-Spalding and Grantham-Boston lines. • *Loading gauge*: Generous loading gauge on ECML (W9), reasonable on other routes (W8) • *Capacity:* Insufficient freight capacity on ECML ***Overall assessment: Poor quality rail access***	Poor standard of highway network serving the sub-region, mainly single carriageway rural routes (poor alignment, slow vehicle speeds). Main highway links are: • A15 • A52 ***Overall assessment: Poor quality road access***	***Overall assessment: Poor access to labour***

Broad Sub-Region	Criteria 1: Market Demand and Central Location to Markets	Criteria 2: Good Quality Rail Access	Criteria 3: Good Quality Road Access	Criteria 4: Access to Labour
9. South Derbyshire	Central location – less than 4.5 hours drivetime from deep sea container ports and RDCs in other regions. Market demand. ***Overall assessment: Meets criteria***	Sub-region is served by the MML and Derby & Birmingham line. • *Loading gauge*: Reasonable loading gauge on Derby-Birmingham line (W8) • *Capacity:* Sufficient freight capacity ***Overall assessment: Moderate quality rail access***	Good network of motorways and dual carriageways serving the sub-region, of which the main highway links are: • M1 • A50 • A38 ***Overall assessment: Good quality road access***	***Overall assessment: Good access to labour***
10. North Leicestershire	Central location – less than 4.5 hours drivetime from deep sea container ports and RDCs in other regions. Market demand. ***Overall assessment: Meets criteria***	Sub-region is served by the MML. • *Loading gauge*: Inadequate loading gauge (W7) • *Capacity:* Sufficient freight capacity ***Overall assessment: Poor quality rail access*** (If the proposed upgrade of Nuneaton-Leicester-Peterborough route to W10 proceeds, sub-region could have good quality rail access if upgrade was extended north of Syston)	Good network of motorways and dual carriageways serving the sub-region, of which the main highway links are: • M1 • A50 • A42 • A46 ***Overall assessment: Good quality road access***	***Overall assessment: Good access to labour***

Broad Sub-Region	Criteria 1: Market Demand and Central Location to Markets	Criteria 2: Good Quality Rail Access	Criteria 3: Good Quality Road Access	Criteria 4: Access to Labour
11. Melton/Rutland	Central location – less than 4.5 hours drivetime from deep sea container ports and RDCs in other regions. Low Market demand. ***Overall assessment: Does not meet criteria***	Sub-region is served by the Nuneaton-Leicester-Peterborough line. • *Loading gauge*: Inadequate loading gauge (W7) • *Capacity:* Sufficient freight capacity ***Overall assessment: Poor quality rail access*** (If the proposed upgrade of Nuneaton-Leicester-Peterborough route to W10 proceeds, sub-region would have good quality rail access)	Poor standard of highway network serving the sub-region, mainly single carriageway rural routes (poor alignment, slow vehicle speeds). Main highway links are: • A607 • A606 ***Overall assessment: Poor quality road access***	***Overall assessment: Moderate access to labour***
12. South Leicestershire	Central location – less than 4.5 hours drivetime from deep sea container ports and RDCs in other regions. Strong market demand. ***Overall assessment: Meets criteria***	Sub-region is served by the MML and Nuneaton-Leicester-Peterborough line. • *Loading gauge*: Inadequate loading gauge (W7) ***Overall assessment: Poor quality rail access*** (If the proposed upgrade of Nuneaton-Leicester-Peterborough route to W10 proceeds, sub-region would have good quality rail access)	Good network of motorways and dual carriageways serving the sub-region, of which the main highway links are: • M1 • M69 (to M6) • A5 ***Overall assessment: Good quality road access***	***Overall assessment: Good access to labour***

Broad Sub-Region	Criteria 1: Market Demand and Central Location to Markets	Criteria 2: Good Quality Rail Access	Criteria 3: Good Quality Road Access	Criteria 4: Access to Labour
13. North East Northants	Central location – less than 4.5 hours drivetime from deep sea container ports and RDCs in other regions. Strong market demand. ***Overall assessment: Meets criteria***	Sub-region is served by the MML and Corby branch line. • *Loading gauge*: Inadequate loading gauge (W7) • *Capacity:* Sufficient freight capacity ***Overall assessment: Poor quality rail access*** (If the proposed upgrade of Nuneaton-Leicester-Peterborough route to W10 proceeds, Corby part of sub-region would have good quality rail access)	Good network of motorways and dual carriageways serving the sub-region, of which the main highway links are: • A14 • A45 ***Overall assessment: Good quality road access***	***Overall assessment: Good access to labour***
14. South West Northants	Central location – less than 4.5 hours drivetime from deep sea container ports and RDCs in other regions. Strong market demand. ***Overall assessment: Meets criteria***	Sub-region is served by the WCML. • *Loading gauge*: Generous loading gauge (W10) • *Capacity:* Sufficient freight capacity • Direct links to deep sea ports and other regions ***Overall assessment: Good quality rail access***	Good network of motorways and dual carriageways serving the sub-region, of which the main highway links are: • M1 • A14 • A45 • A43 ***Overall assessment: Good quality road access***	***Overall assessment: Good access to labour***