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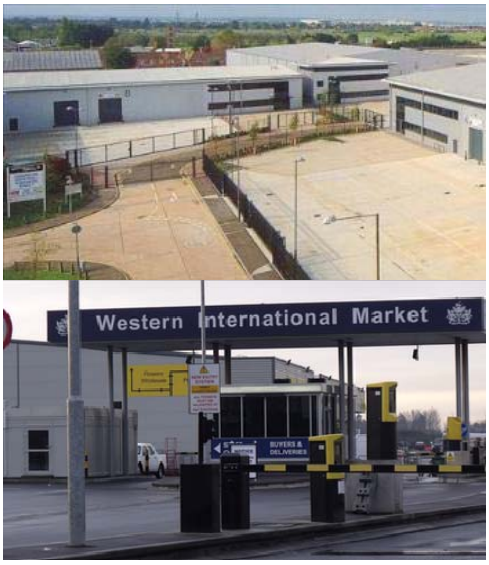
Greater London Authority

Industrial Land Demand and Release Benchmarks in London



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APPENDIX

1 INTRODUCTION

1.1 The Industrial Land Demand and Release Benchmarks Study assesses future demand for industrial land across London and compares it with the current and planned supply. The aim of the study is to provide evidence to inform London-wide and local planning policy in order to ensure that London has the right quantity and quality of industrial land to support its economy and its population while using the land efficiently. Where there is evidence of an over-supply, the study estimates how much land may be released to other uses and makes recommendations for the management of surplus capacity.

1.2 The Industrial Land Demand and Release Benchmarks studies have long been a key component of the evidence base for the London Plan. A first study was published in 2004[1] and a second one in 2007[2]. So far, the analysis has always concluded that there was going to be an over-supply of industrial land and that some could therefore be released to other uses. Each study allocated a release benchmark to London's sub-regions and occasionally boroughs to specify the quantity of land they might release over the plan period.

Why is a new study needed?

1.3 Since 2007, significant changes have occurred to the economic and policy context which call for a review of the baseline data and analysis. The recession has affected market demand and sectoral performance; the Olympic Park has transformed a large area of London traditionally used by industry; the nature of occupiers of industrial land keeps evolving beyond traditional manufacturing and warehousing activities; a new Mayor was elected and as a consequence the London Plan has been replaced. In addition, existing trends have continued to put pressure on industrial and warehousing land in the capital, in particular the pressure from higher value uses such as housing and offices. In view of these various changes, the question of industrial land management, release or protection in London is more relevant and challenging than ever.

1.4 As well as updating the underlying data, this report aims to build upon and improve what has been done before in order to best inform planning policy in London. It is critical to get the analysis right as the 2011 Industrial Land Demand and Release Benchmarks study (hereafter referred to as 'The Industrial Land Demand study') is a key component of the evidence base underpinning the new London Plan, its Implementation Framework and associated Supplementary Planning Guidance. As such it will also contribute to the strategic framework with which London boroughs' Local Development Frameworks must align.

Scope of the study

1.5 The underlying question this study aims to answer is: how much land should London continue to protect for industrial uses? This question is pertinent as pressure from other,

[1] Roger Tym & Partners, Industrial and Warehousing Land Demand, 2004

[2] Mayor of London, London Industrial Land and Release Benchmarks, April 2007

higher value, uses is unrelenting and could suggest that industrial land is not the most efficient use of space in London.

1.6 Assuming that, as in past studies, we find that there is indeed scope to release some industrial land, we must quantify how much, where it should be, and how the planning system can best support this process without hindering economic competitiveness.

1.7 In order to answer these questions, we:

- Analyse the short, medium and long term demand and supply dynamics for industrial and related uses in London including logistics, waste and recycling, utilities, transport functions, renewable energy generation and wholesale markets.
- Draw upon the published 2010 industrial land baseline mapping study[3] for London and incorporate information about the pipeline from the London Employment Sites Database[4].
- Update the indicators and benchmarks of industrial land release to other uses.
- Produce quantified benchmarks for industrial land release in hectares for each borough.
- Make policy recommendations on how to protect industrial land or manage its release to other uses.

1.8 Our answers and recommendations are based on a combination of: literature and policy review; property market and economic data analysis; employment forecasts; and a workshop with industrial and warehousing occupiers and investors of large scale premises in London.

Report structure

1.9 The report structure is as follows:

- Chapter 2 reviews the current and emerging policy context and explores how the benchmarks influence local authorities' planning decisions.
- Chapter 3 describes the stock of industrial land in London and the different categories of users, as set out in the 2010 Industrial Land Baseline study.
- Chapter 4 focuses on general and light industry (including manufacturing) occupiers, how they have changed over the last few years and their role in London's economy as well as future requirements.
- Chapter 5 looks at the same issues for warehousing (including logistics and storage)
- Chapters 6 presents property market intelligence for industrial and warehousing activity
- Chapters 7, 8, 9 and 10 analyse the requirements for non-industrial activities including utilities, transport, waste and recycling, and wholesale markets.
- Chapter 11 combines the findings of the previous chapters in order to produce the release benchmarks.

[3] URS, London's Industrial Land Baseline, November 2010

[4] London Employment Sites Database complied by Roger Tym & Partners for GLA/TfL/LDA

- Chapter 12 summarises our key findings and provides policy recommendations to implement the benchmarks.

2 POLICY CONTEXT

2.1 In this chapter we set the national and London policy context relevant to the provision of industrial land. We review Planning Policy Statement (PPS) 4, relating to Planning for Sustainable Economic Growth, and PPS3 on Housing, and follow with the London Plan (2011) and the existing Industrial Capacity Supplementary Planning Guidance.

2.2 However, prior to this we undertake a brief review of the case for the protection of industrial land in London. Considering the limited amount of land available and the competition from higher value uses, it is timely to consider the role and value of industrial land occupiers to the London economy and why they should be protected by the planning system.

2.3 At the end of the chapter we explore the link between the release benchmarks agreed for policy purposes and their implementation by the boroughs. The 2010 supply baseline shows that land losses have been significantly higher than the benchmark for the 2006-2010 period set out in the 2007 study. If this new study and the related Industrial Capacity SPG update are to be effective, we need to understand why benchmarks have not translated into reality so far. In order to do this we investigate how development control operates and what constraints there may be to translating strategic policy advice such as the benchmarks into local planning decisions.

2.4 We conclude with a summary of the implications for this study.

Why should planning policy protect industrial land in London?

The roles of industrial land occupiers in London

2.5 As we demonstrate in this report, there is a wide range of occupiers of industrial land in London. They can be grouped into three broad categories, based on their function in the wider economy:

- Activities which belong to the supply chain of products and services provided to London's residents and businesses. These include the manufacture and delivery of food products to catering and hospitality businesses; building trades and construction materials; repair and renting services of machinery and equipments; printing and office services such as cleaning or security. It also includes all the logistics activities related to the operation of these sectors and the delivery of their products to clients.
- Activities which are part of the strategic infrastructure of London and is a critical part of the operation of the economy i.e. waste, utilities and transport. These occupiers while not 'industrial' in the traditional sense tend to locate on industrial land for a number of reasons combining: the amount of space available, the affordability, not being close to residential neighbours, transport access.
- Some retail activities which sell directly to consumers such as car show rooms, retail stores and consumer services such as plumbers and other trades.

2.6 Sectors which contribute to London's supply chain tend to be located in London to be close to their customer and enable fast, sometimes same-day, delivery. This is particularly true with food delivery to catering businesses but also, increasingly, as part of e-commerce

developed by large retail store. It also applies in office services such as printing and office equipment repair.

2.7 Waste and utilities is in London not only because that is where customers are but also because of the growing low-carbon agenda which encourages self-sufficiency and local production of energy. Transport is key to London's operation on many levels and while some larger sites may be located outside London, others must be in the city.

2.8 Finally, there are questions about retail activities located on industrial parks. While they reflect similar needs in terms of road access and space, they tend to be higher value and may be able to afford premises on non-industrial land. This is may be more the result of a constrained supply.

2.9 Some of these activities will continue to move out of London and may not be necessary to the operation of London's economy but for others, there may be costs to the wider society and to consumers in terms of price of and access to goods and services, if they have to be provided from outside London. This is an area which has not been explored in great depth but would be valuable to better draw the lines between where a more liberal planning system is useful and where it might have negative longer term impacts.

Why planning policy may protect industrial land

2.10 Because there are different types of users, the role of planning policy may change as well. It may make sense to protect some uses and not others and for different reasons as well.

Policy Objectives

2.11 Planning policy exists to ensure wider policy objectives are not subsumed by unregulated activity and that an appropriate balance of housing, employment, amenity land uses are achieved to deliver the desired quality of life. There is no explicit national guidance on how much of what type of activity should be provided in industrial land use designation. The amount needed is the amount necessary to deliver the London Plan policy objectives consistent with other land uses.

2.12 Industrial land use designations exist to ensure that viable industrial activity is not 'crowded out' by other uses. In assessing the amount of industrial land to be retained we should consider market signals within land uses but not necessarily between land uses.

Economic Efficiency

2.13 The traditional theory for public sector intervention in the economy resides in market failure. Briefly summarised, it holds that the market, when left to its own devices, maximises economic efficiency and hence the economy's total output (GDP, economic well-being, economic growth etc).But this is only true in a theoretical world in which markets work perfectly. In real life, there are market imperfections, or *market failures* – which mean that the market will not maximise total output, unless the failures are corrected by government / planning authorities.

2.14 The forms of market failure that are most obvious with regard to industrial land provision are co-ordination market failures and externalities – both positive and negative.

- **Co-ordination Market Failures** - As noted in countless textbooks, one role for land-use planning is to control environmental and amenity impacts, so that smoky factories do not locate next to people's homes for example. In London in particular there are fewer and fewer locations for these kinds of noisy and dirty activities (applies to waste and recycling, utilities, construction). Replacing them with other uses makes it highly unlikely that they will find alternative sites within London.
- **Negative Externalities** - These will include congestion, pollution, health risks and also climate change. What would happen if industrial users moved outside London in terms of CO2 emissions? If goods to be supplied to the London market have to be supplied from further away then there may be additional costs in terms of pollution etc. The question is whether the full social cost of additional trips is factored into land and fuel prices.
- **Positive Externalities** -To illustrate through an often-quoted example, a development of large-scale strategic warehousing may deliver few visible benefits in its immediate locality, if it provides few jobs in relation to land area. But the development may generate substantial benefits: modern logistics lowers distribution costs and improves the supply of goods, so raising the economically sustainable level of output and employment in the economy as a whole. These benefits mostly accrue to people who live a long way from the new warehousing and the link between the new development and the resulting benefits is 'in the price': it operates through market mechanisms but is not visible either to the naked eyes or to planners' analyses.

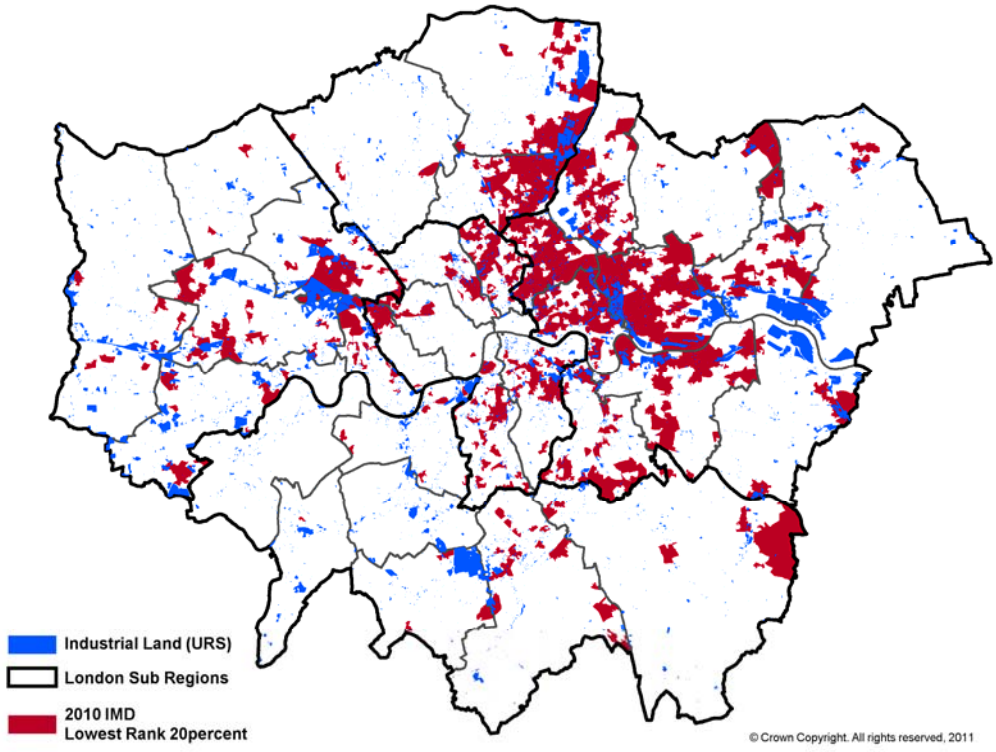
2.15 There is also reason to doubt that current market prices are necessarily going to make the most efficient land use allocations for what might be very long term time horizons of thirty years of more.

Equity objectives

2.16 Even if markets work perfectly and so produce the highest possible wealth in total, there is no reason why they should produce a fair distribution of that wealth, or indeed the costs of generating it. Therefore, besides correcting market failure, a second rationale for government intervention in the economy is to promote social justice, also known as fairness or inclusion. Planning does this, for example, by steering development and jobs to disadvantaged areas.

2.17 There is thus a labour market rationale to achieve equity objectives. There could be a strong rationale for maintaining industrial land if this was providing labour market opportunities to the most disadvantaged workers. The map below demonstrates that there is a close fit between the immediate catchment area of industrial estates and the areas of London experiencing the highest levels of deprivation. Whilst we do not have the information to know where the labour for these industrial sites is drawn from it is a reasonable assumption that in many cases loss of industrial land would disproportionately impact upon the job opportunities of those in the areas of highest deprivation.

Figure 2.1 Location of Industrial Land relative to areas of Deprivation



2.18 For lower skilled workers the wages in sectors occupying industrial land are significantly higher than those in other lower skilled service sectors such as hotels and catering and retail. Economic intervention can be justified to maintain better paid employment opportunities in areas of higher deprivation.

2.19 But in addition to pure economic objectives the London Plan has a range of broader policy objectives which also need to be considered when making land use allocations.

National Policy

PPS4: Planning for Sustainable Economic Growth

2.20 PPS4, Planning for Sustainable Economic Growth, was published in December 2009. It brings together planning for all economic land uses, so as well as the previous PPG 4 relating to Industrial and Commercial development, it also replaces PPS6, relating to town centre uses, and parts of PPS7, relating to economic development in rural areas. The key objective of PPS4 is to ensure that the planning system positively and proactively supports economic development.

2.21 Two of the policies in PPS4 relate to employment land provision. The first is Policy EC1 'Using Evidence to Plan Positively'. The opening paragraph reads in part:

'Regional planning bodies and local planning authorities should work together to prepare and maintain a robust evidence base to understand both existing business needs and likely changes in the market… [They] should ensure that the evidence they gather is proportionate to the scale of the issue.'

2.22 The policy goes on to say that local evidence bases should assess the need for and supply of land for economic development over the plan period. It adds that the assessment should ensure that 'existing site allocations for economic development are reassessed against the policies in this PPS, particularly if they are for single or restricted uses.'

2.23 The second relevant policy is Policy EC2, which sets out requirements for both regional planning bodies and local planning authorities in producing development plans. They are expected to:

- Set criteria for, or identify the general location of, strategic sites;
- Seek to make the most efficient and effective use of land, prioritising previously developed land which is suitable for re-use, reflecting the different location requirements of businesses.
- At a regional level, disaggregate minimum job targets to local authority level.

PPS3: Housing

2.24 With land in London at a premium, industrial land is under pressure from other higher value uses, in particular housing. PPS3 encourages the re-use of previously developed land for housing, and specifically states that local planning authorities should consider 'whether sites that are currently allocated for industrial or commercial use could be more appropriately re-allocated for housing development'.

2.25 This stresses the need to get the balance right between protecting industrial land and ensuring the most efficient use of land for the city as a whole.

The emerging planning agenda

2.26 In March 2011, the Government released its Plan for Growth[5] setting out its strategy to set the UK on the path to recovery and ultimately to sustainable, long-term economic growth. In this document, it states its intention to overhaul the national policy framework in order to embody the pro-growth principles of the Government and to simplify the planning system. The Government will bring forward the new National Planning Policy Framework (NPPF) with the aim of finalising it by the end of 2011.

2.27 For employment land planning in London this emerging policy has two main potential impacts.

2.28 Firstly the new agenda is clear that planners should seek to meet the market demand for land; both employment and housing. Outside of London this maybe a sound principle; ensuring enough new land is released even when local politics may be reluctant to provide new land. But this is more problematic in London as with a finite supply of land it is very unlikely that market demand for both uses can be met. This means that protecting the employment land supply in the future may require a greater understanding of the market demand for land in London and even stronger policies and evidence to justify the retention of industrial land.

[5] HM Treasury and BIS, The Plan for Growth, March 2011

2.29 The second and potentially more concerning policy change is the proposed revision to the Use Class Order to allow units to move between uses without the need for planning permission. The exact details and mechanics of this proposal are still unclear. But any relaxation of planning controls for small units will adversely affect the supply of space most suited to value conscious SMEs. This is because small office and workspace units are likely to be the most viable to turn to residential without any further planning control.

London policy

London Plan[6]

2.30 The London Plan sets out the Mayor's spatial strategy, to which individual boroughs' planning policies are required to broadly conform. The replacement London Plan was published in July 2011.

2.31 The Mayor's vision for London is that:

2.32 'Over the years to 2031, – and beyond, London should excel among global cities – expanding opportunities for all its people and enterprises, achieving the highest environmental standards and quality of life and leading the world in its approach to tackling the urban challenges of the 21st century, particularly that of climate change'.

2.33 In order to achieve this vision, London must be:

- a city that meets the challenges of economic and population growth;
- an internationally competitive and successful city.

2.34 Policy 4.1 sets out the broad economic strategy to deliver these objectives. It states that the Mayor and his partners will 'promote and enable the continued development of a strong, sustainable and increasingly diverse economy across all parts of London, ensuring the availability of sufficient and suitable workspaces in terms of type, size and cost, supporting infrastructure and suitable environments for both larger employers and small and medium sized enterprises'.

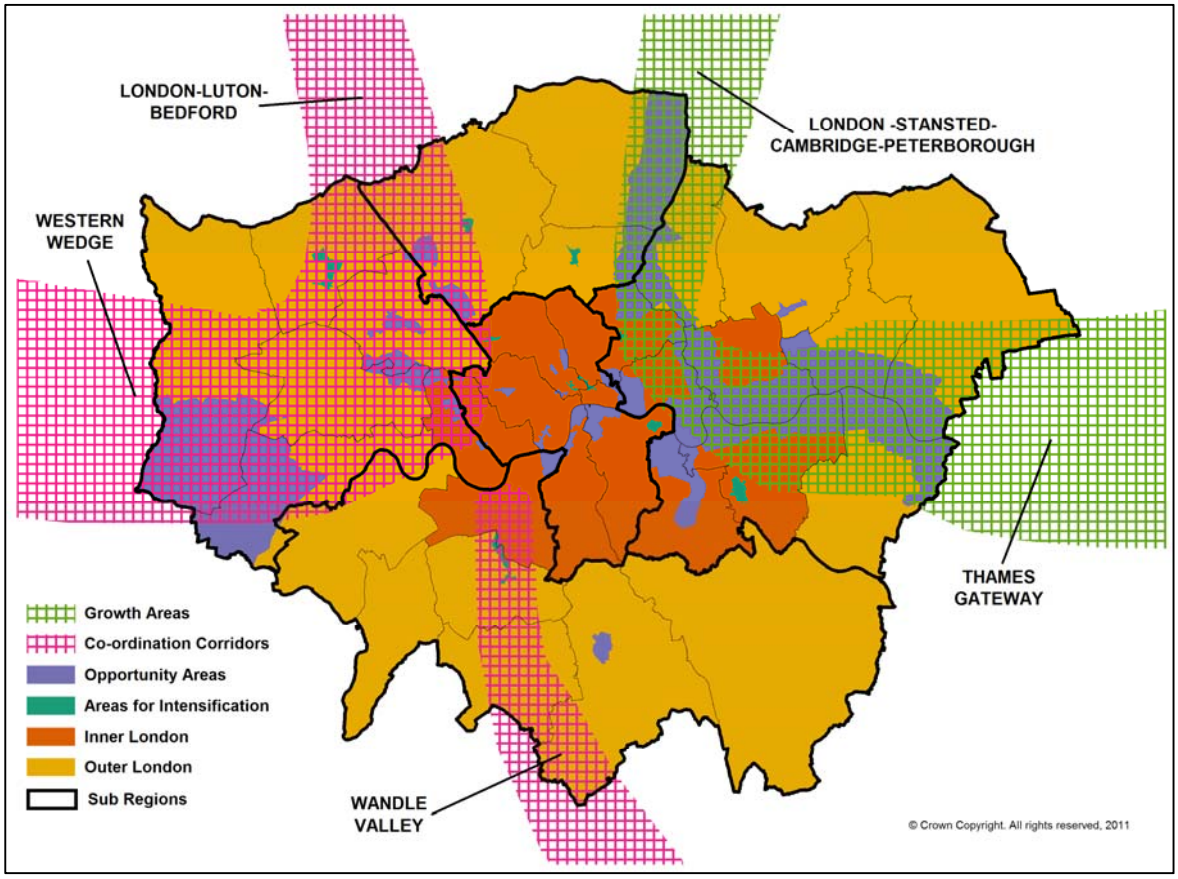
2.35 Policy 4.10 seeks to support new and emerging economic sectors, with the supporting text noting that, 'This Plan's managed approach to provision of offices and industrial type activities will help underpin innovative firms seeking affordable premises, as well as ensuring there is adequate capacity to accommodate innovation among more established businesses'.

London's Spatial Strategy

2.36 The London Plan splits the capital into a number of strategic geographies which this study must take into account and which are illustrated in Figure 2.2 below.

[6] Mayor of London, The London Plan – Spatial Development Strategy for Greater London, July 2011

Figure 2.2 London Plan's spatial strategy



2.37 The London Plan creates five sub-regions (North, East, South, West, and Central) and encourages partnership work at this level (Policy 2.5).

2.38 It also differentiates between Outer London, Inner London and the Central Activity Zone (CAZ) in recognition of their different functions in the metropolitan economy.

2.39 Outer London is more residential than Inner London (it is where 60% of Londoners live) and provides the bulk of the labour force for London. However, there have been concerns that it could be relegated to a 'dormitory' role and the Plan aims to realise the economic potential of Outer London as well as to improve quality of life for its residents.

2.40 Inner London outside the CAZ contains 'what is probably the country's largest concentration of deprived Communities and some of the most challenging environments in London, and places that have experienced remarkable growth and development'. It is an area with considerable constraints to economic growth and prosperity but also with significant opportunities as a result of its proximity to central London.

2.41 The CAZ (including Canary Wharf) is the economic and political heart of London and the UK. It has the largest concentration of global businesses, is the seat of national Government, a prime retail destination and the country's cultural centre.

2.42 The Plan also emphasises the role of Growth Areas and Co-ordination Corridors (Policy 2.3). The Growth Areas, i.e. the Thames Gateway and the London-Stansted-Cambridge-Peterborough corridor, are places with the scope to accommodate new homes and jobs to

cope with the expected population and employment growth in and around London. These broad areas overlap with Opportunity Areas and Intensification Areas which are identified as preferred locations for future growth in housing and employment floorspace (Policy 2.13). Co-ordination Corridors are areas with strong commuting and economic links with London and where a co-ordinated approach is favoured, in particular with regards to transport infrastructure.

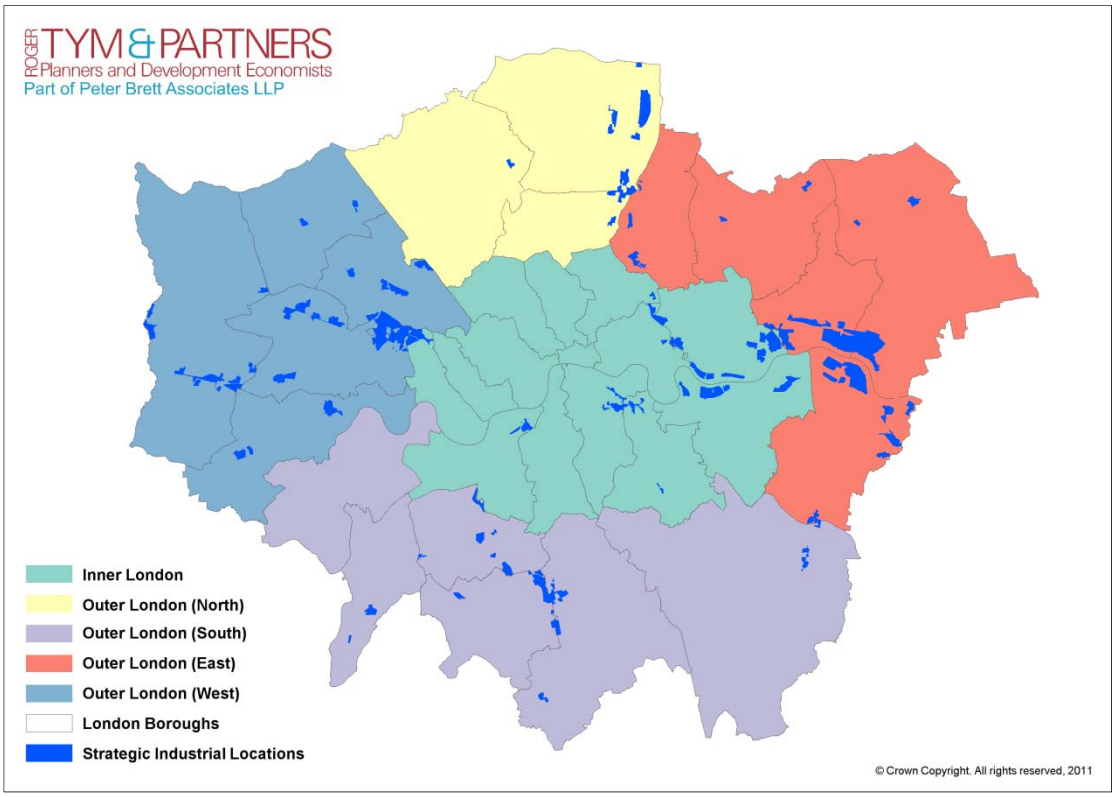
Managing industrial land

2.43 With regards to industrial land and premises, the economic strategy translates into 'a rigorous approach to industrial land management to ensure a sufficient stock of land and premises to meet the future needs of different types of industrial and related uses in different parts of London, including for good quality and affordable space' (Policy 4.4). Boroughs are supposed to plan and manage the stock of industrial land and premises in Strategic Industrial Locations, Locally Significant Industrial Sites and other industrial sites taking into account a range of criteria such as quality, fitness for purpose and accessibility.

2.44 Strategic Industrial Locations (SILs) are London's main reservoir of industrial land comprising approximately 40% of London's total supply. They perform a specific role in London's industrial land supply (see Policy 4.4) by accommodating strategically important logistics, waste management and transport functions as well as meeting other and more local needs including provision of relatively affordable workspace.

2.45 For this reason, the London Plan states that development in SILs for non-industrial or related uses should be resisted other than as part of a strategically coordinated process of consolidation, or where it addresses a need for accommodation for SMEs or new emerging industries, or where it provides local, small scale, 'walk to' services for industrial occupiers (workplace crèches for example), or office space ancillary to industrial use (Policy 2.17).

Figure 2.3 Strategic Industrial Locations



2.46 SILs are given strategic protection because their scale and relatively homogenous character mean they can accommodate activities which elsewhere might raise tensions with other land uses. Most are over 20 hectares in size although in some areas, especially parts of West and South West London where there is particular pressure on industrial land, smaller locations, for example of 10 hectares, can be of strategic importance. Typically, SILs are located close to the strategic road network and many are also well located with respect to rail, river and canals and safeguarded wharves which can provide competitive advantage and address broader transport objectives.

2.47 There are of two types of SILs which meet and support the requirements of different sorts of industrial occupiers:

- Preferred Industrial Locations (PIL) which are 'particularly suitable for general industrial, light industrial, storage and distribution, waste management, recycling, some transport related functions, utilities, wholesale markets and other industrial related activities'.
- Industrial Business Parks (IBP) which are 'particularly suitable for activities that need better quality surroundings including research and development, light industrial and higher value general industrial, some waste management, utility and transport functions, wholesale markets and small scale distribution'.

2.48 A number of SILs and Opportunity Areas have been identified in Policy 2.16 as potential Strategic Outer London development centres i.e. centres with one or more strategic economic functions of greater than sub-regional importance. Those relevant to this study are: logistics (parts of Bexley, Barking & Dagenham, Havering, Hillingdon, Hounslow,

Park Royal); other transport related functions (in parts of Hillingdon, Hounslow, the Royal Docks and Biggin Hill); and industry (in the Upper Lee Valley and Bexley Riverside).

2.49 These centres are to be supported by:

- coordinating public and private infrastructure investment
- bringing forward adequate development capacity
- placing a strong emphasis on creating a distinct and attractive business offer and public realm through design and mixed use development as well as any more specialist forms of accommodation
- improving Londoners' access to new employment opportunities.

2.50 For Locally Significant Industrial Sites and Other Industrial Sites, protection or release is subject to the supply of robust evidence and economic, land use and demand based criteria.

Users of industrial land

2.51 Industrial land is occupied by B2 (factories) and B8 (warehouses). These types of premises usually accommodate light and general manufacturing, storage and logistics activities. However, beyond these traditional users a number of other activities add to the demand for such land. They include utilities (energy and water), waste and recycling, transport functions, and wholesale markets. The London Plan sets out policies and strategies for these uses as well.

2.52 With regards to **energy** supply, the Mayor expects 25% of the heat and power used in London to be generated through the use of localised decentralised energy systems by 2025. In order to achieve this target the Mayor prioritises the development of decentralised heating and cooling networks at the development and area wide level, as well as larger scale heat transmission networks (Policy 5.5).

2.53 Policy for **water** use and supplies is set out in Policy 5.15 and focuses on protecting and conserving water supplies and resources by managing demand, minimising leakage levels, enhancing the use of rainwater harvesting and grey water recycling. It also promotes the provision of additional sustainable water resources to reduce the water supply deficit and achieve the security of supply in London.

2.54 With regards to **waste**, the London Plan promotes self-sufficiency in line with national policy set out in PPS10. Policy 5.16 sets a target to manage as much of London's waste within London as practicable, working towards managing the equivalent of 100 per cent of London's waste within London by 2031. This policy also sets targets to exceed recycling or composting levels in municipal waste of 45% by 2015, and to achieve recycling, composting and re-use rates of 70% by 2020 for commercial and industrial waste, and a rate of 95% by 2020 for construction, excavation and demolition waste.

2.55 Policy 5.17 supports the need to increase waste processing capacity in London. The Mayor will work with London boroughs and waste authorities to identify opportunities for introducing new waste capacity, including strategically important sites for waste management and treatment, and resource recovery parks / consolidation centres, where recycling, recovery and manufacturing activities can co-locate.

2.56 It is envisaged that land in Strategic Industrial Locations will provide the major opportunities for locating waste treatment facilities. Boroughs should also look to Locally Significant Industrial Sites and existing waste management sites. Existing waste management sites (including safeguarded wharves with waste use or potential) should be clearly identified and safeguarded for waste use. Suitable brownfield sites and contaminated land elsewhere may also provide opportunities.

2.57 The London Plan's strategy for **transport** is structured around reducing the need to travel, especially by car, and supporting public transport and other sustainable transport modes. It highlights a range of key public transport projects such as Crossrail as well as upgrades / extensions to the underground, overground, Docklands Light Railway and Tramlink network. However, bus and railway operators need land for stablings, depots and garages. For this reason, the Plan encourages boroughs to identify land for transport support functions in their Development Plan Documents.

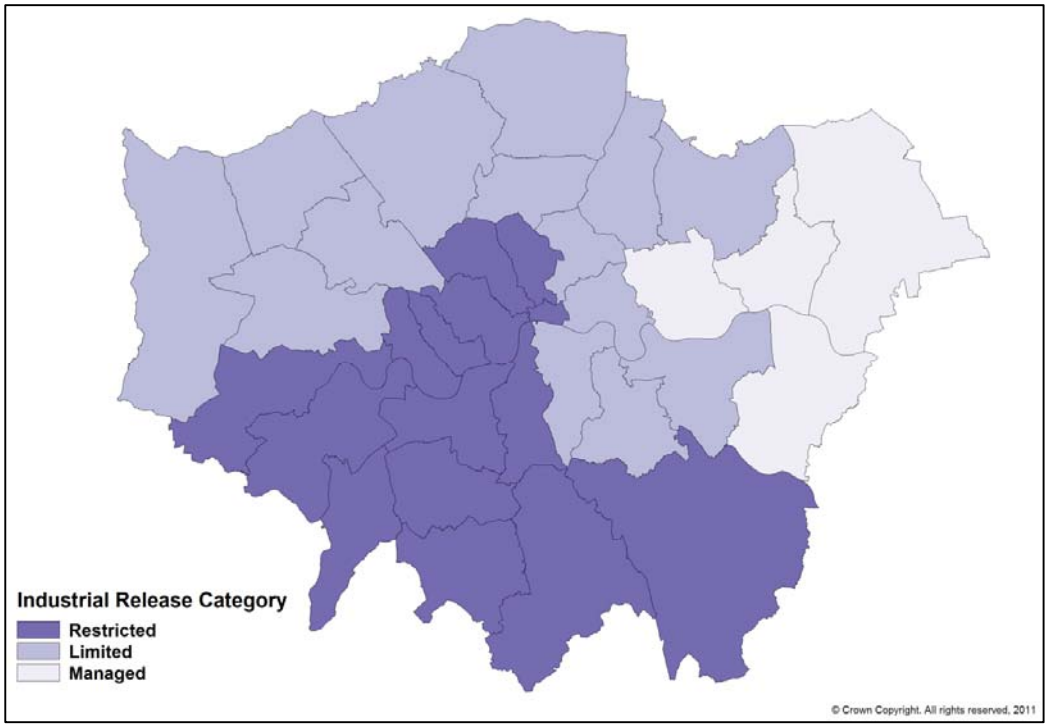
2.58 With regards to **wholesale markets**, the Mayor seeks to retain an efficient wholesale market function to meet London's requirements. The strategy favoured by the London Plan centres around consolidating composite wholesale market functions at Western International, New Covent Garden and New Spitalfields.

2.59 A detailed approach towards the implementation of the London Plan's strategy for industrial land provision is provided by the Industrial Capacity SPG which we review further on.

Releasing industrial land for other uses

2.60 The London boroughs are categorised into three groups to reflect the pressure of demand for industrial uses and the recommended approach to land release.

Figure 2.4 London Boroughs' 2011 Industrial Land Release Designations



Source: The London Plan, 2011

2.61 'Managed transfer' boroughs have the most generous supply relative to demand and should allow managed release of industrial land to other uses. 'Restricted transfer' boroughs are at the other extreme, with an undersupply of industrial land and little or no land protected by SIL designations, and should adopt a more restrictive approach. 'Limited transfer' is the intermediate category under which 'boroughs are encouraged to manage and where possible, reconfigure their portfolios of industrial land, safeguarding the best quality sites and phasing release to reduce vacancy rates for land and premises.' This study will help update these categorisations and benchmarks.

Industrial Capacity SPG

2.62 The Supplementary Planning Guidance (SPG) on Industrial Capacity was adopted in March 2008. It is currently based on estimates from the 2007 London Industrial Land Release Benchmarks study and will be updated using evidence from this study.

2.63 The Guidance sets out a London-wide benchmark of 814 ha of industrial land to be released in the period 2006-26. Of this total, 254 ha is a reduction in the required stock ('negative demand') and 560 ha would result from a more effective management of vacant and under-used industrial land.

Sectoral guidance

2.64 The SPG aims to guide the implementation of the London Plan "to accommodate industry and other activities with similar land-use needs". As mentioned before, as well as industry, this includes logistics and warehousing, utilities, waste and recycling, transport and wholesale markets.

2.65 SPG5 deals with **Logistics and warehousing**. It recommends that in implementing London Plan policies, the Mayor, the boroughs, the LDA, TfL and other partners:

- take particular account of the need for logistics provision in the market areas in outer North East, South East and West London;
- encourage logistics and distribution facilities which will promote the movement of goods including waste and aggregates by rail or water;
- ensure that provision is made for large scale distribution activities, particularly in environmentally acceptable Preferred Industrial Locations with good access to the strategic road network, existing and potential intermodal rail freight, river and/or canal related facilities including wharves, and generally resist it elsewhere;
- accommodate smaller scale logistics, warehouse and storage facilities within SILs and Locally Significant Industrial Sites in line with strategic road capacity;
- explore the potential for rail freight interchanges and more general logistics provision in conjunction with authorities in the wider South East and East of England regions;
- consider whether all or parts of SILs and LSIS, where there are existing or potential opportunities for sustainable modes of distribution, should be formally promoted as Logistics Parks.

2.66 With regards to **waste and recycling**, SPG6 stresses the need to make sufficient land provision in DPDs to meet the waste apportionment targets set out in the London Plan and provide additional waste management and recycling facilities. It also urges policy makers to

explore opportunities for co-location of waste treatment facilities with other forms of development.

2.67 SPG7 on **transport, utilities and wholesale markets** asks the Mayor and his partners to:

- make adequate provision of land for transport functions in DPDs, including where appropriate on industrial land, in response in particular to the demand for additional bus garages and for rail freight facilities;
- take into account land requirements for new utility infrastructure and particularly in the Thames Gateway and London-Stansted-Peterborough-Cambridge growth areas; the Opportunity Areas; Areas for Intensification and other locations where growth in new homes and jobs is anticipated;
- consolidate composite market functions at Western International, New Covent Garden Market and New Spitalfields.

Guidance on mixed use development

2.68 The SPG addresses the continuing issue of industrial uses in mixed use developments. According to SPG8, the Mayor and his partners should consider whether 'industrial areas that have, or will have, good public transport accessibility, especially those within or on the edge of town centres, would be appropriate for higher density, mixed-use redevelopment'. However, 'this redevelopment should not incur a significant net loss of industrial capacity or compromise the offer of wider areas as competitive locations for industry, logistics, transport, utilities or waste management. Where this affects SILs this consolidation should be managed sensitively having regard to the process set out in SPG1 (relates to Plan, Monitor and Manage approach)'. In addition, 'robust and sensitive industrial relocation arrangements to support redevelopment where necessary' should be considered.

2.69 This suggests that the GLA will accept mixed use options within existing employment locations, including some in the indicative SIL areas, so long as the above criteria are taken into account.

Retaining a diverse offer

2.70 Finally, SPG9 and SPG10 set out a number of requirements relating to the quality of industrial capacity and the need to meet the full range of occupier requirements including those for low-cost space, accommodation for SMEs and start-ups.

Safeguarded wharves

2.71 A small proportion of London's stock of industrial land is located on wharves. They are sites with specific requirements and constraints because of their strategic role in transport and in processing a range of cargoes including waste and aggregates. For this reason, London's wharf capacity is protected by policy.

2.72 In 2005 the Greater London Authority (GLA), the Port London Authority (PLA) and riparian local authorities produced a comprehensive assessment of wharves in London. The objective of the work was to assess the supply and demand of wharf activities so that viable wharves could be safeguarded against redevelopment for other uses. Based on strong growth forecasts in trade and handling of aggregates, the document concluded with a list of 50 Recommended Safeguarded Wharves, along with advice on implementing the

safeguarded wharves policy and how the London Development Agency (LDA), PLA, and GLA could work to bring disused wharves back into use.

2.73 Overall, existing wharf capacity and its safeguarding for current and potential future uses is taken to be essential, especially given the pressures for redevelopment along the Thames. The London Plan states that the redevelopment of safeguarded wharves should be accepted only if 'the wharf is no longer viable or capable of being made viable for waterborne freight handling'[7].

2.74 A study is currently underway to provide updated evidence on the existing and potential capacity of the Blue Ribbon Network, including wharves, compared with forecast demand for transportation of freight by water. This evidence will then be used by the Greater London Authority (GLA) and partners to draw up a revised Safeguarded Wharves Implementation Plan to 2031.

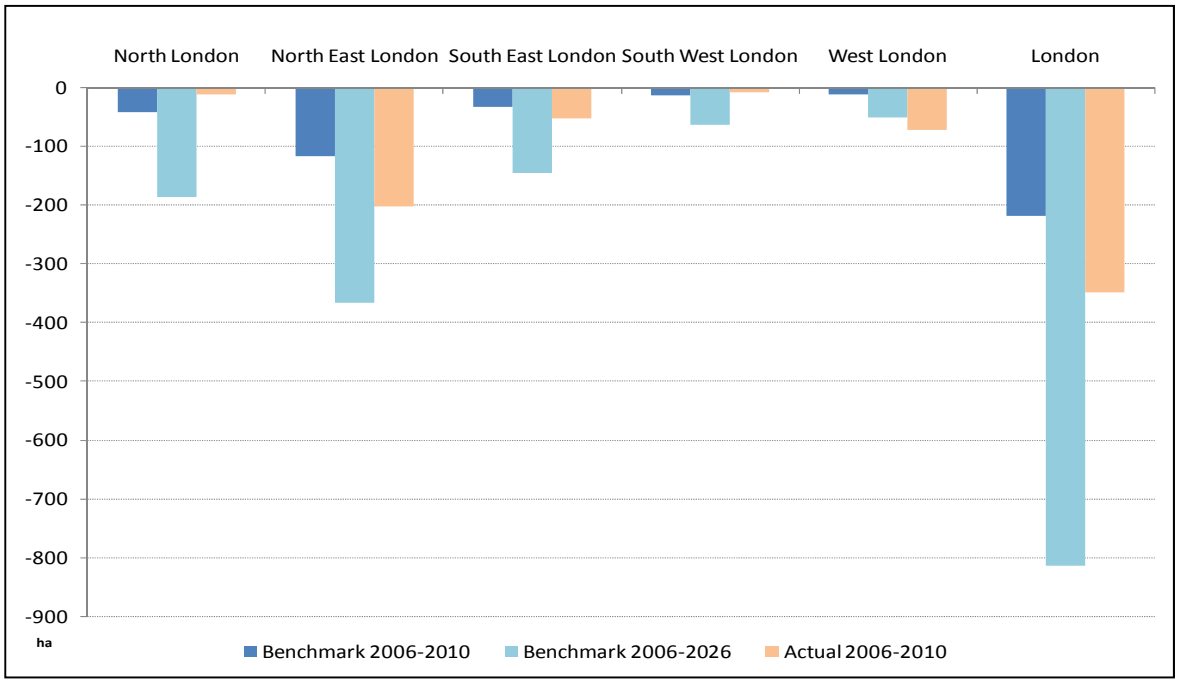
Development Management

2.75 We have shown in Figure 2.4 how the existing London Plan classifies the boroughs in terms of the approach they should follow to industrial land release. However, the 2010 London's Industrial Land Baseline study shows that these policy designations have not translated into fact on the ground.

2.76 As illustrated below, the actual release of industrial land in London during the period 2006-2010 amounted to 348.5 ha compared to a recommended benchmark for the same period of 219.5 ha. This is 59% more land released than estimated in the 2007 Release Benchmark study. It also means that 43% of the benchmark for the 2006-2026 period has been released in 4 years.

[7] London Plan Policy 7.26

Figure 2.5 Release benchmarks vs. actual industrial land release 2006-2010



Source: London's Industrial Land Baseline, URS, November 2010

2.77 The largest loss of industrial land occurred in the North East London sub-region (-217 ha) and this is where the largest differential with the benchmark was recorded. West London and South East London also released far more land than expected. Indeed, the actual land release in West London was 5 times that anticipated for 2006-2010 and is 20 ha above the estimated benchmark for the whole period to 2026. In the other two sub-regions, the loss of land remains below the benchmark.

2.78 This differential between the actual release of land and the benchmark can be the result of three factors:

- The release figures may be inaccurate;
- The benchmarks were not set at the right level (possibly because forecasts for future demand were very different to what actually happened so far);
- The benchmarks have been ineffective because they were not understood and implemented by the boroughs.

2.79 The first two points are likely to happen to some extent but they alone will not explain the large discrepancies observed. In order to ensure that this new study learns from the past, we explored the last point through in-depth discussions with borough officers.

2.80 We interviewed six boroughs. We selected two boroughs in each release category (restricted, limited, managed), one within the release benchmark and one over the benchmark. These are set out in Table 2.1 below.

Table 2.1 : Local authorities interviewed

Borough	Designation	Release to date (2006-2010)
Bromley	Restricted	-4.6 ha (> benchmark for period which was 0 ha)
Hounslow	Restricted	-6.7 ha (probably close to benchmark for period)
Tower Hamlets	Limited	-33.7 ha (> benchmark for period which was -16.8 ha)
Haringey	Limited	-3.1 ha (probably below or within benchmark for period)
Barking & Dagenham	Managed	-74.7 ha (> benchmark for period which was -10.4 ha)
Bexley	Managed	-0.6 ha (< benchmark for period which was -10.4 ha)

2.81 We originally sought to speak to both development control officers and policy officers. However, our preliminary discussions showed that there is very little understanding of strategic employment land issues in development control teams. When considering the loss of employment land the advice of the policy teams is always sought. So we focused on the planning policy teams and the type of advice they offer to development control officers.

Planning policy officers' understanding of the benchmarks

2.82 Most policy officers we spoke to were aware of the 2007 Industrial Land Release Benchmarks study and the Industrial Land SPG. They also understood how their borough was classified and what the classification broadly meant for their employment land strategy. However few knew exactly what their benchmark figure was. There are two reasons for this.

2.83 Firstly in North, South West and West London only a sub-regional figure was produced in the benchmark report. This relied on boroughs to work jointly in order to monitor their performance against the benchmark but it was not done in practice.

2.84 Secondly, even when an individual benchmark was produced (or generated through sub regional work), the boroughs tended not to use it directly relying instead on local evidence including their own employment land reviews.

Development control officers' understanding of the benchmarks

2.85 Most policy officers reckoned that their development control teams had no familiarity with the benchmarks or with the GLA evidence base in general. They might understand the general strategy (restricted / limited / managed) but not the detailed benchmarks, rationale or technical detail behind the numbers.

2.86 However this did not concern policy officers because in all the boroughs we spoke to policy officers were asked for formal advice (written letters / memos) when development control teams were considering the loss of employment sites. This is because it is not considered to be the development control officers' role and responsibility to understand the strategic evidence.

2.87 One potential area of concern was the loss of small sites; where formal policy advice is not requested. If the local evidence (ELR/Planning Policy) does not strongly protect these sites the cumulative loss could go unnoticed.

The role of the local Employment Land Reviews

2.88 Both policy and development control officers give greater prominence to local evidence over the GLA benchmarks and background work. There are some very practical reasons for this.

2.89 Firstly most local ELRs make site specific recommendations and these are much easier to manage and defend than the more abstract GLA benchmarks[8]. Practically it is much easier for policy officers to highlight site specific comments in their ELRs and for development control officers to use those comments in their reports.

2.90 Secondly local evidence is more likely to reflect local circumstances, providing useful qualitative evidence which is used extensively in the decision making process. It will also be likely to have local political buy in.

2.91 If the ELR reflects the GLA evidence this should not present the GLA with a strategic planning problem. However, officers are not always sure how their ELR reflects the GLA policy.

2.92 In some cases, this is because the ELR predates the GLA Benchmarks, sometimes by a number of years. In others, it is because the process to develop local employment land targets is not transparent and does not clearly relate to the benchmarks. For instance, some ELRs used multiple scenarios and techniques which were not fully understood by the officers. Because they did not understand the mechanics of the ELR the officers were unaware of how their local targets related to the GLA evidence.

2.93 In one of the boroughs the Council disagreed with many of the site specific recommendations and much less land was protected for employment uses in practice. In other words, the quantitative and qualitative strategy the ELR had outlined was not implemented. However, the officers were not fully aware of the implications of this discrepancy between policy and practice for their strategy or the wider GLA position.

2.94 Another borough we spoke to had decided to depart from the benchmarks and had adopted their own scenario in their ELR, with no reference to the GLA benchmark. The officer was confident that this had been done for sound local policy reasons but accepted that if every borough choose to significantly differ from the benchmarks then this could undermine the London Plan strategy.

2.95 A further complication is that where ELRs had been undertaken jointly and boroughs have 'traded' the stock of employment land between themselves the direct link between the GLA evidence base and the ELR had been lost.

2.96 The key message for the GLA is that the benchmarks and SPG alone cannot be relied on to implement policy, or changes in policy. The ELRs are a vital tool but they vary in quality and approach. In addition, there is often a long delay between any change in GLA policy and the boroughs' implementation through an updated ELR.

[8] One Borough did not have a ELR

Scope and coverage of the GLA baseline

2.97 One major issue we identified related to a potential misunderstanding of the coverage of the GLA industrial land baseline. A number of officers thought the benchmarks related only to designated employment sites i.e. land protected in old UDPs.

2.98 The most noticeable impact of this is that, when quantitatively balancing the land supply, officers (and ELRs) consider only the designated employment areas. So if the benchmark (or local ELR) suggests 50 ha can be lost over the lifetime of the plan this is often taken to mean that the policy areas can be re-drawn 50 ha smaller.

2.99 This has obvious implications for managing stock outside designated sites as development plans afford these sites much more limited protection. They are more vulnerable to competing uses because of their isolated and non conforming nature which means many officers (and members) may be willing to see them replaced. But this means that any further losses over the whole life of the plan are additional to the benchmarks. This is an important issue as, according to the URS Baseline Study, approximately a third of industrial land is outside a SIL or LSIS designation, meaning a large proportion of the supply is vulnerable to loss.

Mixed use

2.100 Related to this is the issue of mixed use redevelopment and the generally permissive policy approach some boroughs have adopted. Strategic policy and more up to date local policy encourages mixed use redevelopment as a way of releasing surplus stock and also replacing some old space with new space.

2.101 In theory the selective promotion of mixed use redevelopment should help the boroughs manage their stock of employment land; securing new space in return for higher density development. But most evidence suggests that genuine opportunities for employment in mixed use development are limited and the type of employment space they provide may not meet the needs of traditional employment space users. Despite this being reported in ELRs officers are still pressured to writing permissive mixed use policies which they have difficulty managing.

2.102 One concern a number of officers raised was that the flexibility of mixed use policies can be abused by the development industry, many of whom are motivated simply by high residential land values and have little commercial interest in providing viable replacement employment space. There is some evidence of purely tokenistic mixed use space provision.

Development plan cycles

2.103 The issue of mixed use and the pressure to release sites is partly linked to the development plan cycle i.e. how old a borough's development plan is.

2.104 Older plans tend to take a much harder line to releasing sites either in total or for mixed use redevelopment. When a plan is in preparation officers take the opportunity to effectively park developers' requests to release sites, claiming decisions are premature and the applicant should wait for the new plan to be finalised. Indeed some of the boroughs we spoke to felt that they had so far managed to defend their stock because the newer, more flexible mixed use policies were not yet final. In other boroughs, with new plans, the loss of

sites either from de-allocation of protected sites or through mixed use redevelopment was rapid.

2.105 A related issue surrounds the timing of potential losses in the development plans. The release benchmarks are long term with losses expected to occur over the life of the plan. However, this is not always understood and policies and development control decisions to release the land take a short term view, immediately de-allocating land which swiftly leads to its redevelopment. Officers say this may be part of the reason why some boroughs have lost more land in the first 5 years of the benchmark than implied.

2.106 This raises the question as to whether development plans, and the GLA, should adopt a much more cautious approach when proactively releasing sites from the supply, avoiding identifying the release of all 20 year (or so) supply.

2.107 This in turn leads on to the further related point of 'policy lag', where policy decisions are taken a point in time, but by the time they are implemented and become effective circumstances may have changed.

Pre-application consultation

2.108 A further source of potential loses we discussed with officers was the role of pre-application discussions. These are increasingly important to the planning process and more formal as applicants pay fees and so expect a formal and considered policy response. However there is a concern that these may jeopardise the considered release of employment sites because officers may concede the 'in principle' loss of sites before the full application material has been submitted.

2.109 A further potential issue is that the 'in principle' release of sites is not formally monitored by the boroughs or the GLA. So the planning pipeline may be much larger than indicated simply by the planning permissions granted.

Absence of 'positive' policies

2.110 One final area we explored with a number of the officers was the absence of positive planning policies seeking to secure net additional space on high quality employment sites.

2.111 This is an issue in many boroughs because the loss of space is running ahead of GLA and local benchmarks. But there is no policy tool to 'claw back' these losses on new sites or through the intensification of older sites.

2.112 For the majority of London employment land stock the default policy stance is that (at best) the quantum of floor space is simply re-provided. Where there is policy and market demand for a different type of employment space (for example modern warehouses) policies may not be drafted to secure this change.

2.113 Where sites are not in employment use there is no requirement for the applicant to consider an employment use on part of the site; even if there is a quantitative need. So when sites are intensified the ability of the site to deliver additional employment space is not considered.

2.114 The officers we spoke to acknowledged this problem and pointed out that up to now the main policy focus had been to release land for other uses.

Conclusions

2.115 The national agenda is clear in its prioritisation of economic growth and sustainable development. Supplying the right quantity and quality of employment land is essential to achieve this but the planning framework must also strive to make the most efficient and effective use of land both for the range of business activities present in the economy and across non-employment uses, in particular housing. Recent changes to the national planning framework suggest that the ability to provide robust evidence to support allocation decisions will become more important than ever in order to safeguard industrial uses in particular.

2.116 This raises the question of the role of industrial land in the economic fabric considering its lower value than other uses such as offices and housing. In order to make sure land is used most efficiently, it is important to be clear about why industrial land is needed and which uses it is needed for.

2.117 At regional level, the London Plan wants to ensure that London excels amongst global cities both as an international location for business and as a diverse economy enabling organic growth.

2.118 The provision of suitable premises for all business sizes is essential and some targeted support may be needed to preserve the diversity of London's economy and help new businesses and emerging sectors to blossom. This is relevant to industrial land as a wide range of uses occupy this type of land beyond manufacturing, logistics and storage. They include transport, utilities, waste and recycling, transport functions and wholesale markets.

2.119 The London Plan recognises the roles played by different types of sites to support this range of activities and allocates protection through a range of designations. In particular, it protects sites which play a strategic role in the operation of London's economy. It also provides broad guidance to boroughs on how to approach the release of industrial land.

2.120 However, this chapter has highlighted a key issue: the difficulty of translating the strategic policy set out in the London Plan into local implementation through planning decisions. Our discussions with local authorities have uncovered a number of reasons for this ranging from a lack of understanding of the benchmarks; the need for more specific guidance; delays in translating the London Plan into ELRs; changes to the planning system; and the difficulty in dealing with mixed use developments. We will bear these initial findings in mind for our recommendations at the end of the study.

3 STOCK AND USERS OF INDUSTRIAL LAND

Introduction

3.1 In this chapter we review the findings of the 2010 London's Industrial Baseline Study[9]. We describe how much stock there is and how this has changed over time; who occupies it; where it is located and how much of it is vacant.

Total stock

3.2 According to the London Industrial Baseline Study, in 2010 there were 7,656 ha of built-on industrial land. However, of the 7,656 ha of occupied industrial land, 787 ha were occupied by non-industrial uses which include offices, housing, retail and community uses. These premises are very unlikely to return to industrial use so we have removed them from the total stock of industrial land, leaving 6,889 ha. In addition to this, there is another 543.5 ha of vacant land in London, making a total stock of industrial land of 7,433 ha. Of this land supply, approximately 4,900 ha are occupied by 'core uses' (i.e. industry and warehousing).

Industrial land users

3.3 The 2004 Industrial Land Demand study[10] set out an initial definition of users of industrial land. This was modified in the 2007 release benchmark study[11] by the addition of a few new sectors. The 2010 London's Industrial Baseline study provides the most recent data on the type of activities which occupy industrial land.

3.4 However, we would highlight that the baseline figures need to be read with some caution as some classification mistakes are bound to have happened. For instance, Wood Wharf was incorrectly included in a SIL leading to an over-representation of banking as an occupier of industrial land (although in this case it would appear under the category of 'non-industrial users' which we have excluded from our baseline).

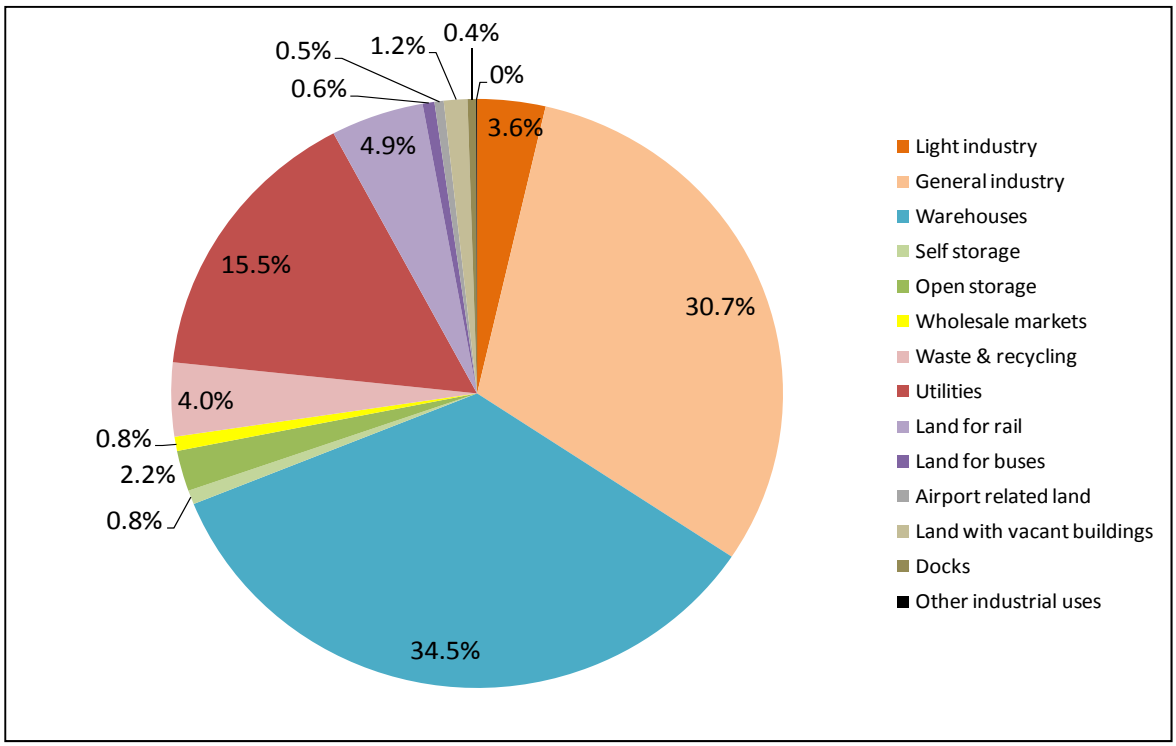
3.5 As seen in Figure 3.1 below, 37.5% of industrial land is used for warehousing and storage, another 34% for industrial activity (general and light) and the remaining 28% by other uses.

[9] URS, London's Industrial Baseline Study 2010

[10] Roger Tym & Partners, King Sturge and C2G, Industrial and warehousing land demand in London, August 2004

[11] URS, London Industrial Land Release Benchmarks, 2007

Figure 3.1 Percentage of industrial land by type of industrial occupiers in 2010



Source: London's Industrial Baseline 2010

3.6 According to the URS definition, light industry includes 'smaller-scale and 'cleaner' industries. Light industries are not obnoxious and do not have negative environmental impacts such as generation of significant noise, obvious pollutants and significant levels of car and HGV traffic. They can sit in harmony with residential uses (and are thus potentially suitable for inclusion in mixed use development). Occupiers may include those involved in research and development, science, media and creative industries'. As a result, they tend to favour units and sites in better condition than general industry occupiers which encompasses more traditional types of manufacturers with 'dirtier' activities.

3.7 Amongst the other uses, utilities are the largest land occupier with 15.5% of the total, followed by land for rail and waste and recycling.

Past trends

3.8 Since 2001, the stock of industrial land has contracted by 839 ha (-10%).

Table 3.1 Change in stock of industrial land between 2001 and 2010

User	2010 stock (ha)	Change 2001-2010 (ha)	% change 2001-2010
Light industry	248	6	2%
General industry	2,118	-506	-19%
Warehousing	2,378	43	2%
Self storage	53	11	26%
Open storage	153	42	38%
Wholesale markets	54	1	1%
Waste & recycling	278	12	5%
Utilities	1,071	-40	-4%
Land for rail	339	-9	-3%
Land for buses	43	-3	-6%
Airport-related land	33	0	0%
Docks	31	-10	-25%
Other industrial uses	4	-3.5	-49%
Land with vacant buildings	86	-53	-38%
Vacant industrial land	544	-331	-38%
TOTAL	7,433	-839	-10%

Source: London's Industrial Baseline 2010

3.9 As seen above the contraction in the stock of industrial land has mainly been driven by a strong drop (19%) in general industrial uses which were also the largest occupiers of industrial land in 2001. As a result, 505 ha of land used by general industry were lost. This was compounded by a 38% reduction in both vacant industrial land and land with vacant buildings.

3.10 These two large changes reflect the continued decline in manufacturing as this constitutes the main component of the URS general industry category as well as a more efficient management of the stock of industrial land, reducing the amount of vacant / under-used sites.

3.11 Most other users of industrial land have also contracted but there have been a few exceptions:

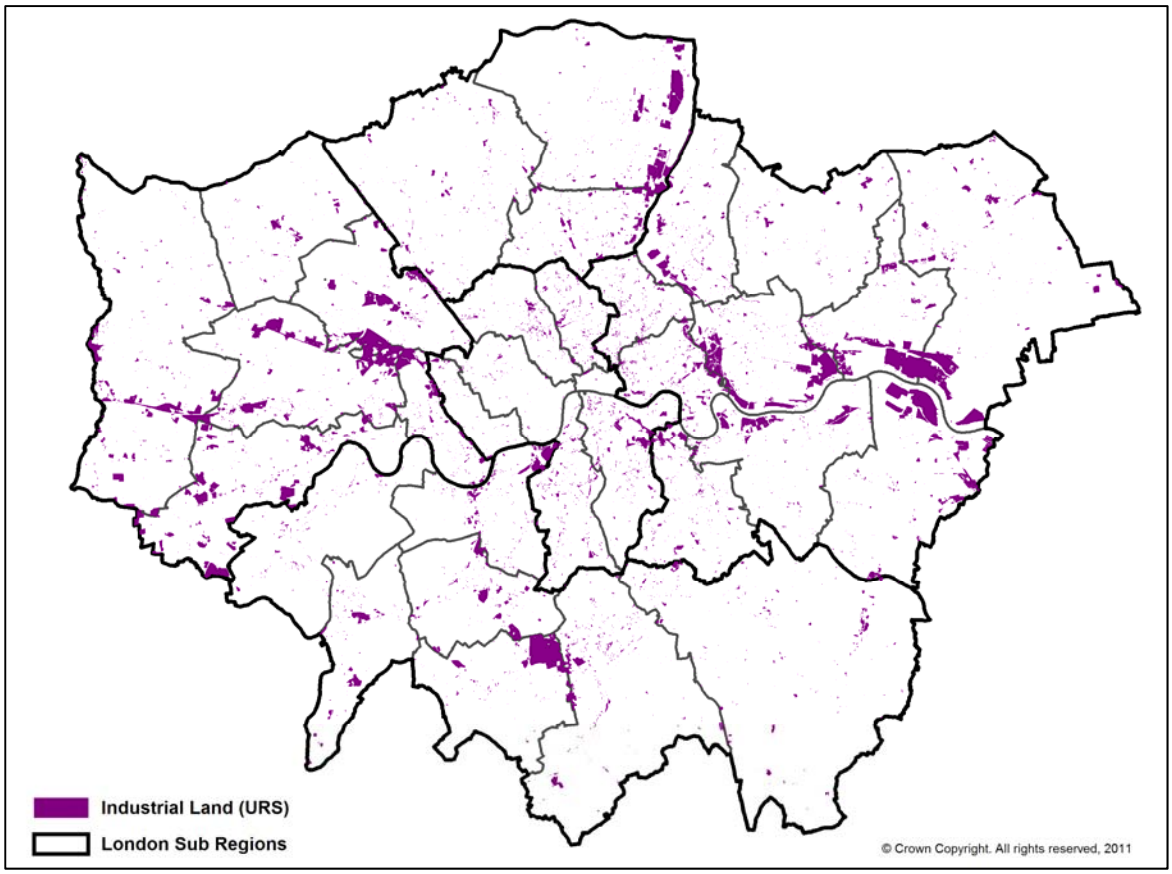
- Warehousing dropped slightly (3%) between 2001 and 2006 but seems to have stabilised since. This hides a strong increase in self and open storage, although they remain small occupiers overall.
- Light industry has risen slightly;
- The land used for waste and recycling rose by 5% (12 ha).

3.12 While data is not available for non-industrial uses on designated land for 2001, the data for 2006 and 2010 shows a reduction of 36% over the last 4 years. However this hides a 300% increase in retail from 54 ha to 215 ha and a 10% increase in offices which remains the largest use in this category with 242 ha. While these are excluded from the supply of industrial land, the trends mentioned here are very important in terms of implications for the planning system and illustrate the continued pressure from other uses on industrial land.

Spatial distribution

3.13 The stock of industrial land is distributed across London as shown in the map below.

Figure 3.2: 2010 Industrial land baseline

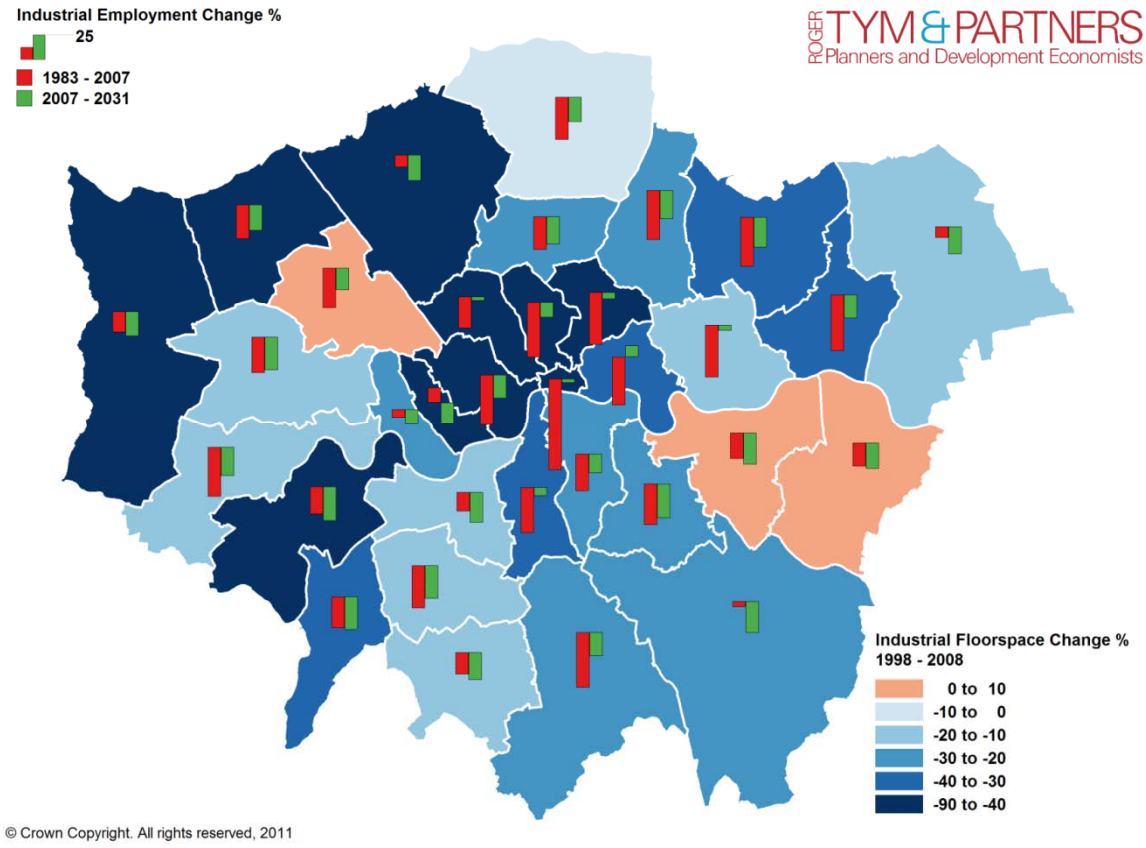


Source: London's Industrial Baseline 2010

3.14 The largest share of industrial land is in East London (39%) followed by West London (28%). The other three sub-regions have much smaller shares of the total with 16% of the stock in South London, 10% in North London and 6% in Central London. As expected, most of the industrial land supply (63%) is located in Outer London.

3.15 The graph below illustrates where the spatial distribution of the loss of industrial employment floorspace by borough. The biggest reductions in percentage terms have been in central London and in North West London. The figure also highlights change in industrial employment over time, using past and forecast data from the London Employment Time Series[12].

Figure 3.3 Industrial Employment and Floorspace Change by Borough 1998-2008



Source: VOA, RTP

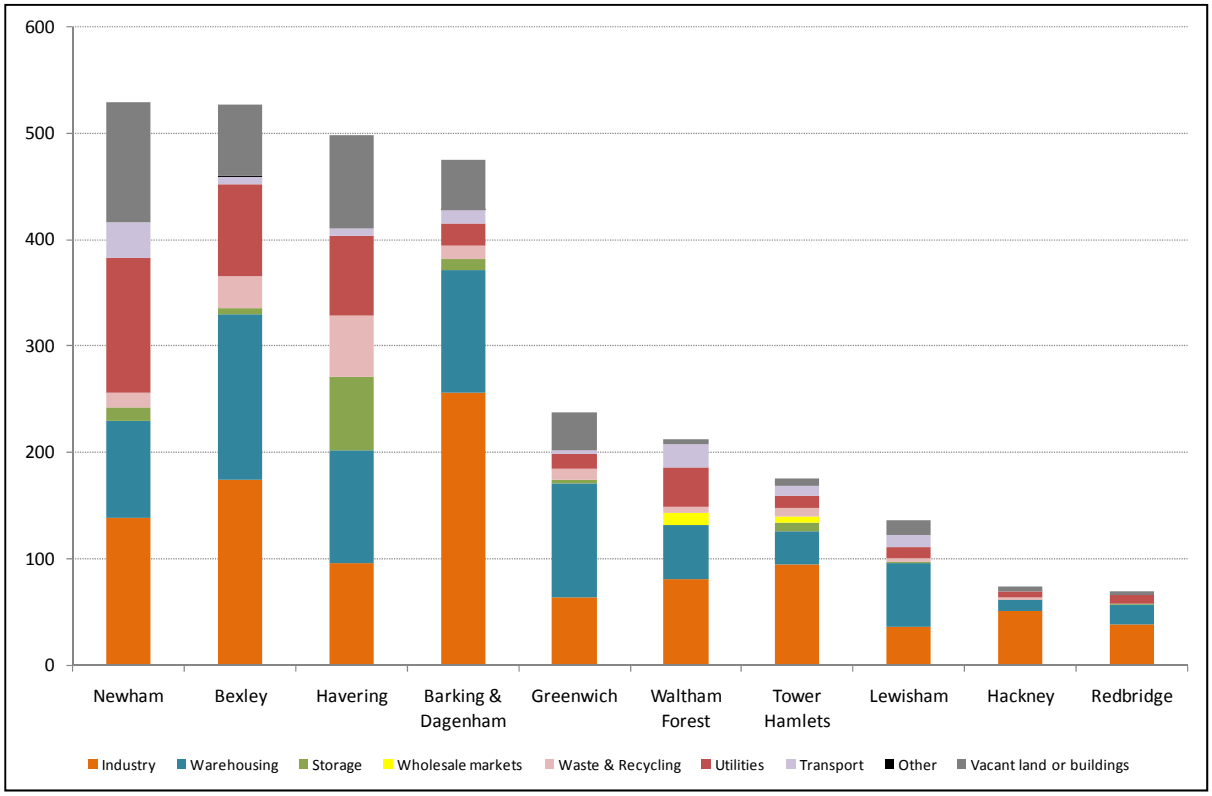
3.16 In the rest of this section we look at the specific profile of industrial land in each sub-region.

East London

3.17 There are 2,935 ha of industrial land in East London. As seen in Figure 3.4, there are four large providers of industrial land: Newham, Bexley, Havering and Barking & Dagenham. The other boroughs' contribution is much more modest.

[12] London Employment Time Series, Roger Tym & Partners for GLA 2010

Figure 3.4 : Stock of industrial land in the East sub-region, 2010



Source: London's Industrial Baseline 2010

3.18 In the sub-region, 66% of all stock of industrial land is occupied by core uses (general and light industry, warehousing and storage) which is in line with the London average. There are however marked differences across the sub-region. In Newham and Waltham Forest these uses are comparatively weaker while in Redbridge, Hackney, Tower Hamlets, and Barking & Dagenham, where traditional industry remains significant, they account for three quarters or more of all industrial land. In Lewisham and Greenwich, the presence of warehouses is much stronger than elsewhere in the sub-region and in London as a whole.

3.19 This sub-region is also the location of two of London's wholesale markets: New Spitalfields in Waltham Forest and Billingsgate in Tower Hamlets; and there are docks and wharves in Newham and Tower Hamlets.

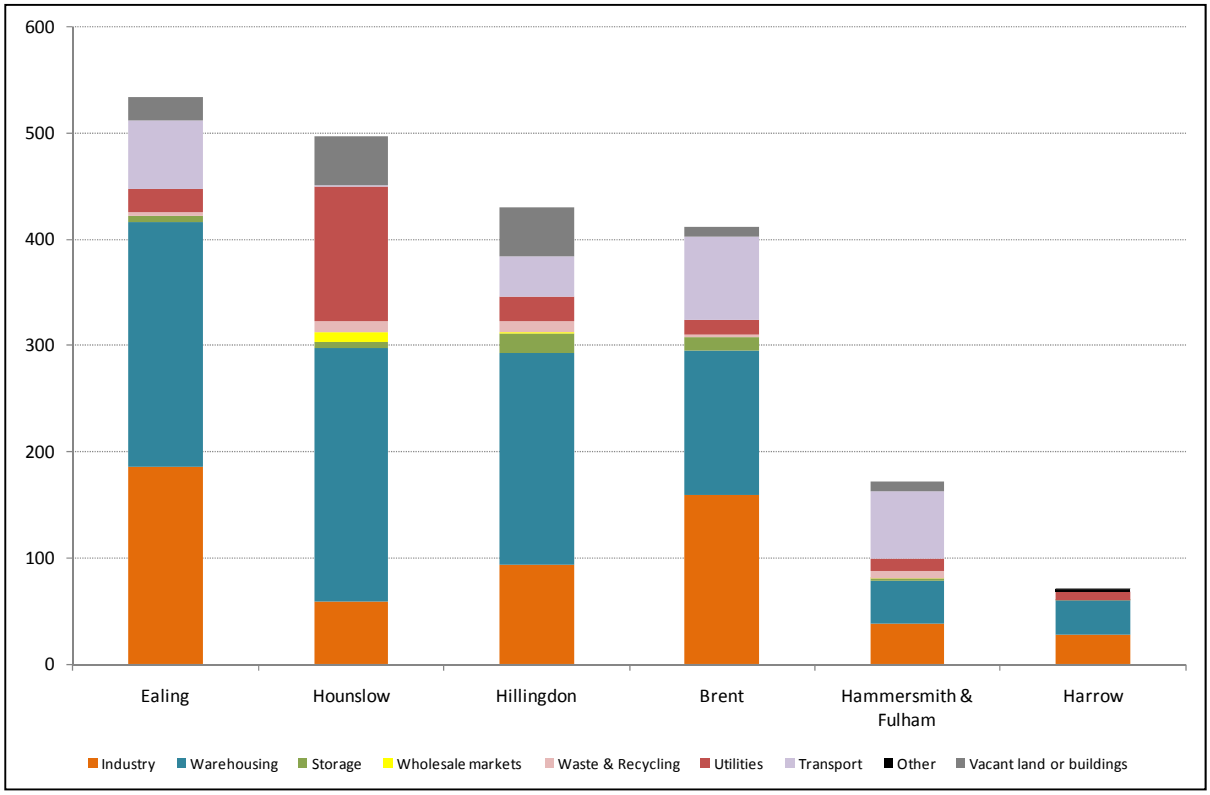
3.20 Other key features include the presence of waste and recycling facilities in Havering; the weight of utilities in Newham (28% of all industrial land); and the high proportion of vacant land and buildings on industrial land in Newham & Havering.

3.21 It is also worth pointing out that there is a large presence of retail activities in Greenwich, and recreation and leisure in Lewisham, on what was identified as industrial land by URS.

West London

3.22 There are 2,114 ha of industrial land in West London, with Ealing and Hounslow accounting for almost half the stock in 2010.

Figure 3.5 : Stock of industrial land in the West sub-region, 2010



Source: London's Industrial Baseline 2010

3.23 Overall, the West London sub-region is stronger on light industry and warehouses than London as a whole. There is also more land used by rail and air transport reflecting the presence of Heathrow and logistics-related activities. On the other hand waste and utilities account for a much smaller share of the total. However, there are stark differences across the boroughs in terms of how the land is used.

3.24 Light industry is concentrated in Hillingdon and Hounslow while general industry is mostly in Ealing and Brent. Warehousing is spread across the boroughs accommodating or surrounding Heathrow: Hounslow, Hillingdon and Ealing. Hillingdon is where all the airport-related land is located as well as over half of the open storage occupiers.

3.25 Hounslow is also the location of the Western International wholesale market and of 62% of utilities activities on industrial land in the sub-region.

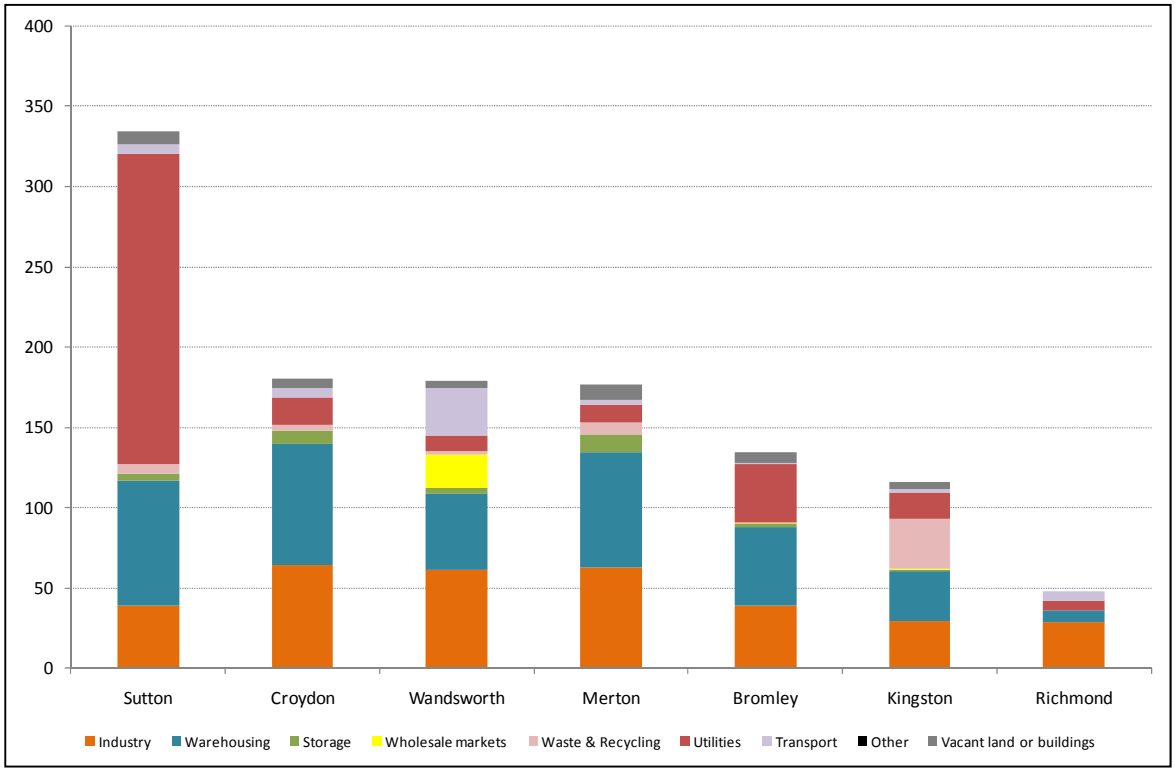
3.26 Offices occupy more industrial land in West London than in the city as a whole. In Hammersmith & Fulham there is a significant retail and housing presence as well.

3.27 Finally, there are higher levels of vacant buildings and land on industrial land in Hounslow and Hillingdon.

South London

3.28 There are 1,169 ha of industrial land in South London, with the largest concentration in Sutton as illustrated in Figure 3.6. The other boroughs have between 100 and 200 ha, except for Richmond where supply is limited at 48 ha.

Figure 3.6 Stock of industrial land in the South sub-region, 2010



Source: London's Industrial Baseline 2010

3.29 There are fewer core uses in South London that in London as a whole, both general industry and warehousing account for a smaller share of total industrial land than average. However in Merton, Richmond-upon-Thames and Croydon core uses account for over 70% of the total. Merton and Croydon are also the main providers of open-storage facilities.

3.30 South London is characterised by a higher proportion of light industry than in London as a whole, especially in Wandsworth and Kingston-upon-Thames. Wandsworth is also the location of New Covent Garden wholesale market.

3.31 Utilities account for 23% of all industrial land, with the main concentrations in Sutton and Bromley.

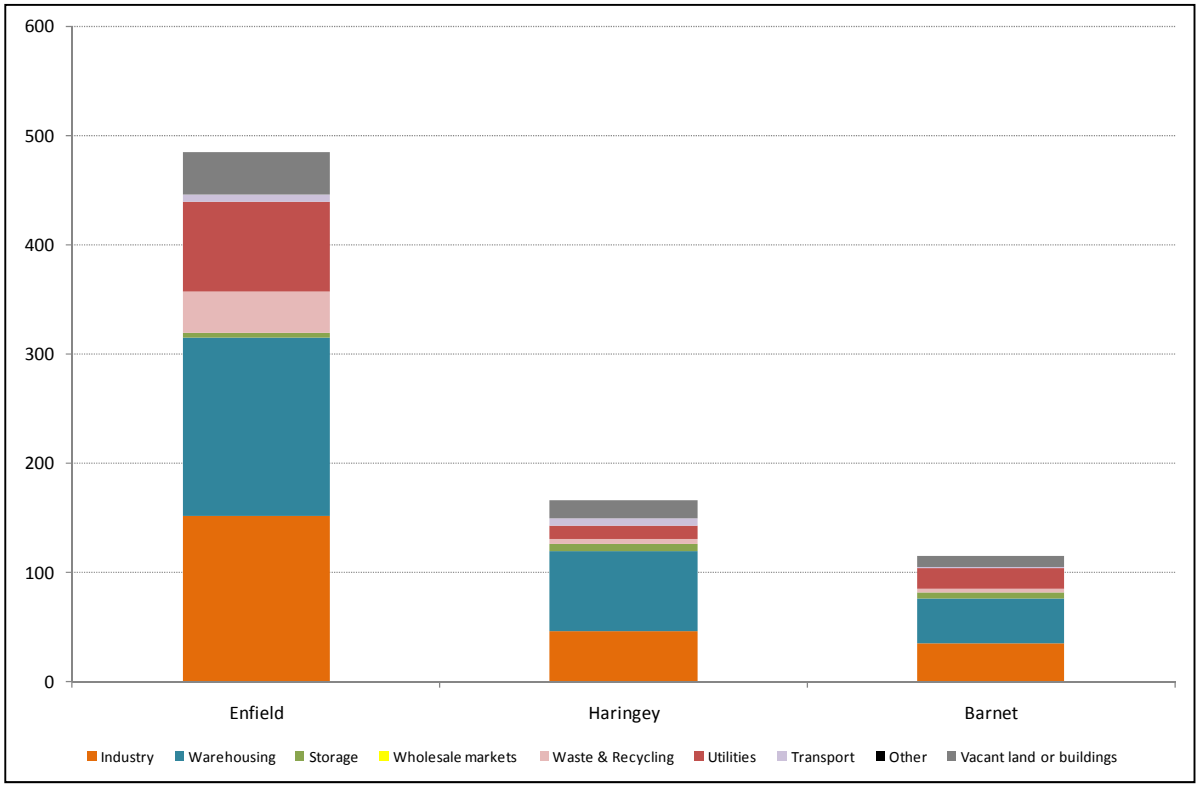
3.32 There is hardly any land with vacant buildings in South London.

3.33 It is worth noting that in Croydon, Merton, Bromley and Kingston-upon-Thames, offices and retail have been significant occupiers of land identified for industrial uses. They account for between 8 and 13% of the original stock compared to 6% in London. These boroughs are all classified under the existing London Plan / SPG release categories as: Restricted. This illustrates the issue mentioned in the previous chapter with regards to the application of the benchmarks and the permissive use of mixed-use developments.

North

3.34 There are 767 ha in the three boroughs which form the North sub-region, 63% of which is in Enfield.

Figure 3.7 Stock of industrial land in the North sub-region, 2010



Source: London's Industrial Baseline 2010

3.35 Industrial land in North London is mostly used for warehousing and general industry. Enfield in particular accounts for 67% of general industry and 59% of warehousing land in the sub-region. Storage space is mainly provided in Haringey (self-storage) and Barnet (open storage).

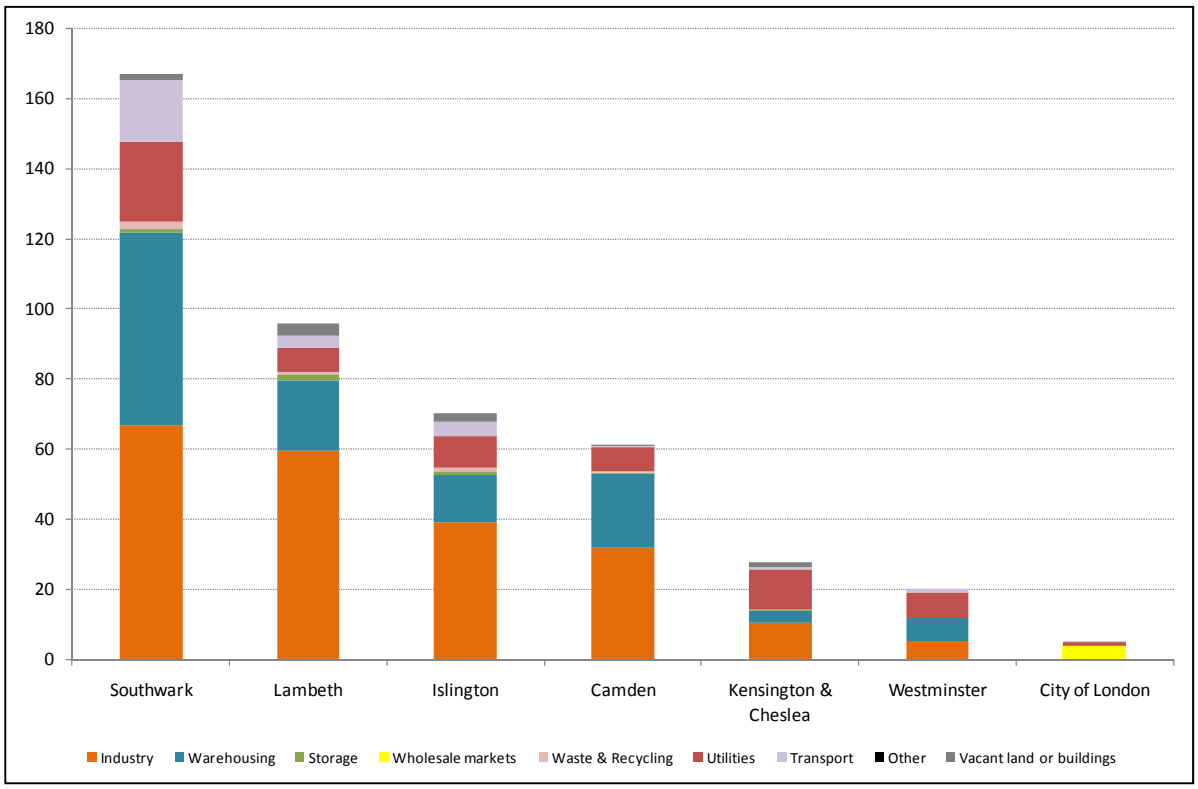
3.36 Light industry on the other hand is almost non-existent and there is comparatively little land for transport.

3.37 On the other hand, waste and recycling facilities are slightly more represented than in London and concentrated in Enfield.

Central

3.38 There are 447.5 ha in the Central sub-region. All central boroughs have limited supply; only Southwark has more than 100 ha in stock. As expected the City has hardly any land for industrial use (5.5 ha). Its stock is used by Smithfield's wholesale market and utilities.

Figure 3.8 Stock of industrial land in the Central sub-region, 2010



Source: London's Industrial Baseline 2010

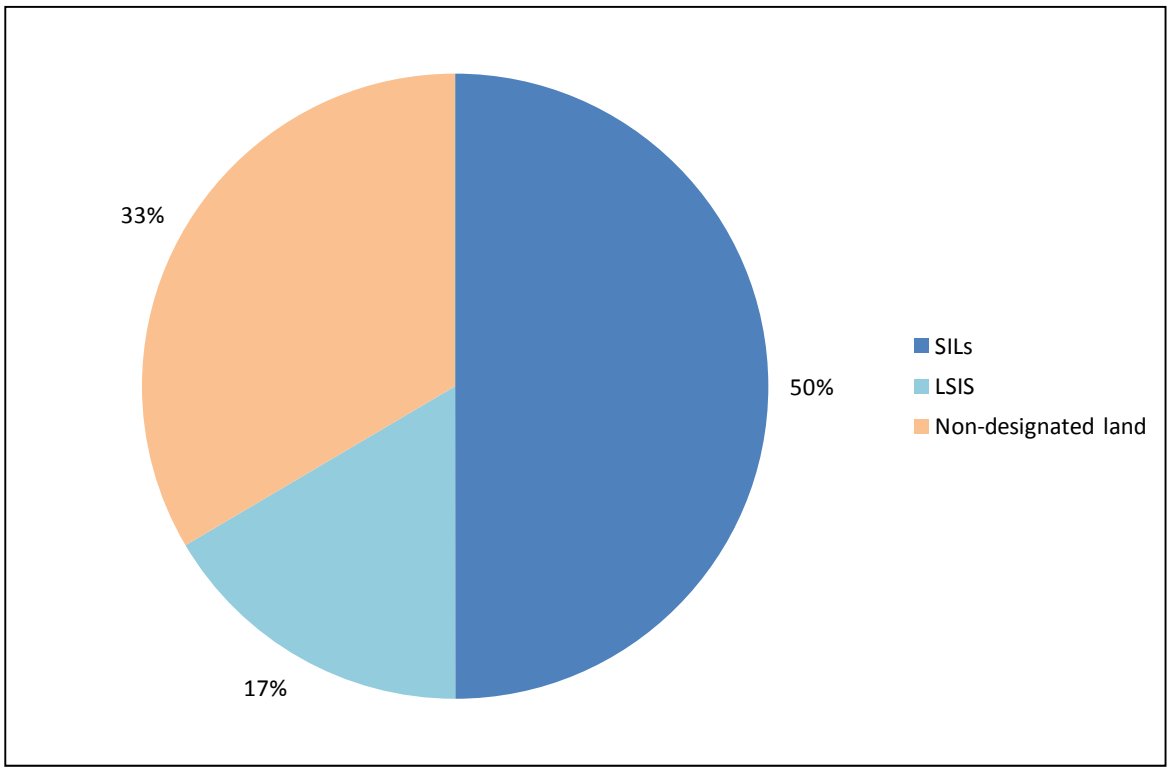
3.39 The proportion of land used for general industry is much higher in Central London (38%) than in London (28%), although this does not apply to Kensington & Chelsea, Westminster and the City of London. Light industry is also more present, in particular in Lambeth. On the other hand there are fewer warehouses and storage facilities and hardly any land is used for waste and recycling. There is almost no vacant industrial land left in Central London.

3.40 The stock of industrial land identified by URS is also largely occupied by offices and community services in the City of London. In Kensington & Chelsea, housing and offices have also located on industrial land.

Planning designation

3.41 Half of the industrial land in London is located in Strategic Industrial Locations (SIL), as identified by the London Plan, and another 17% are in Locally Significant Industrial Locations (LSIS). The remaining third are in non-designated industrial land.

Figure 3.9 : Industrial land by planning designation, 2010



3.42 The significant proportion of industrial land in non-designated land underlines the vulnerability of a large portion of London's industrial land to pressure for changes to other high-value uses. This is further illustrated by the table below which sets out examples of land value for residential uses compared to industrial uses across four London boroughs.

Table 3.2: Industrial and Residential land values within Greater London at Jan-11

Location	Industrial Land Value (£/Ha)	Residential Land Value (£/Ha)
Hammersmith	3,025,000	n/a
Croydon	2,000,000	4,700,000
Romford	2,000,000	3,125,000
Enfield	2,200,000	4,150,000

Source: VOA Property Market Report 2011

3.43 In general, the residential land values at the start of 2011 were between 55% and 135% higher than industrial land values. This actually reflects a reduction in the differential between both land uses since the beginning of the recession.

Vacant land

3.44 Vacant industrial land is a useful indicator of the current balance between supply and demand as well as the ability of London to churn industrial activities.

3.45 According to URS, in 2010 there were 543.5 ha of vacant industrial land i.e. 7.3% of the stock[13]. This compares with 719 ha in 2006 (9.2% vacancy rate) and 874 ha in 2001 (10.6% vacancy rate) and an estimated vacancy rate of 14% in 1998[14]. If considered just in terms of the core industrial and warehousing stock this represents a current vacancy rate of 9.9% compared to 12.3% in 2006 and 14% in 2001.

3.46 In terms of stock, this represents a drop of 38% in vacant industrial land between 2001 and 2011. Planning policy has been successful in managing down the stock of vacant land.

3.47 Vacant land in London is overwhelmingly located in East London (62% of the total), followed by West London (18%) and North London (12%). The table below summarises the spatial distribution of vacant land across the sub-regions and their respective vacancy rates. It suggests constrained markets in the Central, South and West sub-regions as vacant industrial land is scarce.

Table 3.3 : Vacant industrial land by sub-region

	% of total vacant land in London	Vacant land as % of total industrial land in sub-region
East	62%	11%
West	18%	5%
South	7%	3%
North	12%	9%
Central	1%	2%

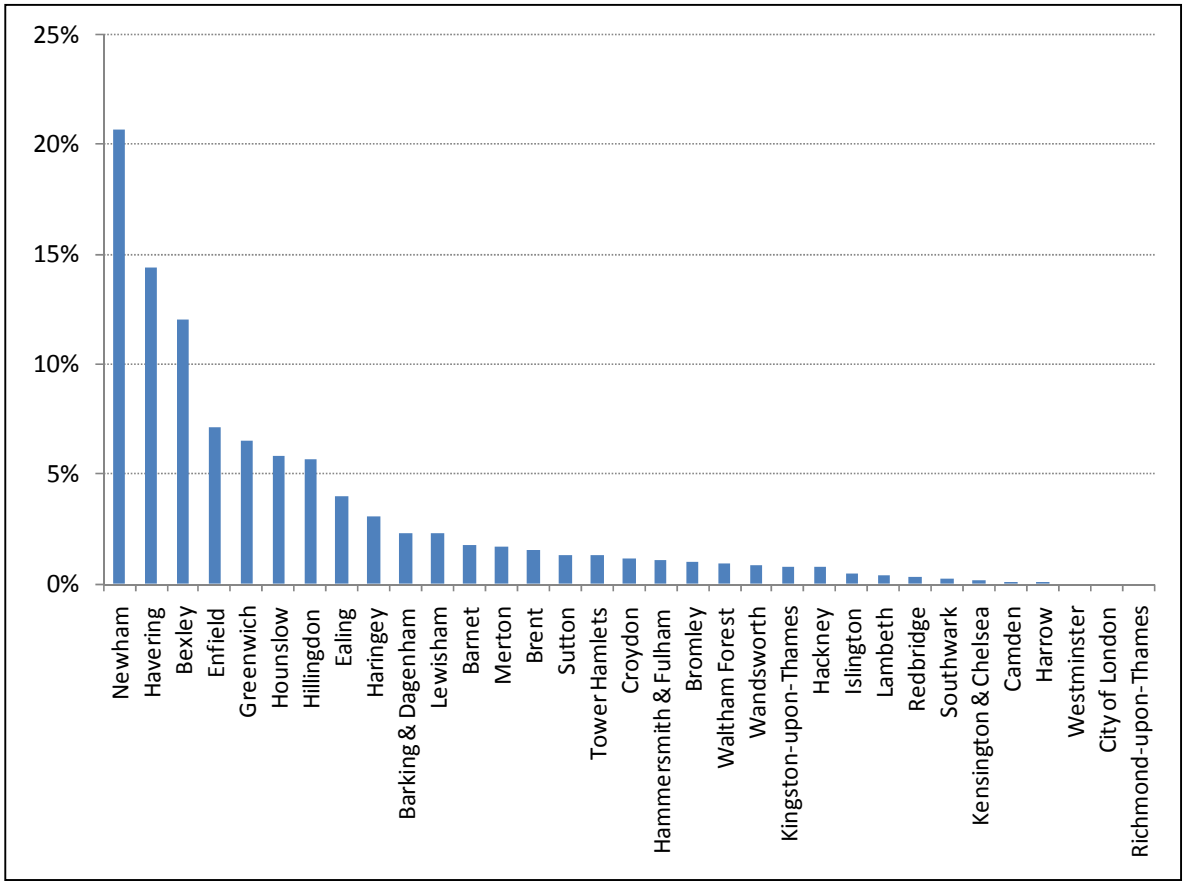
Source: URS, 2010

3.48 Taking a more detailed view, Figure 3.10 below shows that vacant land is largely concentrated in a small number of boroughs. Indeed, the top three boroughs in terms of vacant land – Newham, Havering, and Bexley - account for almost half the London total. These boroughs are also those with the highest rate of vacant industrial land along with Greenwich.

[13] Excluding non-industrial uses

[14] Industrial Land Demand in London - Roger Tym & Partners for LPAC (1999). The data source for this differed from the later estimates and thus the figures are not exactly comparable.

Figure 3.10 % of total vacant land in London by borough, 2010



Source: London's Industrial Baseline 2010

3.49 On the other hand, a number of boroughs effectively have no vacant industrial land: Camden, Westminster, the City of London, Richmond-upon-Thames and Harrow. A greater number have very low vacancy rates reflecting a similarly constrained supply.

Conclusions

3.50 The URS study shows a contraction of 10% in the stock of industrial land in London since 2001. This is the result of a number of combined trends: the continued decline in manufacturing; more efficient land management; the transfer of the land to other non-industrial uses such as retail and offices.

3.51 There is a risk that this could continue in the future, beyond a level beneficial to London's economy. Indeed, a significant share of industrial land (a third) is vulnerable to changes of use because of their lack of protection through planning designations. This has already been explored in Chapter 2 and will be an important factor in our final recommendations.

3.52 As a result, by 2010, there were 7,433 ha of industrial land left in London. The term industrial land may be misleading as the range of occupiers extends well beyond general and light industry which together only account for 37.5% of the stock. A third of the stock is occupied by warehouses and the remainder by a range of users including utilities, waste, transport and wholesale markets.

3.53 The mix of industrial land users evolves constantly. Over the last 10 years, manufacturing has contracted while light industry and waste have gained ground. We look at market / occupier trends in more detail in the following chapters. It is important to continue to monitor these changes in order to provide appropriate land supply.

3.54 The spatial distribution of industrial land in London is strongly polarised between East and West London while the other sub-regions have much smaller stocks. East London is also the sub-region with largest stock of vacant land. The sub-regions with the smallest supply (Central, South and West) have very little vacant land and as a result a very constrained market. This will have implications for the benchmarks and future allocation of industrial land across London.

3.55 In the next chapters we explore each of the broad categories of occupiers of industrial land in order to better understand their role in the London economy, the reason why they locate on industrial land and their future land requirements.

4 GENERAL AND LIGHT INDUSTRY

Introduction

4.1 In this section we examine the general industrial users of industrial land in London, excluding warehousing and logistics which are discussed in the next chapter.

4.2 Our starting point is to consider the existing categories of industrial employment used to inform the past Industrial Land SPG. We break down the analysis by two broad categories:

- Production sectors – which might be expected to occupy industrial land. This is a slightly refined version of the definition of industrial (non-warehousing) sectors used in the previous two Industrial Land Demand Studies. We include within this category construction industries and related trades.
- Service sectors – which carry out activity that may be best suited to industrial land or may be occupying it due to availability and price factors.

4.3 The chapter reviews both existing structure and current trends in both these segments of the market. It follows with forecasts of future employment numbers as well as floorspace and land requirements for the planning period 2011-2031.

Production sectors

Profile of employment

4.4 In 2008 the total number of employees in employment in industrial production sectors in London was just 178,900. Eighteen sectors employed more than 2,000 workers and between them these sectors accounted for over half (55%) of the total general industrial employment in London.

Table 4.1 Industrial sectors with more than 2,000 employees in London

Sectors	Employees
Maintenance and repair of motor vehicles	15,641
Printing not elsewhere classified	14,054
Plumbing	12,095
Manufacture of bread; manufacture of fresh pastry goods and cakes	7,563
Joinery installation	6,327
Painting and glazing	5,392
Manufacture of motor vehicles	4,587
Other building installation	4,070

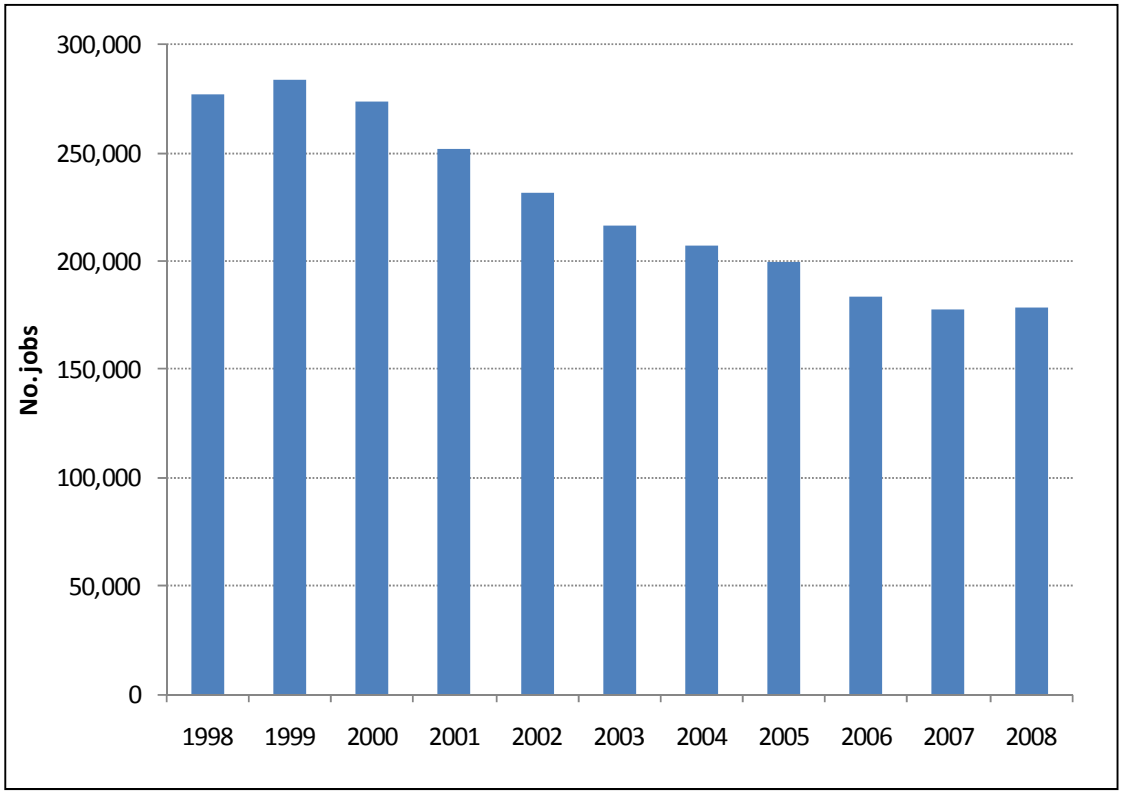
Renting of construction and civil engineering machinery and equipment	3,388
General mechanical engineering	3,321
Production of meat and poultry meat products	3,286
Manufacture of other outerwear	3,110
Maintenance and repair of office, accounting and computing machinery	2,666
Manufacture of other plastic products	2,459
Manufacture of lifting and handling equipment	2,218
Manufacture of pharmaceutical preparations	2,199
Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment	2,140

Source: ABI

4.5 The sectors cover a range of activities. The largest employment sectors are motor trades, printing, building trades and fresh foods.

4.6 Employment in London's production sectors has continued to decline at a steady rate. Over the period 1998-2008, total employment in London in these sectors fell by 35% a decline of nearly 100,000 jobs. This is a more rapid rate of decline than experienced nationally where total employment in these sectors declined by 25%.

Figure 4.1 Employee jobs in production sectors in London



Source: ABI

4.7 The industrial sectors with the biggest absolute decline in employment over the period 1998-2008 are set out in the table below. They have lost between 43% and 100% of their jobs in London. They are also sectors where employment has fallen heavily nationally although, with the exception of the clothing sectors, the decline has been quicker in London than in the country as a whole. These tend to be sectors that have no specific reason to be in London.

Table 4.2 Industrial sectors with the largest job losses between 1998-2008

Industry	Change 1998-2008	Change %	GB %
Printing not elsewhere classified	-10,665	-43.1%	-33.2%
Manufacture of motor vehicles	-6,619	-59.1%	-30.2%
Manufacture of other outerwear	-5,566	-64.2%	-82.7%
Maintenance and repair of office, accounting and computing machinery	-4,880	-64.7%	-32.1%
Manufacture of other wearing apparel and accessories not elsewhere classified	-4,095	-73.6%	-76.7%
Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment	-3,366	-61.1%	-32.6%
Manufacture of other plastic products	-2,654	-51.9%	-41.1%
Manufacture of perfumes and toilet preparations	-2,452	-81.0%	-48.6%
Pre-press activities	-2,376	-74.5%	-64.7%
Manufacture photographic chemical material	-2,018	-100.0%	-77.5%

Source: ABI

4.8 There were just four sectors where employment increased by more than 1,000 over the ten years 1998-2008. Of these three were in the building trades, one related to fresh food.

Table 4.3 Industrial sectors with the largest job gains between 1998-2008

Industry	Change 1998-2008
Plumbing	3,599
Joinery installation	2,114
Processing and preserving of fruit and vegetables not elsewhere classified	1,263
Other building installation	1,258

Specialisation

4.9 There are a few industrial production sectors for which London is still the most significant location in the country but most of these are small in terms of employment numbers. The table below lists all those industrial sectors where London both had more than 1,000 employees and a Location Quotient greater than 1 – i.e. where it is relatively specialised compared with the national average.

4.10 The table also shows the proportion of total national employment in that sector which is located in London. For example 43% of total employment in Great Britain in the 'Reproduction of sound recording' sector is located in London.

4.11 These sectors tend to be at the more creative end of the manufacturing spectrum related to sectors such as music, fashion and printing. The activities carried out would probably fall into the lighter industrial categories, possibly occupying B1(c) premises. Therefore they may not be located on designated industrial sites such as SIL.

Table 4.4 Industrial sectors concentrated in London

Industry	2008	London as % of GB	LQ
Reproduction of sound recording	1,018	43%	2.7
Manufacture of other outerwear	3,110	29%	1.8
Manufacture of jewellery and related articles n.e.c	1,725	28%	1.8
Ancillary operations related to printing	1,964	20%	1.3
Manufacture of other wearing apparel and accessories n.e.c	1,469	19%	1.2
Bookbinding	1,166	19%	1.2
Manufacture of mineral waters and soft drinks	1,793	17%	1.1

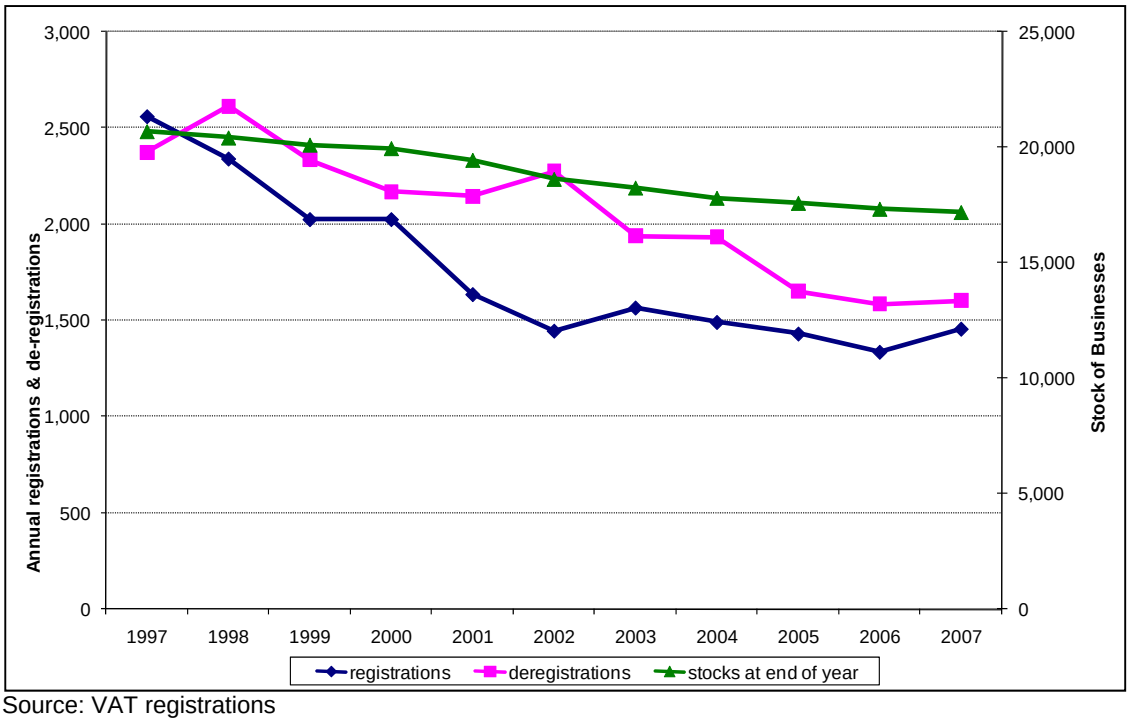
Source: ABI

Business Dynamics

4.12 Manufacturing which is the core of industrial production activity has been in decline for a very long time in London. But the analysis of the manufacturing stock in London should not disguise the fact that manufacturing like all other sectors consists of businesses that are growing and businesses that are declining.

4.13 The figure below shows the stock of manufacturing business in London over a ten year period from 1997-2007, which illustrates this point. Over this period the number of manufacturing businesses declined by 17% yet new manufacturing businesses continued to be formed. For the period 2001-2007 there was an average of just under 1,500 new manufacturing business registered each year, or around 8% of total manufacturing stock. The businesses that are new registrations are likely to have different property market requirements, by size and location from the firms that cease business.

Figure 4.2 Business population in manufacturing in London



Source: VAT registrations

Changes to the workforce

4.14 The increasing role of service provision by manufacturing is a trend that has been evident for many years. BIS analysis of ONS data has shown the change in total manufacturing employment by occupation for the period1994-2009. This shows a growth in professional occupations in manufacturing activity which now account for over one third of all manufacturing employment. Correspondingly there has been a decline in trade occupations which now account for just 43.6% of all jobs in manufacturing compared with 52.4% in 1994. This shift in occupational activity profile will also have an implication for the types of floorspace that will be in demand.

Table 4.5 Proportion of UK manufacturing employment by occupation 1994-2009

Occupation	1994	2009
Production, Professional	11.4%	14.4%
Production, Trades	42.1%	34.3%
R&D, Development	3.2%	3.5%
Support services, professional	16.8%	19.3%
Support services, trades	10.3%	9.3%
Sales & marketing	10.5%	11.7%
Logistics & Distribution	5.9%	7.4%

Source: BIS analysis based on ONS Labour Force Survey data[15]

4.15 The profile of manufacturing employment in London is even more strongly weighted to what might be seen as 'white-collar' occupations.

Table 4.6 Occupational Profile of Manufacturing Employment in London[16]

Occupation	% of jobs
Managers and Senior Officials	25.9%
Professional Occupations	11.2%
Associate Prof & Tech Occupations	13.1%
Administrative and Secretarial Occupations	9.1%
Skilled Trades Occupations	18.9%
Personal Service Occupations	1.0%
Sales and Customer Service Occupations	2.6%
Process, Plant and Machine Operatives	11.3%
Elementary occupations	6.8%

Source: RTP analysis of APS data

4.16 With an occupational profile of this nature it would come as no surprise if a significant proportion of employment in London's manufacturing sector did not occur on industrial land.

Service and other sectors on industrial land

4.17 In addition to the production sectors that we might expect to occupy industrial land; there are also a large number of service sector companies that occupy industrial land in London. The ONS has undertaken some analysis using IDBR data to map the employment sector of establishments on identified industrial land from the 2010 Industrial Land Baseline report.

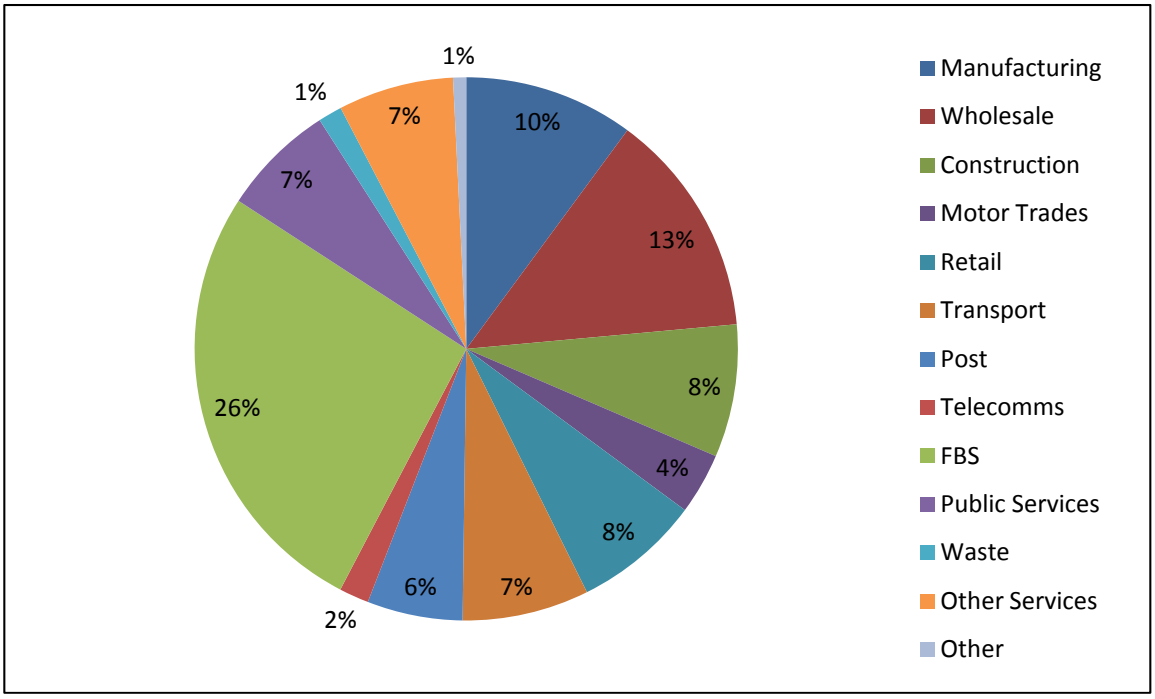
[15] Manufacturing in the UK: An economic analysis of the sector - BIS (December 2010)

[16] Based on average of last five yearly estimates to June 2010. Data has been averaged to smooth fluctuations caused by low sample size.

4.18 This showed a total of 556,000 jobs on industrial land, 13% of total London employment. Of the 490,000 jobs for which data is not suppressed one-third of these are in industrial sectors. In other words two-thirds are not.

4.19 This data enables occupiers of employment land to be analysed in terms of employment rather than land use as set out in Chapter 3. Thus higher density occupation activities will appear to have a disproportionately high share compared to the amount of land they occupy.

Figure 4.3 Employees on industrial land by sector



Source: RTP Analysis of IDBR data

4.20 Whilst the sectoral classification of industrial land occupiers exhibits a very wider spread, the range of functional activity carried out on these sites may be narrower. For example some large business services companies may maintain in-house engineering & maintenance functions that are better suited to industrial type locations.

4.21 Of the eleven largest employment sectors on industrial land only one is from the production or distribution sectors. But this is also the only sector where employment on industrial land accounts for more than half of the sector's total employment. The same pattern maintains, with a few exceptions, for all sectors of industrial land occupiers. For production and distribution sectors more than half of employment is on industrial land whereas for service sectors only a small proportion of employment is located on industrial land.

4.22 In many cases these are large employment sectors with a small proportion of their activity on industrial land. But this still makes them among the largest occupiers of industrial land in terms of jobs.

Table 4.7 Largest Employment Sectors Occupying Industrial Land

Sector	Employment on Industrial Land	% of London Sector Total
Traditional cleaning services	24,089	25.0%
National post activities	18,140	63.0%
Television activities	16,618	46.7%
Catering	11,195	21.3%
Labour recruitment and provision of personnel	9,832	5.6%
Other software consultancy and supply	9,158	10.4%
Security and related activities	8,645	18.2%
Other scheduled passenger land transport n.e.c.	8,540	28.9%
Construction of civil engineering constructions	8,288	41.4%
Telecommunications	8,113	18.0%

Source: RTP Analysis of IDBR data

4.23 We do not have access to the data to be able to undertake further analysis so our conclusions are to some extent speculative but we would suspect that cleaning services for example are depots on industrial land with the employees actually working on site.

4.24 As seen in Table 4.8 below, there are only three sectors that fall outside our original definition of Industrial and Warehousing Land where more than 50% of employment is located on industrial land. These are engaged in the renting of machinery and equipment and are not large employment sectors.

4.25 There are a further fifteen sectors where between a third and a half of total employment is located on industrial land. These sectors lie broadly in construction, retail, and motor trades.

Table 4.8: Other employment sectors on industrial land

SIC2003	Employment on Industrial Land	% of London Sector Total
Renting of other machinery and equipment n.e.c.	2,645	63.0
Renting of other personal and household goods not elsewhere classified	687	57.3
Renting of construction and civil engineering machinery and equipment	1,815	55.0
Washing and dry-cleaning of textile and fur products	3,613	48.8
Activities of other transport agencies	6,798	48.6
Sale of motor vehicle parts and accessories	4,204	48.3
Television activities	16,618	46.7
Maintenance and repair of motor vehicles	7,294	44.2
Construction of civil engineering constructions	8,288	41.4
Renting of buses and coaches	1,077	39.9
Retail sale of photographic, optical and precision equipment, office supplies and equipment (incl. computers)	1,825	38.8
Retail sale of mobile telephones	3,090	38.6
Sale of new motor vehicles	3,827	37.5
Construction of motorways, roads, airfields and sport facilities	1,940	37.3
Demolition and wrecking of buildings; earth moving	524	34.9
Retail sale of floor coverings	757	34.4
Sale of used motor vehicles	810	33.8
Sale or leasing activities of advertising space or time	2,137	33.4

Source: RTP Analysis of IDBR data

Service Sector Occupiers of Industrial Land

4.26 There are then two questions we need to address:

- Why are service sectors occupying industrial land?
- Should service sectors occupy industrial land?

4.27 In response to the first question, for many occupiers they will neither know nor care about the land use designation of their premises. Occupiers across a range of manufacturing and service sectors are driven by the desire to find the right premises to suit their business needs. So a service sector may locate on industrial land due to:

- Availability of appropriate premises in the right location at the right price.
- Lack of provision of appropriate premises forcing them in to sub-optimal solutions.
- Part of the service companies activity requiring industrial land.

4.28 The first two reasons imply a broader employment land policy response. Where service sector companies are carrying out industrial activity then industrial land is the appropriate location and policy makers need to ensure this is factored in to their calculations of demand.

4.29 There are also large numbers of jobs in industrial sectors that are occupying non-industrial land. Again we suspect that the answers are similar to before in terms of available space at the right location. It also reinforces that view that the industrial production sector in London has a high service component which means its activity can be carried out in non-industrial premises.

4.30 It is this service component that is likely to grow. A Foresight report for the Government Office for Science looked at technology and innovations that might drive future economic growth. It believes there is a future for manufacturing and that "By the 2020s, the UK could lead a 21st-century group manufacturing revolution, fuelled by new technologies, tools and materials, with local bespoke manufacturing-on-demand based on 3D printing and a move to a product *plus* service commercial models – 'servicisation'." More personalised manufactured goods may imply more locally produced goods both in terms of enabling a more local character to products and also where there is a requirement for just-in-time demand. This is an area where London already shows examples of providing bespoke high value products such as tailoring in Saville Row. The creation of a new market for highly tailored goods may increase demand for industrial type premises close to the market in London. But these may not be traditional industrial units.

A revised classification of Industrial land activity

4.31 The 2004 Study of Industrial Land produced a definition of industrial land sectors by 4-digit SIC. There were a small number of minor amendments to this definition in the 2007 report. These definitions are set out in the Appendix and we have used these definitions to inform the preceding analysis of industrial employment in London.

4.32 Based on an analysis of IDBR data we are able to review this definition.

4.33 We would suggest that SIC section 511 (wholesale on a fee or contract basis) is excluded as a primary industrial land use. These sectors are agents and are minority occupiers on industrial land. The largest employment locations for these sectors are Westminster, Hounslow, City and Camden, between them accounting for nearly half of the jobs in this sector. This adds further weight to the suggestion that they are not primarily industrial land activities (at least in London). However the exclusion of these activities will not make a significant difference to previous demand conclusions. They are a relatively small sector, accounting for 13,500 jobs in London. More importantly they are classified under the warehousing category and the forecasts for this are not being generated from sectoral employment numbers.

4.34 For SICs 451 – 454, construction activity, an average of 26.5% of employment is on industrial land.

4.35 Other Supporting Land Activities (SIC 6321) should not be included as this includes railway stations and similar activity[17].

4.36 We are then left with the following classifications of activity

- Manufacturing – amended to account for publishing. Almost without exception these sectors have the majority of their employment on industrial land. Although we should also recognise that a lot of manufacturing employment does not take place on industrial land. In terms of allocating employment to industrial land these two factors will tend to cancel each other out.
- Building Trades – these all occupy some industrial land but not a majority of employment. For London as a whole for SIC sectors 451-454 we have applied a fixed proportion of 25% of this sector as occupying industrial land.
- Motor Trades – a minority of their employment is on industrial land. For the forecast we have allocated the maintenance and repair sectors SICs 502 and 504 to industrial land but not the sales sectors.
- Retail – which has no real justification for occupying industrial land as a primary usage. There may be a case for allowing some small local convenience stores as an ancillary use to support industrial estates by providing local amenities, but there would be no need to make an allocation for this in terms of the strategic forecasts for London.
- Service sectors – a number of service sectors occupy industrial land. In all cases it is a minority of employment but given the size of these sectors they can be substantial occupiers – at least in employment terms. We discuss these further below.

4.37 A revised classification of industrial land sectors by 4-digit SIC is set out in the Appendix[18].

[17] This will not in reality affect the forecasts as this was previously categorised as part of the Warehousing segment which is forecast in a different way as set out in the subsequent chapter.

[18] The Appendix also includes the other sectors that are also users of industrial land associated with waste, utilities and warehousing and logistics that are addressed in subsequent chapters.

Future demand for land

Method

4.38 For each category of use we have adopted a different mechanism to forecast the demand for industrial land. For Industrial Production sectors we calculate demand based on employment projections. For the service sector occupiers we have a more fundamental question of whether they should be occupying industrial land at all.

Industrial Production Sectors

4.39 The method follows four simple steps, though each of these steps contains a number of technical issues.

- First we project employment by sector;
- Employment by sector is then mapped to produce a definition of industrial land use;
- Employment by use class is then converted to floorspace via application of employment density ratios;
- Floorspace is then converted to land requirements by application of plot ratios.

4.40 We set out each of these steps below.

Employment Forecasts

4.41 The forecast used is the latest GLA Borough projections published in Working Paper 39.

4.42 The GLA uses a forecast method known as triangulation to produce its Borough level forecasts. The Triangulation method brings together three components[19]. These are:

- Trend projections prepared by GLA Economics with the assistance of Volterra;
- Site Capacity projections based on RTP's London Employment Sites Database; and
- Accessibility projections based on CBP accessibility indices.

4.43 The GLA's London trend employment projections prepared are provided for 12 employment sectors for the forecast period (2008-2031) as well as historically (all years between 1971 and 2007). These forecasts by sector are summarised in the table below.

4.44 At broad sector level manufacturing is the closest match to industrial employment. According to the GLA trend forecast the numbers employed in manufacturing are projected to decline by 135,000 over the forecast period to 2031. This represents a decline of 60%. For the plan period 2011-31 the number of jobs in manufacturing is projected to fall by 103,000.

[19] The detailed method is set out in GLA Economics Working Papers38 and 39.

Table 4.9 London employment sector forecasts

Employment (000's)	2007*	2011	2016	2021	2026	2031	*Change 2007-31*	*%*
Primary & utilities	29	25	21	18	15	12	*-17*	*-59%*
Manufacturing	224	192	158	130	107	89	*-135*	*-60%*
Construction	242	230	216	203	191	179	*-63*	*-26%*
Wholesale	215	211	206	201	196	191	*-24*	*-11%*
Retail	402	407	415	422	429	437	*35*	*9%*
Hotels & restaurants	305	336	378	426	480	540	*235*	*77%*
Transport & communications	342	335	327	318	310	302	*-40*	*-12%*
Financial services	334	335	336	336	337	338	*4*	*1%*
Business services	1,222	1,323	1,431	1,522	1,594	1,646	*424*	*35%*
Public Admin	229	218	206	194	183	173	*-56*	*-24%*
Health & education	731	740	751	762	773	785	*54*	*7%*
Other services	400	446	509	582	665	760	*360*	*90%*
Total	**4,676**	**4,797**	**4,953**	**5,114**	**5,280**	**5,452**	***776***	***17%***

Source: GLA Economics, Working Paper 38: Employment projections for London by sector and trend-based projections by borough, Nov 2009. *Note 2007 is the base year is actual rather than forecast data

4.45 These London forecasts form the basis for the Borough forecasts produced by the GLA.

4.46 The triangulated borough projections do not have a sectoral dimension. We have therefore prepared Borough sector projections by applying London sector projections to Borough employment structure (taken from the ABI 2008 data) and constraining to Triangulated Borough and GLA Economics London sector totals. Initial projections were iterated to approximate to this dual constraint: the sum of borough sector projections were factored to equate to London sector totals and the revised borough sector totals were factored to equate to Triangulated Borough totals. This process continued until both borough and sector totals were consistent with the control totals as set out above.

Land Use Sector Forecasts

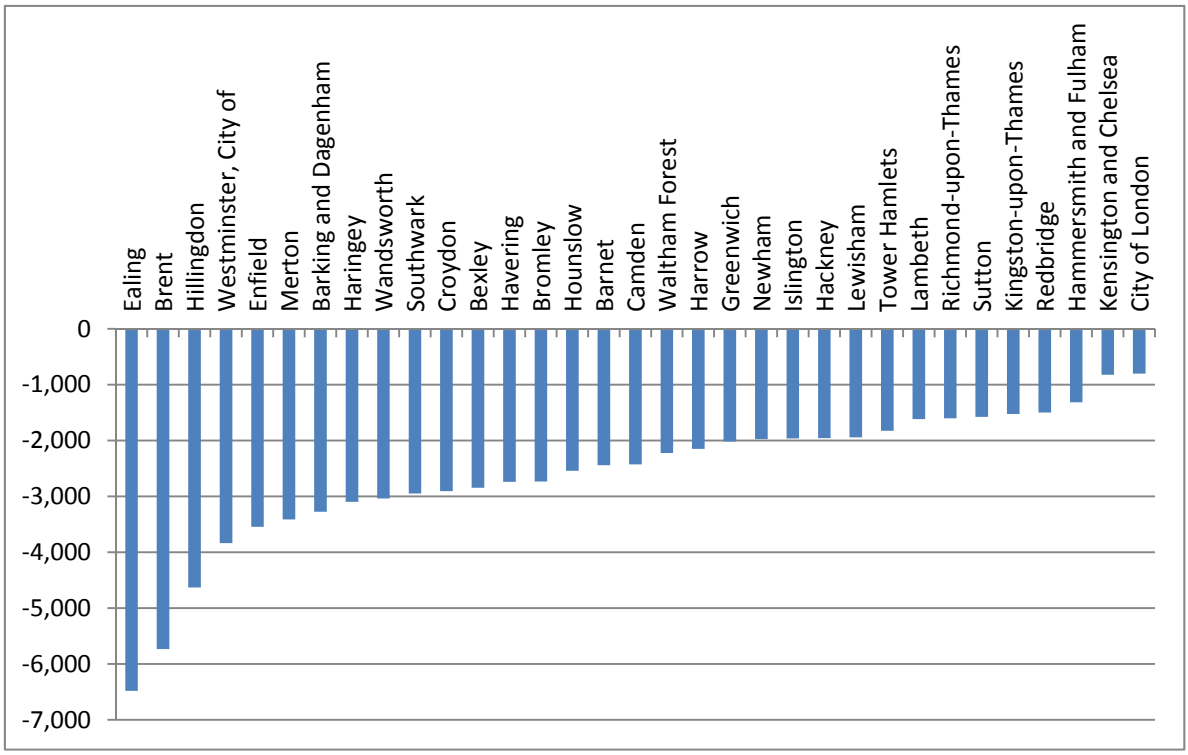
4.47 This produces borough forecast at the level of the twelve sectors listed in Table 4.9. To construct the forecasts of industrial employment by borough we use the following steps:

- Define Industrial Production sectors at 4 digit SIC;
- Calibrate 2008 4 digit SIC data to the GLA 12 sector totals at Borough level;
- Apply Borough sector growth rate from GLA 12 sector level for each five-year period to relevant 4 digit SIC;

4.48 This follows the revised definition of employment by SIC sector discussed earlier in the chapter.

4.49 This method results in a decrease of 85,400 jobs for London as a whole over the period 2011-31. The split by borough is illustrated in the Figure 4.4 below.

Figure 4.4 : Change in industrial job numbers between 2011 and 2031



4.50 The largest forecast reductions in industrial employment are in the outer London boroughs, particularly to the west in Ealing, Hillingdon and Brent. This is a reflection of the existing scale of industrial employment in those boroughs.

From Employment to Floorspace

4.51 We then translate future employment change into demand for space using employment densities (floorspace per worker. The London Employment Sites Database (LESD) used densities based on information from the RTP study carried out for SERPLAN in 1996 (which remains one of the most comprehensive data sources), a review of evidence by Arup Economic and Planning for English Partnerships (which recommended employment densities for use for different types of activity and location) and a survey by DTZ Pieda for SEERA. In addition we supplement this information with newer data emerging from the RTP study of 2006 (RTP, Ramidus, King Sturge, 2006 "The use of business space in London).

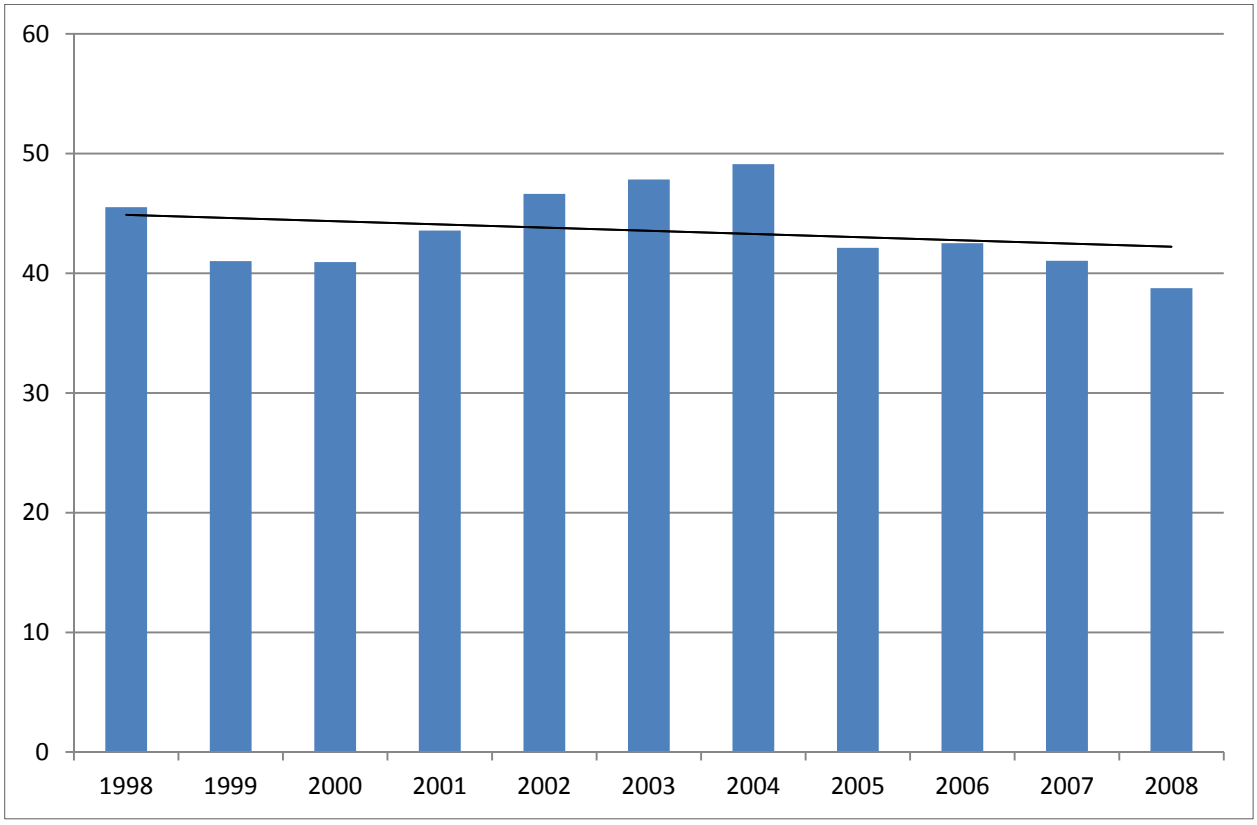
4.52 The assumptions used in the LESD 2009 are presented in the Table below.

Table 4.10 Employment densities (sqm)

Floorspace per Worker	CAZ ward	Inner London	Outer London	*Source*
B1	*14.4*	*14.7*	*20.6*	*RTP, Ramidus, King Sturge, 2006 "The use of business space in London"*
B2	33	39	44	*LESD 2006*
B8	33	39	44	*LESD 2006*

4.53 In Figure 4.5 Industrial Employment:Floorspace Ratios for London below we examine the actual ratio of employment in industrial sectors to total industrial floorspace. The data is displayed for the period 1998-2008, which enables us to even out fluctuations in the data and perhaps also to identify if there is some trend over time. The figure fluctuates around 40 sq m per worker although there appears to be a downward trend. Both of these findings are consistent with what we might expect to see. However the downward trend is over-exaggerated as there was a re-classification of industrial floorspace in Hillingdon in 2005: up until 2004 runway use had been classified as industrial. If we re-adjust for this change then the downward trend is less pronounced.

Figure 4.5 Industrial Employment:Floorspace Ratios for London



Source: VOA

4.54 Around the 2008 London average of 39 sqm per worker there is a considerable variation at the borough level. Outliers at one end are the City and Westminster which implies that the standard definitions of industrial sector employment are not a good fit at the CAZ level.

4.55 At the other extreme there are very high floorspace to workers ratios for the east London boroughs of Barking & Dagenham, Newham, Hackney and Tower Hamlets. This implies

either or both of the following factors prevail: very land extensive employment use or high levels of vacancy or under-occupation[20].

From Floorspace to Land

4.56 RTP have undertaken some analysis of the LDD dataset to examine the relevance of the plot ratio assumptions used in the LESD 2006. The analysis showed that the plot ratio assumptions used in the 2006 LESD still hold.

4.57 But as noted the employment density ratios are not a good fit to our industrial SIC definition for the City and Westminster and hence have not been applied to these two boroughs.

Table 4.11 Plot ratio assumptions (Sq m of Floorspace per Ha)

	CAZ wards	Inner Wards	Outer Wards	*Source:*
Plot Ratios				
B1	77,000	18,500	9,000	*LESD 2006*
B2	9,000	*6,500*	*3,800*	*LESD 2006; URS Industrial Land research 2007*
B8	9,000	*6,500*	*3,800*	*LESD 2006; URS Industrial Land research 2007*

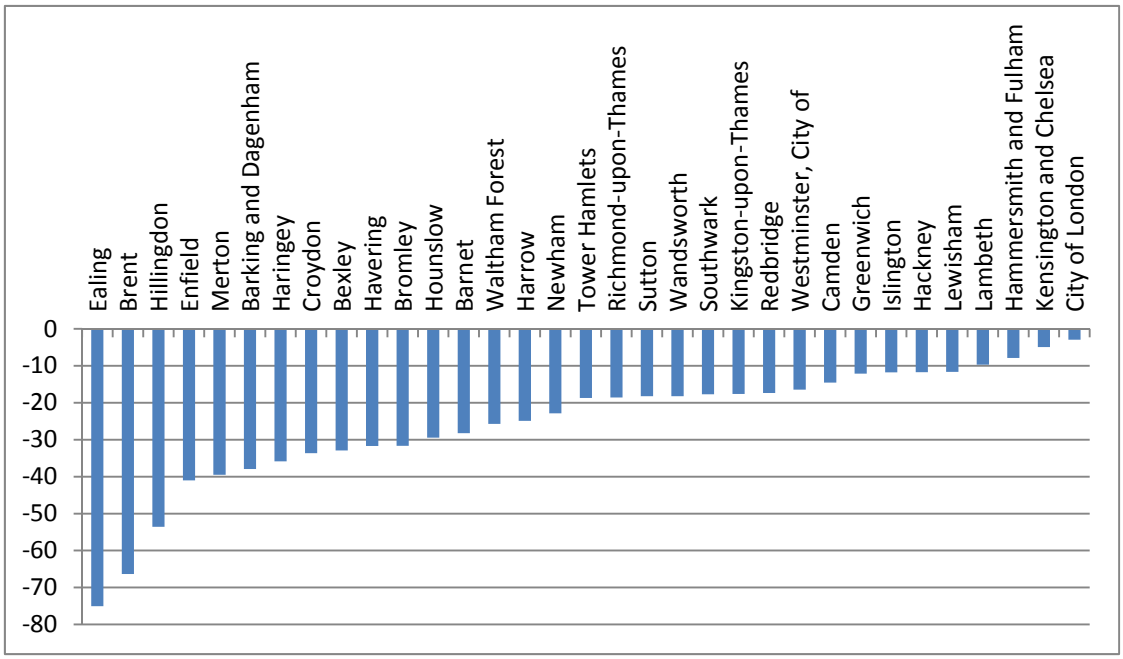
4.58 The higher density figures for inner London suggest that it is possible that higher densities might also be achieved in outer London. But the differentials are likely to reflect both the mix of activity and cost pressures. For the purpose of our central scenarios we maintain the density differential between inner and outer London.

4.59 A tendency towards a higher service component suggests that density ratios may tend closer to B1 densities. We suspect the dividing line between production and service activity in London is often very blurred. We believe there are probably two offsetting trends. On the one hand the move to a higher service component can increase densities; on the other hand a higher distribution component associated with larger scale logistics operations would lower average densities.

4.60 For London as a whole this results in a projected reduction in demand for industrial land of 821 ha over the period 2011-31. This compares with a projected reduction in demand for industrial land of 934 ha over the period 2006-26 in the 2007 Industrial Land Benchmarks Study.

[20] We do not propose to use borough specific ratios to inform future density projections as they reflect historic circumstances rather than future use. For example a high floorspace per worker ratio that is due to under-utilisation of land should not be used to determine future floorspace needs. The more relevant factor is the mix of uses going forward.

Figure 4.6 Industrial Production Land Demand – Ha 2011-31[21]



4.61 In line with the projected decline in employment the largest projected reductions in industrial employment land would be in the outer west London boroughs of Ealing, Hillingdon and Brent.

Sensitivity Test

4.62 The shift in mix of activities and continuous cost pressures may result in a higher utilisation of land and floorspace over time. If at 2031 average employment densities were 10% higher than those set out in Table 4.10 and average plot ratios were also 10% higher then there would be the potential to release a total of 1,003 ha of industrial employment land over then plan period.

4.63 Both these assumptions are well within the range of existing achieved employment density ratios and plot ratios.

Service Sectors

4.64 Whether to include service sector occupiers of industrial land in forecasts of future demand is largely down to how we see the industrial land policy operating. There are broadly three options:

- Accept that these are legitimate occupiers of industrial land and construct the forecast accordingly – which would probably result in a net positive allocation for this segment of demand;

[21] The graph illustrates the effect of applying this method to the City and Westminster although these boroughs have been excluded from our calculations.

- Accept that these are the current occupiers of industrial land but we do not want to provide additional industrial land for them in the future – this would result in a zero net change allocation for this segment of demand;
- Whilst recognising these are current occupiers of industrial land we should not encourage their continued occupation of protected land and instead believe that they should be exposed to correct market prices for land – this would result in a negative allocation for this segment of demand.

4.65 We consider that the second of these options is the best for the purposes of calculating the future demand for employment land and hence have made a zero net demand allocation. This effectively maintains non-industrial occupiers on industrial land and, whilst there is no reason for them to have a protected status, if a negative allocation is made there is no mechanism to choose which uses are maintained and which are forced out. It also raises the question of what type of land these non-industrial users should be occupying.

Conclusions

4.66 Industrial employment accounts for a relatively small and still declining percentage of the overall London economy. Over the period 1998-2008 London lost over 100,000 jobs in industrial production sectors and employment in these sectors fell faster than the national average.

4.67 London's remaining industrial employment has a high tertiary content. It consists of a few small specialist sectors and sectors servicing London's population and businesses. Employment projections show a continued loss of industrial employment with a consequent fall in demand for industrial land that can be recycled into other uses.

4.68 But examination of IDBR data on occupiers of industrial land has shown in addition to the production and construction sectors that might be expected to occupy industrial land a large proportion of London's industrial land is occupied by service sectors. Some of these may be carrying out industrial functions, but others are likely to be occupying it for reasons of price and availability.

4.69 For the forecast period 2011-31 we project that employment in industrial production and construction sectors will fall by 85,400. Using standard employment density ratios and plot ratios for London boroughs this would result in 821ha less land being needed for industrial employment in 2031 which could be released for other uses.

4.70 This will leave a large proportion of industrial land occupied by a variety of non-industrial uses. These will be sectors that are also contributing to London's economic activity. If they do not occupy industrial land, the question is where would they locate instead or would their activity be lost to the London economy?

5 WAREHOUSING AND LOGISTICS

Introduction

5.1 Warehousing and logistics are often used interchangeably to describe the activities of 'storage and distribution' which in land use planning terms are covered by the B8 use class. From a logistics perspective, warehouses are important nodes of supply chain networks through which materials and goods pass en route from source to end consumers. However, not all warehouse occupiers are engaged in logistics activities. For example, document or archive storage is not a logistics activity, but this is a source of demand for warehousing in London and elsewhere. Other warehouse uses which do not conform to standard logistics-related activities include the use of warehousing for the storage of operational business equipment, such as the storage of lighting and filming equipment and 'props' for the media industry, or the use of warehouses as 'data centres' or potential disaster recovery facilities.

5.2 Bearing in mind the breadth of warehousing activities, we explore how it contributes to the operation of London's economy with a focus on logistics. We have focused on this activity because there is a growing realisation that efficient logistics management makes a significant contribution to the overall successful functioning of the London economy. It is also one of the most dynamic sources of demand for warehousing, because logistics and the ways companies manage their supply chains have been, and remain, subject to significant change. Logistics and supply chain management are also clearly related to the achievement of other key policy objectives, including sustainable distribution

5.3 Our assessment of the trends likely to affect demand for land in the future then directly feeds into our methodology to forecast future land requirements from this category of occupiers of industrial land.

The size and significance of London's logistics sector

5.4 While there has been a decline in London's manufacturing output, jobs and 'factory' floorspace over time, existing research data show that the output of the logistics sector in London has increased whilst employment has remained relatively stable, and the stock of warehouse floorspace has increased[22] :

- London's logistics 'sector' accounted for an estimated 3.4% of London's output in 2007, and employed around 221,000 full-time equivalent employees (5.2% of London's total).
- Between 1996 and 2007, the sector grew by 41% in terms of GVA, whilst manufacturing output actually fell.
- Between 1996 and 2007, the number of FTE employees working in logistics in London was broadly flat, having increased by up to 2,000 but then fallen back.

[22] GLA London's Logistics Sector, Working Paper 37, August 2009

- Between 1998 and 2008, London's stock of warehouse floorspace increased by a net 586,000 m² (3.9%), whilst the stock of factory floorspace fell by a net 5,381,000 m² (-36.7%)[23].

5.5 These data highlight the growing size of logistics in London but, if anything, underestimate its significance. This is because whilst it is a relatively small and difficult to define 'sector', efficient logistics operations are an essential cog in the London economy, bringing goods from manufacturers and wholesalers to retailers and ultimately customers. Without efficient logistics it is difficult to see how the London economy and population could grow in the way that forecasts suggest it will. We demonstrate why by looking at the range of logistics activities which need warehouses in the next section.

The infrastructure: the role of warehouses

5.6 Warehouses are the principal property 'infrastructure' supporting logistics activities; they are covered constructions, but the same functions that they perform may occur for different types of goods in open yards (such as for the storage of certain building materials).

5.7 Warehouses form the nodes of supply chain networks between the various transport links. They may occur in various stages of the supply chain for the storage and/or handling of materials, work-in-progress and finished goods. As a result, they perform a wide range of roles which may give rise to different property and land requirements and different location factors. The main functions of warehouses include:

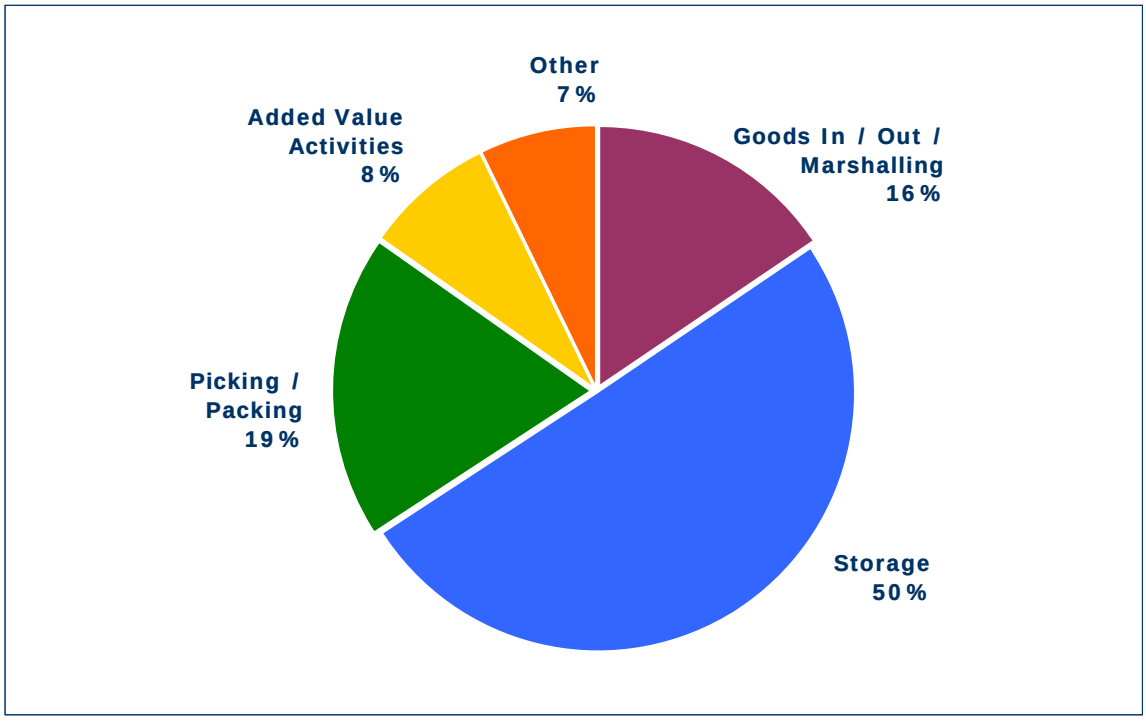
- Material stockholding point: ensuring a constant supply of materials to a manufacturing facility.
- Finished goods warehouse: acting as a temporary holding point for goods immediately after manufacture.
- Finished goods stockholding point: acting as a buffer between variations in supply and demand so as to provide continuing high service levels in terms of stock availability to customers.
- Break-bulk consolidation centre: breaking down large vehicle loads into smaller vehicle loads for delivery.
- Make-bulk consolidation centre: bringing together loads from various sources to form single loads for delivery.
- Cross-docking point: serving as a sortation point, for example, of imported container loads for distribution to various retail shops.
- Assembly facility: holding parts and sub-assemblies ready for final assembly to specific customer orders within the warehouse.
- Value added service centre: performing a wide range of value added services, such as labelling, tagging, cutting, testing and kitting.

[23] ONS Commercial and Industrial Floorspace and Rateable Value Statistics (2005 Revaluation), 2008

- e-fulfilment centre: storing goods ready to complete orders for home shopping, for example, for orders received via the internet or mail order.
- Logistics hub: acting as pallet or parcel sorting centres, or airfreight consolidation / deconsolidation centres.
- Reverse logistics goods centre: handling goods back up the supply chain, for example, for returns of goods from customers, goods for recycling, waste packaging and transport assets (e.g. plastic trays, roll cages and pallets).

5.8 Any one warehouse may of course combine a number of these roles and may undertake these tasks for a range of product categories or customer groups. In general, stockholding is still one of the key activities undertaken by warehouses, as shown by a survey in 2008, which covered 83 UK warehouses from a wide range of industrial sectors, including food and drink producers, manufacturing companies, wholesalers, retailers and third-party logistics providers. This study examined the footprint usage (see Figure 5.1) and found an average split of 50% storage, 19% picking / packing and 16% goods in / out, which can be considered fairly typical of warehouses holding stock ready for picking and packing together for delivery to customers. This analysis was based on a survey of large modern warehouses operated by food and non-food retailers, manufacturers and third party logistics operators and was not specific to any particular type of product.

Figure 5.1 : Floor area usage



Source: Baker, P. and Perotti, S. (2008), UK Warehouse Benchmarking Report, Cranfield School of Management in association with The Chartered Institute of Logistics and Transport (UK) and the UK Warehousing Association)

Drivers of demand for warehouses and their spatial distribution

5.9 The different roles that warehouses perform means that the demand for warehousing is driven by a variety of factors, from economic and market drivers, to corporate strategy and operational choices to adapt to customer demands.

Economic and market drivers

5.10 Over the past few decades, many supply chain concepts have been developed with the aim of reducing the requirement for stockholding and hence, partially, the need for warehouses. These include more agile manufacturing (e.g. small production batches), production postponement (i.e. assembling the goods at the last possible moment), cycle time compression (reducing the need for buffer stock), inventory centralisation (reducing the total amount of stock), virtual warehousing (i.e. treating the stock across a number of warehouses as one), cross-docking (i.e. moving goods directly from the goods-in bay to goods-out without placing into stock), supply chain visibility and information exchange. However, across England, and to a lesser extent across London, the built stock of warehouse floorspace has grown, largely driven by the development of large-scale facilities of 10,000 m^2 and over.

5.11 The reasons why requirements for stockholding have not reduced as much as might be expected by the application of modern supply chain concepts can be debated, but at least three factors have tended to drive requirements for stockholding up:

- Economic growth. The real growth in economic activity and particularly retail sales has meant that, in aggregate, even where manufacturers and retailers have succeeded in not growing inventory by as much as output or sales, the total amount of inventory held by manufacturers and retailers is likely to have increased.
- Globalisation. The longer lead times involved in serving UK customers from locations such as the Far East result in higher stock levels being required to offer the same service levels in terms of stock availability.
- Product ranges. Many companies have offered wider product ranges to customers in order to try to increase market share. These wider product ranges may be in terms of colours, sizes or flavours or more subtle changes such as pack sizes and promotional packs with each distinction giving rise to a 'Stock Keeping Unit' (SKU). Again, widening product ranges result in higher stock levels being necessary to provide the same customer service levels.

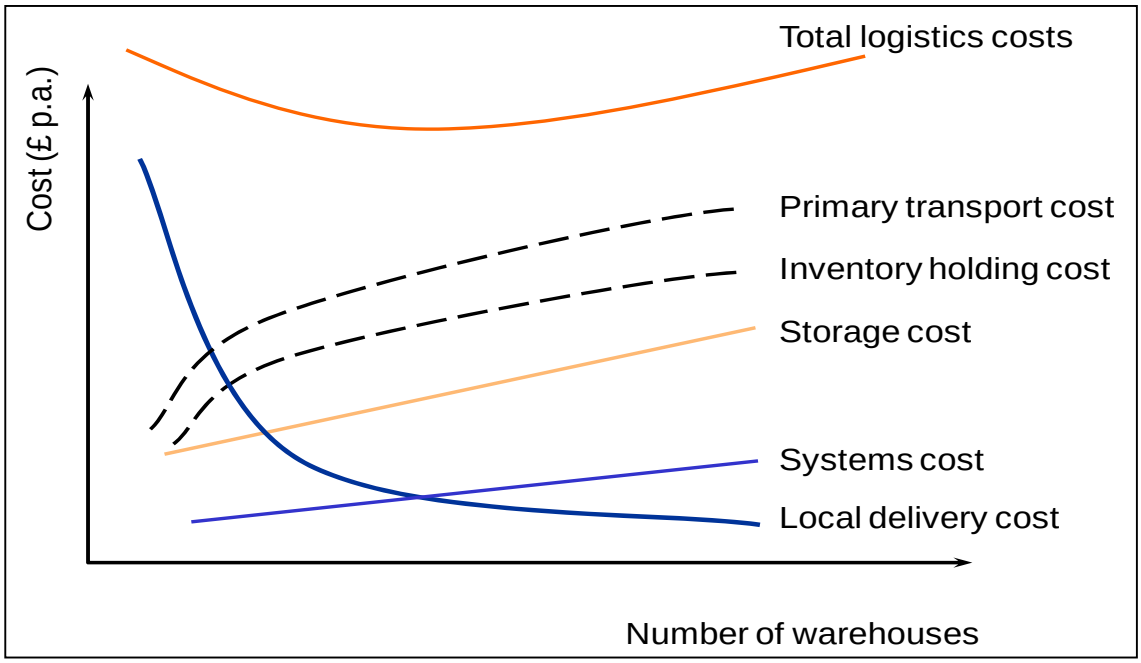
Corporate strategy and cost functions

5.12 As noted earlier, warehouses are nodes in much wider supply chain networks. Even within one company, a warehouse is likely to be part of an overall corporate network of warehouses. Such a network may be regional, national, European or even global in nature.

5.13 Typically, distribution network studies are undertaken by companies to determine the optimum number and location of warehouses. The solutions determined by such studies may range from a single warehouse to serve the UK (or Europe or globally) through to numerous warehouses located throughout the UK. Such decisions are typically reached by analysing the effect of different warehouse numbers on warehouse costs (i.e. rents, rates,

equipment, staff, etc), inventory costs (i.e. working capital costs), systems costs (i.e. for warehouse management systems), trunking costs (i.e. primary transport to the warehouses) and delivery costs (i.e. secondary transport from the warehouses to customers). Typically, these costs rise with more warehouses in the network, except for the delivery costs which fall, as shown in Figure 5.2.

Figure 5.2 : The relationship between total and functional logistics costs as the number of warehouses in a network changes



Source: Rushton, A., Croucher, P. & Baker, P. (2010), The Handbook of Distribution and Logistics Management, 4th Edition, Kogan Page, London.

5.14 The optimum number of warehouses is determined by the lowest overall costs, which is represented by the lowest point of the U-shape curve at the top. This point varies with such factors as the size, weight and value of the goods.

5.15 Where the optimum number of warehouses is one, then the modelled location for a single National Distribution Centre is normally found to be in a triangle covering the West and East Midlands down to about Bedfordshire or North Buckinghamshire, although the final location chosen may be further afield owing to factors such as labour availability. Where the optimum number is two, three, four or more, then it is quite likely that the distribution network model would try to locate a warehouse in or near London, owing to the typical high demand for product in the London area. However, in reality this model-based “optimum” solution is often then modified either because suitable facilities or plots of land cannot be found, or because property and labour costs are considered too high.

5.16 A common solution for companies is, therefore, to service London from outside, often from two warehouses either East and West, or North and South of London. In this respect, there is a high demand for warehousing in London that is not reflected in actual warehouse space. This demand may not appear as take-up of warehouse space within London or may be reflected in a scaled-down usage, for example, holding forward stocks of popular items

in small London warehouses to satisfy the immediate needs of customers and also using these small warehouses to break-bulk large vehicle loads from stockholding warehouses outside London onto smaller delivery vehicles.

Delivery times

5.17 Where very short customer lead times are offered to customers, then multiple local warehouses may be required throughout the country, including London - for example, if a company wishes to offer a same day service, whereby customers order in the morning and receive delivery in the afternoon. This may occur in industries such as pharmaceuticals, wholesale paper, wholesale stationery, building trade products, motor parts etc.

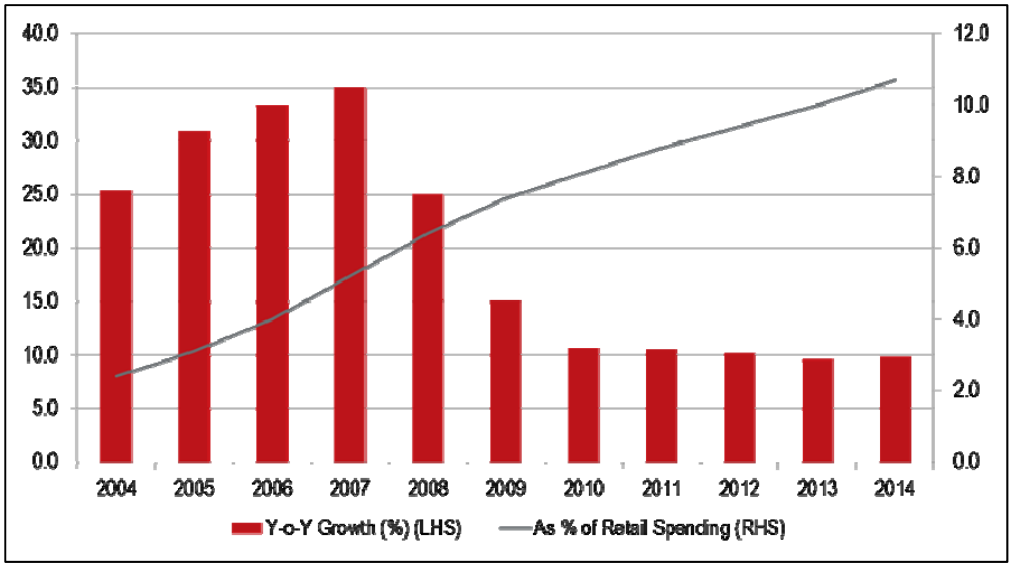
Supply chain trends

5.18 Supply chain trends include: the growth of e-commerce; the potential growth of consolidation centres and break bulk centres; the potential development of more 'port centric' logistics; the potential growth of direct shipment from source to UK stores bypassing distribution centres.

E-commerce

5.19 Internet sales have been growing rapidly and nationally are forecast to reach around 14% of total retail sales by 2015 compared with around 10% in 2010, as illustrated below. This growth is likely to continue over the longer-term, assisted by the development of new technologies, such as 'smart' phones.

Figure 5.3 Internet retail sales



5.20 From a warehouse perspective, e-commerce is normally served from National Fulfilment Centres, ideally near the centre of UK within reach of the main parcel hubs so as to enable late cut-off times to be offered to customers. As sales grow, a network of fulfilment centres may be established, each specialising in product categories that are typically ordered together. These warehouses may be centrally based or, particularly if they feed into postal services, they may be based in areas that offer low land costs, available labour, grants, low postal rates, etc. As an example, Amazon has set up a network of fulfilment centres in

England, Scotland and Wales on this basis. London is not an attractive location for this type of centre. However, the situation is different for food retail, where customers have normally been served by vans based at local supermarkets, from where the goods are order picked. However, this model is changing in some urban areas: as sales volumes have increased, specialist food retail fulfilment centres have been set up by a number of retailers including Ocado, which opened its first e-fulfilment centre at Hatfield, Tesco, which has facilities in London, and more recently Waitrose, which in agreement with Ocado has been permitted since July 2011 to operate an internet service inside the M25.

5.21 These can offer an efficient delivery network whilst avoiding any conflict between shoppers and pickers (also between cars and vans) and enabling stock to be allocated at the time of ordering (or alternatives to be offered on-line at the time of ordering).

5.22 For large items or items that companies decide to deliver through their own networks rather than via parcel carriers, then local home delivery centres may be established. A number of such facilities have been established in London over recent years. For example, John Lewis recently opened a facility in Enfield and Tesco.com is currently developing a facility in Enfield. Similarly, if some e-retailers compete on delivery speed in the future (e.g. by offering same day delivery), then there may be a demand for warehouse space within London in order to store these goods and act as a base for local delivery.

5.23 In addition, there are small fulfilment centres situated in London for local businesses that have grown in the area. These would feed into the parcel or postal networks from their London address, but might be expected to move to a more central location when they outgrow their existing premises.

Consolidation centres

5.24 Consolidation centres tend to be used for increased operational efficiency and in a number of instances have been driven by restrictions (e.g. restricted access to certain shopping centres).

5.25 Existing research undertaken by the University of Westminster for the Department of Transport[24] has distinguished between three different types of consolidation centres namely:

- Special projects urban consolidation centres. The best examples of this type of centre are those consolidation centres set up to handle specific construction projects, such as previously used in the construction for the T5 at Heathrow Airport and currently for the London Olympic park development. These CCs tend to be land intensive, rather than specifically warehouse intensive, as many construction items can be stored in the open. The centres may be located inside or outside the GLA area depending on land costs, availability of land, planning permissions, etc. As with RDC location choices, there is a trade-off between land cost and transport cost.

[24] Transport Studies Group, University of Westminster, Urban Freight Consolidation Centres Final Report, November 2005

- Consolidation centres on a single site servicing customers based in properties in the ownership of a single landlord. This includes centres related to particular shopping centres or retail locations. For example, a number of retail CCs have been set up to service major regional shopping centres, and Clipper Logistics also operates a CC warehouse in Enfield on behalf of the Crown Estate to service certain retailers based on Regent Street. Another example is the CC operated by DHL at ProLogis Park, Heathrow which services all the retailers on the Airport. It should be noted that this is a mandatory scheme unlike the other retail consolidation and in this case evidence suggests that it has resulted in a substantial reduction in vehicle movement.
- Consolidation centres serving a town or a city, which exist on the continent (e.g. German city logistics schemes) but which are not to our knowledge significant in the UK.

5.26 In general, whilst the recent use of construction consolidation centres has been successful in managing the flow of construction materials, retail consolidation centres have not taken-off in a big way in the UK. In terms of operational efficiency, these CCs can be beneficial by consolidating loads into single vehicle drops, particularly where there are timing or access restrictions on unloading at the shops. However, their use nationally has been limited and cost efficiency appears to be marginal at best. One issue is that many of the CCs have not been set up at the outset of the large retail developments that they are designed to serve but rather have been grafted on at a later date after retailers have already started their own logistics operations, and have attracted relatively few users. This suggests that to maximise the prospects of implementing a successful retail CC, the CC should be considered at the outset of the retail development with the latter having limited shop unloading facilities to encourage retailers to sign up to the CC. Whilst consolidation centres have played a relatively modest role to date, if it is decided to restrict the size and/or type of vehicle allowed into areas of London, then this could have a major impact on the demand for consolidation centres on the outskirts of those areas. For example, if truck access was limited to small electric, or low-emission, vehicles, then this would stimulate a requirement for warehouses where goods could be transferred from larger trunk vehicles (e.g. emanating from National Distribution Centres or ports) onto these smaller final delivery vehicles. This is an area of activity we would expect to increase over the medium and longer-terms in line with increasing interest in promoting more sustainable logistics and more collaborative logistics management. Another factor can limit their cost efficiency: double-handling. This can be an issue for some goods, such as furniture, where potential damage may be a consideration.

Port centric logistics

5.27 The potential growth of port centric logistics is linked to global sourcing and the growth in container imports into the UK. Traditionally, imported goods often passed straight through a port to a national distribution centre which would normally be located near the Midlands area. However, particularly if a company operates a regional distribution centre network or delivers bulky items directly to store, it may be advantageous to postpone the decision as to where to send the goods (e.g. to avoid the possible extra expense of subsequently transporting the goods to a region of high demand). In this case, holding the goods as

buffer stock at a port may be a cost effective strategy. Further efficiencies may be gained by eliminating the need for many return empty container trips (as the containers would be unloaded near the port) and by loading containers to their full weight potential (if the goods can be unloaded before travelling onto public roads). The interest in port-centric logistics has increased and a number of ports have attracted very large warehouses to their areas, notably Teesport in the North of England, where both ASDA and Tesco have very large import centres.

5.28 However, if port centric logistics grows further, this would not appear to have a significant direct effect on the demand for warehouse space in London, because the major container ports that service London are outside of the region, e.g. at Felixstowe, Southampton, Tilbury and Thamesport. Some of these ports have quite significant potential to offer port centric facilities, either on their own estates or on adjacent or nearby land. For instance, the new port at London Gateway in Thurrock has consent for around 860,000 m² (9.25 million ft²) of logistics space on land adjacent to the port. This is clearly a substantial supply of logistics land which could attract significant demand from retailers and others seeking to serve London and wider markets.

Direct shipment to store from source: the 'distribution bypass'

5.29 The method of operation involving direct shipment from Asia to UK stores has been used for many years and is suitable in an industry where there is an intention to always offer new product lines (e.g. fashion lines). For example, with new season fashions often the first batches are cross-docked in warehouses immediately to stores without being put into warehouse stock. Subsequent batches may be held in warehouse stock for replenishment, for example, on a sold-one replenish-one basis. However, this type of operation is not normally suitable where companies offer specific products on a continuous basis. The latter normally requires companies to hold stock close to the consumer (e.g. in the UK or Europe) so as to buffer against variations in demand volumes, as well as supply lead times.

5.30 A "distribution bypass" type of operation is, therefore, only applicable to parts of some industries and would mainly affect the national distribution centre (NDC) and regional distribution centres (RDCs), most of which are located outside London. It could, however, occur that sufficient volume may warrant a full container load destined solely for London stores to be sent to a warehouse in London for unloading and immediate despatch to the stores.

Transport related factors

5.31 Transport-related factors which shape and change logistics operation and their spatial distribution include: an increasing focus on more sustainable logistics; the potential development of strategic rail freight interchanges; air freight logistics and the future potential of Heathrow Airport; the impact of a rise in fuel prices.

Sustainable logistics

5.32 The latest available data on freight by transport mode shows that road is the by far the most popular option accounting for 64% of goods moved in Great Britain in 2009 (measured by tonne kilometres) whilst rail account for 9%, water for 22% and pipeline for 5%[25].

5.33 The significance of road clearly reflects a number of favourable attributes including the flexible door-to-door service it enables, the many alternative routes available through a readily accessible network, its suitability for ad hoc flows and its cost efficiency.

5.34 However, there is increasing pressure to shift freight towards more sustainable transport modes such as rail or water in order to comply with CO^2 emission targets and reduce road congestion. As seen below, air freight is less sustainable than road and pipeline is only suitable for a limited range of goods and therefore they do not represent practical or desirable alternatives to road.

Table 5.1 : Average CO_2 emissions for different freight transport methods

Transport mode	gCO_2 / tonne-km
Road transport	62
Rail transport	22
Barge transport	31
Short sea	16
Intermodal road / rail	26
Intermodal road / barge	34
Intermodal road / short sea	21
Pipelines	5
Deep-sea container	8
Deep-sea tanker	5
Airfreight	602

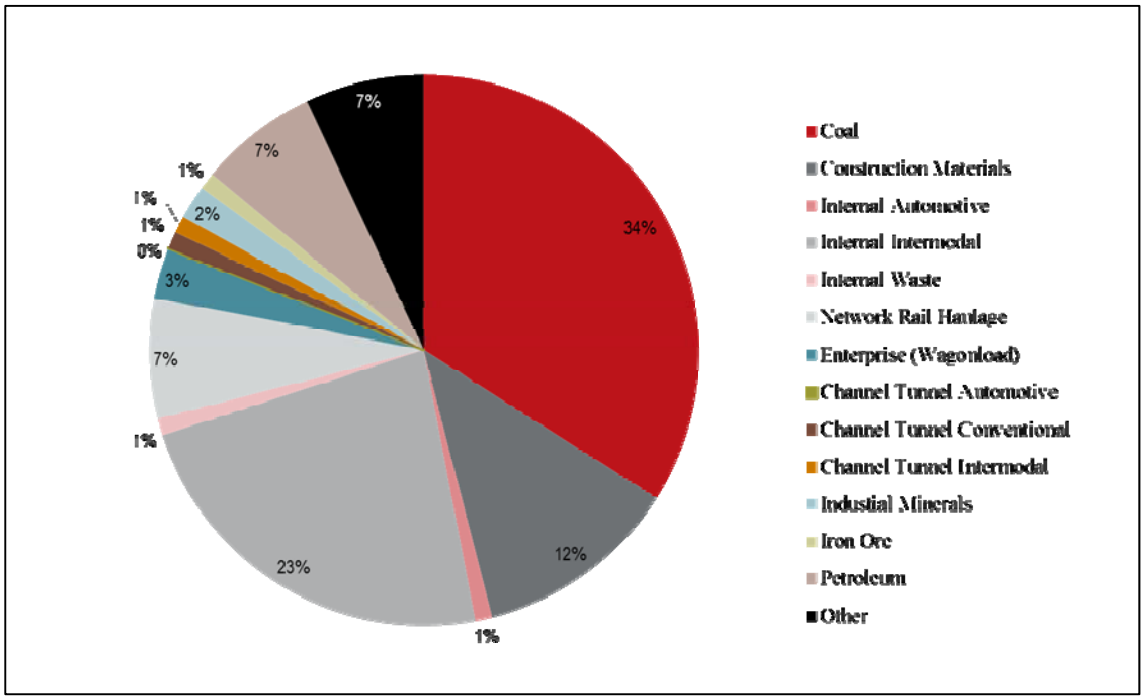
Source: Measuring and Managing CO_2 Emissions of European chemical transport, Cefic 2010

5.35 With regards to **rail**, existing research has identified a number of factors that currently limit its use as a freight transport mode. These include limited network coverage, route capacity and capability constraints, the fact that road is often required at one or both ends of the rail leg, and the costs and risks associated with transhipment as freight is moved from one mode to another. In addition, the costs associated with infrastructure provision and maintenance are high and there are significant entry barriers for new rail freight operators. As a result of these issues rail tends to be best suited for transporting large volumes over relatively long distances[26] such as on routes from Continental Europe to the UK and from South / Mid England to Scotland. As seen below, the majority of rail freight is related to bulk markets, including coal (34%) and construction materials (12%).

[25] Department for Transport

[26] AECOM/ITS Freight Modal Choice Study for Department of Transport, November 2010

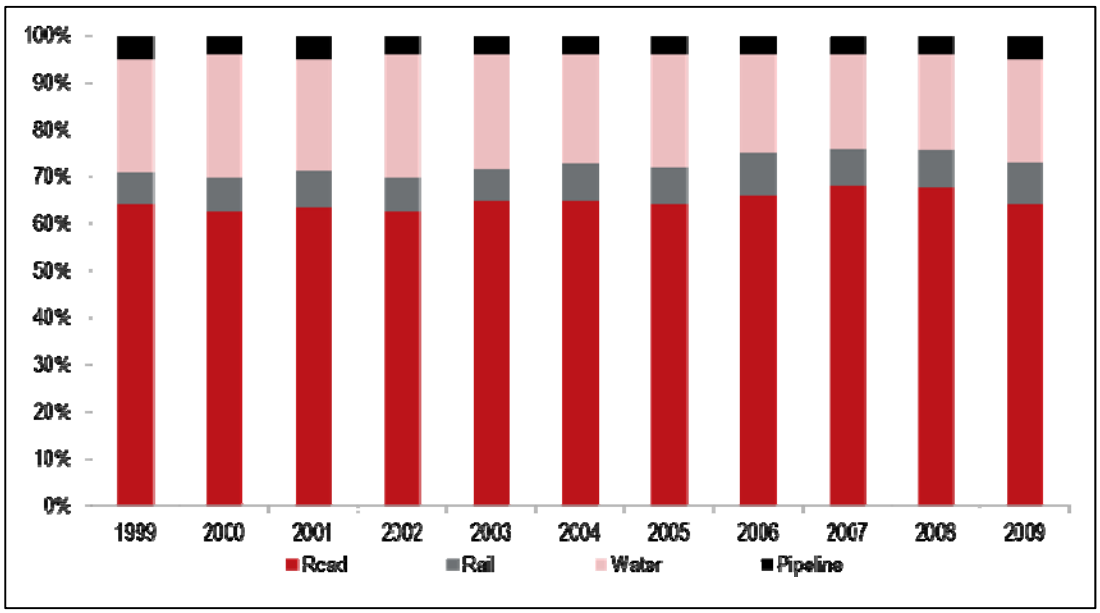
Figure 5.4 GB Rail Freight market by type of traffic



Source: Office of Rail Regulation, 2010

5.36 The higher costs and poorer flexibility of rail compared to road may also explain why, as shown in Figure 5.5, rail's share of domestic freight has changed little over the last ten years, although the overall trend has been upward increasing from 7 to 9% of domestic freight between 1999 and 2009.

Figure 5.5 GB domestic freight by mode: 1999-2009

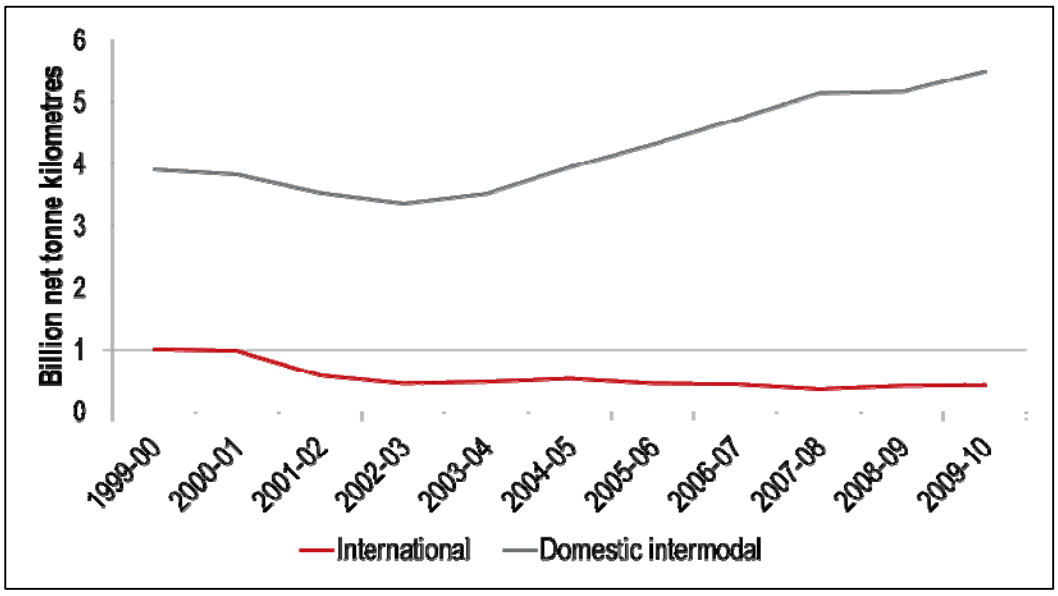


Source: Department for Transport

5.37 The main rail freight traffic relevant to warehousing and logistics includes domestic intermodal traffic (which includes the movement of containers from ports) and Channel Tunnel traffic. Domestic intermodal traffic has shown a broadly upward trends, whereas

Channel Tunnel traffic has been broadly flat having fallen in the early 2000s. However, it is anticipated that international traffic should increase again as suitable infrastructure becomes available, for example, the recent opening of the HS1 line from the Channel Tunnel to London for freight traffic, allowing the larger European-sized freight wagons to be used. As the remainder of the UK rail network has a more restricted loading gauge, it is anticipated that East London will act as a terminal for such traffic, at least until the infrastructure situation changes.

Figure 5.6 Domestic intermodal and Channel Tunnel rail freight traffic

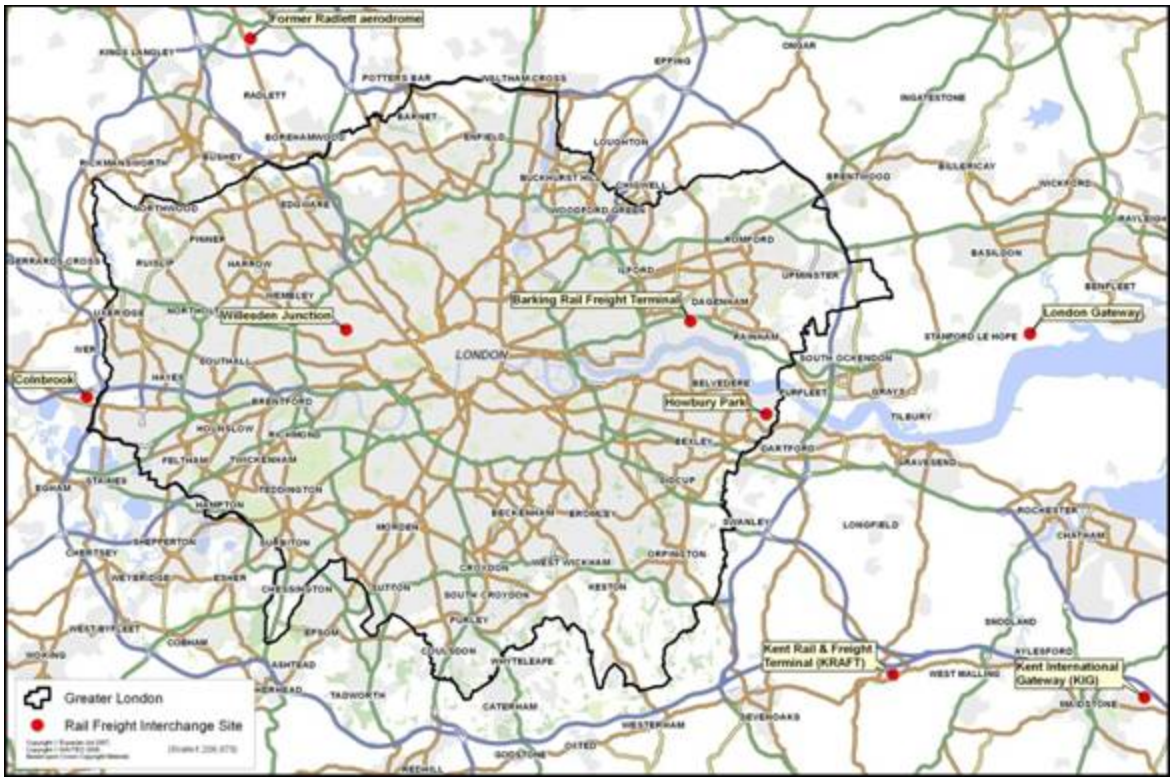


Source: Office of Rail Regulation, 2011

5.38 Intermodal freight interchanges (whether smaller scale or strategic) are set up for the transfer of goods from rail to road, and vice versa. These unit loads typically comprise shipping containers, swap-bodies or piggyback trailers which are delivered either directly to an end customer or to a warehouse for de-stuffing, storage (if necessary), any value-added services and loading onto final delivery vehicles. This is normally a land intensive operation requiring sidings and land for the storage of unit loads.

5.39 Figure 5.7 below highlights the major rail freight sites in and around London, both operational and proposed. With respect to the major SRFIs, only ProLogis's Howbury Park has received planning consent.

Figure 5.7 : Strategic rail freight terminals in and around London, operational and proposed



5.40 Of these projects Willesden Junction and Barking are both operational. The remainder are not yet operational:

- Howbury Park is not operational. The application was consented at the end of 2007 but the scheme has not been developed.
- Kent International Gateway is not operational. The Secretary of State refused permission in August 2010 following a public inquiry and the applicant (Kent International Gateway Ltd) has decided not to appeal further.
- Kent Rail & Freight Terminal is not operational.
- Former Radlett Aerodrome is not operational. On 1 July 2011 the High Court quashed the Secretary of State's decision to refuse permission (July 2010). The applicant's appeal is therefore being reconsidered.
- Colnbrook is not operational. The application was refused by Slough Borough Council in September 2011 though the applicant is likely to appeal this.

5.41 For completeness the map also indicates London Gateway. This is not a Strategic Rail Freight Interchange but has sometimes been considered in the same context. The scheme has consent for a new port and logistics park development and it is under construction. The Port will have its own rail terminal and the Park is also providing 50 hectares of land specifically for rail-served buildings and a common user rail terminal which will be provided in the Park for use by those customers whose buildings are not directly served by rail. i.e. it will not be open to parties outside the scheme and London Gateway is only the marketing of the Park to major companies that will also use the Port.

5.42 Looking to the future, Network Rail has published some high level forecasts of rail freight growth based on a range of forecasts which indicates potentially strong growth in the movement of consumer goods[27]. However, one issue affecting the potential growth of rail freight is the availability of suitable rail freight sites to give access to the rail network. These sites vary in terms of the activities they support and the size of sites they require and include, for example, bulk terminal sites for aggregates, smaller-scale intermodal terminal sites and very large-scale 'strategic' rail freight interchanges (SRFIs).

Table 5.2 Growth scenarios for rail freight between 2006/07 – 2031 (t/km)

Commodity	Lower forecast growth rate	Higher forecast growth rate
Coal	-70%	0%
Metals	-20%	20%
Construction materials	6%	50%
Consumer goods – carried internationally	60%	310%
Consumer good – carried domestically	200%	1200%
Total Rail Freight	13%	140%

Source: Network Rail, Value and importance of rail freight, July 2010

5.43 It may also be conceivable that a "rolling road" service (similar to that operating for trucks through the Channel Tunnel) over medium distances could develop for environmental reasons, whereby whole vehicles and their drivers are transported for part of their journey by rail.

5.44 As for **water** borne freight, it is popular in parts of Europe which are served by major rivers and waterways; in the UK it is mainly used for slow moving bulk cargos, including aggregates, and waste. There are examples of supermarket freight traffic along the Manchester Ship Canal (e.g. Tesco wine) and the Port of Liverpool is marketing the Manchester Ship Canal, and the waterside logistics opportunities along it, as part of its value proposition. In addition, in 2007 Sainsbury conducted trials to assess the viability of delivering goods by river barge to stores along the River Thames and, according to the Institute of Grocery Distribution (IGD), the trial revealed potential savings across the London area of around 350,000 road km per annum. As of 2009 the retailer was continuing to deliver goods via river in London.

5.45 There are major ports on the River Thames handling large container ships. These include Tilbury, Thamesport and the planned London Gateway. This raises the possibility of

[27] Network Rail, Value and Importance of Rail Freight, July 2010

transferring containers destined for London by barge to appropriate wharves. This would require:

- Sufficient cargo in individual containers destined for London (i.e. as opposed to a mix of destinations, such as goods destined to a nationwide mix of shops for a retailer).
- Wharves with container handling cranes and space for the holding of transit containers.
- The containers would often need to be de-stuffed before delivery, and therefore either warehousing facilities may be needed at the wharf or the containers would be transported to other warehouses in the London area.

5.46 In order to meet these requirements and fulfil their strategic function for London, wharves would need to preserve large swathes of land. This is recognised in the fact that several of London's wharves are found within designated Strategic Industrial Locations.

Air freight logistics and the future potential of Heathrow

5.47 Heathrow is by far the largest airport in the UK in terms of passenger and freight volumes.

5.48 In 2010 Heathrow handled some 65.9 million passengers (terminal and transit) more than twice the number handled by Gatwick (31.4 million) the UK's second busiest passenger airport. In 2010 Heathrow handled close to a third (31.2%) of all terminal and transit passengers at UK airports[28].

5.49 Its predominance is even more marked in the freight market, where in 2010 it handled 63.7% of all freight at UK airports. In 2010 Heathrow handled close to 1.5 million tonnes of cargo compared with 273,669 tonnes handled by East Midlands International and 202,238 tonnes handled by Stansted, the next largest freight airports.

5.50 Most cargo is brought into Heathrow in the belly-hold of passenger aircraft and therefore the capacity for airfreight transport is likely to increase in relation to passenger numbers, as adjusted for changes to future aircraft types. Around 95% of all freight handled by Heathrow in 2010 was transported in the belly haul of passenger aircraft with the remainder accounted for by cargo aircraft. This is in marked contrast to East Midlands International and Stansted airports, where virtually all freight is transported in dedicated cargo aircrafts. In 2010 99.9% of cargo handled by East Midlands International was accounted for by cargo aircraft, whilst in Stansted the corresponding share was 99.1%. Given the above, Heathrow's potential to handle more freight is largely related to its passenger capacity.

5.51 In the past the belly-hold freight carrying capacity of aircraft has tended to increase over time. However, there is some issue with the use of belly hold for cargo owing to terrorism. This could become a more important constraint in the future unless it is offset by better cargo screening.

5.52 Heathrow's potential for future growth may also be constrained as a result of responses to climate change and other environmental concerns. The Government is currently reviewing its aviation policy as it believes that the previous government's 2003 White Paper, The

[28] Civil Aviation Authority

Future of Air Transport is out of date as it fails to give sufficient weight to the challenge of climate change. With regards to Heathrow specifically, one of the Government's first actions on securing election in May 2010 was to cancel plans for a third runway at Heathrow airport and to confirm that it would refuse permission for additional runways at Gatwick and Stansted airports. It also ruled out mixed mode operations at Heathrow. In addition, the Government will shortly make an announcement on its plans for a new night flying regime at Heathrow. The current night restriction regime expires in October 2012. In general, the Government is looking to make better use of existing airport capacity, e.g. potentially by reforming the allocation of 'slots'.

5.53 The London Mayor's support for a new hub airport in the Thames Estuary also bears consideration, although the Prime Minister has said that the Government has no plans to construct a new airport in this area. Clearly, if such plans were to materialise they could potentially have significant impacts on Heathrow and wider industrial property markets in West London, with a shift in focus of logistics activity towards the Thames Gateway. Given the nature of such proposals, impacts will not be felt in the short or medium term.

The growth in fuel prices

5.54 Reflecting the relationship between logistics costs and warehouse networks illustrated in Figure 5.2, an increase in fuel prices would tend to increase the number of warehouses / depots in a distribution network, as the final local delivery cost is the most expensive transport leg and this cost can be reduced by more warehouses / depots. As a result, a significant rise in fuel prices may mean that there could be a requirement for more local warehouses / depots in the London as bases for delivery, although this could be offset by other costs (e.g. property and labour costs) or other issues, e.g. potential restrictions on warehouse operations.

5.55 Increases in fuel prices may also affect transport modal choice and increase the use of more sustainable transport modes, including the use of intermodal freight terminals or water, and the mainstream commercialisation of electrical vehicles. Indeed, there are numerous trials with alternative fuels at present and the use of electric vehicles is expanding. However, if the mileage range of such vehicles continues to be a constraint in the future then this may still push towards an increase of warehouses and bases within London for the transfer of goods onto these vehicles.

Technology changes impacting on transport and warehouse operations

5.56 Technology changes impacting on the supply chain, transport and warehouse operations include telematics, efficient vehicle and supply chain technology, new fuels and warehouse technology.

5.57 Reductions in transport costs due to increased efficiency may have the opposite effect to the growth in fuel prices on the number of warehouses outlined above, but this would depend on the exact nature of change.

5.58 Quieter vehicles may allow for 24-hour operations and deliveries which could increase the attractiveness of warehouses within London. However, as well as the noise of the vehicles, the noise of the loading and unloading operations, both at the warehouses and the destinations, need to be considered.

5.59 Improvements to warehouse storage technology enable operators to utilise racking systems that permit the storage of product at much higher levels than can be reached by conventional fork lift and reach trucks. However, such high-bay warehouses are normally used for inventory holding (e.g. the use of Automated Storage and Retrieval System technology, whereby pallets can be put away and extracted by computer controlled cranes in buildings up to about 40 metres in height). This is typically the function of NDCs and RDCs, which tend to be located outside London. Also, planning permissions in built-up areas such as London often do not allow buildings of this height.

5.60 The role of warehouses in London is often more focussed on small-scale stockholding and the rapid handling of goods to customers. These operations tend to be suited to low-bay operations. Multi-storey warehouses are used in some instances but the operational effectiveness of such facilities may be impaired by the need to move goods quickly and efficiently between floors (e.g. by use of lifts, fork-lift gates, conveyors, ramps, chutes, etc).

Conclusions

5.61 Table 5.3 seeks to summarise the effect of the supply chain trends and transport related factors discussed above in terms of their potential impact on the demand for warehouse and logistics facilities both nationally and in London. The potential impact on warehouse demand is assessed along a potential spectrum as follows: significant negative impact (lower demand), moderate negative impact, marginal negative impact, negligible impact, marginal positive impact, moderate positive impact and significant positive impact (increase in demand).

5.62 In should be noted that in some cases a clear trend in not necessarily discernible at present and hence the table summarises the impact of that trend assuming it develops.

Table 5.3 : **The impact of supply change changes and transport related factor on the demand for warehousing**

Supply chain/transport change	Overall impact on UK warehouse demand	Potential impact on warehouse demand in London
Growth in e-commerce	Moderate to significant positive	Marginal to moderate positive
Increase in consolidation centres	Marginal positive	Moderate positive
Increase in port centric logistics	Moderate positive	Marginal positive
Increase in direct shipment to store from source	Moderate positive	Marginal positive
Increase in rail freight	Moderate positive	Marginal positive
Increase in freight on water	Marginal positive	Marginal positive
Air freight logistics	Marginal positive	Moderate positive
The growth in fuel prices	Marginal positive	Moderate positive
Warehouse technology changes	Marginal negative	Marginal negative

5.63 This summary table suggests that the demand for warehouses in London is likely to follow an upward trend in the future.

Future demand for land

5.64 At para 5.15 above we noted how London's logistics demand is often serviced from a distribution solution from outside of the capital. Bearing this in mind, we have developed a

model in order to quantify the amount of land likely to be required for warehousing activities to 2031 in London.

5.65 The presumption from the 2007 Industrial and Warehousing Demand study was that warehousing demand was a function of GVA[29]. A paper prepared for the Foresight Land Use Futures project suggested that the relationship between GDP and warehouse floorspace is a mix of two factors: firstly, GDP to inventory and secondly inventory to warehouse floorspace. Thus an apparently close correlation may in fact have captured two independent factors which over that time period were operating in different directions.

5.66 Data on inventory is however not available to model this in practice. In any event it is likely that whilst this relationship holds at the national level it may not be so applicable to London. This is because the London area tends not to contain the major import centres and National Distribution Centres where the main inventories may be held. Much of the large-scale warehousing that services London is located outside of London, so it may be more appropriate to consider GVA over a wider area (e.g. London, South East and Eastern).

5.67 On the other hand, London contains some Regional Distribution Centres on the outer edges, many local cross-docking and forward stock depots, small depots for local businesses, and just a few National Distribution Centres for London based companies that have grown substantially. These are essential in order to enable operators to guarantee delivery times into the London population centres – Tesco and Sainsbury both operate warehouses in London to guarantee very quick delivery times to London (for DVDs and other non food items). In addition, some operators are moving into London because the national distribution hub locations are increasingly crowded.

Warehouse floorspace and GVA

5.68 The table below shows annual change in warehouse floorspace for the period 1998-2008 for London and the Greater South East. This Greater South East area accounts for more than 85% of all freight with a London destination[30].

5.69 Over this period warehouse floorspace in London grew at an annual average of 0.4% p.a.[31], compared with 1.9% for the Greater South East. London's share of the Greater South East floorspace fell from 33.7% in 1998 to 30.2% in 2008, or to express it another way its share declined at a rate of -1.1% p.a.

[29] there In the 2007 study the approach to forecasting warehouse demand was to extrapolate a linear trend of warehousing floorspace in London over the period 1998-2005, adjusted for the fact that this represented a period of above trend GVA growth. This produced a projected growth in floorspace of 0.73% p.a. over the period 2006-2026, which converted to an increase in demand for warehousing land of 0.76% p.a.

[30] Source: Continuing Survey of Road Goods Transport, DfT. Goods Lifted by origin and destination region of goods 2008.

[31] This compares with an average of 0.8% p.a..used in the 2007 report.

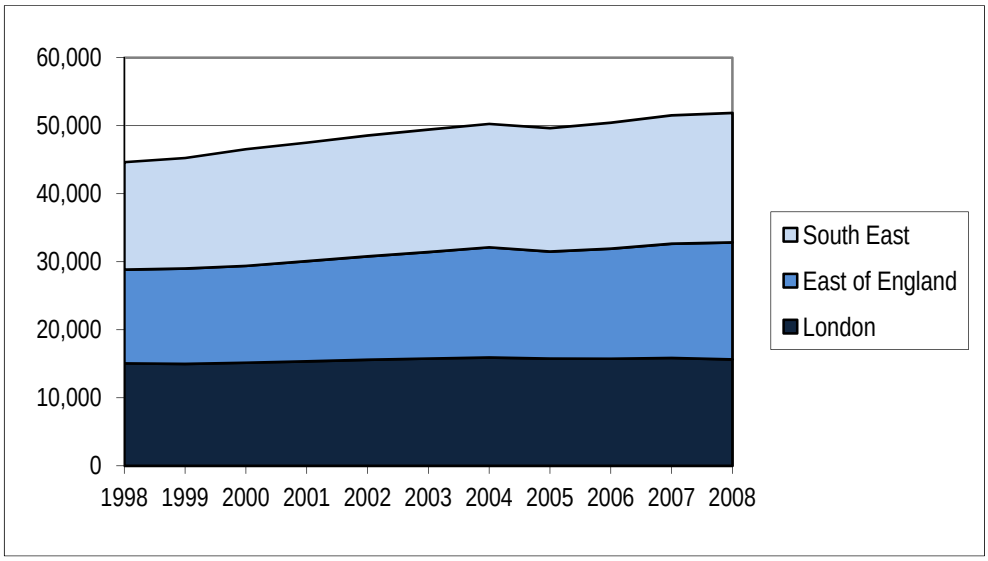
Table 5.4 : Warehouse floorspace (sqm)

	London	East of England	South East	GSE	London as % of GSE
1998	15,062	13,781	15,801	44,644	33.7%
1999	14,983	14,018	16,249	45,250	33.1%
2000	15,156	14,239	17,153	46,548	32.6%
2001	15,356	14,733	17,424	47,513	32.3%
2002	15,592	15,195	17,777	48,564	32.1%
2003	15,771	15,662	17,994	49,427	31.9%
2004	15,922	16,204	18,142	50,268	31.7%
2005	15,756	15,742	18,143	49,641	31.7%
2006	15,746	16,174	18,525	50,445	31.2%
2007	15,860	16,785	18,878	51,523	30.8%
2008	15,648	17,186	19,042	51,876	30.2%
Ann Avg 98-08	**0.4%**	**2.2%**	**1.9%**	**1.5%**	**-1.1%**

Source: VOA

5.70 The pattern is illustrated in the graph below.

Figure 5.8 Warehouse Floorspace ('000 sq m)



Source: VOA

5.71 Over the same period Gross Value Added (GVA) growth in London was higher than the other two regions. GVA in London grew at an average of 3.6% p.a. compared to 3.1% for the Greater South East. Its share of Greater South East GVA increased from 45.7% to 47.9%

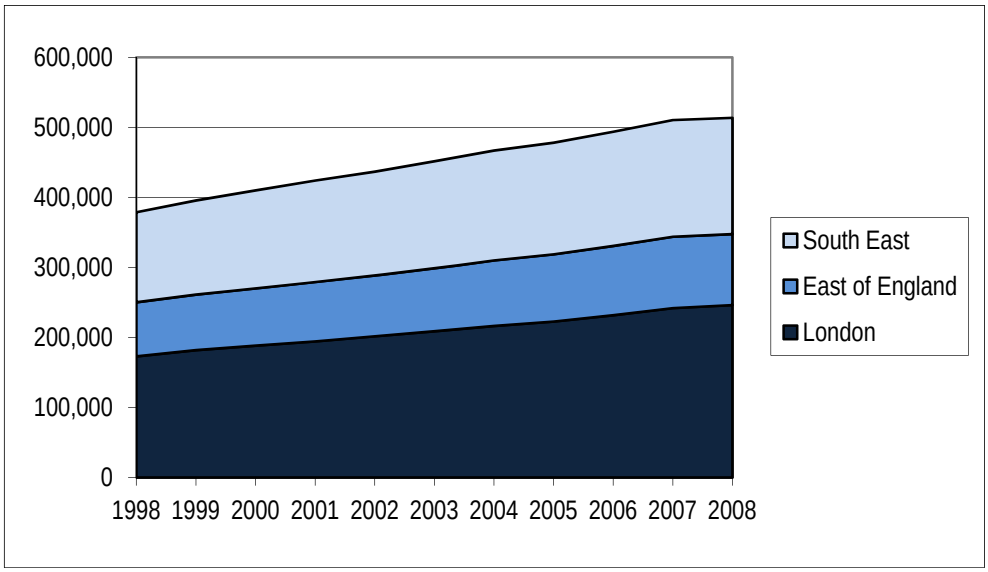
Table 5.5 GVA by Region

	London	East of England	South East	GSE	London as % GSE
1998	172,951	77,320	128,547	378,818	45.7%
1999	181,891	79,383	134,399	395,673	46.0%
2000	188,386	81,833	139,820	410,038	45.9%
2001	194,401	84,501	145,164	424,066	45.8%
2002	201,712	86,671	148,399	436,782	46.2%
2003	208,889	90,008	152,767	451,663	46.2%
2004	216,373	93,664	156,934	466,971	46.3%
2005	222,702	95,989	159,447	478,138	46.6%
2006	231,742	99,024	163,019	493,785	46.9%
2007	241,900	101,930	166,693	510,523	47.4%
2008	246,288	101,363	166,020	513,671	47.9%
Ann Avg 98-08	**3.6%**	**2.7%**	**2.6%**	**3.1%**	**0.5%**
As % of GVA growth	11%	81%	73%	49%	
GVA- Fspce	3.2%	0.5%	0.7%	1.6%	

Source: ONS/RTP

5.72 As illustrated below the pattern of GVA growth is very different to that for warehouse floorspace.

Figure 5.9 GVA by region



Source: ONS

5.73 Either the relationship between GVA and demand for floorspace is fundamentally different in London, or more likely some of the demand generated by London's growth in GVA is being satisfied from outside of London due to constraints of meeting that demand within the London administrative boundaries. These constraints may include physical availability of sites. If demand for warehouse floorspace is being forced out of London due to lack of availability then the issue becomes one of whether the planning system is preventing

resources being allocated efficiently i.e. is the planning system preventing land from being supplied at normal commercial rents?

5.74 But it may just be that the cost of premises and labour in the capital means that it is more cost effective to supply London's needs from outside its borders. If market prices accurately reflect all costs then this would represent an efficient allocation of land use. The externality costs of additional road miles are priced in to some extent through fuel charges, although there is always a debate about the extent to which these are fully reflected in fuel prices. If the externality costs of congestion and pollution are not fully captured by market prices then there may be a justification to allocate more land for logistics in London if this reduces lorry miles.

London forecasts

5.75 For the forecast period 2011-31 we assume that the growth rate for the Greater South East will be 2.8% p.a.[32]. Long run forecast for the UK economy show growth rates of between 2.3%-2.5% p.a. We would expect the growth rates for the Greater South East will continue to run significantly above the UK average, with the latest GLA Economics medium term forecast showing a return to growth of 2.9% p.a. by 2013[33].

5.76 If we assume that the relationship between growth in GVA and warehouse floorspace holds at the GSE level with annual growth in warehouse floorspace being half of the rate of growth in GVA, then warehouse floorspace for the Greater South East will grow at an average of 1.4% p.a.[34]. At this rate then warehouse floorspace for the GSE as a whole would rise to 71,423,000 by 2031

5.77 If London's share of GSE floorspace continues to decline at a rate of -1.1% p.a. below the GSE total – i.e. there was only growth of 0.3% p.a. in London to accommodate this – then by 2031 there would be 16,705,000 sq m of warehouse floorspace in London[35]. London's share will have fallen to 23.4% of the GSE total.

5.78 This would represent an increase of 923,000 sq m over the period 2011-31 or an annual average net increase of 46,000 sq m per annum. At a plot ratio of 40% this would generate demand for a net additional 231 ha of employment land for warehousing over the period 2011-31.

5.79 This compares to a total increase of 586,000 sqm at an annual average of 58,600 sqm over the period 1998-08. If warehouse floorspace were to continue to grow at the London 1998-

[32].For example, NIESR April 2011 forecasts GDP growth of 2.5% p.a. over the period 2016-20

[33] London Economic Outlook (Spring 2011)

[34] Over a long period of time we would expect that this function may be logarithmic rather than linear. We would expect floorspace to grow less than proportionately to GVA growth as efficiencies kick in and a higher proportion of total economic value is provided from services rather than goods. Indeed even for the ten years for which data is available there is a better fit for a log function. But the data is not available to construct a robust relationship and any functional fit would be theoretical. We have therefore simplified for the purpose of this assessment and constructed a linear fit. If anything this is likely to over-estimate the demand for floorspace.

[35] If London were to grow at a rate of 1.1% below the GSE average of 2.8%, the differential at 2031 would be 0.285%, which we have rounded to 0.3% for subsequent calculations.

2008 rate of 0.4% pa., for the forecast period 2011-31, then this would generate a net addition of 1.3m sq m of warehouse floorspace, equivalent to 329 ha.

Sensitivity tests

5.80 In order to test a range of possible outcomes we have explored a set of scenarios consisting of:

- Three potential growth rates for demand for warehousing space in London
- Three alternative plot density ratios to test the potential for intensification

5.81 The three growth rate scenarios we have adopted are:

- 0.3% p.a. – this is based on London's share of the South East floorspace declining at the same rate as in the past
- 0.4% p.a. – this is the average warehouse floorspace growth in London over the period 1998-2008
- 0.6% p.a. - this is the average warehouse floorspace growth in London over the period 1998-2005

5.82 If the growth rate of 1.4% for the Greater South East were applied the results are shown in the table below

Table 5.6 Sensitivity Test on Land for Warehousing Demand

Growth Rate/Plot Ratio	0.35	0.40	0.45
0.3%	264	231	205
0.4%	376	329	292
0.6%	579	506	450

Plot ratio and the potential for intensification

5.83 There has been a trend for warehouse plot ratios (i.e. the ratio of warehouse footprint to site footprint) to decline over time. This tends to be related to increased vehicle movements and parking at sites, often reflecting a change of warehouse roles towards sortation, cross-docking, non- stockholding or forward stockholding depots, etc. Also, possible future changes such as longer vehicles or reduction in vehicle heights may result in more or larger vehicles requiring more yard space at warehouses. Land demand may, therefore, not increase directly in line with the demand for warehouse floorspace.

5.84 Table 5.7 and 5.8 respectively show development densities for a selection of standard industrial developments involving multiple units below 10,000 m² and large-scale logistics warehouses providing over 10,000 m² of floorspace in London. On average, the development density for standard multi-unit schemes is around 52 percent compared with an average of 38 per cent for large logistics warehouses.

Table 5.7: **Development densities of speculative industrial developments with units under 10,000 m² in London, May 2011**

Scheme	Location	Developer	Size (ft²)	Site size (acres)	Development density (%)
Origin	Park Royal	SEGRO	535,000	24	51%
Tudor Estate	Park Royal	SEGRO	30,000	1.68	41%
Hanworth Trading Estate	Feltham	Marlin Land/ John Sisk & Son	79,330	3.88	47%
4-40 Link	Southall	Chancerygate	58,809	2.8	48%
Nexus	Heathrow	ING Real Estate	62,000	2.35	61%
550 White Hart Lane (former Bridsco site)	Tottenham	LaSalle Investment Management/ Curtis Real Estate	143,000	7	47%
Imperial, Innova Park	Enfield	Canmoor/Salmon Harvester	100,000	3.2	72%
Total			1,008,139	44.91	NA
Average			144,020	6.42	52%

Source: JLL

Table 5.8: **Development densities of existing logistics warehouses over 10,000 m² in London, May 2011**

Scheme	Location	Developer	Size (ft²)	Site size (acres)	Development density (%)
Scylla Road	Heathrow	SEGRO	106,000	5	49%
G-Park	Enfield	Gazeley	150,000	15.5	22%
Beam Reach	Dagenham	London Development Agency	500,000	35.2	33%
Voltaic, G-Park	Dagenham	Gazeley	232,965	10.95	49%
Total			988,965	66.65	NA
Average			247,241	16.66	38%

Source: JLL

5.85 These average densities are consistent with industry norms and were supported by views expressed at the 'Industrial Market' workshop held as part of this research study. At this workshop it was acknowledged that whilst densities were often a function of the shape of the site ,and could additionally reflect who had developed the space, as a general guide the density for a multi-let development is around 50% whilst the densities for large-scale logistics warehouse is between 40 and 45%.

Borough Projections

5.86 For the Borough projections we have used the Central Scenario set out above as the guide – i.e. an additional 329 has of land for warehousing use.

5.87 In order to provide an initial borough level guide on the distribution of this total we have calculated the projected change by borough based on annual floorspace change by borough over the period 1998-2008 and apportioned the summed total pro-rata to the forecast London change. The results are set out in the table below.

Table 5.9: Warehousing land requirement by borough 2011-2031

Sub Region	Borough	Change 2011-31 Ha
Central	Camden	-8.4
Central	City of London	-1.1
Central	Islington	-10.5
Central	Kensington and Chelsea	-2.4
Central	Lambeth	-3.8
Central	Southwark	-18.7
Central	Westminster	-6.0
East	Barking and Dagenham	37.4
East	Bexley	68.7
East	Greenwich	49.3
East	Hackney	-12.7
East	Havering	19.0
East	Lewisham	-3.3
East	Newham	-7.9
East	Redbridge	5.8
East	Tower Hamlets	-10.7
East	Waltham Forest	14.2
North	Barnet	7.8
North	Enfield	59.0
North	Haringey	-8.1
South	Bromley	6.9
South	Croydon	-2.7
South	Kingston upon Thames	-4.5
South	Merton	4.8
South	Richmond upon Thames	13.1
South	Sutton	17.1
South	Wandsworth	13.1
West	Brent	61.1
West	Ealing	42.5
West	Hammersmith and Fulham	15.4
West	Harrow	3.2
West	Hillingdon	-9.8
West	Hounslow	1.3
	London	**329.0**

5.88 The figures above are top down projections based on forecasts at the London level apportioned on the basis of past growth in warehousing floorspace. They do not take account of local supply factors. In subsequent chapters we will test these projections against indictors of local supply and stock to assess where we might expect a spatial redistribution of the above projections.

5.89 These projections indicate strong demand for warehousing space in three broad markets area:

- Thames Gateway to the east of London– with an increase of 68ha in Bexley, 49ha in Greenwich and 37ha in Barking & Dagenham
- The west London area around Park Royal – with an increase of 61ha in Brent and 43ha in Ealing
- The Lea Valley in North London – with an increase of 59ha in Enfield

5.90 As we will see in the next chapter, this is broadly consistent with where demand is understood to be coming from in property market terms.

5.91 According to these projections most central and inner London boroughs would experience a reduction in the quantity of warehousing floorspace which probably reflects pressure from competing uses.

Conclusions

5.92 London's logistics and warehousing activity has been growing over time. In 2007 it was estimated that logistics accounted for 3.4% of London's output and that it employed 221,000 full time equivalent employees. Over the period 1998-2008 the stock of warehouse floorspace grew at an average of 0.4% p.a.

5.93 There are a number of reasons to expect that this positive demand for warehousing floorspace in London will continue. Amongst the factor expected to lead to this positive demand are an increase in Consolidation Centres, the growth of air freight logistics and the increase in fuel prices.

5.94 Our central scenario is based on an assessment that the demand for warehouse floorspace in London at a rate of 0.4% p.a. and that floorspace will be built at an average plot ratio of 0.4. This produces a central estimate of net additional demand for warehouse floorspace of 329 ha, or an average of 18 ha per annum.

5.95 We have also undertaken sensitivity test around this central scenario which produce a range of estimates from a lower figure of 205 ha to an upper figure of 579 ha. In part the amount of land that will be taken up will be determined by the amount of land that planning policy makes available.

6 LONDON'S INDUSTRIAL AND WAREHOUSING PROPERTY MARKETS

Introduction and overview

6.1 Whilst light industrial, general industrial, storage and distribution activities are covered by different land use classes (i.e. B1c, B2 and B8 respectively), from a market perspective it makes sense to consider these uses together as the properties in which these activities take place are, in reality, typically covered by a broad a B1, B2/B8 planning permission, as opposed to a permission that limits their use to a specific industrial use. This in turn reflects the fact that the basic property requirements of industrial and warehouse users are broadly the same, except where users have very specialist requirements in which case their facilities have to be built to suit them. As a result, the market for industrial and warehouse space is broadly one market covering the same types of property in the same locations.

6.2 In common with national trends, London's industrial and warehouse property markets endured a severe recession in 2008 and 2009, during which occupier demand declined, available supply rose, rental and freehold prices fell and new speculative development virtually ceased. During 2010 a fragile recovery began and occupier demand increased, available supply peaked and rental levels began to stabilise. However, at September 2011 this property market recovery appears to have stalled with reduced occupier activity reflecting the still lacklustre nature of the economic recovery. . At September 2011, the London market is only just beginning to see a very modest return to speculative development and, in this, London is leading the market nationally.

6.3 Reflecting the composition of London's business base, most demand for industrial and warehouse floorspace comes from small and medium-sized enterprises which typically occupy a range of different property types, including managed workspace, small units on multi-occupied estates and larger detached units. Statistics for London show that SMEs with no or fewer than 20 employees accounted for 98.5% of London's enterprises and 34.9% of London's employment.[36]

6.4 We look at the geography and typology of the London market in detail next.

London's industrial market areas

6.5 London's industrial / warehouse market comprises a number of sub-markets which vary in their degree of self containment and relationship to one another. Several also extend beyond London's boundaries highlighting the relationship between London and parts of the South East as competing and complementary business locations. Existing studies, and our assessment, suggest that the main sub-markets consist of:

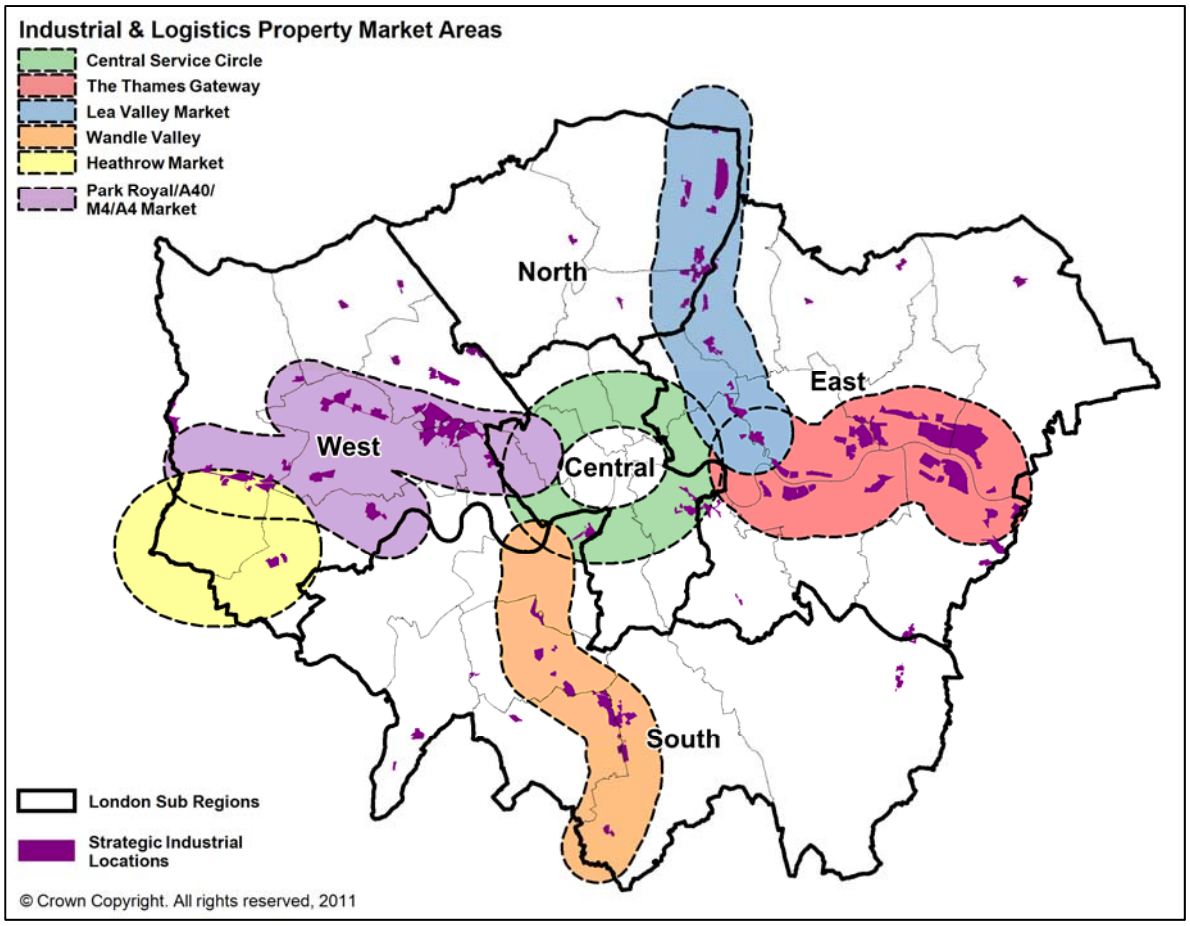
- A central London fringe market on the edge of the Central Activities Zone. This central London fringe area includes locations such as Camden/Kings Cross/Kentish Town,

[36] Department for Business Innovation & Skills. Figures refer to 2009.

Vauxhall/Nine Elms/Wandsworth and parts of Tower Hamlets, Southwark and Lewisham

- The Thames Gateway area extending through Newham, Barking and Dagenham and Havering on the north side of River Thames and from Greenwich/Charlton, to Belvedere/Erith on south side;
- The Lea Valley includes parts of the Lower Lea Valley, Haringey, Waltham Forest and particularly Enfield;
- Park Royal / A40 corridor (Perivale/Greenford);
- Heathrow / M4 corridor including Feltham, Hayes/Southall and Colnbrook Poyle.
- Wandle Valley covering Wandsworth, Merton, Sutton and Croydon.

Figure 6.1 Major industrial / warehousing property market areas in London



6.6 The market around the edge of the **Central Activities Zone** is dominated by businesses servicing the West End and City / Docklands office and retail economies. Typically demand in this area is driven by companies which must be in close proximity to their customers, including, for example: food and drink preparation for central retail and café outlets; printers and publishers; couriers and express delivery operators, and other providers of time critical 'services'. Competition for land in these areas is generally intense, and over time industrial users have been squeezed out by other uses, notably other business users, residential and retail. Industrial rents in this market are typically higher than elsewhere.

6.7 Formerly the location of much of London's manufacturing industry; the **Thames Gateway** has developed as a significant location for large-scale warehouses and logistics facilities, notably along the A13 corridor, where a number of major new developments have been constructed over recent years, and south of the River, in places such as Belvedere and Erith. Last year Tesco purchased 14.2 hectares (35 acres) at Beam Reach from the LDA for a 46,450 m² (500,000 ft²) warehouse facility. This area has been the main focus for recent large-scale warehouse facilities due to the availability of brownfield sites.

6.8 The **Lea Valley** is a major industrial and warehouse location, notably north of the North Circular Road, in Enfield. Over time, locations inside the North Circular, e.g. Tottenham, have seen a loss of industrial floorspace. Enfield has seen some significant new development over the past 10 years or more, notably at Innova Park. However the Sainsbury RDC although on the south side of the M25, lies just outside the GLA boundary.

6.9 **Park Royal** is often referred to as London largest single industrial area and whilst historically this was an important centre for manufacturing, industrial demand is now more driven by warehousing and logistics activities and small-scale manufacturing / quasi service activities. One of the key attractions of Park Royal for end users is its proximity to central London including the shops of the West End and Brent Cross, which allows just in time replenishment.

6.10 The **Heathrow** market is a very important market in London, and is substantially driven by airport-related activities, including air freight but also all the industries required for the air industry to function (e.g. aircraft maintenance, in-flight catering etc). On-airport facilities, such as airline warehouses for transit cargoes, attract the highest rents followed by off-airport facilities near the cargo terminal. Some of these off-airport facilities, such as freight forwarder consolidation and deconsolidation centres, may be located outside the GLA boundary in the boroughs of Spelthorne and Slough. Industrial rents in Heathrow are the highest in London and the UK.

6.11 The **Wandle Valley** includes significant clusters of industrial and warehouse users notably in Merton and Croydon (off the A23 particular) and includes a number of SILs. Whilst the northern part of this area in Wandsworth extends to the fringe of the Central Activities Zone many of the industrial areas in the outer London part of the area are not particularly well served by the main road infrastructure, including the A3 and the A23. In addition, the latter is not dualled and is recognised as a bottleneck. As a result, the Wandle Valley is not as attractive for many industrial / warehouse users that service London compared with Park Royal, and the lower rents reflect this. From a market perspective, certain locations in the Wandle Valley, such as Croydon, compete for industrial and warehouses users with locations outside London in the wider A23 corridor, such as Crawley.

6.12 Table 6.1 summarises these industrial sub-markets in terms of their stock, rental levels and land values. London's largest concentration of industrial / warehouse stock is in the Thames Gateway which accounts for around 35% of the total built stock. Heathrow attracts the highest industrial/warehouse rents and land values.

Table 6.1 London's major industrial / warehouse property markets

	Central Service Circle	Thames Gateway	Lea Valley	Park Royal / A40 Corridor	Heathrow	Croydon / Wandle Valley
Typical prime rent, units of 1,000m^2 (£psf)	10-11	8-8.50	9	12.5	11.50-13.25	10
£psm	108-118	86-91	97	135	124-143	108
Typical prime rent, units of 10,000m^2 (£psf)	n/a	7-7.50	8	11.5	10.50-12.50	n/a
£psm		75-81	86	124	113-136	
Typical land values (£m per acre)	0.8	n/a	0.75-0.8	1.2-1.3	1.2-1.75	0.6-0.8
£m ha	2.0		1.9-2.0	3.0-3.2	3.0-4.3	1.5-2.0
Built Stock						
Factory floorspace 000sq ft	1,061	3,781	911	1,259	862	1,424
000 sqm	99	351	85	117	80	132
Warehouse 000sq ft	1,594	4,976	1,683	3,219	1,794	2,383
000 sqm	148	462	156	299	167	221
Total floorspace 000sq ft	2,655	8,757	2,594	4,478	2,656	3,807
000 sqm	247	814	241	416	247	354

Source: Jones Lang LaSalle for rents and land values, Office for National Statistics 2008 for stock. Stock figures are based on respective London sub-regions except Park Royal /A40 corridor which is defined as Brent, Ealing, Hammersmith & Fulham and Harrow, and Heathrow which is defined as Hillingdon and Hounslow.

6.13 Whilst it is possible to identify these broad market areas, in many instances London's markets interact with other markets in the Greater South East, notably in the case of larger distribution facilities, which are often located around the M25 (i.e. either just inside or just outside the GLA. Given that industrial / warehouse property and labour costs are often significantly higher in London compared with locations in the South East or Eastern regions, in general companies are only likely to choose to be in London if they can derive some other cost advantage to offset these higher costs (e.g. lower transport costs) or if they can secure some service benefit, for example in terms of serving their customers. In addition, other factors clearly impact on the industrial/warehouse location decision, including the availability, or otherwise, of suitable land and premises and the availability of suitable labour.

6.14 In the case of larger warehouse facilities that service London it is often the case that a model- based solution would suggest a location within Greater London to order to minimise local delivery costs, i.e. the transport costs from the warehouse to customers (e.g. the retail stores). These costs are typically considerably higher than the transport costs into the warehouse, largely because they involve multiple drops. However, property/land supply

constraints or property and labour costs may 'push' the company out of London and suggest a location around the M25, for example, or even further afield. In this respect, many occupiers have to be are relatively footloose in their location and may have to compromise on their preferred locations.

6.15 For example, Harrods recently agreed to take a 23,766 sqm (255,825 sq ft) warehouse facility at Thatcham, west of Reading, having previously considered a new purpose built facility in Park Royal.

6.16 However, where a distribution facility is primarily servicing London there is likely to be associated costs if that facility is pushed further out of London, particularly in terms of increased traffic flows, potential congestion and ultimately higher level of CO2 emissions.

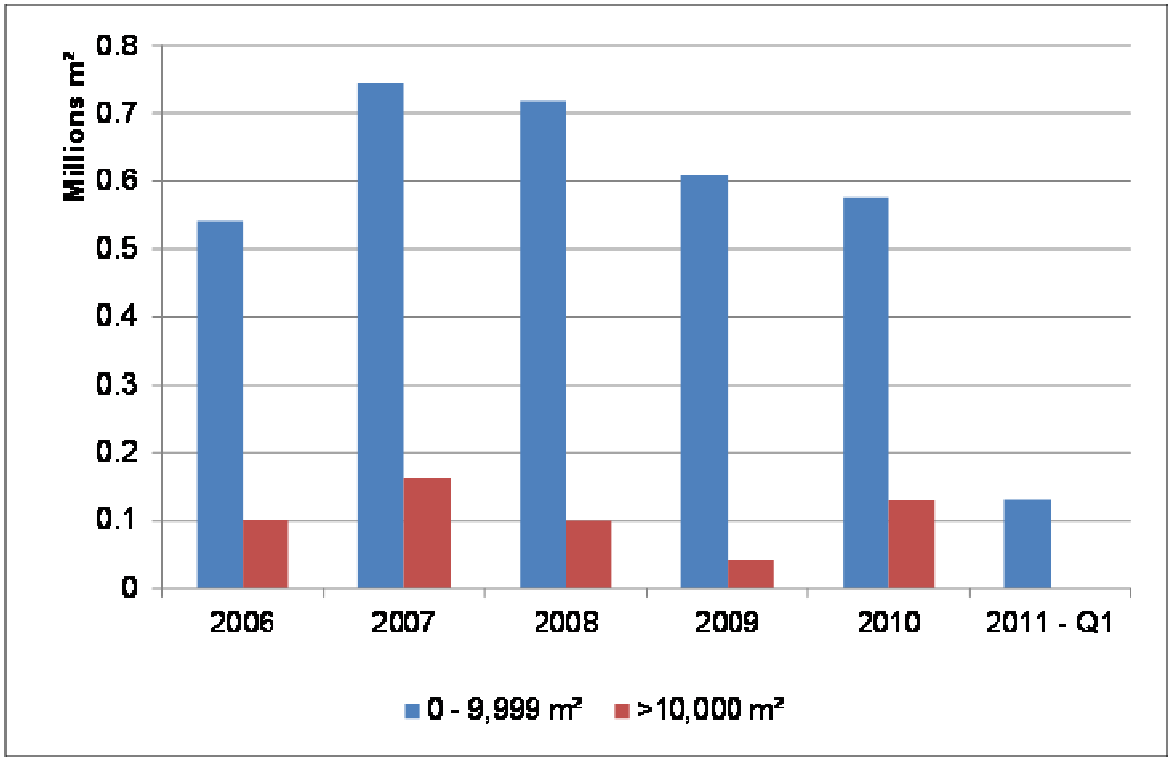
Occupier demand for industrial and warehouse space

6.17 Reflecting the composition of London's business base, most demand for industrial and warehouse floorspace comes from small and medium-sized enterprises which typically occupy a range of different property types, including managed workspace, small units on multi-occupied estates and larger detached units. Statistics for London show that SMEs with no or fewer than 20 employees accounted for 98.5% of London's enterprises and 34.9% of London's employment.

6.18 The conventional property market measure of occupier demand is the take-up of floorspace based on market transactions. Take-up measures the gross demand for floorspace because it does not take account of any property that may be returned to the market as a result of the transactions, which may occur, for example, if a company moves from one property to another or consolidates its operations from a number of facilities into a single building.

6.19 Estimates of industrial and warehouse take-up across Greater London vary, but what appears clearly in Figure 6.2 is that following the onset of the credit crunch and recession, the gross take-up of industrial and warehouse property in London fell significantly in 2008 and then again in 2009, before staging a modest recovery in 2010. This trend highlights a fairly clear correlation between take-up and overall economic activity, although there are clearly a wide range of demand drivers in addition to the economic cycle.

Figure 6.2 : Take-up of industrial and warehousing floorspace in Greater London 2006 – Q1 2011



Source: Focus / Jones Lang LaSalle

6.20 Table 6.2 provides an analysis of this take-up by London sub-region and highlights the significance of the East sub-region in terms of accommodating demand for larger units (i.e. 10,000 sqm and over). Between 2006 and the first half of 2011 inclusive, the East sub-region accounted for just under half of all floorspace taken-up for occupation in units of 10,000 sqm and over across London.

Table 6.2 Industrial and warehousing take-up in Greater London by sub-region

Year	Area	<10,000 sqm	>10,000 sqm	Total take-up per year sqm
Q1 2011	Central	18,165	-	18,165
	North	22,958	-	22,958
	South	14,291	-	14,291
	East	19,874	-	19,874
	West	29,005	-	29,005
	Heathrow	25,954	-	25,954

2010	Central	47,221	-	47,221
	North	77,709	24,235	101,944
	South	106,365	13,181	119,546
	East	125,421	91,629	217,050
	West	129,511	-	129,511
	Heathrow	90,548	-	90,548
2009	Central	28,239	-	28,239
	North	93,486	-	93,486
	South	90,693	-	90,693
	East	178,466	-	178,466
	West	93,194	-	93,194
	Heathrow	124,208	43,500	167,708
2008	Central	28,737	-	28,737
	North	102,495	29,078	131,573
	South	129,866	18,580	148,446
	East	190,546	53,112	243,658
	West	151,201	-	151,201
	Heathrow	117,048	-	117,048
2007	Central	3,158	-	3,158
	North	174,016	41,954	215,970
	South	202,067	24,328	226,395
	East	199,069	97,718	296,787
	West	66,537	-	66,537
	Heathrow	101,163	-	101,163

2006	Central	18,951	-	18,951
	North	82,322	18,495	100,817
	South	97,955	32,516	130,471
	East	128,552	19,021	147,573
	West	91,829	-	91,829
	Heathrow	123,192	31,568	154,760

Source: Focus / Jones Lang LaSalle

Changes in demand for premises

6.21 One significant driver of demand is the opportunity created by a 'lease event', such as a lease expiry or the opportunity to exercise a break option. Across the Greater London industrial market as a whole, lease lengths have become shorter whilst the proportion of leases with break clauses has increased, see Table 6.3 below. Even though many tenants renew their leases at the end of their terms and do not exercise their options to break, other things being equal, a trend towards shorter leases and more break options would lead to more demand being generated by a 'lease event'. As a result, the 'churn', or turnover, of the existing stock would increase. In a period of weak economic growth, this is likely to be a more important driver of demand.

Table 6.3 : Industrial lease length and break clauses in Greater London

	Average lease length (years)	Average period (years) to first break	Leases with break clauses as a percent of total sample
1999 / 2000	10.7	6.5	22.4
2000 /01	11.2	5.4	23.8
2001/02	8.0	4.3	24.4
2002/03	8.6	4.9	22.2
2003/04	7.4	4.8	39.3
2004/05	8.0	4.6	37.6
2005/06	7.3	4.7	39.8
2006/07	6.8	4.6	47.9

2007/08	6.8	4.4	36.8
2008/09	6.5	4.3	50.9
2009/10	6.1	4.3	49.4

Source: BPF / IPD Annual Lease Review 2010 (August 2010). Lease lengths based on equally weighted tenancies.

6.22 Another driver of demand which may be unrelated to the economic cycle is the continuing search by companies to reduce their supply chain costs and improve their efficiency. This tends to be a particularly important driver of demand for large-scale warehouses and this demand picked up significantly in 2010. In addition, new channels to market, including most obviously the development of internet and home delivery services, has been an important driver of demand for warehousing, as illustrated, for example, by the new warehouse facilities opened in London by Tesco.com and John Lewis, both at Enfield.

6.23 The upsurge in freehold requirements has reduced, possibly due to lack of product, but also due to lending issues and the cautious approach of valuers.

Type of occupiers in London

6.24 In addition to the traditional industrial and warehouse sectors, a number of related industrial property users have been particularly active during the market recovery to date including self-storage, trade counters, building suppliers, car repair and service operators, data centres, and waste management and recycling companies.

6.25 Demand from self-storage operators is concentrated in densely populated urban areas, and hence London locations are usually key targets among expanding operators such as Access and Safestore. Demand is focused on locations which benefit from main road frontage and good prominence, and which have significant populations within a short drive time, such as five miles.

6.26 Trade counter operators have been significantly more active over the past year and a number of national operators such as ToolStation, Travis Perkins, Screwfix, Topps Tiles and the Wolseley Group having announced targets for new store openings in 2011/12. Building suppliers, including Buildbase and Selco, have also been very active taking pre-lets.

6.27 At present the market is also seeing significant demand form automobile-orientated / roadside operators. Companies such as Halfords Autocentres, Kwik-fit, Mr Clutch, Euro Carparts, Formula One Autos, are all active in the market. This market is partly being driven by the fact that car owners are holding onto their cars for longer.

6.28 Demand from data centres, which are often based in warehouses, has re-emerged driven by demand from companies seeking to outsource their data storage requirements. This outsourcing trend is, in turn, largely related to the trend for more companies to adopt ‘cloud computing’. In this event, instead of a company building its own IT infrastructure to host databases or software, a third party hosts them in a large server ‘farm’, with the customer company having access to its data and software over the internet. In addition, increasing

financial trading, online shopping and the downloading of music and video data from the internet are leading to a rise in demand for facilities to house large computer servers.

6.29 London-based companies, especially large financial institutions, have been a major source of demand for data centres, and the wider London area is one of the largest data centre markets in Europe. In the past, areas on the fringe of central London, such as Docklands, have been highly sought after for data centres because of their proximity to central London-based end users. For example, Telecity Group, one of Europe's leading providers of data centre space, has eight data centres in London offering some 24,000 m² of co-location and hosting space in total, including its most recently opened centre called Powergate in Park Royal, which is a former Sainsbury's warehouse.

6.30 However, London locations are comparatively high cost locations for data centres compared with locations out of London, and there is now evidence that customers are looking further afield for data centre facilities. For example, Matterhorn Capital is entering the UK data centre market by investing £250 million in two sites in the South East, in Hertfordshire and Buckinghamshire respectively.

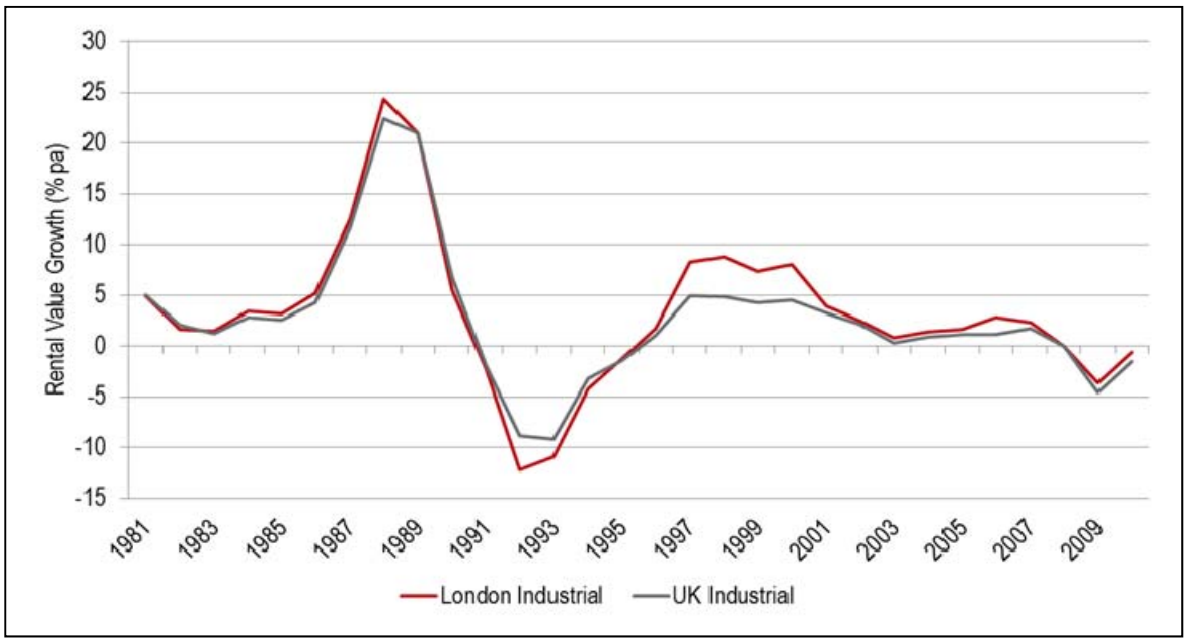
6.31 Finally, waste management and recycling has been a significant growth area in terms of the demand for industrial property and land. This growth reflects the growing importance attached to the 'waste hierarchy', which promotes reduction and recycling of waste above disposal. The 1999 EU Landfill Directive and the Landfill Tax Escalator are key drivers of demand due to the combination of the stringent limits the Landfill Directive places on the amount of waste that can be disposed of in landfill sites and the ever increasing cost of landfill as a waste disposal method under the terms of the Landfill Tax Escalator. Across the UK, the waste management and recycling sector is currently valued at over £11 billion with forecasts from the Sector Skills Council predicting sector growth of between 3 and 4% over the coming years with an estimate that the sector will grow by 37% overall between 2010 and 2020[37]. We look at this category of occupiers in Chapter 9.

Rents and land values

6.32 Following 12 consecutive years of nominal industrial rental growth across London (1996-2007 inclusive), industrial rental values were flat in 2008 and then declined in 2009 and 2010, according to Investment Property Databank (IPD).

[37] Energy & Utility Skills; The UK Waste Management and Recycling Industry 2010 Labour Market Investigation.

Figure 6.3 Industrial/Warehouse Rental Value Growth: London versus All UK

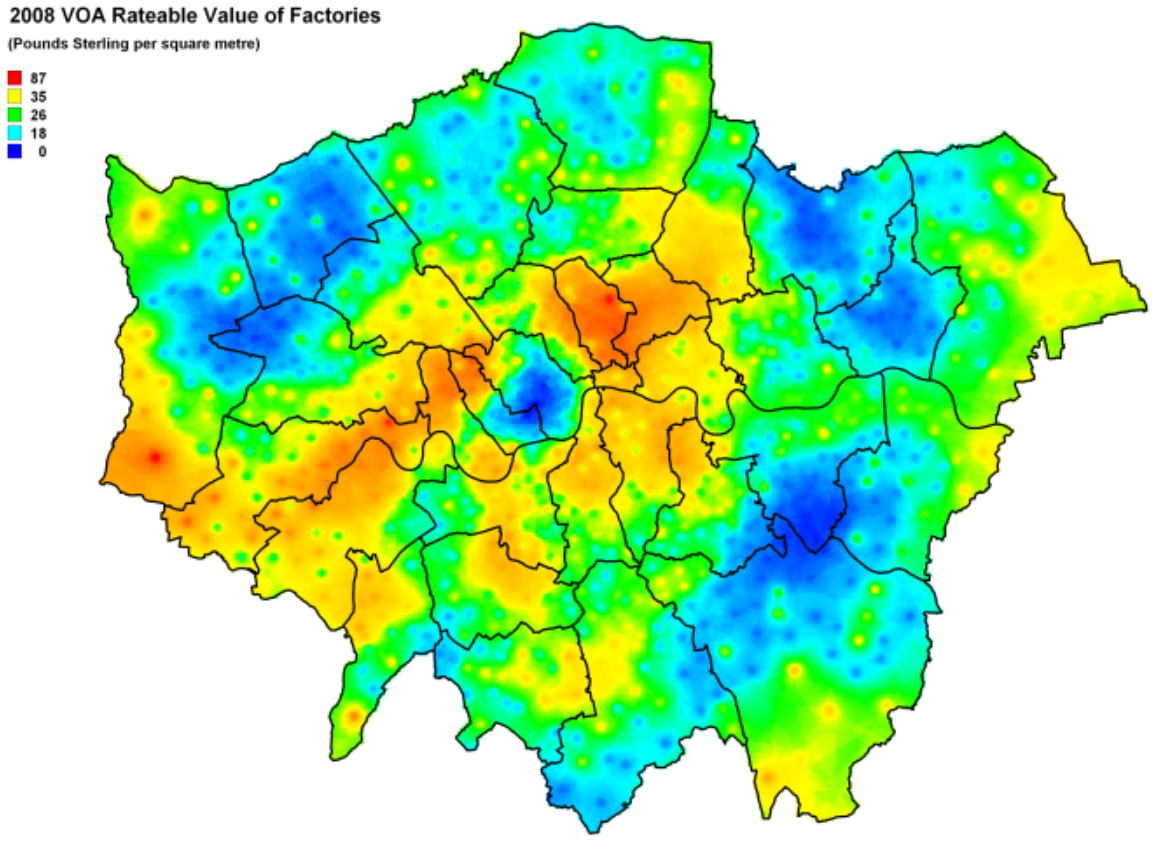


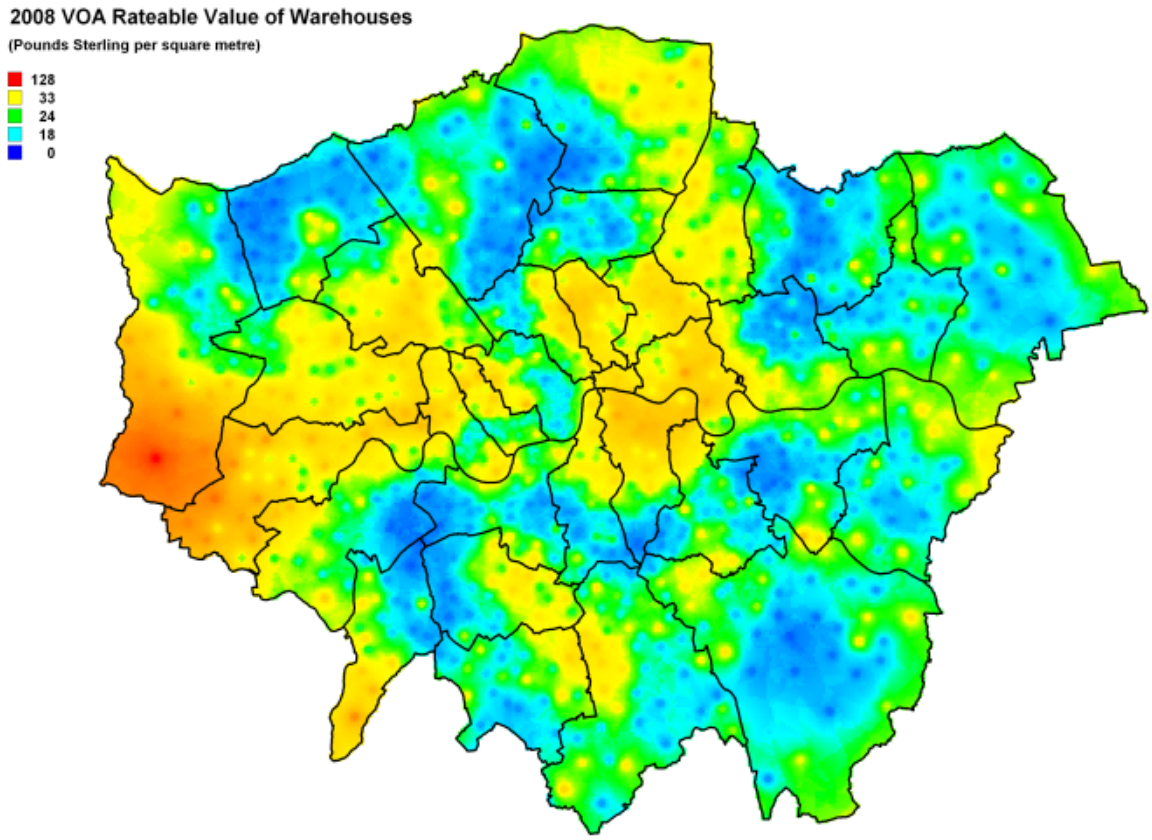
6.33 However, the declines in industrial rents shown by IPD for 2009 and 2010 are comparatively modest, and do not reveal the true depth to which rental levels fell during the recession. Whilst the IPD rental data are based on Estimated Rental Values (ERVs), in our assessment, market rental values actually fell more steeply than the IPD figures suggest because of the level of incentives available to tenants which impact on the 'net effective' rent as opposed to the 'headline' rent. Whilst 'headline' rents did not generally fall that much during the recession, tenants were able to secure significant incentives by way of extended rent free periods, stepped rents and capital contributions, and we do not believe that the IPD figures fully reflect these.

6.34 In the current market we believe that for a standard (10,000 ft²/10% office content) building in London a new occupier signing a 5-year lease would typically be able to secure around 9 to 12 months rent free, whilst for a 10-year lease, the corresponding rent free would be between 12 and 15 months.

6.35 The figures below show the pattern of relative industrial land values across London as a whole for factories and warehouses respectively. The factories data shows a hotspot around the Central London fringe, especially Camden and Islington. The warehouse map highlights the higher values around Heathrow.

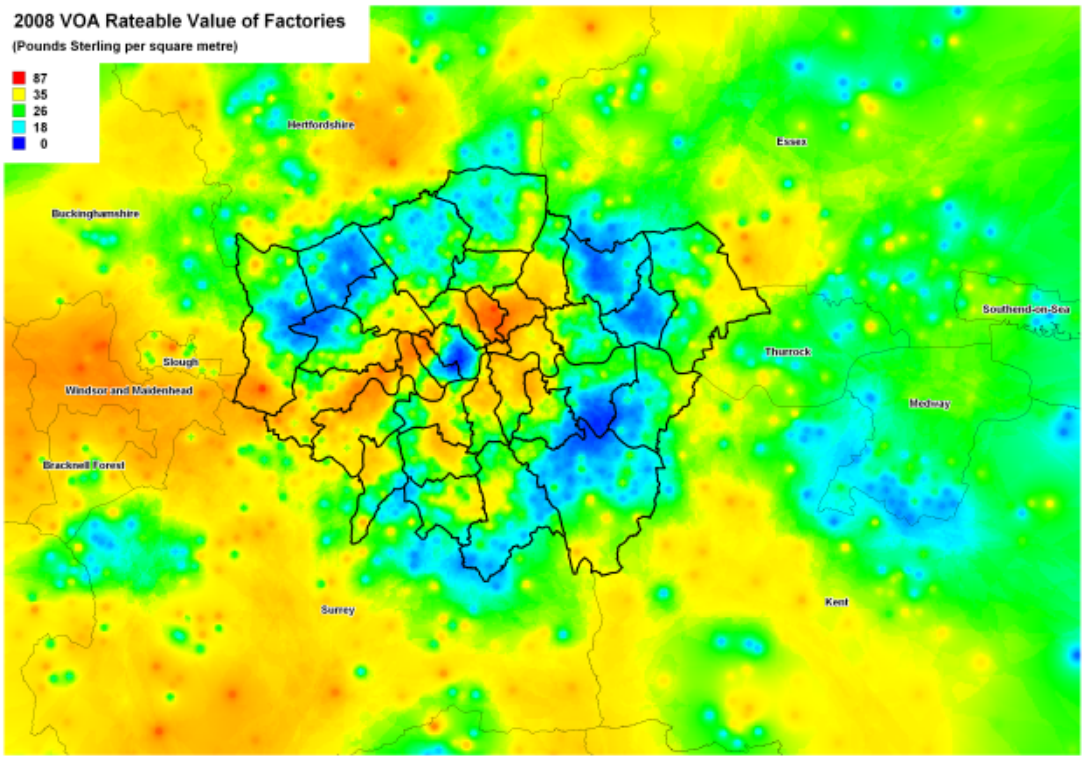
Figure 6.4 : Industrial and warehousing land values in London

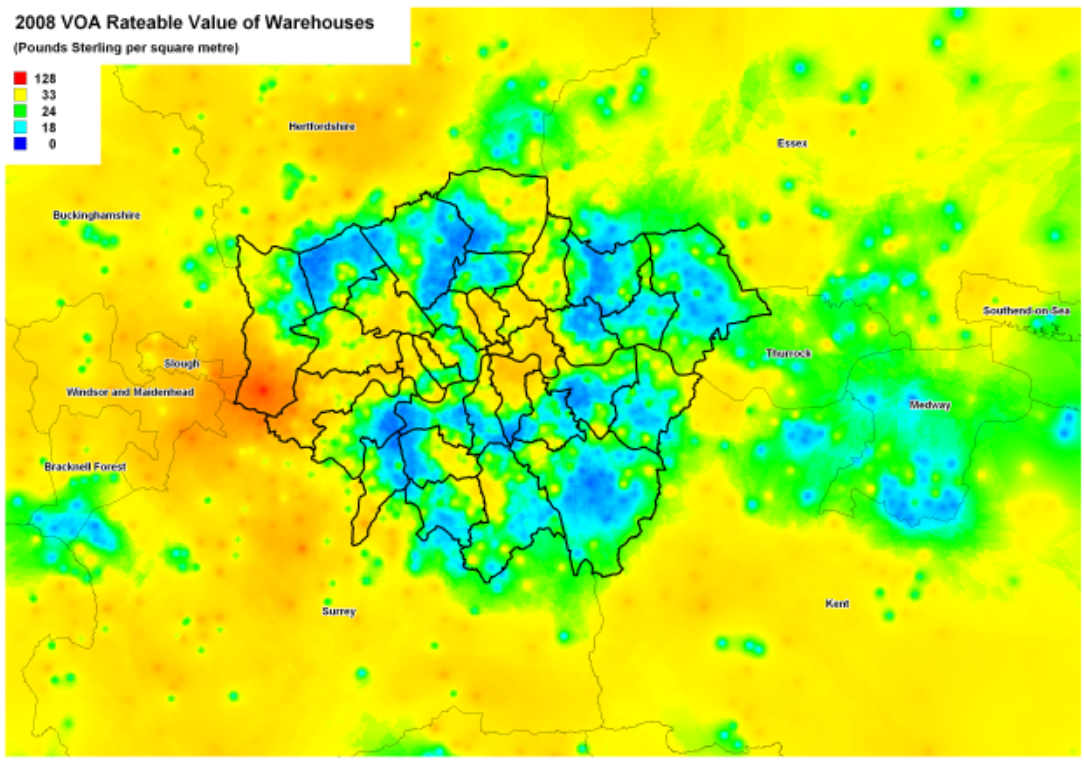




Source: VOA/RTP

6.36 When these values are set in the context of London's wider South-East hinterland, the Heathrow hotspot is seen to bleed across the London boundary, whilst to the north, south and east warehousing values appear higher than those in most of outer London.





Source: VOA/RTP

Available supply

6.37 At April 2011 the total supply of available industrial and warehouse floorspace stood at close to 2 million sqm, of which new and refurbished space accounted for around 14%, and second-hand space accounted for around for 86%. The relatively low share of new and refurbished supply is likely to partly reflect the very low level of new speculative development following the credit crunch and recession.

Table 6.4 : New and second-hand supply of industrial / warehousing floorspace in London at April 2011

m²	New/Refurbished	Second-hand	Total by Size band
<1,000m²	88,000	568,000	656,000
1,001 - 2,500m²	70,000	461,000	531,000
2,501 - 5,000m²	52,000	283,000	335,000
5,001 - 10,000m²	42,000	210,000	252,000
10,001m² +	35,000	187,000	222,000
Total	287,000	1,709,000	1,996,000

Source: Focus / Jones Lang LaSalle

6.38 The quality of the second-hand available stock varies hugely and it is likely that a sizeable proportion of it is relatively old and does not meet the typical requirements of users in terms of allowing them to operate efficiently. As a result, this space is therefore only marketable on the basis of being offered at a significant discount to better quality space and on more flexible terms of occupation or because better quality supply is not available in the same location. For smaller units, the main weakness of older stock is that it typically provides insufficient clear internal height (which is typically 6 metres plus for modern units) or insufficient yard space. For larger units, say of 4,000 m ² typically, the factors that typically tend to make second-hand properties difficult for occupiers include ceilings of insufficient height, too many columns restricting the occupier's ability to use the floorspace efficiently or flexibly, poor loading facilities (e.g. no dock level loading) and inadequate yard space, hindering inbound and outbound vehicle operations.

6.39 One issue that has impacted on the available supply of industrial/warehouse buildings (and other types of non-domestic property) is the reform of business rates which took effect in 2008. As a result of this change, owners of industrial and warehouses premises, which had previously been exempt from empty property rates, became liable for empty rates after an initial rate-free period of six months. Whilst data do not exist to quantify this, there is anecdotal evidence that some owners have demolished their empty properties so as to avoid this liability. Other things being equal, this is likely to have reduced the level of available supply below the level that might have otherwise prevailed. However, in our assessment the impact is likely to have been quite modest overall and limited to poorer quality buildings.

6.40 Table 6.5 provides a sub-regional analysis of the London totals split between units up to 10,000 m and units of 10,000 m and over.

Table 6.5 Greater London supply of industrial / warehousing floorspace by sub-region, April 2011

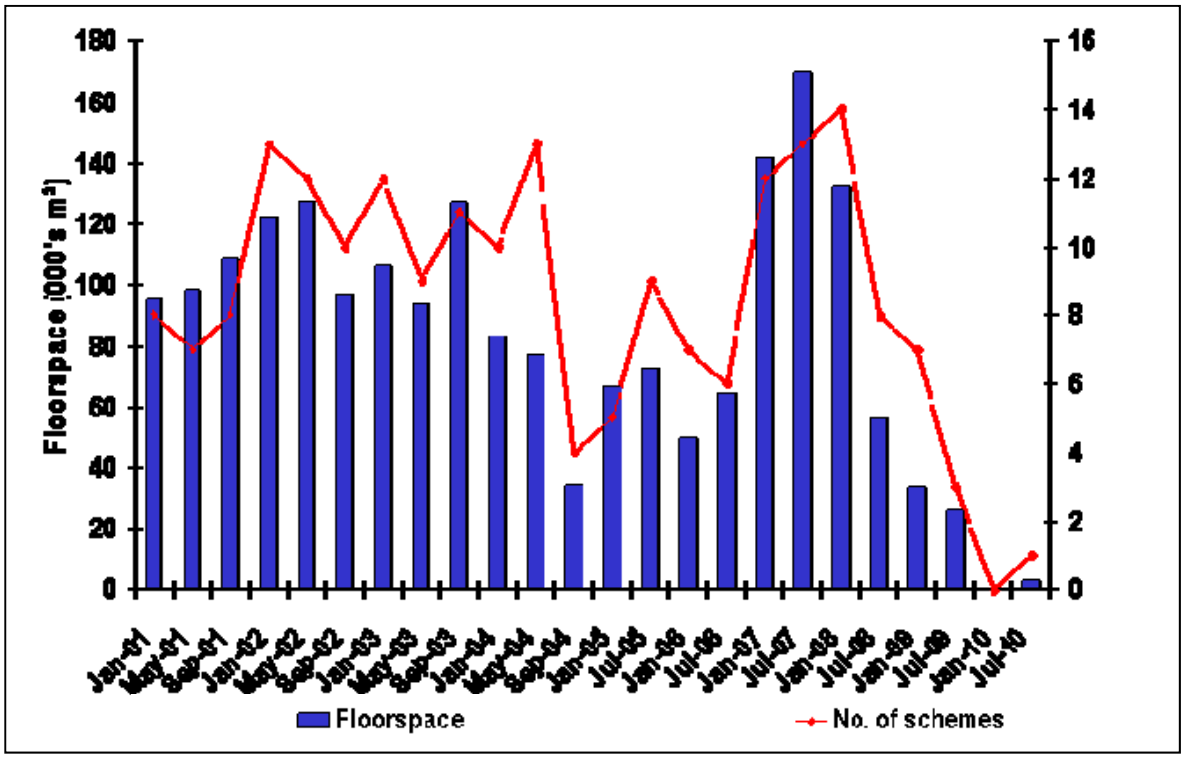
Sqm	<10,000 sqm	>10,000 sqm	Total
Central	131,717	-	131,717
North	159,823	17,811	177,634
South	242,008	19,311	261,319
East	521,782	115,539	637,321
West	354,674	61,536	416,210
Heathrow	359,844	34,066	393,910
Total	1,769,848	248,263	2,018,111

Source: Focus / Jones Lang LaSalle.

Development

6.41 New industrial and warehouse development in London, particularly new speculative development, dropped off sharply when the recession started. In general, because the timescale involved in bringing forward and completing industrial schemes is much shorter compared with major office or retail developments, supply tends to be more responsive to changes in market conditions. Once the recession started, developers very quickly turned the development tap off. The level of speculative industrial warehouse development in Greater London fell from a pre-recession peak of 169,300 sqm in 13 schemes in zero development at January 2010, see Figure 6.3.

Figure 6.5 Speculative industrial / warehouse development in Greater London – floorspace and number of schemes under construction



Source: Jones Lang LaSalle

6.42 The near moratorium on speculative development since the recession has reflected a range of factors. First, most speculative development was simply unviable because the outward movement in yields (capitalisation rates) and the fall in potential achievable rents meant that the end Gross Development Value could not justify the development costs, given build costs and land values, even if bank finance could be secured. As Table 6.6 shows there was a sharp increase in industrial property yields between mid- 2007 (at the height of the pre-recession boom) to around the end of 2009, when prime yields peaked, according to Jones Lang LaSalle data. Prime yields have been on a broadly downward trend since the start of 2009.

Table 6.6 Prime industrial / warehousing investment yields

	Mid 2007	End 2009	Mid 2011
Multi-let estates	4.75	7.75+	6.0
Single-let distribution unit	5.0	7.50+	6.25

Source: Jones Lang LaSalle

6.43 Second, finance has been extremely difficult to secure for any type of speculative development, although there are now some funds that are prepared to fund this type of development. Third, market sentiment has been generally weak over this period and even where developers have been prepared to commit to speculative development this has

usually only been once a pre-let has been secured for part of the development, and typically this pre-let has not materialised. An additional deterrent in this respect has been the potential burden of empty rates, which since the reforms of 2008 are now incurred after a six-month void.

6.44 There has been very little speculative industrial development in London over the past year with just one scheme under construction on a speculative basis at July 2010, according to Jones Lang LaSalle data.

6.45 Over the past year or so there has been speculation in the property industry as to when speculative development would return to the market, but to date expectations that a greater number of development starts would materialise due to developers 'gearing up' has generally not materialised. Whilst developers have been more active in terms of land acquisitions, funding constraints and a lack of confidence remain strong inhibitors on speculative development actually commencing. Table 6.7 summaries the main speculative industrial developments either currently under construction or likely to proceed in the short-term across Greater London.

Table 6.7 : Speculative industrial developments under construction or likely to proceed in the short-term in Greater London, June 2011

Scheme	Location	Developer	Size (ft²)	Comments
Origin, Rinsford Road	Park Royal	SEGRO	535,000	Half of the site is under consideration for speculative construction and the remaining is set aside for pre-lets.
Tudor Estate, Abbey Road	Park Royal	SEGRO	30,000	Segro are considering speculative construction at this site, planning application has been submitted to the council.
Westway Estate	Acton	SEGRO	60,000	Sego is considering infill speculative development within the estate. Various units from 5-30,000 sq ft totalling 60k.
Hanworth Trading Estate	Hanworth	Merlin Land	32,454	Marlin Land is planning to construct 7 new units totalling 32,454 ft², another unit on site totalling 50,000 ft² is pre-let to Selco. Construction is expected to complete in early 2012.
4-40 Link	Southall	Chancerygate	58,809	Chancerygate is now on site.
Nexus	Heathrow	ING	62,000	ING has approved this scheme for speculative development for circa 62,000 ft²; construction is expected to start in Q2 2011.
Trade City	Sunbury	Kier Property	30,000	Planning to build 6 units of 5,000 ft² each.
Trade City	Uxbridge	Kier Property	71,360	Kier Properties plan to start on site shortly.
550 White Hart Lane (former Bridsco site)	Tottenham	LaSalle Investment Management/ Curtis Real Estate	143,000	Curtis Real Estate and La Salle Investment Management plan to construct 7 units totalling 143,000 ft² but they are likely to seek a pre-let before starting any speculative construction.
Imperial, Innova Park Enfield	Enfield	Canmoor/ Salmon Harvester	100,000	Canmoor and Salmon Harvestor are considering speculative construction.

Source: Jones Lang LaSalle

Conclusions

6.46 The analysis in this chapter has focused on short-term market conditions. It highlights the fact that business demand for industrial and warehouse premises remains weak, a condition that is likely to reflect the fragile nature of the economic recovery. Although overall forecasts for the UK economy are still predicting GDP growth this year (about in line with 2010) and a pick-up in 2012, rather than a double-dip recession, downside risks have clearly increased and, as a result, occupier demand looks set to remain subdued in the short-term (2011-2012).

6.47 Against this background, speculative industrial development is likely to remain very limited and confined to small and medium sized units in selective parts of London, such as Heathrow or Park Royal. The development of larger units is likely to remain demand-led, i.e. dependent upon an occupier agreeing to lease or purchase the building.

6.48 These conditions suggest that a recovery in occupier industrial/warehouse demand could be slower to arrive than widely expected at the start of 2011. However, these short-term conditions should not detract from the continuing importance of industrial and warehouses property and the importance of ensuring an adequate and appropriate supply of premises and land over the medium and longer terms to support activities that serve the needs of London's businesses and population. Whilst, some of these activities could take place outside of London, in many cases there could be costs associated with such 'displacement' including, for example, increased traffic flows over longer distances if companies serving London are forced to relocate outside the GLA.

7 UTILITIES

7.1 According to URS, utilities is the third largest occupier of industrial land with 1,071 ha used by infrastructure for energy production, transmission and distribution; water supply and treatment; and telecommunications. Telecommunications infrastructure has minimal land-take so we focus on energy and water.

7.2 The demand for utilities (i.e. water and energy) is driven by a range of factors such as population, economic activity, behaviour and lifestyle, and technology. This in turn influences the demand for infrastructure and for land. The location of this infrastructure is determined by spatial policy and available land.

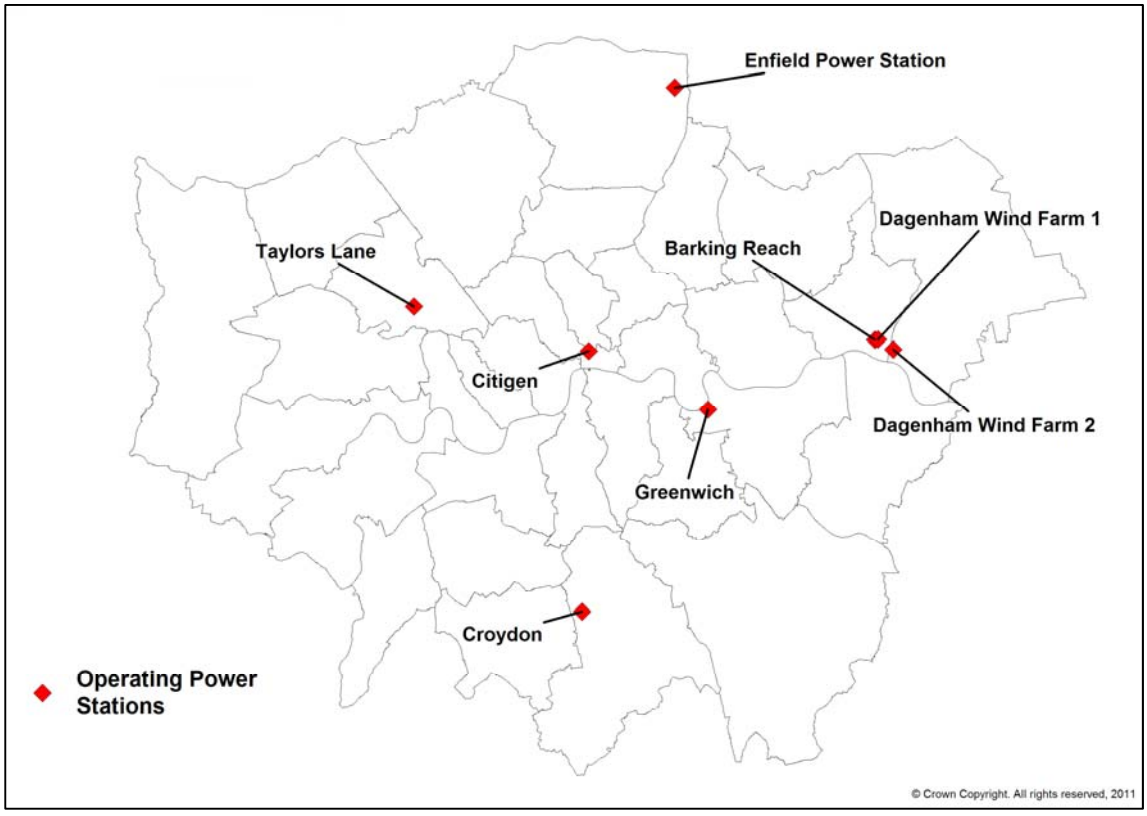
Energy

Infrastructure

7.3 Energy infrastructure on industrial land includes: power stations; cableways and transformer stations for the distribution of electricity; gas manufacture and storage facilities.

7.4 Energy generation in London comes from a variety of sources, specifically gas, oil and renewable sources: there are power stations in Barking Reach (Barking & Dagenham), the City of London (Citigen), Croydon, Enfield, Greenwich and Brent. In addition, Dagenham Wind Farm has one turbine in Barking & Dagenham and one in Havering. Aside from Barking Reach which is very large (approx. 14 ha), the other stations' land-take ranges between 0.15ha and 2.7 ha.

Figure 7.1 Power stations in London



Source: Digest of UK Energy Statistics – DECC. Operating power stations of greater than 1MW

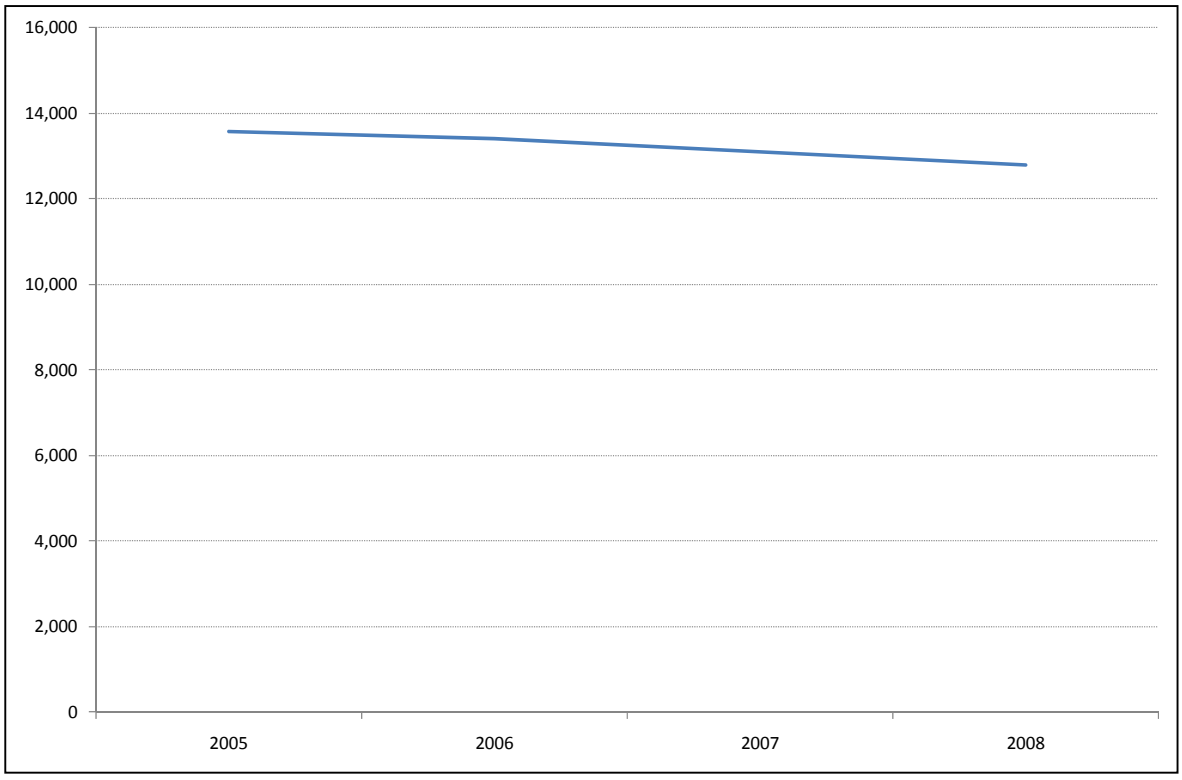
7.5 In addition, according to the London Heat Map, there are also 13 heat generating power plants and 6 energy-from-waste plants in London.

Drivers of demand for land

7.6 The infrastructure needed to meet the energy requirements of individuals and businesses depends on peak demand and on the technologies chosen to generate electricity. According to National Grid[38], many factors can influence the level of peak demand met by the transmission system. These include: population numbers; the weather; economic activity; energy prices; energy efficiency/conservation; customer demand management; take up of self-generation; supplies taken from generation embedded within distribution networks; the level of external interconnection exports and regulation.

7.7 According to the Department of Energy and Climate Change, in 2008 London's final energy consumption amounted to 12,793 Ktoe[39], a 6% drop since 2005.

Figure 7.2 London final energy consumption, Ktoe



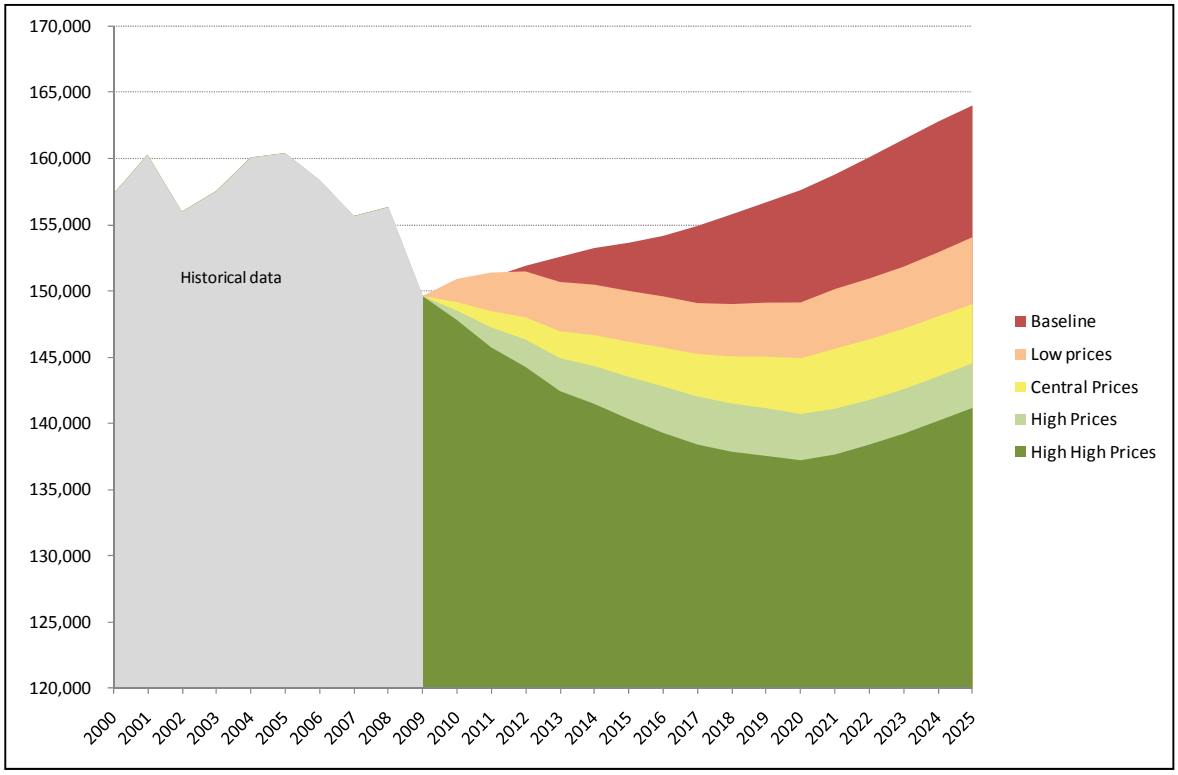
Source: DECC

7.8 This downward trend is likely to have been driven in part by the continued rise in energy prices. At the national level, DECC has produced forecasts for energy consumption which reflect a number of price scenarios. As illustrated below, except under the Baseline

[38] National Grid, National Electricity Transmission System Seven Year Statement, May 2010
[39] Kilo Tonne Oil Equivalent

scenario (which excludes Low Carbon Transition Plan measures), total consumption over the next 15 years is not expected to get back to 2005 levels.

Figure 7.3 Final energy demand projections in the UK, Ktoe



Source: DECC

7.9 It is therefore likely that energy consumption will diminish in the future at national level, although we do not have any baseline forecasts for London. However, the impact on land requirement will also depend on the choices made to produce energy. Recent policy developments which aim to tackle climate change have focused on new ways to produce energy. As part of its Climate Change strategy for achieving environmental emissions targets, the Government favours the development of energy generation through combined heat and power (CHP) systems and other renewable sources. The Mayor's Low Carbon Strategy[40] supports this objective and aims to shift the supply of a quarter of London's energy to low carbon, and where possible, renewable, decentralised heat and power networks. As it stands, London performs more poorly than all other UK regions in terms of renewable electricity capacity per pound of GVA generated[41]. Other means to generate sustainable energy will be explored; this may include the installation of solar panelled roofs on warehouses to make use of under-utilised roof space and generate energy without additional land-take.

[40] GLA, Powering ahead: delivering low carbon strategy for London, October 2009
[41] DECC

7.10 Electricity demand is – after a temporary decrease during the economic downturn - forecast to increase in the medium term, and with sustained levels of population and business growth the spare electricity capacity in London's 11 kV network is significantly diminishing. UK Power Networks plans to invest in electricity distribution infrastructure in London involving a number of new main substations. Such substations typically require a footprint in excess of 1,000 sq m and minimum headroom of 10m.

7.11 National Grid's London Cable Tunnels programme phase 1 (completion by 2015) will provide a new tunnel route from Willesden to Hackney and from Wimbledon to Kensal Green. At the latter and at Finsbury Park new substations will be built typically occupying an area of up to 250m x100m with a height of below 15 m.

7.12 The following CHP-led district energy schemes have been identified: Olympic Park and Stratford City, Citigen, the Pimlico District Heating Undertaking (PDHU), Barkantine Heat and Power, Whitehall District Heating Scheme, the Bunhill Energy Centre, King's Cross Central and the University College London and Bloomsbury CHP. The Mayor also contributes to the delivery of exemplar decentralised energy projects such as the London Thames Gateway Heat Network or the Upper Lee Valley Energy Network, which are geared towards unlocking barriers to investment by the private sector.

Energy

Forecast demand for land

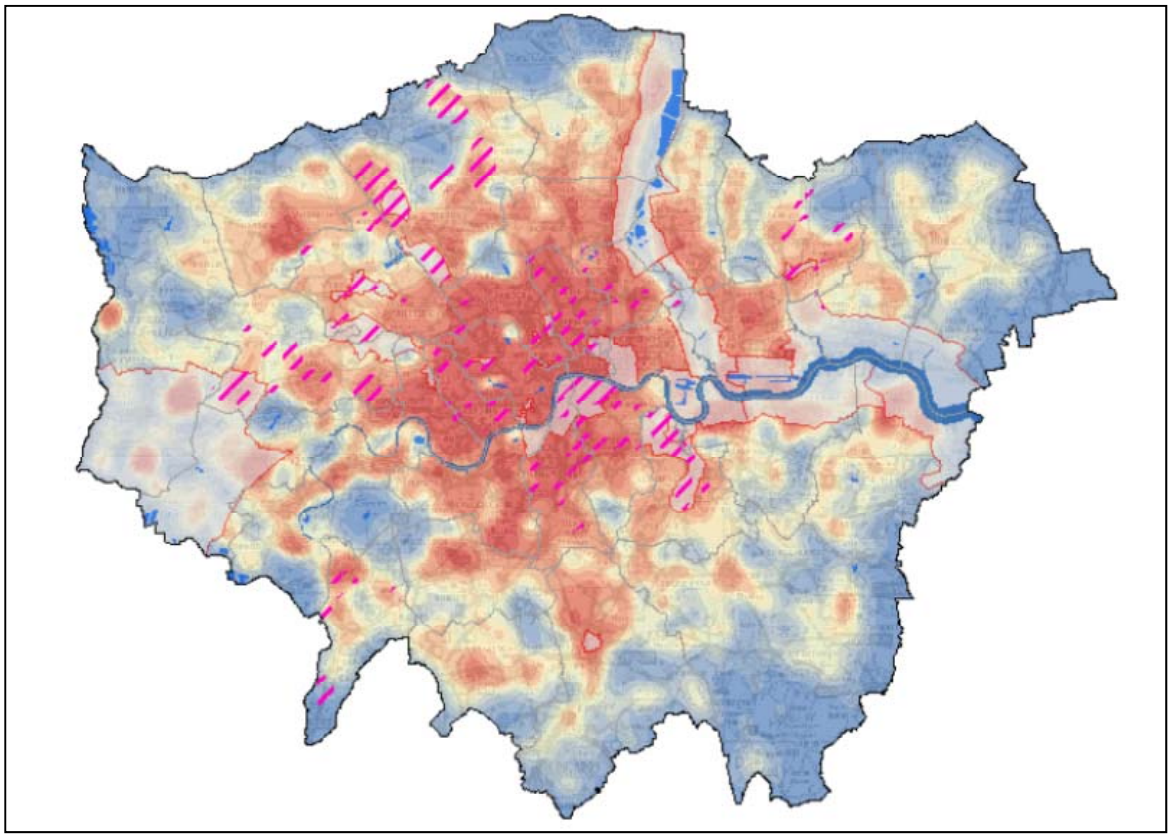
7.13 The largest demand on land from the utilities sector would result from the construction of new power stations. We are not aware of any such plans in London. However, the Mayor's Low Carbon Strategy will place new demands on land development to generate the energy required by Londoners' in the future.

7.14 In order to achieve the Low Carbon Strategy's goals, the Mayor is seeking to: develop area wide district heating networks; and encourage boroughs to identify existing and potential heat networks through energy strategies and masterplans for key sites and to provide land to accommodate energy centres. Indeed, Policy 5.5 of the London Plan prioritises the development of decentralised heating and cooling networks at the development and area wide level, as well as larger scale heat transmission networks (Policy 5.5).

7.15 In parallel, and over the next few years, the GLA will develop energy strategies for each of the 28 Opportunity Areas (OA) identified in the London Plan.

7.16 The map below illustrates the areas of opportunities identified by the LDA.

Figure 7.4 Focus areas and Opportunity Areas for Decentralised Heating infrastructure



7.17 The LDA had also identified a number of proposed infrastructure projects, namely: the BXC CHP energy-from-waste plant; the Stonegrove / Spur Road CHP Plant; the Colindale CHP plant; the Mill Hill East CHP plant and Phase III at the Former Bell Gas Works.

7.18 However, the identification of infrastructure requirements for energy in London is still very much a work in progress so it is impossible at this point to estimate future land-take. The Mayor is working on the implications of growth proposed in the London Plan through the London Plan's Implementation Plan. Indeed it recognises that 'more work is necessary to investigate the distribution infrastructure in London for electricity and heat/gas in detail. This will include engaging with the network operators (National Grid, EDF, Scottish and Southern and Southern Gas)'.[42]

7.19 It is likely that new CHP facilities, in new schemes, will generally be included as part of the development and as such would have minimal impact on industrial land, except as part of a transfer of use for residential / office uses. According to the LDA, 'the main source of carbon reduction by decentralised energy is anticipated to be through locally generated Combined Heat and Power (CHP) systems and district heating networks'. More specifically 'energy supply through CHP will become the norm in new developments in London. The Mayor has introduced mandatory use of CHP in developments of 500+ dwellings through

[42] Mayor of London, Early Working Draft London Plan Implementation Plan, October 2010

planning guidelines. CHP is also technically viable for mixed use developments of 250+ dwellings'. However, there is also likely to be a need for larger infrastructure and this will need to be monitored and land impacts assessed.

Water

Infrastructure

7.20 Water infrastructure which may be found on industrial land includes: water treatment and purification facilities; water storage and distribution places e.g. reservoirs, water towers and pumping stations; sewage disposal and treatment works, including drains, pumping stations and sewage farms.

7.21 In London, water is supplied by four companies: Thames Water, Veolia Water Three Valleys, Essex & Suffolk Water, and Sutton & East Surrey Water. The majority of London's water supplies come from outside the city's boundaries, from the rivers Thames and Lee and is then stored in reservoirs around the capital.

7.22 With regards to water treatment, Thames Water is the 'sewerage undertaker' for almost the whole of London (a small part of Havering is served by Anglian Water). It is responsible for collecting wastewater from homes and businesses, and treating it at one of the sewage treatment works listed below, before returning the treated water back to the River Thames or one of its tributaries. There are currently nine treatment works in London and they tend to be large land occupiers.

Treatment work	Catchment area
Beckton	Waltham Forest, Barking & Dagenham, Brent, Camden, City of Westminster, City of London, Ealing, Hackney, Hammersmith & Fulham, Haringey. Islington, Kensington & Chelsea, Newham, Redbridge, Tower Hamlets.
Crossness	Bexley, Bromley, Croydon, Greenwich, Lambeth, Lewisham, Merton, Southwark, Sutton, Wandsworth
Mogden	Barnet, Brent, Ealing, Harrow, Hillingdon, Hounslow, Richmond Upon Thames, Hertsmere, Slough, Three Rivers, Spelthorne, Windsor & Maidenhead, South Bucks
Long Reach	Bexley, Bromley, Croydon, Chelsham, Farleigh, Tatsfield & Titsey, Limpsfield, Sevenoaks, Dartford
Riverside	Havering, Barking & Dagenham, Redbridge, Stapleford & Abbots
Deephams	Barnet, Brent, Enfield, Haringey, Waltham Forest, Waltham Abbey, Broxbourne, Northaw & Cuffley
Hogsmill A	Kingston upon Thames, Sutton, Epsom & Ewell, Banstead Village, Nork, Tattenhams, Preston, Tadworth & Walton
Hogsmill B	
Beddington	Croydon, Sutton, Chipstead, Kingswood, Caterham, Warlingham, Whyteleafe and Woldingham

Source: Mayor of London, Securing London's Water Future, October 2011

Drivers of demand

7.23 Water use rose more or less continuously during the twentieth century as the fall in industrial demand for water has been more than outpaced by the rise of household use. London is now classified as an area under serious water stress.

7.24 The forecasting model used by Thames Water offers insight into the key drivers of demand for water and ultimately for water infrastructure. These drivers include:

- Household numbers and profile. This will cover variables such as the appliances they use; the number and age of occupants; their attitude to water use; their lifestyle and the presence of water meters.
- Property numbers;
- Economic activity;
- Estimates of peak demand which would occur during dry periods;
- The impact of climate change on water demand both in terms of more frequent periods of drought and floods;
- Leakage across the water system;
- Technical developments;
- Policy and regulation.

7.25 Pushed by the forecast growth in population and climate change impacts and the slow impact of demand management measures, more water will have to be supplied, more sewerage treated and sludge disposed of, and the construction of more homes for this growing population will mean more surface water runoff.

7.26 As the demand for water rises across the whole Thames basin, London can no longer just rely on drawing in ever more water to meet their needs. A discussion paper prepared in 2007 by the Environment Agency *Water for the Future – Managing water resources in the South East of England* concluded that by 2035 demand for water in the South East of England would significantly outweigh supply unless we reduce the amount of water we use or find new resources.

7.27 In response, the Water Strategy for London[43] stresses the need to use the existing water supply more effectively and efficiently, reducing leakage, demand for water and simultaneously carbon emissions. Policy 5.15 also promotes the protection of water supply and the minimisation of water use. However, sustainable water supply infrastructure should be supported as there will be a need for additional resources in order to meet future needs.

[43] GLA, Mayor's Draft Water Strategy, August 2009

Forecast demand for land

Water supply

7.28 We have reviewed the Water Resources Management Plans of the four water suppliers to London in order to identify any planned investment which may require significant land-take. Our findings are summarised in the table below.

Water company	Investment strategy
Thames Water[44]	According to Thames Water's figures, a deficit of supply is expected from 2011. This will be dealt with through a combination of demand management and the delivery of the Beckton desalination scheme in 2009/10. However, resource development in the medium to long term is also required to avoid a return to supply deficit and deal with the uncertainty over future demand and available supply. Thames Water believes that a major resource is required by 2026. The Upper Thames Reservoir is their first choice for such a resource. It is also referred to in other water suppliers' plans. This would be located outside London. In the longer term (beyond 2020) Thames Water is also considering an aquifer recharge scheme in South London and a resource development scheme in East London.
Veolia[45]	Veolia's strategy is focused on demand management through metering and reducing water loss through leakages. It expects that no further investment will be needed to maintain security of supplies until 2025 or 2026 for the critical period. However, after this date a supply-demand deficit is expected to emerge. For this reason, and given the uncertainty over whether demand reductions from metering and water efficiency will succeed, and the impacts of climate change, Veolia will closely monitor changes in demand and supply and continue to explore options for resource development. The Plan mentions the Upper Thames Reservoir and other resource development options although none are located in London.
Essex & Suffolk Water[46]	The Water Resources Management Plan forecasts a growing deficit of water supply for the Essex Resource Zone which includes the

[44] Thames Water, Revised Draft Water Resources Management Plan, September 2009
[45] Veolia, Water Resources Management Plan, March 2010
[46] Essex & Suffolk Water, Final Water Resources Management Plan 2010-2035, January 2010

	London Boroughs of Redbridge, Barking & Dagenham, and Havering. It states that the timing of the problem is such that water resource management options are required now to address the deficit in actual headroom and absence of target headroom in Essex. The extension of Abberton reservoir is identified as a key part of the solution. This reservoir is located south of Colchester so it has no impact on London in terms of industrial land take.
Sutton & East Surrey Water[47]	The Water Resources Management Plan identifies a supply deficit for the area and the implementation of an upgrade of Reservoir A is a central part of the solution to this problem. This scheme is expected to be completed in 2012/13 and is located outside London. The plan also mentions the Upper Thames Reservoir as a new resource.

7.29 The latest Water Resources Management Plans for the four companies supplying water to London do not show any commitments to capital investment in London over the next 15 – 20 years. We conclude that no additional industrial land take is expected for this use.

Waste water

7.30 According to the Mayor's Water Strategy, 'additional capacity for the management of sewage sludge will be needed as a result of population growth and tighter environmental standards. Thames Water has prepared a 25-year sludge strategy48 that favours processes that (a) maximise energy recovery and (b) minimise sludge volumes. Where there is suitable land bank availability, recycling sludge to land remains the favoured option. To help protect this outlet Thames Water anticipates investing in sludge treatment to improve product quality'. However, Thames Water do not identify any investment in new sites / facilities in London. It focuses on the upgrading and expansion of five sewage treatment works, namely Beckton, Mogden, Long Reach, Riverside and Deephams.

Conclusions

7.31 With the expected growth in population, housing and employment, providing adequate infrastructure is going to be challenging but it is critical to the quality of life of London's residents and to the city's competitiveness as a business location. Indeed, the London Plan stresses the need to ensure that London has the physical infrastructure adequate for the needs of a growing city, meeting the highest and most modern standards to help use the city's resources as efficiently and sustainably as possible.

7.32 In response to both environmental, financial and land constraints, the strategy to meet future energy and water demand very much relies on a mixture of more efficient processes

[47] Sutton & East Surrey Water, Final Water Resources Management Plan, March 2010

[48] Thames Water, Consultation on Thames Water's Draft Strategic Proposals for Sludge Management, June 2010

and demand management. However, reducing consumption through demand management relies on achieving behavioural changes across the population and businesses and this is a slow process.

7.33 Based on the information available to us, we are not able to identify an additional land requirement in London for water supply or treatment; though there are planned upgrades/expansions may require additional land. This depends to a large extend on the scale of the upgrade/expansion and the treatment technologies that would be used: Traditional technologies tend to require more land, more innovative ones tend to be more expensive and more risky in terms of the treatment results, however, they may require less land.

7.34 While additional land is likely to be needed to meet Londoners' energy need, and a strategy has been produced to address this, the land implications have not yet been determined. This is an area which should be monitored. At borough level, policy with regards to industrial land should also take this category of uses into account before considering release to other non-industrial uses.

8 LAND FOR TRANSPORT

8.1 Transport related activities occupy approximately 446 ha of industrial land in London, almost 6% of the total: they include land for rail, buses and airport operations, and docks. These activities play a central role in the operation of London's economy, bringing employees to jobs, visitors to attractions and shoppers to retailers, and enabling the delivery of goods and services to businesses and residents.

8.2 London's transport network overwhelmingly remains a radial system, bringing people from outer and outside London to the centre. According to the Mayor's Transport Strategy, the trend of concentration of employment growth in central London is likely to persist: on current forecasts, over the next 20 years, 35% of London's future employment growth is expected to be located within the CAZ and Canary Wharf. The CAZ will therefore continue to be important not only for London's economy, other areas of London and the surrounding regions, but for the UK as a whole. Meanwhile housing growth will be more dispersed, albeit with higher rates of growth in Inner London. This pattern of growth will continue to place ever greater strains on the capacity of the transport network into and out of central London, requiring the provision of ever more radial transport capacity.

8.3 Overall, without adequate transport infrastructure, as population and employment levels grow, delays to private, business, public transport and freight journeys are likely to increase, harming London's ability to operate as a competitive business location.

Land for buses and coaches

Context

8.4 According to the Mayor's Transport Strategy, London buses now carry 2.2 billion passengers each year – the highest level since 1962, with service levels also at their highest since 1957. They are the most widely used form of public transport across London and as such play a key role in providing access to jobs and services. Buses also facilitate longer radial trips into London by feeding into railway stations and by enabling passengers to get to their final destinations in central London. Finally, they are central to achieving the Mayor's strategic objectives of reducing traffic volumes and overall $C0^2$ emissions.

8.5 The Mayor's Transport Strategy recognises this and aims to deliver 'a bus network that is developed to provide an even better value for money service, building on its success and expansion over the last decade'.

8.6 It also recognises the role of coaches in the London transport system. They offer five broad types of services: "UK short distance services, including commuter coaches; UK long distance services; European services; private hire or charter services; and airport services". The majority of UK scheduled short and long distance services, including European scheduled coaches, serve Victoria Coach Station, which is directly managed by TfL.

Infrastructure

8.7 Industrial land provides accommodation for bus operations, mainly for garages and depots and occasionally for terminals. Under the Town and Country Planning Act, bus garages are classified as sui generis but they do have similarities with B2 / B8 uses which explain their

presence on industrial land. In particular, bus garages and depots need sites on which they can operate for extended hours without disrupting neighbours and they need good road access. Bus garages and depots provide space for the overnight storage of vehicles, fuel and wash, maintenance, driver facilities and bus operating company management. It is important to distinguish them from bus stations which are not located on industrial land as they need to be in areas of high passenger flows.

8.8 According to London Buses, in 2010 there were 84 bus garages within the Greater London area and 8 garages in surrounding counties that operate buses for London.

8.9 With regards to coaches, one of the key challenges faced by coach operators is the lack of appropriate pick-up and set down areas as well as parking spaces. These are not located on industrial land but coaches and their drivers tend to make use of on-street space and other parking areas near these sites. In addition, there is an issue of capacity at Victoria Coach station. The SPG refers to a TfL study which found that 'demand in the future is likely to exceed capacity at Victoria Coach Station'. However, no increase in the footprint of VCS is possible due to the constrained nature of the land in the immediate vicinity.

Drivers of demand for land

8.10 Requirements for bus garage facilities are largely determined by: changes and enhancements to the bus network, which in turn are dictated by increases in demand and new development; the availability of suitable sites; and consolidation of sites and operations as appropriate and where possible.

Future land requirements

8.11 In 2007, the Land for Transport Functions SPG estimated that 'up to 12 additional sites will be required within London by 2016'. This analysis has not been updated since then so we contacted TfL to understand their view on future land requirements for bus garages and depots.

8.12 In the short to medium term (to 2017 / 2018), London-wide bus kilometres are not projected to increase, however the network will continue to evolve to meet demand which means potential changes to the spatial distribution of bus garages and depots. In the longer term, London's population and employment growth over the next 20-25 years as well as public transport policy are bound to result in growth in the bus network, which in turn can be expected to increase the requirement for bus stations, stands and garages. However, land requirements have not been quantified. They may be significant as a bus garage needs at least 1.2 ha and good road access in order to accommodate parking, maintenance, fuel and wash.

8.13 Local authorities need to bear this in mind when considering industrial land release. Bus garages are predominantly owned by the private bus operators who compete for contracts to run bus routes in an open market. TfL would expect the private sector to select, obtain consents for and develop the sites they need for garages themselves. However, local authorities have a key role to play to ensure that sufficient sites are available in appropriate locations to accommodate depots and enable bus operators to respond to growth in the bus network. Some degree of surplus capacity of suitable garage sites could also be viewed as desirable as it facilitates a competitive marketplace where multiple operators can bid for

bus routes and where it is possible for new operators to enter the market. This also enables sites to relocate if, for example, development of an area results in an existing garage no longer being an appropriate use.

8.14 Therefore, while TfL does not provide a figure for future land required for bus operations they recommends that local authorities: identify potential sites for bus garages (in particular on SILs); carefully considers the needs of the bus network prior to releasing industrial land to other uses; and protects existing bus sites against changes of use.

Land for rail

Context

8.15 The passenger rail network in London includes National Rail infrastructure, the Docklands Light Rail, the London Underground and, in the future, Crossrail.

8.16 London is more dependent on rail than any other city in the UK with three quarters of all trips from Outer London to central London made by National rail[49]. Overall, 70 per cent of all **passenger rail** travel (including Tube journeys) in the UK is to, from or within the Capital[50]. In addition, the number of passenger journeys by rail has increased by 70% since 1995 / 96. In other words, London's success and future growth is bound with the future of its rail network and services.

8.17 This is recognised in the Mayor's Transport Strategy which aims to deliver:

- An expanded National Rail network, better integrated with the rest of the transport system;
- Greater Mayoral influence over National Rail service standards and service planning and development;
- Crossrail, Thameslink and the Chelsea Hackney line to improve connectivity and capacity;
- Increased capacity on all other National Rail lines and new orbital rail services on London Overground;
- An upgraded Tube service including a separation of services on the Northern line to increase service frequencies through the City, an extension of the Northern line to Battersea, providing greater capacity and more reliable journeys, and consideration of an extension of the Bakerloo line.

8.18 The rail network is also used for freight, which is vital for ensuring London is able to function as a dynamic world city. In 2005, 5% of freight lifted in London travelled by rail[51]. London is a net receiver of rail freight from other parts of Britain, with more than twice as

[49] Mayor of London, Mayor's Transport Strategy, May 2010
[50] Mayor of London, Mayor's Transport Strategy, May 2010
[51] TfL, London Freight Data Report, January 2008

much arriving into the city as leaving[52]. The major flows into and within London are aggregates for the construction industry, while domestic waste is the biggest outward flow.

8.19 The London Plan encourages modal shift of freight towards rail and water in order to reduce CO^2 emissions, road congestion and improve safety.

Infrastructure

8.20 Industrial land can be used by rail operators to accommodate depots and rail sidings for loading / unloading goods. It can also include land for strategic freight interchanges and local rail terminals but it does not include railway stations or the rail track itself.

8.21 As we have seen in Chapter 5, strategic freight interchanges are particularly important to the efficient and sustainable operation of the logistics sector in London. They make rail freight more efficient by reducing the number of expensive and time consuming transfers onto lorries. This is achieved by constructing new warehousing around the rail node, so that it can co-locate on the same site and avoid a further journey leg. SRFIs can use more efficient methods of moving goods around the site without having to use public roads. Such sites require good road and rail access, and sufficient land available for the associated warehousing. Ideally they would be as close as possible to the end markets to minimise the length of the final road leg to the retailer; in practice the suitable sites are generally on the periphery of London, adjacent to the M25 or the motorways radiating out of London.

8.22 There are also 29 active rail freight terminals in London[53] but others are currently mothballed and may return to use in the future or new terminals may be constructed for specific purposes. They mostly deal with construction materials.

Drivers of land demand

8.23 The demand for land for rail is influenced by a range of factors including: population growth, economic activity, modal shifts, policy objectives and planning choices. As London's population grows and the concentration of employment in the CAZ continues, additional capacity for passenger railway will be needed. Indeed, according to the Mayor's Transport Strategy, 'the demand on the National Rail network will increase, by approximately 35 per cent by 2031'.

8.24 It also estimates that freight tonnage carried by rail 'is expected to increase by 30 per cent nationally between 2006 and 2015, although some 85 per cent of all freight movement will remain carried by road'. This will place further pressure on Greater London's rail infrastructure.

Future land requirements

8.25 The information in this section is derived from our communication with TfL and represents their position on future infrastructure needs at the time.

[52] TfL, London Freight Data Report, January 2008

[53] TfL, London Freight Data Report 2009, May 2010

Passenger Rail

8.26 The latest information from TfL acknowledges that more depots will be needed for passenger stock but their location has not yet been identified.

8.27 Recommendations are currently being made for HLOS2 which informs Government funding for the railways from 2014 to 2019 and as part of this process TfL have identified the need for 130 more vehicles ('coaches') on orbital routes, 79 on the Essex Thameside corridor (c2c), and 77 on South Western, which trigger depot / stabling requirements. Of those 3 corridors, the orbital (mostly London Overground) stabling would be within Greater London (probably in the Neasden area). On the other hand, whether the depots for South Western and c2c would be in London has not been finalised.

8.28 This also raises the question of what happens beyond 2020 but no strategy has been developed yet.

DLR

8.29 Research into land requirements for extensions to the DLR network is underway and was not completed prior to the end of this study. TfL recently acquired land for additional depot stabling facilities at Beckton Depot but our understanding is that there are no further committed schemes which require additional land.

8.30 However, there are a number of proposed schemes to bear in mind for this study:

- Another vent shaft is being considered above the DLR tunnels into Bank. This would require a small amount of space on the surface but not on industrial land.
- There may be a need for a very small "sliver" of land alongside the railway at Cable Street (near Black Church Lane) to build a siding in the next 5 years. This is currently mainly used as car parking space for the businesses under the arches and only represents a small amount of land.
- At Beckton Depot, as part of the Dagenham Dock Extension, a piece of land to the northeast of the depot would need to be acquired in order to connect the depot to the new extension. The land requirement for the depot is around 9,700m² but the site earmarked is currently brownfield i.e. not in industrial use.

8.31 There are other potential schemes based around the extension of the DLR and the Bakerloo Line to South London but these are very tentative and will need to be monitored for any implication on land requirements.

Underground

8.32 According to the London Draft Replacement Plan and TfL's Network Work Schedule, most investment projects relate to upgrades, new stations and repairs to the existing infrastructure.

8.33 A developer-led extension of the Northern Line to Battersea Park is planned as part of the development at Nine Elms but land has already been allocated for this purpose.

8.34 The proposed Northern and Southern extensions to the Bakerloo Line may lead to some land-take although it is too early to tell as the scheme and route are under development.

Tramlink

8.35 Our understanding of the investment plans for Tramlink based on the London Draft Replacement Plan is that the focus is on increasing capacity through higher frequency and improving the existing infrastructure. Network extensions from Beckenham to Bromley and Wimbledon to Sutton are considered, albeit in the longer term. Any new extension of the Tramlink network will require another stabling facility for an increase in the tram fleet. However, there is land available within TfL ownership near Woodside tram stop that has been identified as a future stabling depot.

Freight rail

8.36 The London Rail team of TfL is currently working on the London and South East Route Utilisation Strategy (L&SE RUS) to consider freight capacity and capability. If there is any capacity shortfall, additional freight capacity infrastructure schemes will be considered. The workstream is programmed to conclude in Autumn 2011.

8.37 However, previous rail industry work has identified three leading sites for Strategic Rail Freight Interchanges, one of which is in London: Howbury Park at Slade Green, Bexley. This has already received planning permission and will therefore not represent an additional requirement for land. The other strategic terminals have not received permission to date.

8.38 London Rail has also undertaken work to assess the feasibility of a smaller intermodal freight terminal serving High Speed One (HS1) in the Barking Riverside area[54]. Although not on the scale of Howbury Park above, the concept is the same in that it would include rail-connected warehousing. Barking is particularly significant because it sits on the HS1 line which provides high speed and high gauge access to France and the rest of Europe. There are no other sites in, or near to, London that could provide access to HS1, so Barking is unique in that respect. It is also a brownfield site with excellent road, rail and water links, and offers the prospect of a tri-modal interchange.

8.39 Network Rail's London and South East Route Utilisation Strategy has also identified a potential rail freight interchange in Cricklewood. A master plan is being progressed but there are potential capacity issues.

8.40 Finally, the role of local freight terminals must not be underestimated and indeed London Rail has marked a number of sites has key for future rail freight activity. Most are on existing terminals, on industrial land, or on Crossrail / TfL land[55].

[54] London Rail, Rail freight development for the sub-regional planning freight workstream, July 2010
[55] London Rail, Rail freight development for the sub-regional planning freight workstream, July 2010

Airport-related land

Context

8.41 This category of users is defined by URS as “ancillary land within the cartilage of an airport that includes storage of planes and aero related parts, repair shops and other areas for cargo”. They only occupy 33 ha, 0.4% of all industrial land in London.

8.42 There are three airports located within the boundaries of London: Heathrow; London City and Biggin Hill.

8.43 Heathrow, to the West of London, is the busiest international airport in the world and is considered critical to the competitiveness of the UK economy.

8.44 London City Airport, located in the Royal Docks, primarily serves the business market, focusing on domestic and European destinations.

8.45 Biggin Hill, located in South East London, provides business aviation and also accommodates private aviation and flying clubs.

8.46 The London Plan (Policy 6.6) recognises that ‘adequate airport capacity serving a wide range of destinations is critical to the competitive position of London in a global economy. Airport capacity serving the capital and wider south east of England must be sufficient to sustain London’s competitive position’. However, ‘the Mayor strongly opposes any further capacity increases at Heathrow due to the adverse noise and air quality impacts already being experienced by residents and others in the vicinity of Heathrow and its environs’. The other airports are not mentioned in the London Plan.

Infrastructure

At Heathrow

8.47 According to BAA’s website, there are approximately 1.4 million square metres of commercial accommodation for more than 280 tenant organisations at the airport. The property portfolio is diverse, including offices, airside support facilities, airline lounges, business centres, warehouses, airline check-in desks, ground handling accommodation, fuel facilities, crew reporting centres and aircraft hangars.

8.48 Most relevant to this study are airside support activities. There are more than 100,000 sqm of space leased for these uses and it includes ramps; motor transport depots, used for servicing the vehicles and equipment that attend the planes; catering bases for the preparation and delivery of in-flight catering; and aircraft hangars for maintenance at a local base to minimise disruption to flight schedules.

At London City Airport

8.49 Commercial and airside activities on the airport site at London City Airport include: an airport fire station and training ground; ground handling and minor aircraft maintenance facilities; a fuel storage facility; an office building, City Aviation House, which houses offices for the Airport company and a number of airlines and other concessions. Further business centre facilities are also located here and in-flight catering is prepared in the King George V Building. Freight handling is also undertaken in this building. The amount of freight passing through LCA is small and predominantly consists of courier and express deliveries.

8.50 A further building at the western end of the site, a former dock warehouse, houses workshop facilities for facilities maintenance and motor transport functions. A stores facility for the Airport and other concessions are also located here.

At Biggin Hill

8.51 As well as an airport, Biggin Hill is an engineering and technology centre. According the airport's website, a substantial number of airport-related businesses are located at Biggin Hill. As in the other airports, this includes a range of aircraft maintenance, high tech engineering and in-flight catering services. Alongside this, Biggin Hill has also received approval for a 76 bed high quality hotel on the airport, to be built by 2012.

Drivers of demand

8.52 The need for land for airports and supporting activities depend from two broad categories of drivers: market demand and Government policy.

8.53 Market demand will depend on economic activity; population numbers; special events (e.g. Olympics) and of course prices which are in turn influenced by oil prices and technology.

8.54 Current Government policy with regards to airports is set out in the Aviation White Paper and in London, as mentioned earlier, it is set out in Policy 6.6 of the London Plan which opposes airport expansion.

Future land requirements

Heathrow Airport

8.55 Heathrow's 2005 Master Plan produced by BAA[56] sets out plans for a third runway, north of existing boundary. Indeed, land is earmarked for this purpose and maps suggests it would involve the uptake of some land currently used for warehousing as well as vacant industrial land. This is in conflict with Policy 6.6 of the London Plan.

8.56 The Master Plan also expects that the future amount of floorspace required for airport ancillary activities could increase compared to 2005. However, 'any additional requirement for airport related development will be accommodated without requiring additional non-airport land'.

London City Airport

8.57 The London City Airport's Master Plan[57] sets out the airport's vision for growth up to 2030. It is based on: a forecast increase in passenger numbers from over 2 mppa in 2005 to 3.5 mppa in 2015 and to 8 mppa by 2030; a forecast increase in corporate aviation movements from 10,000 per year in 2005 to around 28,000 per year in 2030.

8.58 According to the Master Plan this can be accommodated within existing boundaries and as a result there will be no need for an additional runway or to host materially larger capacity

[56] BAA, Heathrow Airport Interim Master Plan – Draft for Consultation, June 2005
[57] London City Airport, Master Plan, November 2006

aeroplanes. The airport will be redeveloped, new buildings built, but within the airport's boundaries.

Biggin Hill

8.59 According to Biggin Hill's 2005 Master Plan[58], 'adding private, helicopter, business and local passenger services together would give a total forecast of aircraft movements of 90,000. This is significantly less than both the 200,000 achieved in the 1970s and the currently permitted limit of 125,000 per annum. The Airport's aspiration is to achieve a viable level of activity with 500,000 passengers a year plus 10,000 business aircraft flights'. These forecasts envisage Biggin Hill as a modest local airport.

8.60 With regards to airport-related activity, the Master Plan assumes the continuation of this activity. It plans for a comprehensive redevelopment of the western part of south Camp which will include a rationalisation of the flying club buildings, providing them with modern facilities, two additional large hangars in line with the existing ones parallel to runway 11/29, a business centre and a hotel/restaurant. Outline planning permission for the two hangars and the business centre has been granted. In addition to this development, there will be a site at the eastern end of South Camp suitable for one additional hangar. The Master Plan zones the whole of South Camp for airport-related uses, namely, aviation support and aircraft maintenance activity, an airport hotel and restaurant, flying clubs and private flying facilities.

8.61 East Camp also contains a number of existing maintenance and support buildings and facilities. The Master Plan envisages the continuing use of part of this area in line with the UDP policy of infilling and replacement, in order to retain the open character of the area. North of East Camp is a substantial area of undeveloped land, which the Master Plan zones as remaining undeveloped, in line with the UDP policies and contributing towards the ecological value of the Airport.

8.62 Overall, the airport's strategy is to be better, not bigger with the aim to enhance Biggin Hill as a high technology hub for South London. This strategy does not involve any significant land-take.

Docks & wharves

Context

8.63 Docks are located in wharves and are used for building or repairing boats, loading and unloading ships or passenger ferries. Their land take is very small: 31 ha in total or 0.4% of industrial land. Within London the maritime industry (wharves, boatyards and passenger facilities) is projected to grow over the London Plan period (to 2031). Some, but not all of these activities take place on strategic industrial land. Some of these activities such as loading and unloading cargo at wharves and boat repairs can involve noisy operations and, due to the tidal cycle of the Thames, can also require working outside normal business hours.

[58] Biggin Hill Airport Ltd, The Biggin Hill Airport Master Plan, December 2005

8.64 In terms of boatyard space, a new boatyard is due to be operational in Greenwich in the near future and a further new boatyard is being sought of 1-1.5ha. This follows research commissioned by the GLA which demonstrated a significant shortfall in boatyard facilities, particularly for those capable of maintaining the larger passenger vessels now operating on the Thames where passenger trips have doubled over the past 10 years[59].

8.65 Planning permission was granted in 2011 for a development that included a new cruise liner terminal. According to a recent report this is a further area for growth in the maritime industry in London[60].

8.66 The most important commodities handled at the London wharves in terms of weight are construction materials with over 4m tonnes handled in 2010.[61]

8.67 Water freight is one of the alternatives to road transport and is identified as a way to tackle road congestion and reduce CO^2 emissions. This is recognised in a range of London Plan policies: policy 5.17 on waste; policy 5.18 on construction, excavation and demolition waste; policy 5.20 on aggregates; policy 6.14 on freight transport; and policy 7.26 on increasing the use of the Blue Ribbon Network for freight transport. This underlines the need to safeguard wharves for these low-value uses. Policy 7.26 also indicates that the redevelopment of safeguarded wharves should only be accepted if the wharf is no longer viable or capable of being made viable for waterborne freight handling uses. Where additional need has been identified boroughs should find locations that are suitable for additional waterborne freight.

8.68 The Mayor has published a Safeguarded Wharves Review consultation draft that includes long term water freight trade forecasts and associated wharf capacity requirements and distribution to 2031. The work on capacity is complemented by assessments of existing wharves based on the viability test set out in paragraph 7.77 of the London Plan. The document concludes with an overview of proposed ways to address identified future capacity surpluses and deficits and recommendations for the future safeguarding or release of individual wharves.

Infrastructure

8.69 The type of wharf activity and demand varies depending on the commodities handled and the location of the site. In general, import and export to London occurs more frequently in the North-Eastern and South-Eastern sites and wharves in the Western region generally handle internal cargo movements to other wharves.

Demand drivers for land

8.70 Demand drivers depend on the commodities handled. In most cases however, they will involve a mix of: population; economic activity (domestic and abroad); major development

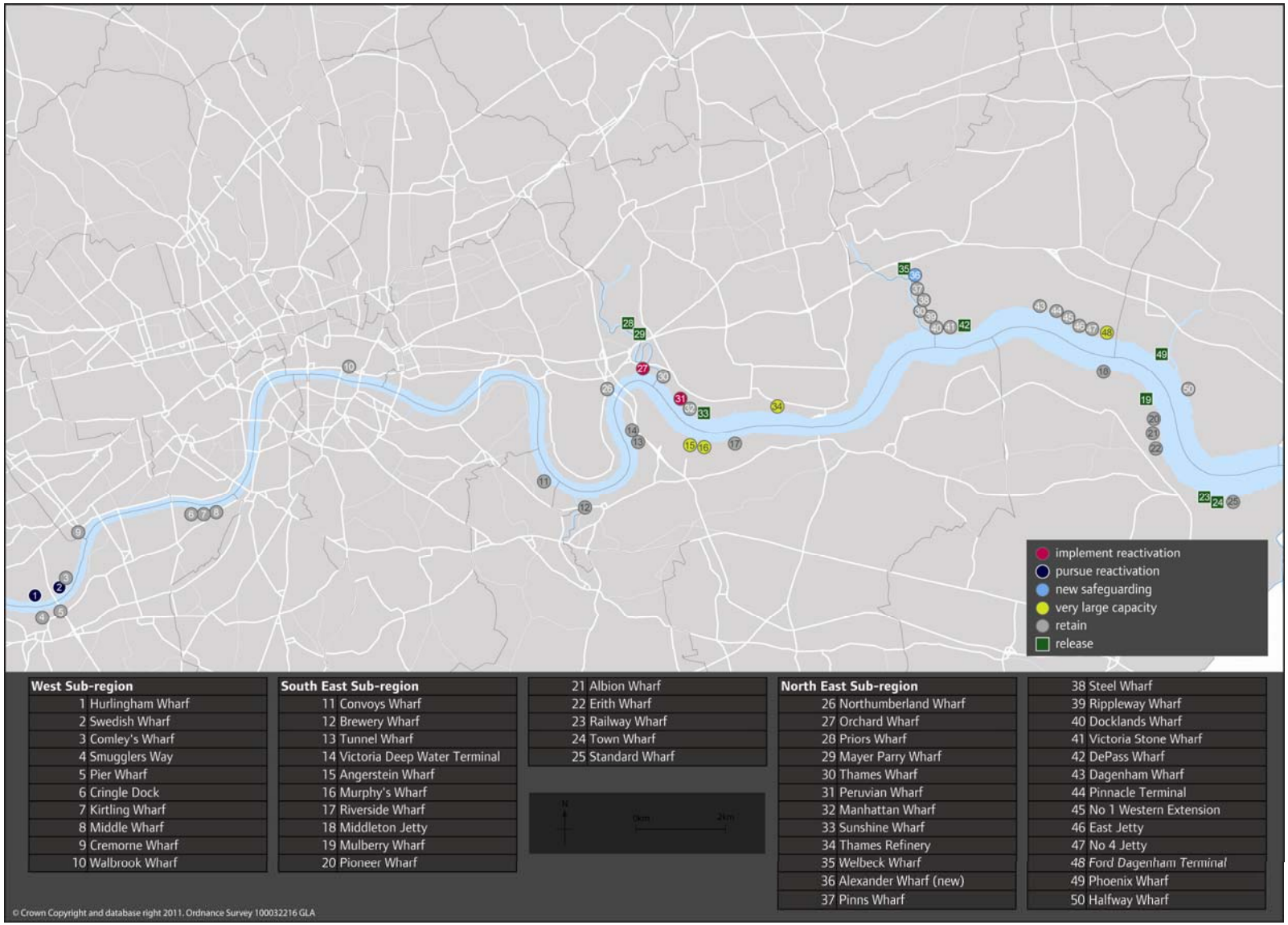
[59] http://www.london.gov.uk/sites/default/files/uploads/boatyard-report.pdf
[60] http://www.london.gov.uk/archive/mayor/publications/2009/docs/lda-cruise-ships-030709.pdf
[61] Mayor of London, Safeguarded Wharves Review – Consultation Draft, October 2011

projects (Olympics, Crossrail, Thames Gateway); and policy choices with regards to transport modes.

Future land requirements

8.71 The Safeguarded Wharves Review includes forecasts under three scenarios - low, medium and high growth - to acknowledge future uncertainty about future economic trends and modal shift in particular. Under the medium scenario the total tonnage is expected in increase steadily from 8.9 million to 10.8 million with tonnages for construction materials and waste individually to increase as well.

8.72 The gap analysis for the medium scenario shows that in total there is an over capacity of wharf space to meet the existing and expected demand. This is estimated to decrease from 8.0 million tonnes to 5.9 million tonnes between 2011 and 2031. There are also examples of under capacity for particular areas, commodities and years. In these areas there may be the need for additional safeguarding. The following map shows how the Mayor recommends addressing estimated capacity surpluses and deficits.



West Sub-region	South East Sub-region		North East Sub-region	
1 Hurlingham Wharf	11 Convoys Wharf	21 Albion Wharf	26 Northumberland Wharf	38 Steel Wharf
2 Swedish Wharf	12 Brewery Wharf	22 Erith Wharf	27 Orchard Wharf	39 Rippleway Wharf
3 Comley's Wharf	13 Tunnel Wharf	23 Railway Wharf	28 Priors Wharf	40 Docklands Wharf
4 Smugglers Way	14 Victoria Deep Water Terminal	24 Town Wharf	29 Mayer Parry Wharf	41 Victoria Stone Wharf
5 Pier Wharf	15 Angerstein Wharf	25 Standard Wharf	30 Thames Wharf	42 DePass Wharf
6 Cringle Dock	16 Murphy's Wharf		31 Peruvian Wharf	43 Dagenham Wharf
7 Kirtling Wharf	17 Riverside Wharf		32 Manhattan Wharf	44 Pinnacle Terminal
8 Middle Wharf	18 Middleton Jetty		33 Sunshine Wharf	45 No 1 Western Extension
9 Cremorne Wharf	19 Mulberry Wharf		34 Thames Refinery	46 East Jetty
10 Walbrook Wharf	20 Pioneer Wharf		35 Welbeck Wharf	47 No 4 Jetty
			36 Alexander Wharf (new)	48 Ford Dagenham Terminal
			37 Pinns Wharf	49 Phoenix Wharf
				50 Halfway Wharf

8.73 It should be noted that whilst the tonnage capacity is not strictly proportionate to the land area of a wharf, it may be valuable to give a rough illustration of the scale of how the tonnage surpluses and deficits roughly translate into land areas involved. It is important to note that these average figures do not take into account detailed site-specific aspects.

- The total area of land currently safeguarded wharves is 224 ha - 7 ha in the West, 68 ha in the South East and 149 ha in the North East, 70 ha of which are at one site - Ford Dagenham.
- The land area for the safeguarded wharves individually varies roughly between 0.1 and 10 ha with Ford being the exception. There may be scope to reduce the land area of large sites. However, the URS study does highlight the benefits of on-site processing opportunities.
- Average land areas of a wharf appear to vary from sub-region to sub-region with 0.7 ha in the West, 3.3 ha in the North East (excluding Ford) and 4.5 ha in the South East[62].

Conclusions

8.74 Based on our research and the information provided to us by TfL, we cannot provide quantitative estimates of the likely amount of land required over the next 20 years to accommodate transport function in London.

8.75 We can only summarise below what our understanding is of the likelihood that land will be needed for various transport modes.

Buses	A significant increase in overall land requirement unlikely in the short – medium term, although changes in spatial distribution of depots and garages are possible. In the longer term, expected growth in population and employment is bound to lead to continued growth in bus journeys and in turn to the need for infrastructure investment, including depots and garages.
Passenger rail	-More depots are expected to be needed for passenger rail although how many has not been determined. The need for an additional stabling in London, for the orbital route, has been recognised. -Research on DLR land requirement is on-going. There are currently no further schemes requiring additional land. -Land may be required for the Bakerloo Line's extension but this scheme is under development so no further information is available.

[62] Mayor of London, Safeguarded Wharves Review – Consultation Draft, October 2011

	-Should Tramlink be extended, a new stabling facility would be needed. However there is land available within TfL's ownership to accommodate it.
Freight rail	A site has been identified for a Strategic Rail Freight Interchange in Howbury Park. It has already received planning permission. There could be another strategic interchange in Barking. A smaller interchange could be located in Cricklewood and a number of key sites with rail freight potential have been identified by London Rail. Most are on existing terminals, on industrial land, or on Crossrail / TfL land[63].
Airport	Additional land-take for airport and airport-related activities is unlikely.
Docks and wharves	No additional land will be required for boatyards. Land for wharves will be retained for / released from wharf use in accordance with revised Safeguarded Wharves Direction issued by the Secretary of State. The Mayor will provide its recommendations based on the on-going review.

[63] London Rail, Rail freight development for the sub-regional planning freight workstream, July 2010

9 WASTE

9.1 Waste and recycling currently occupy 278 ha (3.6%) of London's industrial land. Activities on these sites include refuse disposal facilities (including tips, landfill and disposal plants) and recycling facilities.

Context

Municipal waste

9.2 According to Defra[64], in 2009/10, London generated 3.8m tonnes of municipal waste. This represents a 14% decrease since 2000/01, faster than in England as a whole. During this period, all methods of treating waste have declined except recycling which has tripled.

9.3 The municipal waste collected continues to be mostly sent to landfill (49%) although this has dropped significantly since 2000/01 when 72% of waste went to landfill. The proportion of waste treated through incinerators without energy from waste has remained broadly unchanged at around 20% of waste. On the other hand, the proportion of waste which is recycled has increased from 8% in 2000/01 to 27%. However, this is still a long way from the target set in the London Plan of 45% by 2015. It is also significantly below the national average as 39% of municipal waste in England is recycled.

Commercial and industrial waste

9.4 In 2008, London generated 7.5m tonnes[65] of commercial and industrial waste. Contrary to municipal waste, almost half (47%) the waste is recycled. Another 21% is sent to landfill.

Construction, demolition and excavation waste

9.5 Construction, demolition and excavation (CDE) waste forms a significant contribution to landfill. Currently about 85% of this waste gets recycled. PPS10 only requires local authorities to identify land for municipal and commercial waste but not CDE waste so we have not included it in our estimates of future land requirements.

9.6 However, CDE waste must be taken into account for local and regional planning purposes: at local level, boroughs have to encourage recycling; at regional level, it is a strategic issue for transport because it generates large amounts of HGV movements on the strategic network.

Drivers of demand

9.7 The amount of land needed for waste and recycling is linked to the amount of waste generated by London residents and businesses, and the management approaches chosen to deal with it.

[64] Defra, Municipal Waste Statistics, November 2010
[65] London Plan 2011 para 5.68

Demographic factors

9.8 There are three broad types of generators of waste: residents; businesses; construction, demolition and excavation activity.

9.9 Residential waste is largely driven by population, and more specifically, household numbers. Commercial waste is driven by the number of businesses and their employees in the economy as well as the economy's sectoral structure. Construction waste is related to investment, population and economic activity. As both population and employment forecasts are expected to rise over the next 20 years, this will continue to push the quantity of waste generated upwards.

9.10 But countering these trends the Mayor's Municipal Waste Management Strategy and Business Waste Management Strategy published in November 2011 contain policies and proposals to reduce the amount of waste produced.

Management choices

9.11 There are different techniques available to deal with waste. While some are more desirable than others from an environmental point of view, all tend to be large users of land. The main types of facilities are:

- Material Reclamation Facilities which receive, separate and prepare recyclable materials for marketing to end-user manufacturers ;
- Mechanical Biological Treatment facilities which combine a sorting facility with a form of biological treatment such as composting or anaerobic digestion. MBT plants are designed to process mixed household waste as well as commercial and industrial waste.
- Mechanical Heat Treatment facilities which combine a sorting stage followed by a form of thermal treatment.
- Incinerators, where waste is burned. Some incinerators implement energy recovery from the process through technologies such as gasification or pyrolysis.
- Landfill.

9.12 The decisions to use one approach over another tend to be governed by cost, legislation and policy. These three factors are currently playing against the use of landfills.

9.13 A key driver changing the way municipal waste is managed is the increase in costs due to landfill tax[66]. The main effect the landfill tax has had over the past six years is to make the cost of recycling (including collection costs) cheaper than landfill – approximately £109 per tonne for recycling compared to £128 per tonne for landfill[67].

9.14 In addition to the increase in landfill tax, the Department of Environment, Food, and Rural Affairs (Defra) is revising the definition of municipal waste, which will include a lot more commercial waste, to ensure the UK is meeting landfill diversion targets under the

[66] GLA, London's Wasted Resource: The Mayor's Draft Municipal Waste Management Strategy, October 2010
[67] At 2010 prices

European Landfill Directive. Implementing this new measure will put considerable pressure on local authorities, communities and businesses to manage more of their waste better.

9.15 Finally, the London Plan is setting a target of zero waste to landfill by 2031.

9.16 For waste generally, PPS10: Planning for Sustainable Waste Management sets out the key objectives in terms of the spatial distribution of waste facilities within London: communities should take more responsibility for the management of their own waste (self-sufficiency) and waste should be disposed of in one of the nearest appropriate installations (proximity). However the London Plan recognises that in some instances the nearest appropriate installation might lie outside the Greater London boundary.

Future land requirements for municipal and commercial waste

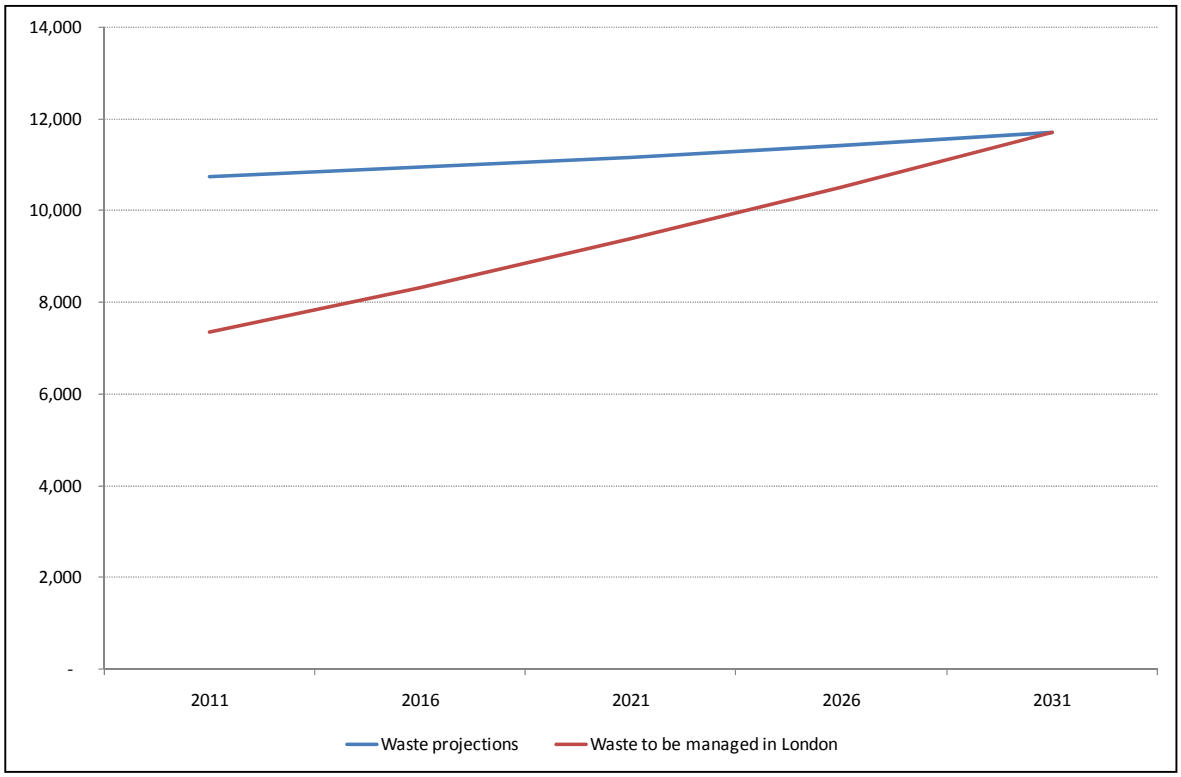
9.17 The main drivers of waste generation (resident and business population) are forecast to keep growing over the next 20 years and as a result they will push the quantity of waste London has to process upwards unless significant behavioural and technological changes improve production and consumption processes.

9.18 The GLA forecasts of municipal and commercial & industrial waste arisings are contained in the London Plan[68]. It estimates that by 2031, London will generate 11.7m tonnes of waste per annum, a 9% increase from 2011.

9.19 These arisings are allocated to boroughs taking into account capacity as well as policy goals. This is why by 2031, all arisings are expected to be dealt with within London compared to 68% in 2011.

[68] London Plan 2011

Figure 9.1: Municipal, commercial and industrial waste arisings in London (thousands tonnes p.a.)



9.20 This means that in addition to coping with the expected increase in the quantity of waste produced by the growing population of residents and businesses, London's infrastructure must also cope with a rising proportion of this waste in the next 20 years.

9.21 The GLA estimates that total current capacity in London is 9.1m tonnes, which leaves a gap of 2.5m tonnes of waste.

9.22 There is no methodology in place at this stage to translate this surplus figure of waste into land requirement while taking into account the required change in the mix of waste treatment infrastructure. In view of the information provided to us we can only undertake a very rough calculation which assumes that the existing estimates of capacity and the mix of facilities they represent remain the same.

9.23 Using the GLA assumptions with regards to throughput per hectare and allocating capacity per borough based on their waste apportionment, an additional 22ha would be needed to deal with the waste arisings by 2031. This is distributed across the boroughs as set out in Table 9.1 below.

Table 9.1 : Net land requirement for apportioned waste to 2031

Borough	Apportioned waste (t)	Land requirement (ha)	Indicative land-take of capacity (ha)	Net indicative land requirement (ha)
Barking & Dagenham	708,000	18.9	34.6	-15.7
Havering	467,000	12.5	22.8	-10.4
Newham	572,000	15.3	27.9	-12.7
Redbridge	218,000	5.8	10.7	-4.8
Barnet	313,000	3.7	2.4	1.3
Camden	264,000	3.1	2.0	1.1
Enfield	426,000	5.1	3.3	1.8
Hackney	289,000	3.4	2.2	1.2
Haringey	264,000	3.1	2.0	1.1
Islington	284,000	3.4	2.2	1.2
Waltham Forest	283,000	3.4	2.2	1.2
Brent	400,000	7.4	1.6	5.8
Ealing	507,000	9.4	2.0	7.3
Harrow	254,000	4.7	1.0	3.7
Hillingdon	426,000	7.9	1.7	6.2
Hounslow	412,000	7.6	1.6	6.0
Richmond	251,000	4.6	1.0	3.6
Hammersmith & Fulham	348,000	4.4	5.9	-1.5
Kensington & Chelsea	284,000	3.6	0.0	3.6
Lambeth	313,000	3.9	0.0	3.9

Wandsworth	442,000	5.5	1.1	4.5
Croydon	353,000	6.0	0.2	5.8
Kingston upon Thames	203,000	3.4	0.0	3.4
Merton	339,000	5.7	2.5	3.2
Sutton	281,000	4.8	4.8	0.0
Bexley	640,000	8.0	14.0	-6.0
Bromley	343,000	4.3	0.9	3.4
City	100,000	1.3	0.0	1.3
Greenwich	470,000	5.9	2.7	3.2
Lewisham	293,000	3.7	6.0	-2.4
Southwark	343,000	4.3	5.7	-1.4
Tower Hamlets	439,000	8,1	6.7	1.4
Westminster	178,000	2.2	0.0	2.2
TOTAL	11,707,000	194.2	171.8	22.3

9.24 However, as mentioned earlier, this does not take into account the change in the mix of facilities to respond to the London Plan's objectives with regards to self-sufficiency. Not allowing for changes to the mix of treatment facilities disregards the fact that their land-take is different and undermines the robustness of the estimates.

9.25 To illustrate this point, Table 9.1 sets out the GLA's own estimates of land-take by type of facility. Table 9.1 suggests that there is likely to be a need for some boroughs to transfer their waste to others which have more capacity.

Table 9.2 Estimated average land take by type of waste processing facility

Facility type	Land-take per facility (ha)
Materials reclamation facility (recycling)	0.9
Composting	1.25
Mechanical biological treatment	1.75
Anaerobic digestion	1
Gasification / pyrolysis	2.25

9.26 We think this is an area which would benefit from more detailed research and a more robust technology as it will continue to create demand for land in London and it is not well understood currently.

Conclusions

9.27 The quantity of waste generated in London is expected to grow significantly over the next 20 years and the city is committed to processing a larger share than it has in the past, without resorting to landfill. Waste processing plants, whichever the method chosen, require large amounts of land, good transport access and they tend to be bad neighbours. For this reason, industrial land in general and wharves in particular are good locations for these activities.

9.28 Based on the data available to us and the method agreed with the GLA we estimate that another 22ha of land will be needed in order to cope with the growth in waste.

9.29 Over the next 20 years, the field of waste management, recycling and energy extraction from waste is likely to experience high levels of innovation in technologies and processes. It is impossible to predict what these changes and their impact on land use will be so it is important that local authorities and the planning system remain open to change and do not hinder the move towards a greener society.

10 WHOLESALE MARKETS

Introduction

10.1 There are five wholesale markets in London which together take up 54 ha: Smithfield, Billingsgate, New Covent Garden, New Spitalfields and Western International.

10.2 Wholesale markets are an integral cog of the London economy, although their role has evolved over time. While their role in the food supply chain has reduced as a result of the development of supermarket chains, a more efficient transport system and a range of other changes, the growth of restaurants and sandwich shops has created a boom in the catering or foodservice sector. Wholesale markets have captured a significant share of the growing foodservice (restaurant / cafes / catering) market either through direct supply or via food distributors based in wholesale markets.

10.3 Overall, the markets mostly supply to foodservice; retailers; other wholesalers; food processors. They are a key source of fresh meat, fish, fruits and vegetables, and processed meals to restaurants and catering businesses in Central London. They also provide a wide range of jobs and in 2006 their combined turnover was estimated at approximately £1,695 million[69].

10.4 Looking forward, the core argument is whether wholesale markets need to continue to be located in London, especially those closest to the centre (Billingsgate, Smithfield, and New Covent Garden) when higher value uses would likely be interested in the site.

10.5 In this section, we present the markets, reiterate the Mayor's policy towards wholesale markets, and explore whether any significant land take or land loss is likely to take place during the plan period.

The markets

10.6 Wholesale markets in London vary in size and location as illustrated in Table 10.1. We present each market below.

[69] Mayor of London, London Wholesale Markets Review, June 2007

Table 10.1 London's wholesale markets

	Smithfield	Billingsgate	New Spitalfields	New Covent Garden	Western International
Location	City of London	Tower Hamlets, Isle of Dogs	Waltham Forest, Leyton	Lambeth	Hounslow
Total site area	2.4 ha	5.5 ha	13 ha	23 ha	7.2 ha
Total floorspace	25,685 sqm	6,381 sqm	24,202 sqm	47,197 sqm	17,431 sqm
No. units	133	218	152	240	101
Broad catchment area	London	London	East London, Kent, East of England	Central London	West London, South East

Source: Mayor of London, London Wholesale Markets Review, June 2007; CGMA

10.7 **Smithfield** is located within the Central Activities Zones (CAZ) in the north-west of the City of London. It is a meat and poultry market and also sells cheese, pies and other delicatessen goods. Approximately 120,000 tons of produce pass through the market each year. Buyers include butchers, restaurateurs and caterers and bargaining between buyers and sellers at Smithfield sets the guidelines for meat and poultry prices throughout the UK. The market has recently undergone a £70 million refurbishment to modernise it and comply with modern hygiene standards.

10.8 **Billingsgate** is London's fish market, located in the north-east of the Isle of Dogs, near to Canary Wharf. An average of 25,000 tonnes of fish and fish products are sold through its merchants each year. Approximately 40% of that tonnage comprises fish imported from abroad. In addition to the wide selection of fish and fish products, the market offers buyers other complementary products such as cooking oils, potatoes, trade sundries and specialist restaurant and catering supplies. The annual turnover of the market is estimated to be in the region of £200m.

10.9 **New Spitalfields** is a fruit and vegetable market located on a purpose-built 31 acre site in the London Borough of Waltham Forest, with a strong specialisation in exotic fruit and vegetables. It is an important supplier for independent retailers and a large proportionate of customers are Chinese, Turkish, Asian or other ethnic minorities groups buying fruit and vegetables for their shops and restaurants. The foodservice trade is also increasingly significant.

10.10 At its centre is the Market Hall, which houses more than 100 trading units for wholesalers dealing in fruit, vegetables and flowers, equipped with a range of facilities that includes cold storage rooms, ripening rooms and racking for palletised produce, according to requirements. There are also four separate buildings with self-contained units for catering

supply companies, fruit importers and other related businesses, as well as accommodation for companies providing back-up services such as diesel/propane supplies, specialist pallet services and fork lift truck maintenance. Essential to the smooth operation of the market is the good road access and the extensive provision of parking spaces.

10.11 **New Covent Garden** is located in the London Borough of Lambeth and more specifically in the Vauxhall / Nine Elms / Battersea Opportunity Area. It primarily sells fruit, vegetables, flowers and plants. It also sells other fresh produce such as cheese and gourmet ingredients. Its key feature is the strong presence of catering distributors, with demand for space exceeding supply of this type of unit.

10.12 These businesses are split between traditional wholesaling, selling face to face; wholesale distribution, delivering direct to the customer; and processors, adding value into the distribution chain.

10.13 Due to its proximity to Central London New Covent Garden is a key supplier for restaurants, hotels and catering businesses. Indeed, according to CGMA, 40% of the fresh fruit and vegetables eaten in the capital, outside the home, come from NCGM, supplying both the public and the private sectors: schools, hospitals, prisons as well as restaurants, cafés, hotels and canteens.

10.14 **Western International** is a horticultural market located near Southall and approximately 4km from Heathrow Airport. As the closest market to the airport, it deals largely with air freighted products which are then moved on throughout the UK. There are approximately 75 wholesalers at the market selling fruit and vegetables; flowers; exotic produce and products for the catering trade.

10.15 In 2008, the market moved to another, nearby site. A development deal was struck with Kier Development: part of the old site was sold for development of B1, B2 and B8 space and Kier Development would build the new market. As a result, the new market is on a smaller site than previously which has led to a reduction in the number of traders (by seven according to the London Borough of Hounslow).

Future demand for land

10.16 As mentioned before in Chapter 2, the London Plan's strategy for wholesale markets is one of consolidation at Western International, New Covent Garden and New Spitalfields. This would have implications for land-take both in terms of potential additional land in these three locations and the release of Billingsgate and Smithfield to higher value uses.

10.17 We have contacted the City of London (responsible for Billingsgate, Smithfield and New Spitalfields) and the London Borough of Hounslow (Western International) in order to determine how likely it was that this strategy would be implemented during the plan period and to discuss any other development plans which may involve land take or land loss.

10.18 While the rationale for consolidation is understood, practical problems stand in the way of the City of London releasing Billingsgate and Smithfield to consolidate at New Spitalfields in the short term:

- Space – while there is a 35 ha site adjacent to New Spitalfields, it is currently used as playing fields which are strongly protected by the planning system. It is also on the other side of the borough boundary and faces strong environmental opposition making a change of use difficult. The other sites around the market are not practicable options.
- Finance – the City would have to fund the consolidation themselves (i.e. purchasing the site and building the expanded market). This means that the sale of Billingsgate and Smithfield would need to cover the cost of the new development. However, the current property market is not favourable to selling. Due to the recession, Billingsgate's market value is unlikely to make consolidation a viable option in the short-term. However, Crossrail may change this and the site might become more valuable post 2018. As for Smithfield, it is listed and therefore restricted in its development potential.
- Property - There are complicated ownership arrangements to overcome.
- Legal – our understanding is that to move the wholesale markets, new primary and hybrid legislation is needed. This is a long process which can take around 5 years.

10.19 Should these barriers be removed, the City of London would then need to find a developer and start the masterplanning process – only once the new legislation has been approved. When the masterplanning process is completed, construction can begin. Altogether, it may take around 10 years for the markets to move once the site and finance have been secured. It makes it very unlikely that the consolidation will occur during the plan period.

10.20 With regards to Western International, our discussion with the London Borough of Hounslow suggests that unless Billingsgate and Smithfield are sold and there is potential to capture some of the meat and fish trade, no development plans are likely during the plan period.

10.21 Finally, New Covent Garden Market is in the process of being redeveloped. In October 2008 the Government gave the green light for CGMA to seek a private development partner to deliver a new market as well as housing, a hotel and serviced apartments, a supermarket and other retail / leisure uses to fund the new development.

10.22 The site will be re-organised to bring all market functions onto the main site, redeveloping the Northern Site – where the Flower Market is currently located – and other land not needed for the new Market with new homes, shops, leisure and commercial uses alongside new public spaces. According to CGMA, the current development plan will increase trading space compared to what is currently there. In March 2010 CGMA began procurement of a private development partner through the OJEU process. The successful partner is expected to be awarded contract in spring 2012.

Conclusions

10.23 While the nature of demand for wholesale market has changed, they still play a key part in the operation of London's economy, albeit not always in locations which are congruent with modern land market conditions. Scope to expand, relocate or redevelop them poses considerable legal, planning, viability and other challenges. Detailed investigation of these is beyond the scope of this study.

11 INDUSTRIAL LAND RELEASE BENCHMARKS

11.1 In this chapter we bring together the analysis of all the different components of demand to prepare benchmark figures for release of industrial land in London. As required by the brief this analysis is disaggregated to borough level in order to provide clearer guidelines for boroughs on release benchmarks. However in doing so we caution that property markets do not always neatly follow borough boundaries and the benchmarks should not be interpreted too prescriptively at the borough level. These figures should be used as a starting point for more detailed analysis in local industrial land assessments.

11.2 In assessing the future demand for industrial land in London we have examined this in relation to a number of distinct categories of demand: demand from production and construction sectors; from service sectors for industrial land uses; from warehousing and logistics; from utilities; transport; waste and wholesale markets.

11.3 The forecast demand for industrial land is then assessed against the existing supply of industrial land to determine how much industrial land can be released or even if further supply is need.

Industrial Land Supply

11.4 On the supply side we broadly consider the following categories:

- The supply of occupied industrial land.
- The supply of vacant industrial land.
- The pipeline supply of new industrial land

The supply of occupied industrial land.

11.5 This data is taken from the 2010 Industrial Land Baseline. As set out in Chapter 3 this amounts to 6,899 ha occupied by industrial uses with a further 787 ha occupied by non-industrial uses

The supply of vacant industrial land.

11.6 This amounts to 543.5 ha of vacant land and represents a significant potential source of release. For London as a whole, vacant land is 9.9% of the core industrial and warehousing stock (7.3% of the total stock), but for the majority of boroughs the figures is well below 5%.

11.7 In terms of assessing the amount of vacant land to release we assumed that:

- For those boroughs with less than 5% vacant land the absolute vacancy in hectares remains the same in 2031 with a ceiling of 5%.
- For those boroughs with between 5-8% vacancy, the vacancy rate is reduced to 5%.
- For those boroughs with greater than 8% vacancy, the vacancy rate is reduced to 8%.

11.8 Vacancy rates are calculated in relation to the projected core industrial and warehousing land at 2031. For London a whole this would represent a vacancy rate of 5.9% at 2031[70].

11.9 This would release 263ha of surplus vacant land.

11.10 In considering the quantity of surplus vacant land to release it is important to note that these are based on a snap shot estimate of current vacant land set out in the 2010 London Industrial Baseline Study. Any changes from that Baseline should be taken in to consideration when making calculations.

The pipeline supply of new industrial land.

11.11 This represents development currently at some stage of preparation for being brought back into use. The table below summarises recorded planning permissions for B2 and B8 use from the London Development Database. The data in this spreadsheet suggests a continued contraction of B2 and B8 floorspace overall in London. This pipeline indicates that releases of industrial land will continue to take place across most London boroughs. The only borough with a large positive floorspace pipeline is Barking & Dagenham. Whilst at typical plot ratios this is equivalent to an additional 70 ha of employment land we would not expect this to be an addition to stock of land but rather re-cycling existing industrial land back in to productive industrial use.

Figure 11.1 Net floorspace change (sqm) based on recorded developments at 2010

	B2	B8
Barking & Dagenham	143,813	159,388
Barnet	-1,989	-25,226
Bexley	25,736	4,130
Brent	-36,446	-31,823
Bromley	112	-5,722
Camden	-14,460	-47,588
Croydon	-7,795	-23,252
Ealing	-11,267	-37,967
Enfield	-27,548	21,314
Greenwich	-3,726	-27,014

[70] Analysis of data from the London Development Database shows completions averaging 1.5% p.a. of stock, thus implying an idle time of around 4 years.

Hackney	-9,949	-34,206
Hammersmith & Fulham	-7,159	-31
Haringey	-4,362	-21,075
Harrow	-418	-4,268
Havering	-3,773	-19,334
Hillingdon	-33,673	12,685
Hounslow	-29,428	15,834
Islington	-3,334	-42,341
Kensington & Chelsea	-47	-992
Kingston upon Thames	-2,636	13
Lambeth	-3,004	-34,262
Lewisham	-5,902	3,694
Merton	-27,979	9,550
Newham	-10,036	-7,608
Redbridge	149	-8,087
Richmond upon Thames	-3,941	-11,025
Southwark	-7,233	-83,656
Sutton	-5	2,750
Tower Hamlets	-135,082	-103,923
Waltham Forest	-17,139	-11,527
Wandsworth	-16,439	-30,317
Westminster	-7,651	-525
TOTAL	-262,611	-382,401

Source: LDA / GLA

11.12 In matching the supply and demand of industrial land we are conscious that the opening fit may not be perfect. i.e. there are some occupiers of industrial land that perhaps should not be occupying industrial land (see section 4.63-4.64). We make no net adjustment for these occupiers in terms of release forecasts. For a strategic study such as this we cannot make decisions about each of the occupiers in each of the boroughs. Equally it is unlikely that existing occupiers can be moved. Hence there are two routes to dealing with this at the individual borough level:

- The land could be reclassified as non-industrial. This would decrease both the demand for that land and the supply of it by the same amount i.e. there would be no net change in the balance
- When a non-industrial user vacates industrial land the effective supply available increases. The borough can then take this into account in considering its available portfolio of industrial land to release.

11.13 Thus these mismatches do not affect the overall strategic forecast but should be taken into account by boroughs on a case by case basis as they make industrial land release decisions.

Spatial Reallocation

11.14 There is one final step before generating the borough level forecast and that is to determine if the supply and demand balance suggest further spatial reallocation. We consider that London's industrial and warehousing property market consists of two broad categories of demand:

- Local demand
- Strategic demand

11.15 Local demand can be seen as tied to its local borough (or adjacent areas) either due to the markets it serves or in many cases due to convenience for owner/managers or considerations of workforce. In a survey of London SMEs on reasons for locational choice, 63% of respondents gave the answer, 'Convenient for staff or owner to get to'; whilst 60% responded, 'Close to customers or client'[71].

11.16 For the demand generated from the production industries our working assumption is that the majority of this falls within the Local Demand category. We have therefore not reallocated the forecast demand from this category. In reality as the forecast is negative much of this will be through loss of existing activity which reinforces this assumption.

11.17 Strategic demand will be for the businesses, seeking to service a wider London market. These might typically be the larger logistics and distribution businesses. Our working assumption here is that an element of the warehousing forecast demand is transferable within the previously defined property market areas.

[71] The Demand for Premises of London's SMEs – Roger Tym & Partners for London Development Agency (2006)

11.18 We have therefore used the supply and demand balance to recalibrate the projections for warehousing demand at borough level. For those boroughs where the preceding calculation generate positive net demand we have reallocate that additional demand. We think it unlikely that there will be a positive addition to the stock of industrial land in London for any one borough when there is an overall surplus. Any positive demand is reallocated using the following rules:

- Reallocate to boroughs in the same property market area
- Reallocate to boroughs in the same sub-region
- Reallocate proportionately according to total industrial land stock.

Future demand for industrial land in London

11.19 The table overleaf summarises the forecast level of demand for industrial land by broad use category and by borough for the period 2011-2031. The 'Other' column refers to transport, utilities and wholesale markets. It is empty as we have not been able to quantify demand for these uses but it is included as a reminder that the needs of these uses must not be forgotten.

Figure 11.2 : Net demand for industrial land in London by borough, 2011-2031 (ha)

Sub Region		Industrial	W'hsing	Waste	Other	Total Demand	Surplus Vacant Land	Net Demand
Central	Camden	-14.6	-8.4	1.1	n/a	-21.9	0.0	-21.9
Central	City of London	-0.2	-1.1	1.3	n/a	0.0	0.0	0.0
Central	Islington	-11.8	-10.5	1.2	n/a	-21.1	-0.7	-21.8
Central	Kensington and Chelsea	-4.9	-2.4	3.6	n/a	-3.8	-0.2	-4.0
Central	Lambeth	-9.7	-3.8	3.9	n/a	-9.5	0.0	-9.5
Central	Southwark	-17.7	-18.7	-1.4	n/a	-37.7	0.0	-37.7
Central	Westminster	0.0	-6.0	2.2	n/a	-3.7	0.0	-3.7
East	Barking and Dagenham	-37.9	48.3	-15.7	n/a	-7.8	0.0	-7.8
East	Bexley	-32.9	62.4	-6.0	n/a	29.8	-33.8	-4.1
East	Greenwich	-12.1	25.4	3.2	n/a	16.8	-16.8	0.0
East	Hackney	-11.7	-12.7	1.2	n/a	-23.3	-2.3	-25.5
East	Havering	-31.7	26.3	-10.4	n/a	-17.4	-56.8	-74.2
East	Lewisham	-11.7	-3.3	-2.4	n/a	-17.3	-5.5	-22.8
East	Newham	-22.9	1.3	-12.7	n/a	-36.3	-95.2	-131.5
East	Redbridge	-17.3	8.6	-4.8	n/a	-14.2	0.0	-14.2
East	Tower Hamlets	-18.7	-10.7	1.4	n/a	-28.0	-1.6	-29.7
East	Waltham Forest	-25.7	14.2	1.2	n/a	-10.4	0.0	-10.4
North	Barnet	-28.2	7.8	1.3	n/a	-19.1	-4.3	-23.4
North	Enfield	-41.0	39.3	1.8	n/a	9.4	-9.4	0.0
North	Haringey	-35.8	11.6	1.1	n/a	-32.4	-9.4	-41.8
South	Bromley	-31.6	6.9	3.4	n/a	-21.4	-1.8	-23.2
South	Croydon	-33.6	-2.7	5.8	n/a	-30.5	-0.2	-30.8
South	Kingston upon Thames	-17.6	-4.5	3.4	n/a	-18.7	-2.1	-20.8
South	Merton	-39.5	4.8	3.2	n/a	-31.5	-3.3	-34.8
South	Richmond upon Thames	-18.5	13.1	3.6	n/a	-1.8	0.0	-1.8
South	Sutton	-18.2	17.1	0.0	n/a	-1.1	-0.9	-2.0
South	Wandsworth	-18.2	13.1	4.5	n/a	-0.7	0.0	-0.7
West	Brent	-66.4	60.6	5.8	n/a	0.0	0.0	0.0
West	Ealing	-75.0	49.0	7.3	n/a	-20.2	-0.9	-21.1
West	Hammersmith and Fulham	-7.9	9.4	-1.5	n/a	1.4	-1.4	0.0
West	Harrow	-24.9	3.2	3.7	n/a	-18.0	0.0	-18.0
West	Hillingdon	-53.6	-9.8	6.2	n/a	-57.2	-8.8	-66.0
West	Hounslow	-29.4	1.3	6.0	n/a	-22.2	-7.3	-29.5
		-821.2	**329.0**	**22.3**		**-469.8**	**-262.8**	**-732.7**
Annual						-23.5		-36.6

11.20 Table 11.2 shows a reduction in the demand for industrial land of 733 ha over the next 20 years. The decline affects almost all boroughs, although to various degrees. For the boroughs of Bexley, Enfield, Brent and Hammersmith & Fulham there is zero net change in the forecast amount of industrial land. The boroughs expected to experience the largest drop in the demand for industrial land are: Newham, Havering and Hillingdon.

11.21 At sub-regional level, a reduction in industrial land is forecast across all London sub-regions with the largest by far taking place in East London. This is also where the largest proportion of the stock is located. Whilst forecast demand is similar in the East to other sub-regions, East London still has a large stock of vacant industrial land which should be factored into strategies to manage surplus capacity.

Figure 11.3 Net demand for industrial land by sub-region, 2011-31 (ha)

Sub Region	Industrial	Whsing	Waste	Other	Total Demand	Surplus from Excess Vacant Land	Net Demand
Central	-58.8	-50.8	11.9	n/a	-97.8	-0.9	-98.7
East	-222.7	159.7	-45.0	n/a	-108.0	-212.0	-320.0
North	-105.1	58.7	4.2	n/a	-42.2	-23.1	-65.3
South	-177.4	47.8	23.9	n/a	-105.8	-8.4	-114.1
West	-257.2	113.6	27.4	n/a	-116.1	-18.5	-134.6
London	-821.2	329.0	22.3	n/a	-469.8	-262.8	-732.7

Sensitivity tests

11.22 There are broadly three types of sensitivity test that we consider, though these are not all quantified. These are:

- Demand forecasts. Forecast for each of the demand components could be higher or lower.
- Land utilisation. What is the effect of varying plot ratios and density ratios?
- Spatial Distribution. Alternative configurations of the spatial distribution of demand within London between different boroughs or different property markets.

Demand Forecasts

11.23 Our forecasts are based on the GLA's employment forecasts for London and there are a large range of plausible levels of growth for the London economy as a whole over the next twenty years. For example GLA Economics publish a regular Economic Outlook and have recently published their Autumn 2011 edition[72]. This provides an update on the GLA's projections to 2013. This shows a forecast for London at 2013 of 4.66m jobs compared with a figure of 4.86m published in WP 39. To some extent the original GLA Economics Forecasts would have taken account of the recession as they are produced as a trend

[72] London's Economic Outlook: Autumn 2011 – GLA Economics

forecast which will even out fluctuations in the cycle, though a pessimistic scenario may view this as 200,000 jobs fewer over the Plan period which will not be regained.

11.24 But with regard to the specific sectoral demands of industrial and logistics uses we think there are two cases which we think are worthy of consideration: industrial renaissance and London logistics.

11.25 The employment forecasts for London show a continued decline in manufacturing employment. Given the current low levels of manufacturing employment we do not think there is much of a downside risk to the scenario. However there is a potential scenario in which production employment in London undergoes a renaissance based on new forms of technology such as 3D printing that enables bespoke production close to the market. Even in this case we do not think there would be sufficient demand to reverse the forecast decline in industrial employment, but the forecast rate of decline could be substantially slowed.

11.26 There is also potential for an upside to the warehousing forecasts. Our forecast is based on the growth in London's warehousing demand continuing to be provided at an increasing rate from outside its borders. If this was not the case in the future, or if there was a policy ambition that this should not be the case, then the demand for warehousing land in London would increase.

Land Utilisation

11.27 For London as a whole we test the implications of varying both plot ratios and employment density ratios for both industrial and warehousing land.

11.28 For industrial production land our central scenario is a negative demand of -821 ha. If at 2031 average employment densities were 10% higher and average plot ratios were also 10% higher, due to more intensive utilisation of land and floorspace then there would be the potential to release a total of 1,003 ha of industrial employment land over then plan period.

11.29 Our central estimate of net additional demand for warehouse floorspace of 329 ha over the period 2011-31. Varying the plot ratio 5% either side around the central growth rate assumption gives a range from 292 – 376 ha.

Spatial Distribution

11.30 Alternative spatial distributions can be generated dependent policy preference. This is something the GLA may wish to consider.

11.31 For example, a number of SILs and Opportunity Areas have been identified in Policy 2.16 as potential Strategic Outer London development centres i.e. centres with one or more strategic economic functions of greater than sub-regional importance. Those relevant to this study are: logistics (parts of Bexley, Barking & Dagenham, Havering, Hillingdon, Hounslow, Park Royal); other transport related functions (in parts of Hillingdon, Hounslow, the Royal Docks and Biggin Hill); and industry (in the Upper Lee Valley and Bexley Riverside).

Benchmarks criteria

11.32 The benchmarks are a balance between giving specific and usable guidance whilst acknowledging that forecasts at this level cannot be overly prescriptive. The benchmarks

first give guidance as to which classification the borough should be given for the purposes of the SPG. The benchmark release figures set out in Figure 11.2 give some guidance on the overall release quantum at borough level but we have already highlighted the caveats of applying these too prescriptively without detailed local supply analysis.

11.33 We therefore also review the existing SPG categorisations using a broader set of indicators. As set out at para 2.59 earlier these categorisations do not relate to a fixed numerical quantity of land to release, but rather how the borough should manage the balance of supply and demand.

11.34 In addition to the forecast demand figure set out in Table 11.2 we have identified four indicators to review the current benchmark designations. These are indicators that are transparent and can be readily monitored and reviewed. The four indicators are:

- Property Agent opinion. Whilst subjective this can be cross-checked with views for other agents and property market professionals. Our views on this matter were tested at a property market workshop.
- Current stock of industrial and warehousing floorspace. A limited stock suggest more caution over further release
- Vacant industrial land. Based on data from the 2010 Industrial Land Baseline. A high vacancy rate implies more scope for release.
- Rents. Whilst we do not have a comprehensive source of current rents at borough level, VOA data on rateable values serves as a consistent proxy for rents. A higher rent will be an indicator of higher demand relative to supply.

11.35 Each indicator is then ranked on a Red/Amber/Green scale corresponding to the three benchmark categories of Restrictive/Limited/Managed. The average score is then summarised in the final column as a benchmark category.

Table 11.1 Benchmark Indicators

	Agent	Fspc Stock	Vac %	Rents	Demand	Average
Barking and Dagenham	Managed	1,714	9.0%	50	-7.8	Managed
Barnet	Limited	435	7.4%	59	-23.4	Limited
Bexley	Managed	1,119	11.9%	53	-4.1	Managed
Brent	Limited	1,570	1.8%	60	0.0	Limited
Bromley	Restrictive	506	4.0%	55	-23.2	Restrictive
Camden	Restrictive	357	0.5%	74	-21.9	Restrictive
City of London	Restrictive	21	0.0%	56	0.0	Restrictive
Croydon	Restrictive	843	3.0%	60	-30.8	Restrictive-Limited
Ealing	Limited	2,091	3.6%	62	-21.1	Limited
Enfield	Limited	1,423	7.6%	58	0.0	Limited
Greenwich	Limited	844	12.9%	48	0.0	Limited
Hackney	Limited	630	4.9%	63	-25.5	Limited
Hammersmith and Fulham	Restrictive	444	4.4%	69	0.0	Restrictive
Haringey	Limited	736	9.2%	44	-41.8	Limited
Harrow	Limited	373	0.3%	64	-18.0	Limited
Havering	Managed	742	16.3%	51	-74.2	Managed
Hillingdon	Limited	1,355	9.2%	99	-66.0	Limited
Hounslow	Restrictive	1,301	8.7%	90	-29.5	Limited
Islington	Restrictive	509	3.0%	76	-21.8	Restrictive
Kensington and Chelsea	Restrictive	120	4.0%	80	-4.0	Restrictive
Kingston upon Thames	Restrictive	332	3.4%	77	-20.8	Restrictive
Lambeth	Restrictive	567	3.0%	58	-9.5	Restrictive
Lewisham	Limited	500	9.5%	53	-22.8	Limited
Merton	Restrictive	688	4.7%	60	-34.8	Restrictive-Limited
Newham	Managed	1,138	19.9%	53	-131.5	Managed
Redbridge	Limited	358	3.9%	48	-14.2	Limited
Richmond upon Thames	Restrictive	293	0.0%	61	-1.8	Restrictive
Southwark	Limited	951	1.0%	61	-37.7	Limited
Sutton	Restrictive	484	2.3%	61	-2.0	Restrictive
Tower Hamlets	Limited	1,056	3.9%	55	-29.7	Limited
Waltham Forest	Limited	656	2.2%	51	-10.4	Limited
Wandsworth	Restrictive	661	2.4%	71	-0.7	Restrictive
Westminster	Restrictive	130	0.0%	97	-3.7	Restrictive

11.36 These indicators suggest that existing designations are broadly appropriate. On these indicators, only Hounslow would change designation moving from Restrictive to Limited these indicators. Hounslow has a large stock and a high vacancy rate. Yet it also has the third highest rents in London. Its indicators are broadly similar to neighbouring Hillingdon which is classified as Limited.

11.37 Two other boroughs fall mid-way between categorisations:

- Croydon is currently classified as Restrictive and has a low vacancy, yet other indicators would suggest it could fall into the limited category
- Merton is also currently classified as Restrictive and has low stock and low vacancy rates, but like Croydon the forecast demand suggests land will be coming available over the plan period which may move it towards the Limited category.

Conclusions

11.38 We have examined the demand for industrial land in London arising from different categories of industrial land use and compared this with the available stock of industrial land. In total for the period 2011-31 we calculate that at total of 732.7 ha of industrial land can be released. This works out at an average of 36.6 ha per annum.

11.39 This total is made up of a negative demand of 821.2 ha of land for industrial production purposes, a positive demand of 329 ha of land for logistics and warehousing and a positive demand of 22.3 ha for waste facilities. In addition a further 262.8 ha of surplus vacant land can be released.

11.40 Demand forecasts shows similar patterns across London's sub-regions, with large losses in industrial production land offset by higher demand for warehousing and logistics land. Release of surplus vacant land is concentrated in East London.

11.41 We have reviewed the existing classification of boroughs according to the SPG categorisations of Managed, Limited and Restrictive. We find that the existing classifications are still relevant and appropriate and see no compelling reason to change them, though if revised Hounslow would be a candidate for re-classification to Limited.

12 CONCLUSIONS AND POLICY RECOMMENDATIONS

Study Aims

12.1 The Industrial Land Demand and Release Benchmarks Study assesses future demand for industrial land across London and compares it with the current and planned supply. It provides evidence to inform London-wide and local planning policy in support of the London Plan policy to 'ensure a sufficient stock of land and premises to meet the future needs of different types of industrial and related uses in different parts of London, including for good quality and affordable space'. .

Occupiers of Industrial Land

12.2 There are a wide variety of uses that occupy industrial land in London. These include:

- Manufacturing
- Logistics and warehousing
- Storage
- Utilities such as energy and water
- Waste and Recycling
- Transport functions, such as land for rail, buses and airport related land
- Wholesale Markets

12.3 Only around a third of land town planners classify as industrial land is actually occupied by industrial type buildings (34.3%). A further third (34.5%) is occupied by warehouses.

12.4 The remaining third is occupied by a wider assortment of other land and buildings. The largest being the utilities who take 15.5% of the total amount of land.

12.5 If industrial land is viewed in terms of employment rather than land use then another picture emerges. Manufacturing, most commonly assumed to occupy industrial type buildings accounts for only 10% of all employment on industrial land in London. Wholesale Distribution accounts for just 13%. Service sectors account for a large proportion of employment on Industrial Land in London.

12.6 Many service sector companies may have industrial type functions they carry out which are best suited to Industrial Land. Because of the dominance of service sector employment in London this in part accounts for this sectoral profile.

12.7 But it is also likely that many firms occupy industrial land and premises because it is available in the right location at the right price.

12.8 The mix and changing nature of industrial land occupiers implies an equally disaggregated approach to examining the future demand for industrial land in London.

12.9 To inform planning policy these occupiers can be further divided into three broad, but not entirely exclusive groups. Those which are:

- essentially local in the markets they serve. Many of these are relatively 'low value added', some providing 'services to the service sector' or, more commonly, direct to

local residents. Functionally they play an important local economic role but, in the high value London land market, they particularly depend on the planning system to sustain a stock of affordable land and buildings to deliver their services. The quality of their premises may not be high but they are not invariably 'bad neighbours' in terms of environmental externalities. Typically this will include sectors such as food production, catering services, building services and plumbing supplies.

- more strategic in the markets they serve, usually with a sub regional if not pan London or wider catchment. They tend to be 'higher value added', but generally not to the extent that they can outbid most other commercial uses, much less housing. They tend be most competitive in modern 'shed and yard' premises with good HGV access, ideally unconstrained by their environmental impact on other uses. This will include the distribution and logistics sectors, e-fulfilment centre and courier activities.
- an emerging category which appears to be mainly strategic in the markets it serves, but requires less stereotypically 'industrial' premises. Instead it benefits from sites and buildings which incorporate a mix of offices/studios, storage sheds and, perhaps, distribution yards. Its local environment impact can vary – some parts require 24 hour operation, while others might make better neighbours. Relative to other land uses they are generally low value and cannot compete for space without the support of the planning system. Typical sectors will include media production, design, office supplies and training activities.

Demand for Industrial Land

12.10 We have considered demand for industrial land in terms of the different categories of demand.

12.11 Employment in **industrial production** sectors in London fell by 35% over the period1998-2008, a loss of nearly 100,000 jobs. Whilst there sectors also declined nationally the rate of loss in London was much higher.

12.12 Forecasts for these sectors show a continued loss for the future, though at a reduced rate of decline. We have estimated that London will lose a further 85,000 jobs in the industrial production sectors over the period 2011-31. Applying employment density and plot ratios to these figures this is equivalent to the loss of 3.44m sq m of industrial floorspace or 821ha of industrial land.

12.13 In contrast demand for land for **warehousing and logistics** activity has been growing in London in past years and is projected to continue to grow. Growth is driven by the strength of consumer and business demand in London. The main consideration is the extent to which this demand is supplied from within London's boundaries or from outside.

12.14 Our central scenario projects demand for a net addition of 329ha. Much of this will come from reconfiguring the redundant industrial production land for logistics need.

12.15 However, as we noted above, a significant proportion of London's industrial land is occupied by **service sector** activity that does not fall under the definition of 'industrial'. As London's service sector continues to grow it is likely that this demand will grow.

12.16 The quantity of **waste** generated in London is expected to grow significantly over the next 20 years and the city is committed to processing a larger share than it has in the past, without resorting to landfill. Waste processing plants, whichever the method chosen, require large amounts of land, good transport access and they tend to be bad neighbours. For this reason, industrial land in general and wharves in particular are good locations for these activities.

12.17 Based on the data available to us and the method agreed with the GLA we estimate that another 22ha of land will be needed in order to cope with the growth in waste.

12.18 We are not able to predict a quantitative figure for additional land needed for **utilities** or **transport** uses. These are liable to be determined on a case by case basis. The quantity of land will not be large in relation to the overall stock of industrial land in London and it is important that consideration be given to these uses before the disposal of any industrial land.

12.19 In total we estimate that there reduced demand for industrial land in London over the period 2011-31 would enable the release of 470 ha of land.

Supply of Industrial Land

12.20 At 2010 there were 7,433 ha of industrial land remaining in London, a fall of 10% since 2001. In the most recent period 2006-10, industrial land release has run well ahead of the previous benchmark release figures. The amount of land released was 144ha or 66% more than the benchmark figure for that period.

12.21 Half of all industrial land falls within the Strategic Industrial Land designation, with further 17% having a Local designation. One third of all industrial land has no planning designation.

12.22 By 2010 there was an estimated 544 ha of vacant industrial land or a vacancy rate of 9.9% based on core industrial uses (7.3% of all industrial land). There has been a steady reduction in the amount of vacant industrial land in London from an estimated 14% in 1998. Furthermore this vacant land is now largely concentrated in just a small number of east London boroughs.

12.23 By continuing to manage down surplus vacant land where it still exists we calculate that there is scope to release a further 263 ha of industrial land[73].

12.24 Thus combining the supply and demand figures we estimate that over the period 2011-31 London can release a further 733 ha of industrial land. This is an average of 36.6 ha of land per annum. The annual figure is noteworthy for two reasons. First it represents a slower rate of release than in the past. Second it implies a steady release over the plan period, a point to which we return in the policy recommendations below.

[73] From the baseline figures on vacant industrial land set out in the 2010 London Industrial Land Baseline

SPG classifications

12.25 The current Industrial land SPG classifies Boroughs under three headings:

- Restricted
- Limited
- Managed

12.26 The existing SPG Borough classifications are reasonable and appropriate. Whilst some classifications will always be on the margins there is no compelling reason to revise any of the existing classifications. If revised then we would suggest there is a case to reclassify Hounslow into the Limited category.

Policy recommendations

12.27 In broad terms the Industrial Land policy that has been operating at the London level seems to have worked. The stock of vacant land was reduced by 330 ha over the period 2001-2010, with the total stock of industrial land reduced by 839 ha over the same time. At the same time there has not been any obvious adverse impact on the London economy from the reduction in this land stock. (Though as we reach the point where industrial stock is managed down to economically efficient frictional levels there will be a point where further releases could have an adverse impact on the London economy.)

12.28 But the way that strategic policy set out in the London Plan translates into local implementation through planning decisions does not always follow the strategic policy objectives. There are a number of reasons for this ranging from a lack of understanding of the benchmarks; the need for more specific guidance; delays in translating the London Plan into ELRs; changes to the planning system; and the difficulty in dealing with mixed use developments.

12.29 In many Boroughs the release of land has exceeded the level the benchmarks would have suggested. One reason for this is the lack of borough level benchmark figures has meant that not all boroughs had a clear target to work towards. In some areas sub regional planning had filled this void but not everywhere. Partly because of an absence of clear borough level figures the scale of losses implied in the benchmarks was not always clearly understood by development management teams; either when considering an application or at the pre-application stage. We identified a risk that development management teams could unknowingly be releasing large numbers of small sites which collectively exceed the benchmark applicable to an individual borough.

12.30 In addition, the process of industrial land loss may not be fully appreciated at individual site level. This can entail land owners failing to renew leases on actively occupied industrial sites and leaving them vacant and/or only nominally marketed for industrial use for the two year period currently suggested in the industrial capacity SPG/period specified in DPDs. This status rather than previous active use may be recorded in subsequent proposals for redevelopment to other uses. During the period of vacancy, apparent dereliction may have a knock on effect on other nearby industrial uses, undermining investment confidence in the area as a whole.

12.31 The Borough level guidance supplied with this version of the Industrial Land Benchmarks should help in this regard but the guideline release figures should be considered alongside what is happening in neighbouring boroughs.

12.32 We would recommend that more detailed guidance is issued to the London Boroughs on how they should apply the Industrial Land SPG in practice. This would include guidance on how to phase release and how to account for existing committed release. Broadly we would see this as evenly phased release over the plan period rather than the front loaded release which has often happened to date. This would allow better monitoring and moderation of the balance between supply and demand.

12.33 Whilst we do not recommend a forecast allocation of land for activities such as transport, utilities and similar uses, there should be criteria based policy which states that before industrial land can be released an assessment needs to be undertaken to establish whether it is needed for any of these uses.

12.34 In addition the Boroughs have difficulty managing a mixed use approach to the redevelopment of industrial areas. There is an increasing body of evidence which suggests that this is not a solution to be adopted universally. Introducing residential uses into traditional industrial areas is challenging and the default answer to such proposals should not always be to promote mixed use. In many areas the success of the industrial area relies on the physical separation of uses; this most obviously applies to strategic locations but also increasingly local industrial areas where the remaining bad (or poor) neighbour uses are required to locate.

12.35 Industrial land needs to be protected from other employment uses if they are pushing it out either through capacity or price. But it appears that in many cases other employment uses occupy industrial land because it is the only place they can find affordable premises. The issue may be less to do with protection of industrial land than with protection of affordable land for employment given the pressures of residential values. We think that policy in this regard could do with greater clarity.

12.36 Consideration might also be given to the balance which should be struck between servicing London's logistics needs from outside the capital, the benefits of further release of current industrial capacity to other uses e.g. housing, and offsetting these against the costs potentially incurred by increased goods traffic and loss of industrial related employment within the city.

Implementation and monitoring

12.37 Above we have suggested publishing Borough level targets. But our consultations have suggested some Boroughs enjoy the flexibility to 'trade' land uses between themselves. Such trading is perfectly in line with the approach we have outlined above; and the emerging Duty to Co-operate. Providing Boroughs do not collectively under provide for land.

12.38 We also suggest that the Boroughs urgently review their own local employment land evidence; this does not necessarily mean that all studies need wholesale revision. But as a matter of urgency we would suggest that the demand and market balance assessments

needs revising in light of the new benchmarks. This may or may not suggest further work is needed. This is urgent because as we noted above that there is implementation lag between the GLA policy and actual delivery on the ground.

12.39 Finally all our analysis suggests that monitoring the loss of employment land in London is now more important than ever. Serious consideration needs to be given to monitoring the ever more important pre-application stage; because it is here where applicants seek the 'in principle' agreement to release sites.

APPENDIX 1

SIC Classification of Industrial Activities

SIC 2003 Classification	Sub Group
1511 : Production and preserving of meat	Manufacturing
1512 : Production and preserving of poultry meat	Manufacturing
1513 : Production of meat and poultry meat products	Manufacturing
1520 : Processing and preserving of fish and fish products	Manufacturing
1531 : Processing and preserving of potatoes	Manufacturing
1532 : Manufacture of fruit and vegetable juice	Manufacturing
1533 : Processing and preserving of fruit and vegetables not elsewhere classified	Manufacturing
1541 : Manufacture of crude oils and fats	Manufacturing
1542 : Manufacture of refined oils and fats	Manufacturing
1543 : Manufacture of margarine and similar edible fats	Manufacturing
1551 : Operation of dairies and cheese making	Manufacturing
1552 : Manufacture of ice cream	Manufacturing
1561 : Manufacture of grain mill products	Manufacturing
1562 : Manufacture of starches and starch products	Manufacturing
1571 : Manufacture of prepared feeds for farm animals	Manufacturing
1572 : Manufacture of prepared pet foods	Manufacturing
1581 : Manufacture of bread; manufacture of fresh pastry goods and cakes	Manufacturing
1582 : Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes	Manufacturing
1583 : Manufacture of sugar	Manufacturing
1584 : Manufacture of cocoa, chocolate and sugar confectionery	Manufacturing
1585 : Manufacture of macaroni, noodles, couscous and similar farinaceous products	Manufacturing
1586 : Processing of tea and coffee	Manufacturing
1587 : Manufacture of condiments and seasonings	Manufacturing
1588 : Manufacture of homogenised food preparations and dietetic food	Manufacturing
1589 : Manufacture of other food products not elsewhere classified	Manufacturing
1591 : Manufacture of distilled potable alcoholic beverages	Manufacturing
1592 : Production of ethyl alcohol from fermented materials	Manufacturing
1593 : Manufacture of wines	Manufacturing
1594 : Manufacture of cider and other fruit wines	Manufacturing
1595 : Manufacture of other non-distilled fermented beverages	Manufacturing
1596 : Manufacture of beer	Manufacturing
1597 : Manufacture of malt	Manufacturing
1598 : Manufacture of mineral waters and soft drinks	Manufacturing
1600 : Manufacture of tobacco products	Manufacturing
1711 : Preparation and spinning of cotton-type fibres	Manufacturing
1712 : Preparation and spinning of woollen-type fibres	Manufacturing
1713 : Preparation and spinning of worsted-type fibres	Manufacturing
1714 : Preparation and spinning of flax-type fibres	Manufacturing
1715 : Throwing and preparation of silk including from noils and throwing and texturing of synthetic or artificial filament yarns	Manufacturing
1716 : Manufacture of sewing threads	Manufacturing
1717 : Preparation and spinning of other textile fibres	Manufacturing
1721 : Cotton-type weaving	Manufacturing
1722 : Woollen-type weaving	Manufacturing
1723 : Worsted-type weaving	Manufacturing
1724 : Silk-type weaving	Manufacturing
1725 : Other textile weaving	Manufacturing
1730 : Finishing of textiles	Manufacturing
1740 : Manufacture of made-up textile articles, except apparel	Manufacturing
1751 : Manufacture of carpets and rugs	Manufacturing
1752 : Manufacture of cordage, rope, twine and netting	Manufacturing
1753 : Manufacture of non-wovens and articles made from non-wovens, except apparel	Manufacturing
1754 : Manufacture of other textiles not elsewhere classified	Manufacturing
1760 : Manufacture of knitted and crocheted fabrics	Manufacturing
1771 : Manufacture of knitted and crocheted hosiery	Manufacturing
1772 : Manufacture of knitted and crocheted pullovers, cardigans and similar articles	Manufacturing
1810 : Manufacture of leather clothes	Manufacturing
1821 : Manufacture of workwear	Manufacturing
1822 : Manufacture of other outerwear	Manufacturing
1823 : Manufacture of underwear	Manufacturing

SIC 2003 Classification	Sub Group
1824 : Manufacture of other wearing apparel and accessories not elsewhere classified	Manufacturing
1830 : Dressing and dyeing of fur; manufacture of articles of fur	Manufacturing
1910 : Tanning and dressing of leather	Manufacturing
1920 : Manufacture of luggage, handbags and the like, saddlery and harness	Manufacturing
1930 : Manufacture of footwear	Manufacturing
2010 : Saw milling and planing of wood, impregnation of wood	Manufacturing
2020 : Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards	Manufacturing
2030 : Manufacture of builders carpentry and joinery	Manufacturing
2040 : Manufacture of wooden containers	Manufacturing
2051 : Manufacture of other products of wood	Manufacturing
2052 : Manufacture of articles of cork, straw and plaiting materials	Manufacturing
2111 : Manufacture of pulp	Manufacturing
2112 : Manufacture of paper and paperboard	Manufacturing
2121 : Manufacture of corrugated paper and paperboard and of containers of paper and paperboard	Manufacturing
2122 : Manufacture of household and sanitary goods and of toilet requisites	Manufacturing
2123 : Manufacture of paper stationery	Manufacturing
2124 : Manufacture of wallpaper	Manufacturing
2125 : Manufacture of other articles of paper and paperboard not elsewhere classified	Manufacturing
2221 : Printing of newspapers	Manufacturing
2222 : Printing not elsewhere classified	Manufacturing
2223 : Bookbinding	Manufacturing
2225 : Ancillary operations related to printing	Manufacturing
2310 : Manufacture of coke oven products	Manufacturing
2320 : Manufacture of refined petroleum products	Manufacturing
2330 : Processing of nuclear fuel	Manufacturing
2411 : Manufacture of industrial gases	Manufacturing
2412 : Manufacture of dyes and pigments	Manufacturing
2413 : Manufacture of other inorganic basic chemicals	Manufacturing
2414 : Manufacture of other organic chemicals	Manufacturing
2415 : Manufacture of fertilisers and nitrogen compounds	Manufacturing
2416 : Manufacture of plastics in primary forms	Manufacturing
2417 : Manufacture of synthetic rubber in primary forms	Manufacturing
2420 : Manufacture of pesticides and other agro-chemical products	Manufacturing
2430 : Manufacture of paints, varnishes and similar coatings, printing ink and mastics	Manufacturing
2441 : Manufacture of basic pharmaceuticals	Manufacturing
2442 : Manufacture of pharmaceutical preparations	Manufacturing
2451 : Manufacture of soap and detergents, cleaning and polishing preparations	Manufacturing
2452 : Manufacture of perfumes and toilet preparations	Manufacturing
2461 : Manufacture of explosives	Manufacturing
2462 : Manufacture of glues and gelatine	Manufacturing
2463 : Manufacture of essential oils	Manufacturing
2464 : Manufacture photographic chemical material	Manufacturing
2465 : Manufacture of prepared unrecorded media	Manufacturing
2466 : Manufacture of other chemical products not elsewhere classified	Manufacturing
2470 : Manufacture of man-made fibres	Manufacturing
2511 : Manufacture of rubber tyres and tubes	Manufacturing
2512 : Retreading and rebuilding of rubber tyres	Manufacturing
2513 : Manufacture of other rubber products	Manufacturing
2521 : Manufacture of plastic plates, sheets, tubes and profiles	Manufacturing
2522 : Manufacture of plastic packing goods	Manufacturing
2523 : Manufacture of builders ware of plastic	Manufacturing
2524 : Manufacture of other plastic products	Manufacturing
2611 : Manufacture of flat glass	Manufacturing
2612 : Shaping and processing of flat glass	Manufacturing
2613 : Manufacture of hollow glass	Manufacturing
2614 : Manufacture of glass fibres	Manufacturing
2615 : Manufacture and processing of other glass including technical glassware	Manufacturing
2621 : Manufacture of ceramic household and ornamental articles	Manufacturing
2622 : Manufacture of ceramic sanitary fixtures	Manufacturing

SIC 2003 Classification	Sub Group
2623 : Manufacture of ceramic insulators and insulating fittings	Manufacturing
2624 : Manufacture of other technical ceramic products	Manufacturing
2625 : Manufacture of other ceramic products	Manufacturing
2626 : Manufacture of refractory ceramic products	Manufacturing
2630 : Manufacture of ceramic tiles and flags	Manufacturing
2640 : Manufacture of bricks, tiles and construction products, in baked clay	Manufacturing
2651 : Manufacture of cement	Manufacturing
2652 : Manufacture of lime	Manufacturing
2653 : Manufacture of plaster	Manufacturing
2661 : Manufacture of concrete products for construction purposes	Manufacturing
2662 : Manufacture of plaster products for construction purposes	Manufacturing
2663 : Manufacture of ready-mixed concrete	Manufacturing
2664 : Manufacture of mortars	Manufacturing
2665 : Manufacture of fibre cement	Manufacturing
2666 : Manufacture of other articles of concrete, plaster and cement	Manufacturing
2670 : Cutting, shaping and finishing of stone	Manufacturing
2681 : Production of abrasive products	Manufacturing
2682 : Manufacture of other non-metallic mineral products not elsewhere classified	Manufacturing
2710 : Manufacture of basic iron and steel and of ferro-alloys	Manufacturing
2721 : Manufacture of cast iron tubes	Manufacturing
2722 : Manufacture of steel tubes	Manufacturing
2731 : Cold drawing	Manufacturing
2732 : Cold rolling of narrow strip	Manufacturing
2733 : Cold forming or folding	Manufacturing
2734 : Wire drawing	Manufacturing
2741 : Precious metals production	Manufacturing
2742 : Aluminium production	Manufacturing
2743 : Lead, zinc and tin production	Manufacturing
2744 : Copper production	Manufacturing
2745 : Other non-ferrous metal production	Manufacturing
2751 : Casting of iron	Manufacturing
2752 : Casting of steel	Manufacturing
2753 : Casting of light metals	Manufacturing
2754 : Casting of other non-ferrous metals	Manufacturing
2811 : Manufacture of metal structures and parts of structures	Manufacturing
2812 : Manufacture of builders' carpentry and joinery of metal	Manufacturing
2821 : Manufacture of tanks, reservoirs and containers of metal	Manufacturing
2822 : Manufacture of central heating radiators and boilers	Manufacturing
2830 : Manufacture of steam generators, except central heating hot water boilers	Manufacturing
2840 : Forging, pressing, stamping and roll forming of metal; powder metallurgy	Manufacturing
2851 : Treatment and coating of metals	Manufacturing
2852 : General mechanical engineering	Manufacturing
2861 : Manufacture of cutlery	Manufacturing
2862 : Manufacture of tools	Manufacturing
2863 : Manufacture of locks and hinges	Manufacturing
2871 : Manufacture of steel drums and similar containers	Manufacturing
2872 : Manufacture of light metal packaging	Manufacturing
2873 : Manufacture of wire products	Manufacturing
2874 : Manufacture of fasteners, screw machine products, chains and springs	Manufacturing
2875 : Manufacture of other fabricated metal products not elsewhere classified	Manufacturing
2911 : Manufacture of engines and turbines, except aircraft, vehicle and cycle engines	Manufacturing
2912 : Manufacture of pumps and compressors	Manufacturing
2913 : Manufacture of taps and valves	Manufacturing
2914 : Manufacture of bearings, gears, gearing and driving elements	Manufacturing
2921 : Manufacture of furnaces and furnace burners	Manufacturing
2922 : Manufacture of lifting and handling equipment	Manufacturing
2923 : Manufacture of non-domestic cooling and ventilation equipment	Manufacturing
2924 : Manufacture of other general purpose machinery not elsewhere classified	Manufacturing
2931 : Manufacture of agricultural tractors	Manufacturing

SIC 2003 Classification	Sub Group
2932 : Manufacture of other agricultural and forestry machinery	Manufacturing
2941 : Manufacture of portable hand held power tools	Manufacturing
2942 : Manufacture of metalworking machine tools	Manufacturing
2943 : Manufacture of other machine tools not elsewhere classified	Manufacturing
2951 : Manufacture of machinery for metallurgy	Manufacturing
2952 : Manufacture of machinery for mining, quarrying and construction	Manufacturing
2953 : Manufacture of machinery for food, beverage and tobacco processing	Manufacturing
2954 : Manufacture of machinery for textile, apparel and leather production	Manufacturing
2955 : Manufacture of machinery for paper and paperboard production	Manufacturing
2956 : Manufacture of other special purpose machinery not elsewhere classified	Manufacturing
2960 : Manufacture of weapons and ammunition	Manufacturing
2971 : Manufacture of electric domestic appliances	Manufacturing
2972 : Manufacture of non-electric domestic appliances	Manufacturing
3001 : Manufacture of office machinery	Manufacturing
3002 : Manufacture of computers and other information processing equipment	Manufacturing
3110 : Manufacture of electric motors, generators and transformers	Manufacturing
3120 : Manufacture of electricity distribution and control apparatus	Manufacturing
3130 : Manufacture of insulated wire and cable	Manufacturing
3140 : Manufacture of accumulators, primary cells and primary batteries	Manufacturing
3150 : Manufacture of lighting equipment and electric lamps	Manufacturing
3161 : Manufacture of electrical equipment for engines and vehicles not elsewhere classified	Manufacturing
3162 : Manufacture of other electrical equipment not elsewhere classified	Manufacturing
3210 : Manufacture of electronic valves and tubes and other electronic components	Manufacturing
3220 : Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	Manufacturing
3230 : Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	Manufacturing
3310 : Manufacture of medical and surgical equipment and orthopaedic appliances	Manufacturing
3320 : Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment	Manufacturing
3330 : Manufacture of industrial process control equipment	Manufacturing
3340 : Manufacture of optical instruments and photographic equipment	Manufacturing
3350 : Manufacture of watches and clocks	Manufacturing
3410 : Manufacture of motor vehicles	Manufacturing
3420 : Manufacture of bodies (coachwork) for motor vehicles: manufacture of trailers and semi-trailers	Manufacturing
3430 : Manufacture of parts and accessories for motor vehicles and their engines	Manufacturing
3511 : Building and repairing of ships	Manufacturing
3512 : Building and repairing of pleasure and sporting boats	Manufacturing
3520 : Manufacture of railway and tramway locomotives and rolling stock	Manufacturing
3530 : Manufacture of aircraft and spacecraft	Manufacturing
3541 : Manufacture of motorcycles	Manufacturing
3542 : Manufacture of bicycles	Manufacturing
3543 : Manufacture of invalid carriages	Manufacturing
3550 : Manufacture of other transport equipment not elsewhere classified	Manufacturing
3611 : Manufacture of chairs and seats	Manufacturing
3612 : Manufacture of other office and shop furniture	Manufacturing
3613 : Manufacture of other kitchen furniture	Manufacturing
3614 : Manufacture of other furniture	Manufacturing
3615 : Manufacture of mattresses	Manufacturing
3621 : Striking of coins and medals	Manufacturing
3622 : Manufacture of jewellery and related articles not elsewhere classified	Manufacturing
3630 : Manufacture of musical instruments	Manufacturing
3640 : Manufacture of sports goods	Manufacturing
3650 : Manufacture of games and toys	Manufacturing
3661 : Manufacture of imitation jewellery	Manufacturing
3662 : Manufacture of brooms and brushes	Manufacturing
3663 : Other manufacturing not elsewhere classified	Manufacturing
3710 : Recycling of metal waste and scrap	Manufacturing
3720 : Recycling of non-metal waste and scrap	Manufacturing
4011 : Production of electricity	Utilities
4012 : Transmission of electricity	Utilities
4013 : Distribution and trade in electricity	Utilities

SIC 2003 Classification	Sub Group
4021 : Manufacture of gas	Utilities
4022 : Distribution of gaseous fuels through mains	Utilities
4030 : Steam and hot water supply	Utilities
4100 : Collection, purification and distribution of water	Utilities
4511 : Demolition and wrecking of buildings; earth moving	Building Trades
4512 : Test drilling and boring	Building Trades
4521 : General construction of buildings and civil engineering works	Building Trades
4522 : Erection of roof covering and frames	Building Trades
4523 : Construction of highways, roads, airfields and sports facilities	Building Trades
4524 : Construction of water projects	Building Trades
4525 : Other construction work involving special trades	Building Trades
4531 : Installation of electrical wiring and fittings	Building Trades
4532 : Insulation work activities	Building Trades
4533 : Plumbing	Building Trades
4534 : Other building installation	Building Trades
4541 : Plastering	Building Trades
4542 : Joinery installation	Building Trades
4543 : Floor or wall covering	Building Trades
4544 : Painting and glazing	Building Trades
4545 : Other building completion	Building Trades
4550 : Renting of construction or demolition equipment with operator	Building Trades
5020 : Maintenance and repair of motor vehicles	Motor Trades
5040 : Sale, maintenance and repair of motorcycles and related parts and accessories	Motor Trades
5121 : Wholesale of grain, seeds and animal foods	Logistics
5122 : Wholesale of flowers and plants	Logistics
5123 : Wholesale of live animals	Logistics
5124 : Wholesale of hides, skins and leather	Logistics
5125 : Wholesale of unmanufactured tobacco	Logistics
5131 : Wholesale of fruit and vegetables	Logistics
5132 : Wholesale of meat and meat products	Logistics
5133 : Wholesale of dairy produce, eggs and edible oils and fats	Logistics
5134 : Wholesale of alcoholic and other beverages	Logistics
5135 : Wholesale of tobacco products	Logistics
5136 : Wholesale of sugar and chocolate and sugar confectionery	Logistics
5137 : Wholesale of coffee, tea, cocoa and spices	Logistics
5138 : Wholesale of other food including fish, crustaceans and molluscs	Logistics
5139 : Non-specialised wholesale of food, beverages and tobacco	Logistics
5141 : Wholesale of textiles	Logistics
5142 : Wholesale of clothing and footwear	Logistics
5143 : Wholesale of electrical household appliances and radio and television goods	Logistics
5144 : Wholesale of china and glassware, wallpaper and cleaning materials	Logistics
5145 : Wholesale of perfume and cosmetics	Logistics
5146 : Wholesale of pharmaceutical goods	Logistics
5147 : Wholesale of other household goods	Logistics
5151 : Wholesale of solid, liquid and gaseous fuels and related products	Logistics
5152 : Wholesale of metals and ores	Logistics
5153 : Wholesale of wood, construction materials and sanitary equipment	Logistics
5154 : Wholesale of hardware, plumbing and heating equipment and supplies	Logistics
5155 : Wholesale of chemical products	Logistics
5156 : Wholesale of other intermediate products	Logistics
5157 : Wholesale of waste and scrap	Logistics
5181 : Wholesale of machine tools	Logistics
5182 : Wholesale of mining, construction and civil egineering machinery	Logistics
5183 : Wholesale of machinery for the textile industry, and of sewing and knitting machines	Logistics
5184 : Wholesale of computers, computer peripheral equipment and software	Logistics
5185 : Wholesale of other office machinery and equipment	Logistics
5186 : Wholesale of other electronic parts and equipment	Logistics
5187 : Wholesale of other machinery for use in industry, trade and navigation	Logistics
5188 : Wholesale of agricultural machinery and accessories and implements, including tractors	Logistics

SIC 2003 Classification	Sub Group
5190 : Other wholesale	Logistics
6024 : Freight transport by road	Logistics
6311 : Cargo handling	Logistics
6312 : Storage and warehousing	Logistics
6411 : National post activities	Logistics
6412 : Courier activities other than national post activities	Logistics
7131 : Renting of agricultural machinery and equipment	Logistics
7132 : Renting of construction and civil engineering machinery and equipment	Logistics
7133 : Renting of office machinery and equipment including computers	Logistics
7134 : Renting of other machinery and equipment not elsewhere classified	Logistics
7140 : Renting of personal and household goods not elsewhere classified	Logistics
7482 : Packaging activities	Manufacturing
9001 : Collection and treatment of sewage	Waste
9002 : Collection and treatment of other waste	Waste
9003 : Sanitation, remediation and similar activities	Waste