

The Role of:
The Highways Agency,
the Environment Agencies
and private utility
companies in delivering
new housing supply
Ecotec – A Review of the
Evidence 2008

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Executive Summary

The role of the utilities, highways and environment agencies in delivering new housing supply

NHPAU has commissioned a literature review to help develop a greater understanding of the role of named providers in the delivery of new housing supply. This review contains evidence appertaining to the roles of specific infrastructure providers – the Highways Agency, The Environment Agency and private utility companies. The study aimed to document a knowledge position of named infrastructure providers in terms of their roles in delivering housing supply. Therefore the research focussed upon the linkages between the growth agenda, the planning system and the operations of the above named providers.

The main findings of the review are summarised below:

- The review found that the RSS revision process across the regions has enabled work on infrastructure capacity to proceed. However, there is a view across the regions that infrastructure provision is currently a constraint on housing supply;
- The intensity and nature of constraints is stated to vary across England, with London, the South East and the East of England (areas where housing demand is high) facing the greatest infrastructure constraints on supply – highways constraints are cited as most problematic;
- Constraints are cited as linked to the planning system, the division of responsibilities within Government, the funding and regulatory frameworks and the relationship between public and private sectors;
- Under funding of infrastructure projects was a frequently cited problem. Additional corrective investment was viewed as necessary to address past funding deficits;
- The review identified an uncertainty and lack of guidance relating to the funding of infrastructure.
Kate Barker has recently stated that these concerns may be ameliorated in the medium term by the introduction of the proposed Community Infrastructure Levy – if it is made site sensitive. The paper also states that consideration could be given to a reduced levy as a means of encouraging the development of previously used land. Barker states that using a form of economic instrument as an incentive to develop a particular site is likely to deliver new housing supply¹.
- Forward funding of infrastructure by the public sector is seen (within the review) as playing a vital role in increasing housing supply. The review found that Regional Infrastructure Funds (to provide catalyst investment), have already been established in the South East and South West regions;

¹ Barker, K (2008) "Planning policy, planning practice, and housing supply" in the Oxford Review of Economic Policy, Volume 24, Number 1, 2008 pp. 34 – 49

- Engagement with the growth agenda was also viewed as an imperative. However the review reported that regulatory bodies appeared to be primarily concerned with managing demand and price reviews as opposed to proactively managing growth. Private utility companies were viewed as difficult planning partners, particularly in terms of information sharing. The organisational structures and internal commercial prioritisation were not aligned with the strategic planning requirements of the growth agenda. Differing planning horizons adopted by various agencies (in both the public and private sectors) in terms of the provision of infrastructure, were viewed as making strategic planning difficult.

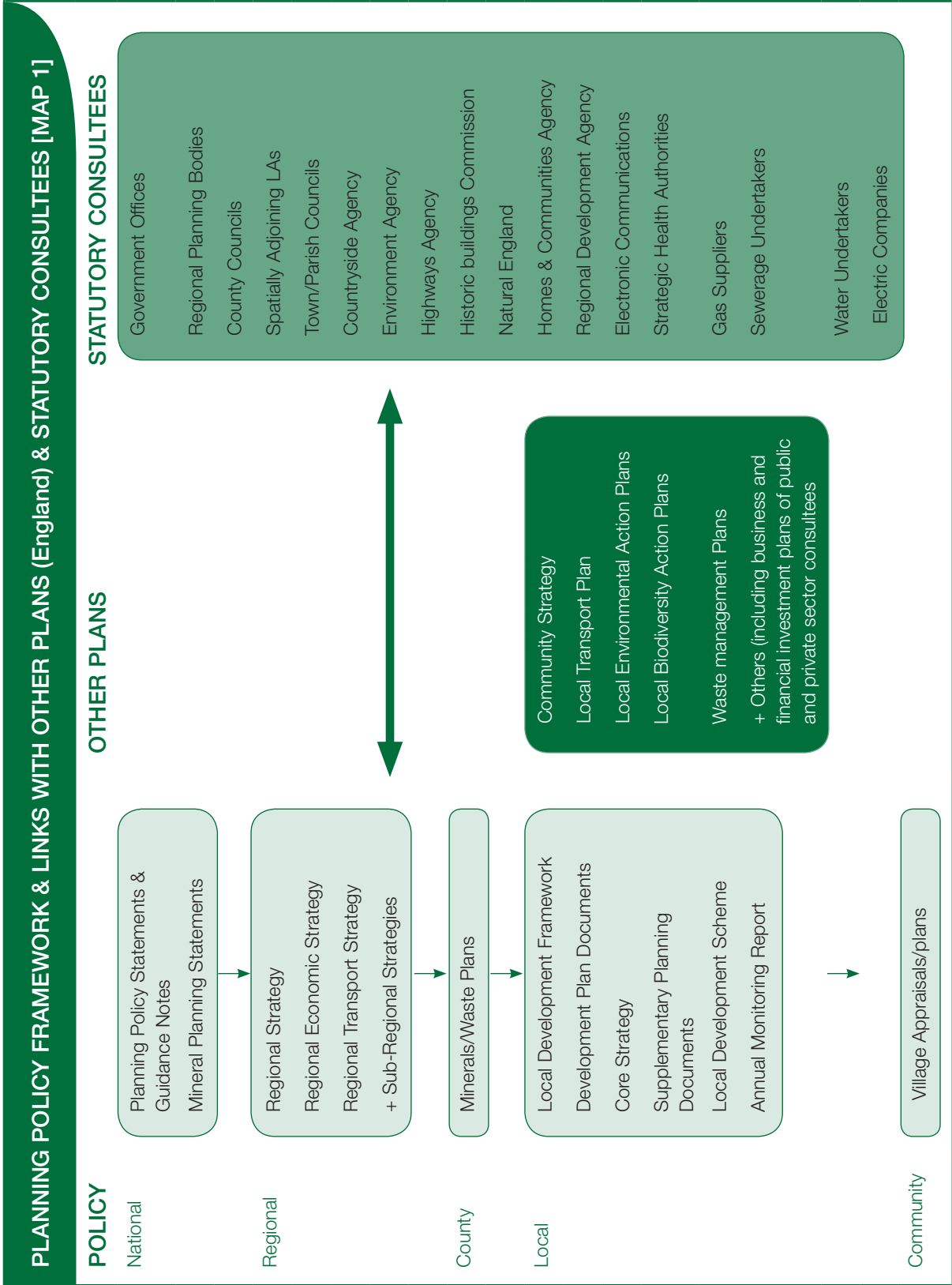
Through the findings a picture has started to emerge relating to the complexities inherent in the relationship between spatial planning and infrastructure provision. To facilitate this review, NHPAU has mapped the current planning policy framework, its links with other plans and statutory consultees and provided an over-view of the intricacies of plans, strategies and players involved in the preparations for future growth and integrated plan making. The complexities inherent within the system are exemplified within the mapping.

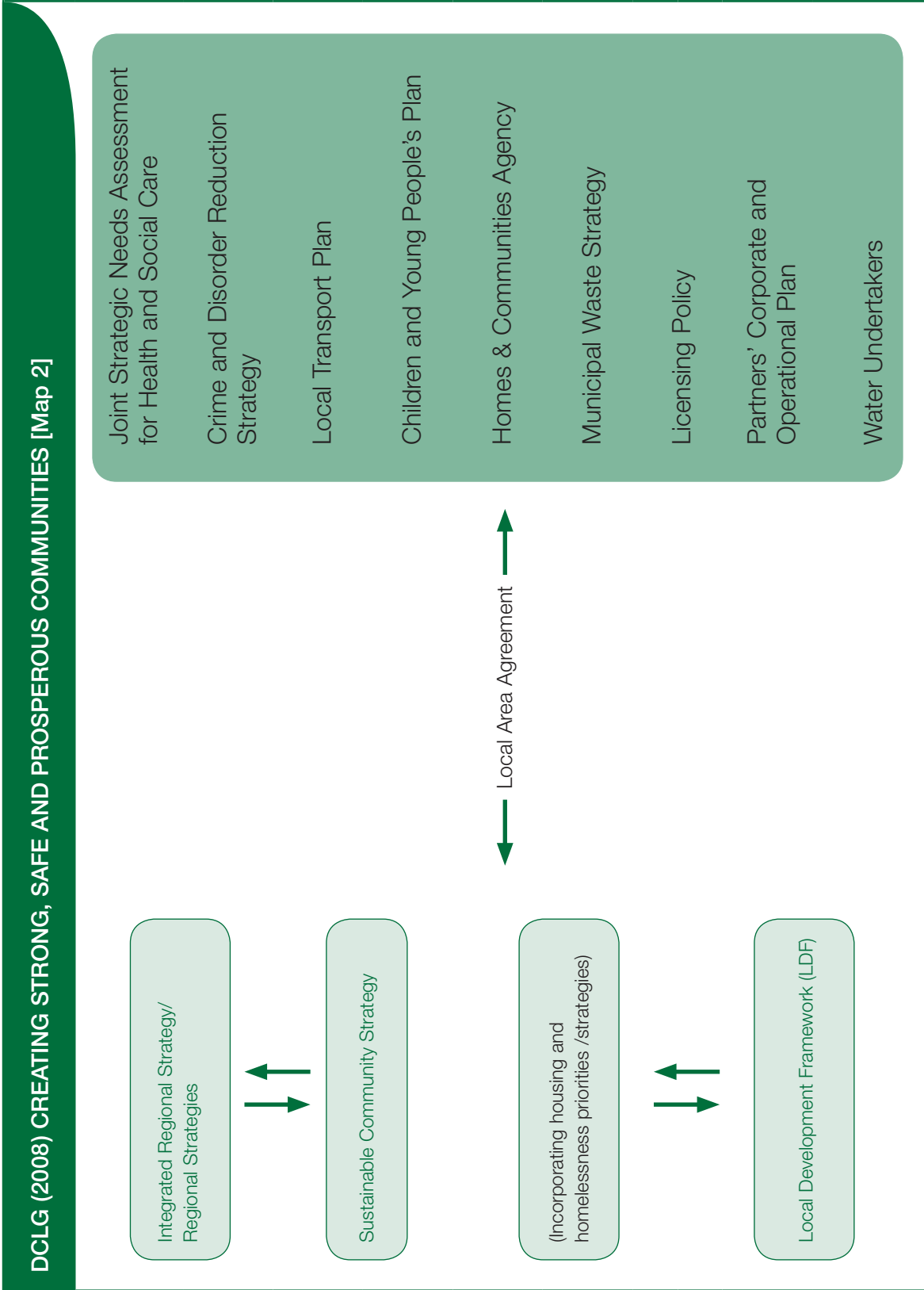
Map 1 demonstrates the integrated provision and plan-making necessary to provide for the needs of sustainable communities².

Map 2 provides an over-view of plan and strategy making necessary to create strong, safe and prosperous communities³.

² Taken from the work of Cullingworth & Nadin (2006) *Town and Country Planning in the UK*, 14th Edn, Routledge. London

³ DCLG (2008) *Creating Strong, Safe and Prosperous Communities*





In summary, an important finding of this review appertained to the nature of the relationship between planning and infrastructure delivery. For example, some respondents stated that strategic planning requirements and housing trajectories did not always align with the priorities for road investment; this was seen as having a strong bearing on housing development outcomes. There was criticism that the Highways Agency did not always align its priorities with the growth agenda. However, other parties viewed relationships as improving, with an increase of understanding between players as a result of partnership working and more formal consultation practices. In synthesis it is likely that the review is reporting a differentiated regional response in terms of working practices and delivery. However, the new Regional Strategy and regional governance structures⁴ will allow for a more joined up approach to strategy making and governance within the regions; retaining the Regional Development Agencies economic expertise and focus, and, through Local Authority Leader Boards bring democratic accountability to the process. This will enable implementation planning and strong partnership working at the heart of each region and focus on the pursuit of sustainable economic development and effective sub-national delivery.

Regional Strategy (RS) implementation plans are aimed at signposting and co-ordinating the delivery of regional strategy objectives. This is achieved by identifying and bringing together separate investment strategies, projects and programmes, thereby helping to increase the confidence of infrastructure providers and delivery partners. In January 2009 Government released a policy document on RS⁵. An important section outlines expectations for RS in terms of implementation and monitoring. This work is currently being expanded and developed by Government Office through innovative guidance which will supplement advice. The deliverability of RS is vital to realising its aims and aspirations, and much is dependant upon necessary funding commitment by partners. RS implementation plans should bring together shorter term investment priorities (3-5 year time horizon), with any uncertainties over longer term availability of finance identified as indicative or subject to partner investment reviews. In synthesis, the RS implementation plan is where the RS commitment to partnership working should be translated into practical actions, bringing together individual partners investment planning. There are many organisations, developers and service providers from both the public and private sectors which have an interest in securing better co-ordinated and more effective delivery of development. One of the main purposes of implementation planning is to ensure that this happens, providing longer term certainty and advanced notice of requirements for major infrastructure, so that providers can set in motion the necessary commitments into their financial and business planning programmes.

It is clear from this Literature Review that research into the impact of infrastructure delivery on housing supply is limited. It is also clear that many recent changes to policy and practice have yet to bed down. As such the NHPAU is committed to further targeted work, and to this end we have commissioned work from the Institute of Fiscal Studies which will cover the role of infrastructure provision on housing costs.

In corollary, the move towards spatial planning frameworks has been significant and formalised in legislation since 2004⁶ – introducing the current system of regional spatial planning has led to more joined up thinking and a greater focus upon delivery and housing supply. It is pleasing therefore that the review reports a ‘greater sense of urgency as the various agencies involved in the planning process realise the enormity of the challenge set by the Government’s growth agenda’.

⁴ DCLG (2008) Prosperous Places: taking forward the review of sub-national economic development and regeneration

⁵ DCLG & BERR (2009) Local Democracy, Economic Development and Construction Bill Policy document on Regional Strategies

⁶ Planning and Compulsory Purchase Act (PCPA) 2004

Introduction

To meet housing demand and promote affordability the Government has made the expansion of housing supply a top policy priority, targeting the production of 2 million new homes by 2016, to reach 3 million by 2020. A step change in new housing supply of this magnitude sets a challenge to the planning system and the building industry. It also represents an infrastructure challenge as new homes can only be built if they are provided with good transport access, utilities, waste disposal, drainage and land protected from flooding. It is possible that the envisaged uplift in housing supply will be held back by delivery issues related to infrastructure provision.

1.1 Aim and Scope of the Study

This study aims to document the current knowledge position concerning the role of Highways Agency, Environment Agency and private utility companies in delivering housing supply. The research focuses on the linkages between the growth agenda, the planning system and the operations of infrastructure providers. It examines planning and development processes as well as the actual delivery phase. Evidence dealing directly with the topic, particularly studies which quantified the effect of constraints, was sought.

The Housing Green Paper and the Sub-National Review contain proposals which are aimed at better alignment of growth objectives and funding streams horizontally across the Whitehall departments and vertically between the centre, the regions, sub-regions and local authorities.

As a result the focus of the review was narrowed to focus on the specific role of the Highways Agency, Environment Agency and private utility companies in delivering housing supply. It therefore covers the following types of infrastructure: highways; environmental, including water, waste treatment and flood risk management; and utilities including gas, electricity and telecommunications. Rail, other forms of public transport and so-called 'soft infrastructure' such as education and health facilities were excluded from the research brief. Because much of the material examined in the research defined infrastructure more widely it has not been possible to limit the scope consistently throughout the review.

The following table, adapted from the Callcutt Review (2007), provides an overview of the various types of infrastructure required to support housing development and whether the public or private sector is responsible for its provision.

Table 1.1: Infrastructure required for new housing development

	Type of infrastructure	Provision
Covered by this research	Roads	Public
	Gas	Private
	Electricity	Private
	Telecommunications	Private
	Water	Private
	Drainage	Private
	Waste disposal	Public
	Flood defence	Public
Not Covered	Rail	Mixed
	Public transport	Mixed
	Schools	Public
	Higher & Further	Public
	Nursery	Mixed
	Primary care	Mostly public
	Hospitals	Public
	Ambulance	Public
	Police	Public
	Fire	Public
	Public spaces	Mixed
	Recreation	Mixed
	Waste collection	Public
	Culture	Public

Source: Based on the Callcutt Review (2007, p 56)

1.2 Methodology

This study set out to identify and analyse existing secondary evidence dealing with the nature and extent of infrastructure constraints on housing supply. No new primary research was undertaken. Relevant studies and documentary evidence were sourced in the following ways. Firstly, a desk-top search for academic work on the topic was made using a variety of search terms keyed into several internet search engines, including Google Scholar.

This was followed by an extensive trawl for relevant documents on a number of websites including:

- The Department of Communities and Local Government (DCLG);
- The Department for Transport (DfT);
- HM Treasury;
- The Highways Agency;
- The Environment Agency;
- English Partnerships;
- OFWAT;
- OFCOM;
- Regional Assemblies;
- Government Offices for the Regions;
- Growth Areas;
- Local Delivery Vehicles (LDVs);
- Selected local authorities;
- Royal institute of Chartered Surveyors (RICS);
- The Royal Town Planning Institute (RTPI).

Consultees were approached and were asked if they knew of any documentary evidence that could be used as input for the study. Once found, published literature was reviewed using rapid evidence assessment, a methodology for assessing evidence to guide public policy research and evaluation.

The second component of the research approach consisted of a series of interviews with a number of practitioners involved in the planning and development of housing and infrastructure in England at various levels. The interviews consisted of a standard set of questions covering the primary aim and scope of the research. They were held in November and December 2007 with professionals from the following organisations:

- The Highways Agency
- The Environment Agency
- English Partnerships
- The Academy for Sustainable Communities
- England's nine Regional Planning Bodies

- The House Builders Federation
- The RTPI
- RICS

A full list of those consulted is provided at the end of this report.

1.3 About the Evidence

As set out above, an extensive search was made to identify academic evidence dealing with the nature and extent of infrastructure constraints on housing supply. Priority was given to finding evidence dealing directly with the topic, particularly that which quantified the effect of constraints in terms of housing numbers.

Academic evidence on the topic was found to be scarce which is understandable given the rapidly evolving policy and regulatory context. The research confirmed that it is very much a practitioner's area of work, with most knowledge and up to date understanding of issues to be found with planners active in the field.

It was therefore necessary to make extensive use of non-academic planning and strategy documents and technical studies to shed light on the topic. These sources, combined with information and insight obtained in the structured interviews held with senior practitioners in the field have provided the most input into the study.

There was very little in the way of hard quantitative evidence which could be used to make a robust judgement on the scale of impacts in terms of actual dwelling numbers and due to the fragmentary nature of the evidence base it is difficult to arrive at a national level picture. Moreover, much of the evidence only dealt with the topic tangentially and much of the regional level analysis contained in planning documents is quite general in nature or based on inconclusive modelling. Taken together, the evidence base available at the regional level would seem to suggest that it is very difficult to determine the point at which an identified infrastructure capacity will begin to impact on the delivery of new build housing.

Local examples of infrastructure policy and provision can offer valuable lessons, and it may be possible to aggregate this information through a large scale survey or case study approach to build up a regional or national picture. There may also be possibilities to utilise information available from the Highways Agency or the Environment Agency to create an aggregate picture of the impact of constraints. Work of this kind was beyond the brief of this study and it is recommended here as an area for further research.

1.4 Report Structure

Chapter 2 presents a policy context that forms the backdrop to this study, covering the Barker Review, the Government's housing growth agenda, planning reform and the process of regional spatial strategies.

Chapter 3 deals with evidence concerning roads, looking at the role of the Highways Agency and its Article 14 powers, illustrated by case studies.

Evidence concerning environmental infrastructure is covered in chapter 4, with particular attention being paid to the role of the Environment Agency.

The regulatory framework and evidence of issues and constraints concerned with utilities are dealt with in chapter 5.

Chapter 6 presents a number of best practice examples explored during the course of the research and the final chapter contains conclusions and recommendations.

A bibliography and list of interviewees are included at the end of the report.

Policy Context

This section profiles recent developments which form the backdrop to this study. Policy makers and practitioners alike recognise that infrastructure forms a major constraint to development and threatens the attainment of the Government's new build targets. Far from being static, the current situation is rapidly evolving as a number of reviews, policy initiatives and funding schemes associated with the growth agenda are addressing the issue of infrastructure constraints either directly or indirectly.

Adding to the complexity of the picture, the development sector has experienced a sudden downturn since the beginning of the 'credit crisis' in the last months of 2007, upsetting the market dynamic and resulting in the postponement of numerous new build projects. The current market trends are not fully reflected in the data and policy document sources reviewed in this study.

2.1 The Barker Review of Housing Supply

The Barker Review of Housing Supply, completed in 2004, found the failure of housing supply to keep pace with the growth in household numbers to be the root cause for worsening housing affordability in England and that a step change in new build supply was urgently needed to address this problem.

The review also recognised infrastructure constraints to be one of a number of barriers to the development of allocated land. The review found that once housing numbers were agreed and land was allocated in local plans, delivery of housing was sometimes constrained by specific infrastructure barriers delaying development, such as the delivery and funding of transport and water services. The review stated that "in the South East alone, over 40,000 dwellings have planning permission but are being held up by infrastructure shortcomings" (Barker 2003, p 147).

One problem identified by the Barker Review was that agencies responsible for transport and social infrastructure tended to be focused on maintaining existing services rather than planning for growth. A second problem identified was that decisions on infrastructure provision were not being taken at the same time, or by the same bodies, as decisions on the size and nature of development (with the exception of Section 106 agreements). Both large and small scale projects were affected. Furthermore, problems were occurring because those responsible for transport planning and delivery were not being involved in the drafting of Local Development Plans, or were not being engaged at an early enough stage in development control decisions. The Review cited the example of three housing developments proposed under the South Norfolk Local Development Plan which received objections from the Highways Agency due to concerns at the pressure these developments would place on existing strategic roads in the area.

Questions surrounding the funding of new infrastructure were identified in the Review as a prominent source of delay, particularly with regard to transport infrastructure. To illustrate the point the Barker Review referred to junction 10 of the M20 (detailed in chapter 3), concluding that there was a lack of clarity as to how large infrastructure projects should be funded when a number of developers stood to benefit from these projects. Finally "gap funding" was identified as an issue when developers were prepared to pay for new infrastructure but not before income had been generated through sales on the site.

The Review identified pressure on infrastructure, especially roads and public transport, as a common reason why local people are opposed to new development. It also considered that additional households create demand for new infrastructure and services (for example extra schools and roads) which may not be covered by the marginal increases in grant income which is a possible disincentive to Local Authorities to develop new housing areas.

The Barker Review found external infrastructure delays such as the construction of access roads were contributing to uncertainty which affected house builders' behaviour. According to the Review house builders would often delay development until infrastructure (for example a road or railway connection) was provided, as this would increase the value of the final development. A number of major house builders provided the Review with detailed information on their forward supply of land with planning permission (land banks). This data indicated that in some cases around 10 per cent of the land held with detailed consent was not under construction due to appeals, water authority objections, delays to off-site infrastructure and relocating wildlife populations.

The Review states that "a more effective planning system would be characterised by clear and timely mechanisms to provide the necessary infrastructure and services to support development and deliver sustainable communities" (Barker 2004, p 32). A number of recommendations with regard to infrastructure provision were made, including:

- A stronger role for regional planning bodies, with an independent Regional Planning Executive charged with setting out advice on market affordability targets, housing numbers, strategic growth areas and co-ordinating links between the key players including infrastructure providers, developers and English Partnerships;
- Infrastructure providers should be more involved in developing regional and local plans from an early stage, as this would reduce the instances in which they used their powers of direct refusal of planning permission;
- Planning authorities should utilize available special purpose vehicles available to drive development where there are problems with land acquisition and infrastructure. A new Community Infrastructure Fund should be established to fund the up-front costs of infrastructure required to facilitate development.

2.2 The Housing Growth Agenda

The stated aim of Homes for the Future, the Government Green Paper released in July 2007, is to raise annual housing production in England to 240,000 new homes by 2016, an increase of more than 50% on new build rates between 2000 and 2006. In total some 3 million new homes are to be built by 2020. Most of the construction is to take place in the wider south east of the country where demand is greatest.

The Green Paper is the latest in a series of Government policy initiatives since the Barker Review aiming at boosting house building rates. These include:

- The Sustainable Communities Plan (2003) which designated four major growth areas to provide a total of nearly 525,000 new homes between 2001 and 2016, these being the Thames Gateway (160,000 new homes), Ashford in Kent (31,000), the London Stansted Cambridge Peterborough corridor (180,000) and Milton Keynes and South Midlands area (153,000);
- The New Growth Points programme launched in 2005 which designated 29 smaller growth areas located across the East, South East, South West, East Midlands and West Midlands with a combined capacity of approximately 425,000 new homes to be built between 2006 and 2016;
- The 'opportunity borough' designation given to the London Boroughs of Barking and Dagenham, Barnet, Brent and Islington, due to their willingness, capacity and potential to accommodate higher housing growth over and above their current London Plan targets;
- The expansion of the New Growth Points Programme announced in the 2007 Green Paper, inviting other local authorities to bid to become part of the programme during 2008/09. For the first time local authorities the north of England were invited to bid, recognising of the growing gap between supply and demand in this part of the country;
- The launch of the Eco-towns initiative concurrent with the release of the Green paper, making funding available for the construction of a number of new zero-carbon environmentally sustainable settlements each containing between 5,000 and 20,000 dwellings. Winning bids are expected to be announced during 2008.

In addition to mainstream funding the DCLG is providing special funding to facilitate the implementation of the various initiatives which make up the Government's growth agenda. Covering the period 2003-04 to 2007-08 DCLG has committed a total of £1.07bn to support local and community infrastructure and regeneration projects in the four Growth Areas. A £200m Community Infrastructure Fund (CIF) has been established to fund transport projects supporting housing growth in the four Growth Areas.

The 29 New Growth Points are currently sharing in an initial sum of £40m in 2007/08 for a first round of infrastructure projects and to support growth-related studies, master planning and local capacity-building. This funding is designed to help overcome local infrastructure problems, unlock sites for new housing and enhance the local environment.

The New Growth Point Programme was set up through a cross-Government approach involving DfT, DEFRA, the Environment Agency, Natural England and the Highways Agency, amongst others. Working co-operatively is recognised to be crucial to ensuring that the growing populations of development areas are provided with the facilities and services they need, examples of these include:

- Ensuring that funding programmes such as health and education are sufficiently flexible and responsive to the needs of growing communities. The Department of Health has included a Growth Area adjustment in its revenue funding allocations to Primary Care Trusts;

- Recognising the pressures on local authorities caused by rapid growth. As a result of recent changes to the formula for allocating local government Revenue Support Grant, local government funding is being reconfigured to be more responsive to the relatively rapid population growth associated with Growth Areas;
- Continuing high levels of mainstream investment in infrastructure. Around £3.5bn is committed or planned by the DfT to go towards infrastructure schemes in the four Growth Areas.

2.3 The Sustainability Impact Study

The Barker Review addressed the implications of housing supply and prices but did not examine the environmental, social and broader economic implications of proposed housing growth. In 2005 the Office of the Deputy Prime Minister commissioned research into these aspects which resulted in a report entitled A Sustainability Impact Study of Additional Housing Scenarios in England (ODPM, 2005). With regard to the environmental impact of housing growth, the study looked specifically at land take, carbon dioxide emissions, waste and the demand for water.

The research was carried out on abstract scenarios for additional housing supply. The impacts of three different rates of housing growth in England were modelled, namely 25,000, 50,000 and 100,000 additional market dwellings per annum in the period 2006-2016. These were based on Barker Review findings and 'additional' refers to existing planned commitments at the time. Three alternative geographical distributions were modelled for each rate of growth. The study assumes that the total population of England will be the same irrespective of the scenarios considered. The additional growth scenarios would increase the number of households thereby reducing the average occupancy level of existing homes. The approach did not factor in any site specific quantitative information.

The findings on waste, water and transport have the most relevance to this study on infrastructure constraints. Under the baseline changes in household and population numbers, household waste production was estimated to increase by 3.3 million tonnes per annum. The estimated amount of additional waste that would be generated under the growth scenarios ranged from 0.3 to 1.3 million tonnes per year (10-40% above the baseline). The study referred to an Environment Agency projection that landfill space would run out in 4.5 years in the East of England Region and 5.9 years in London if current disposal rates were to continue. The study recognised that treatment capacity for the additional amounts of waste estimated to arise as consequence of the growth scenarios was not planned for, concluding that the various levels of Government would need to work together to ensure that adequate provision is made within the waste planning and management frameworks to accommodate the additional waste requiring treatment.

Water usage is more closely related to population growth rather than growth in the number of dwellings. The study recognised that the effects across regions would differ as a result of migration generated by additional house building. It was found that the implications of additional growth can be accommodated although there was possible insufficient provision in Water Resource Plans for population growth under the baseline scenario (ODPM 2005, p.161). It was concluded that water companies may have to review existing provisions for supply and waste water treatment to ensure adequate provision is made for the anticipated increase in demand.

As with water, the study found transport demand to be largely determined by the number of people rather than the number of households, and as a result was relatively insensitive to additional construction. But decisions concerning the location of new dwellings – at the inter-regional and at the local level – would have a major impact on transport demand. It was concluded that more detailed model tests were required to provide more robust estimates of the impacts of household formation on travel demand.

The study makes clear that the need for new infrastructure is not solely driven by housing growth alone. Population growth and rising demand from existing households is also a significant part of the total picture. However, decisions on where to accommodate growth both between and within regions is likely to significantly influence the magnitude and location of impacts.

2.4 Planning Reform

One of the main findings of the Barker Review on Housing Supply was that deficiencies in the planning system were slowing the delivery of new houses. To investigate this further and come up with recommendations to address the problem Kate Barker was tasked with conducting a second review, this time on land use planning.

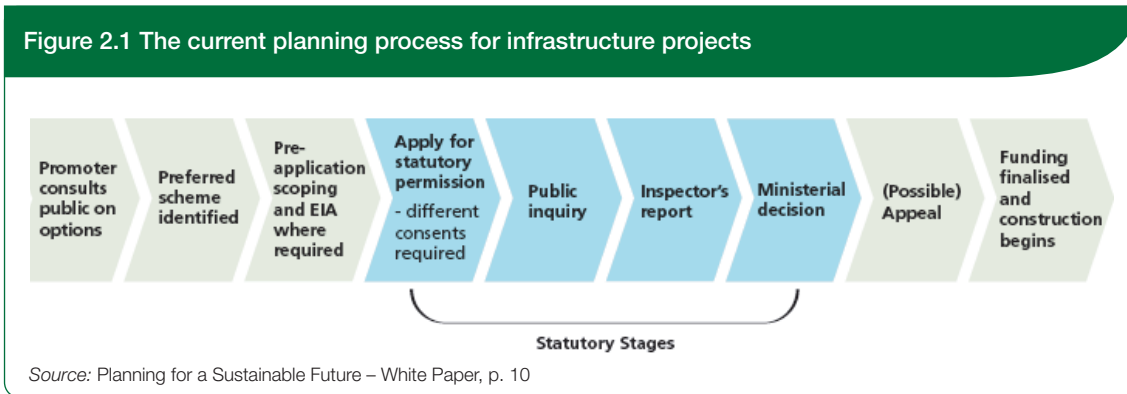
The Barker Review of Land Use Planning Final Report was published in December 2006. In order to improve efficiency the review recommended reform of the planning process for major infrastructure projects, with a new independent Planning Commission to be established to make final decisions in this area. This proposal was developed in collaboration with the Eddington Transport Study (December 2006), which examined the long-term links between transport and the UK's economic productivity, growth and stability, within the context of the Government's broader commitment to sustainable development.

The Review made further recommendations aimed at increasing the efficiency of the land use planning system concerning:

- streamlining policies and processes, including a simplification of national policy and further rationalisation of consent regimes;
- a reduction in the emphasis on targets for decision-making, and
- a greater use of Planning Delivery Agreements so that local planning authorities can focus on outcomes.

The Government has since acted on the recommendations made in the Barker Review of Land Use Planning and the Eddington Review. Published in May 2007, the Planning White Paper entitled "Planning for a Sustainable Future" included a call for a more co-ordinated approach to infrastructure provision. "We propose to take a forward-looking approach to planning infrastructure provision to ensure the timely delivery of infrastructure. This will provide developers with confidence that the necessary infrastructure will be delivered. There is a need to move away from the specific planning of infrastructure delivery to a more strategic and holistic view, which takes infrastructure decisions on roads alongside those of, for example, schools, hospitals, cultural and community facilities" (p. 130).

The White Paper included the following diagram to illustrate the prolonged nature of the current planning process for new infrastructure.



Following a period of consultation on the White Paper a new Planning Bill was introduced into Parliament in November 2007. The legislation proposes a number of reforms to the town and country planning system including two important new measures directly related to infrastructure provision.

Firstly, a new system of development consent for nationally significant infrastructure projects is to be established, designed to simplify and speed up the consents process. The number of applications and permits required for nationally significant projects is to be reduced and a new body called the Infrastructure Planning Commission will be made responsible for examining applications for development consent.

Secondly, the Planning Bill included proposals for a new Community Infrastructure Levy which it is hoped will help to harness the value of an increased range of planning permissions to generate additional infrastructure funding and thereby unlock housing growth. The details of the proposal will firstly be subject to consultation with stakeholders before being set out in secondary legislation. A further fully costed impact assessment will be carried out once details of the levy are finalised. This initiative replaces the proposal for a planning-gain supplement which is no longer the favoured option.

The Community Infrastructure Levy has the potential to facilitate the crucial forward funding of infrastructure to support housing growth but much will depend on the detail contained in clauses when it is finalised as an Act of Parliament. The view expressed by some consultees of this research was that the Levy would need to be ‘bankable’ – enabling planning authorities to raise funds on the capital markets based on the security of future payments flowing from development returns.

Future regulations will determine whether a calculation method will be imposed on authorities or whether it will be up to their discretion. This provides a level of uncertainty. The DCLG have suggested that authorities charging the Community Infrastructure Levy will need to firstly identify

what infrastructure is needed and the cost, and secondly, work out what contribution each development should make to the cost. The Planning Bill already contains an outline of the proposals on certain matters. For example, the Bill specifically states that the regulations must ensure that Levy will become payable when development commences in reliance on planning permission. Liability for payment will rest with the owner or developer of the land at the time development commences, and the amount payable will be determined at, or by reference to, the time when planning permission first permits the development as a result of which Community Infrastructure Levy becomes payable.

2.5 Regional Spatial Strategies

As identified by the Barker Review of Housing Supply, coordination at the regional level is necessary to ensure the planning of housing growth and infrastructure provision is effectively joined up. Established by the Planning and Compulsory Purchase Act 2004 and governed by Planning Policy Statement 11, Regional Spatial Strategies (RSS) guide the broad development of each of England's nine regions for a period of 15 to 20 years⁷.

Regional Spatial Strategies provide a framework to inform the preparation of Local Development Documents, Local Transport Plans and regional and sub-regional strategies and programmes that have a bearing on land use activities. The RSS does not identify specific sites as suitable for development but does establish the locational criteria to be applied to regionally and sub-regionally significant land uses. Local authorities are required to prepare Local Development Documents which are consistent with the RSS, identifying specific locations for development. Demonstrating delivery is a key focus of current planning practice and PPS11 requires the Regional Planning Body to adopt a strengthened focus on implementation when preparing the Regional Spatial Strategy.

The following table provides an overview of the current status of the RSS in each region.

Table 2.1 Status of Regional Spatial Strategies

Region	Status of RSS
London	The London Plan published Feb. 2004; alterations to the Plan's housing provision targets published Dec. 2006.
South East	Draft South East Plan submitted to SoS March 2006; EiP Nov. 2006 – March 2007; Panel report published Aug. 2007.
South West	Draft RSS submitted to SoS April 2006; EiP April – July 2007; Panel report published Jan. 2008.
East of England	Draft RSS submitted to SoS Nov. 2004; EiP Nov. 2005 – March 2006; Panel report published June 2006; SoS Proposed Changes published Dec. 2006 and Oct. 2007; Publication of Final Plan expected early 2008.

⁷ Although Greater London is not technically a region, it is treated as one here, as the GLA is a regional planning body.

Region	Status of RSS
East Midlands	Draft RSS submitted to SoS Sept. 2006; EiP May – July 2007; Panel report published Nov. 2007.
West Midlands	Phase 2 RSS Revision submitted to SoS in Dec. 2007; EiP planned for Sept. 2008.
North West	Draft North West Plan submitted to SoS Jan. 2006; EiP Oct. 2006 – Jan. 2007; Panel report published May 2007; Publication of Final Changes expected Q2 2008.
Yorkshire & Humber	Draft RSS submitted to SoS Dec. 2005; EiP Jan. – Oct 2006; Panel report published Nov. 2007.
North East	Draft Revision RSS submitted to SoS June 2005; EiP March – April 2006; Panel report published Aug. 2006; SoS Proposed Changes published May 2007; Second Stage consultation on SoS Proposed Changes Feb. 2008.

Source: Situation as of March 2008

With the exception of the West Midlands, the majority of RSS reviews that have been undertaken in recent years have used 2003-based or earlier household forecasts. In the case of some Regions, the 2004-based household forecasts, which were published in March 2007, predicted higher household growth rates than previous years. This, together with the requirements of the Housing Green Paper of July 2007, has prompted the Secretary of State to advise upward revisions of the housing numbers contained in the Spatial Strategies of some regions. Because supporting technical work on infrastructure capacity and potential bottlenecks were based on lower housing numbers, the raised housing figures could have significant infrastructure implications. This has prompted new technical work in some cases.

2.6 Examination in Public of the Draft South East Plan

Information from the Examination in Public (EiP) of the Draft South East Plan is presented here to illustrate the way the relationship between housing numbers and infrastructure capacity was dealt with during the RSS process. In its Draft RSS submission the Regional Assembly argued that 28,900 dwellings per annum was the best fit with available and likely future infrastructure.

Policy CC5 of the Plan makes the scale and pace of development dependent on adequate infrastructure capacity to meet current needs and the needs of new development. As described in the EiP Draft Panel Report (August 2007) this ‘conditional approach’ prompted much debate between those who felt it was a necessary safeguard against overloading already strained infrastructure and those who felt it could be used to halt necessary development. The Town and Country Planning Association for example submitted that the housing crisis is so serious that lack of infrastructure must not be used as an excuse for inaction.

The panel sided with the opponents of the conditional approach stating that “in our view it is not practicable to match much infrastructure capacity exactly to a particular level of housing

development. At the individual site level it is of course possible to identify essential infrastructure and to impose appropriate conditions on a planning permission. But at a strategic regional or sub-regional level in our view such conditionality is neither sound in concept nor realistic in practice” (p. 54).

The Examination Panel recognised that the South East faced major infrastructure challenges, referring to the desk top study carried out by Roger Tym and Partners (covered in 3.5). It also acknowledged the very full identification of “necessary” infrastructure that was undertaken by the region as listed in the RSS draft Implementation Plan.

However the Panel found that “persuasive evidence was not presented to indicate that only a fixed figure of 28,900 dwellings per annum could be accommodated” (p. 94). It went on to recommend a higher housing target for the region (32,000 dwellings per annum until 2026) stating that although there were genuine uncertainties about the environmental implications of some new infrastructure even at 28,900 dwellings per annum, clear guidance on the planned housing level was necessary for infrastructure and utilities providers to be able to resolve these, and to bid for/ obtain necessary funding.

Justifying its decision the Panel report cited work done by the Environment Agency indicating that no insuperable problems were demonstrated on water supply and water quality when testing levels of 40,000 dwellings per annum. It also found that much of the expenditure on new water infrastructure will be necessary without any additional new housing because of Water Framework Directive requirements and this was also true of much transport expenditure which would be necessary to reduce bottlenecks arising from the growth in background demand.

The interdependence of housing growth and infrastructure provision is an issue that all Regions have been grappling with during the preparation of RSS. Several broad conclusions can be drawn from the experience in the South East cited above. For one, it is difficult to gauge the capacity of infrastructure in terms of housing numbers at a regional level, even when extensive technical work has been carried out. While studies may inform decisions about the most appropriate general locations for growth, robust and quantifiable information concerning the direct effect of constraints may only be available at the local or site-specific level.

Roads

The public sector is predominantly responsible for the provision of new road infrastructure, although schemes are often proposed and delivered by the private sector as part of large development projects. Managing and improving local roads is the responsibility of local highway authorities while the strategic road network (SRN), including motorways, is the responsibility of the Highways Agency.

Both the Highways Agency (through the Department for Transport's spending programme and the Regional Funding Allocations process) and local highway authorities deliver new or improved highways across England, but much of the focus in the national debate on infrastructure has been on how road infrastructure is considered and delivered through the spatial planning process, and this is examined in more detail here.

3.1 Involvement of the Highways Agency in the Planning Process

The Highways Agency is an Executive Agency of the Department for Transport (DfT) and is responsible for operating, maintaining and improving the strategic road network in England on behalf of the Secretary of State for Transport. The Agency's primary functions are to manage traffic, tackle congestion, provide information to road users and improve safety and journey time reliability, whilst respecting and minimising the adverse impact on the environment.

Of particular relevance to this study is the DfT Circular 02/2007 'Planning and the Strategic Road Network' which states that "the Agency will work co-operatively within the framework of the Government's policies for planning, growth areas, regeneration, integrated transport and sustainability" (p 1). The circular provides advice on the highway and transport considerations which planning authorities are expected to take into account when assessing planning applications of developments affecting trunk roads. In the circular it is stated that it is Government transport policy to, wherever possible, look for alternatives to building new roads and that any strategic road capacity constraint on sustainable economic development should be identified at the RSS stage. Where appropriate, measures to overcome such constraints should be promoted through the Regional Transport Strategy, which forms part of the RSS, and therefore the 'development plan' in each local authority area.

DfT Circular 02/2007 also sets out the intention of the Agency to work with Regional Planning Bodies to contribute to the production of a deliverable RSS. This engagement should occur at an early stage and continue throughout the RSS revision cycle, improving the prospects of delivering realistic objectives and policies.

Involvement of the Highways Agency in the West Midlands RSS Revision

In the West Midlands the Highways Agency is a consultee of RSS revision and has been involved in the revision processes in a number of ways and at different levels.

Firstly, the Draft WM RSS incorporates the region's Regional Transport Strategy in its entirety. The Highways Agency played an important role in shaping the RTS through its role as a key stakeholder and consultee of the Regional Transport Partnership, which inputs into RSS. The Agency also sits on an officer group known as the RSS Co-ordination Group which advises the Regional Planning Partnership and other officer groups on RSS revision issues. Furthermore the Highways Agency sits on the RSS Strategic Management Steering Group which is a strategic level officer group which advises the RPB on the RSS process. PPS 11 requires this group to be set up to oversee and guide the RSS. Finally, the Agency is included on RSS Reference Groups (Transport being one) which are thematic groups set up to ensure better integration and to advise and consider the emerging RSS revisions in more detail.

In developing the RSS Revision the Highways Agency was invited to comment on the Project Plan, the Spatial Options and emerging draft policies and attend the various workshops and stakeholder events. In the West Midlands the Highways Agency has commissioned work to test the emerging RSS policies on the highways system and this work has helped to provide details of where potential constraints lie. Early in 2008 testing on the effects of the Preferred Option numbers is ongoing.

The Highways Agency is a formal consultee in the process for producing Local Development Frameworks, including Local Development Documents. Local Planning Authorities are required to ensure that the Agency is involved from the outset. Circular 02/2007 states that where the Agency considers a proposal contained in a Local Development Document not to be deliverable, for example because it would require improvements to the strategic network that are not practicable or which may be unaffordable, it will provide a full and reasoned case to the relevant planning authority. It further sets out that the Agency can not be expected to cater for unconstrained traffic generated by new development proposals. In line with Government policy local development should be promoted at sustainable locations and the Agency expects to see demand management measures incorporated in development proposals.

3.2 Article 14

In responding to consultations on planning applications, the Highways Agency, on behalf of the Secretary of State, is able to respond to the local planning authority under Article 14 of the Town and Country Planning (General Development Procedure) Order 1995, in one of four ways:

1. No objections to the planning application;
2. Recommend permission be refused or granted subject to conditions;
3. Direct that conditions be added to the planning consent; or
4. Direct that planning permission not be granted indefinitely or for a specific period of time.

Of the 3,709 planning applications dealt with by the Highways Agency in the 2006/07 financial year under Article 14, only 60 (2%) resulted in a direction that permission not be granted while 389 (10%) had conditions of transport mitigation measures placed upon them. The full breakdown is given in Table 3.1.

Table 3.1 Planning applications dealt with by the Highways Agency 2006/07

Highways Agency response to application	Number	%
No objection	2,257	61%
Further information requested	397	11%
Advice offered to LPA	606	16%
Package of transport mitigation measures conditioned	389	10%
Article 14 direction that permission not be granted	60	2%
Total	3,709	100%

Source: Highways Agency Development Control Database

The data only covers a single year and an analysis of the Highways Agency Development Control Database over a number of years would provide a more robust picture of the extent of the impact on development. Additional data on the size of the planning applications (in terms of house numbers) may also be available. Primary research of this sort is beyond the scope of this study, but we point out that the Highways Agency Development Control Database is a potential source that could be further tapped to provide additional quantitative data on the magnitude of infrastructure constraints, which may help to build up a national picture.

The Highways Agency intervenes where developments are likely to have an unduly negative impact on the strategic road network or have failed to introduce sustainable transport elements where these are considered necessary and appropriate. Although sometimes portrayed as holding back certain projects, the Highways Agency, in this largely reactive and responsive role is almost entirely dependent upon the quality of development and infrastructure schemes that come forward from the private sector or from other parts of the public sector – in some cases consultation between the applicants and the Highways Agency have led to a resolution.

The Highways Agency’s responsibilities on behalf of the Secretary of State, as set out in Circular 2/2007, are clear in this regard, but occasionally the involvement of the Agency in large or complex proposals can highlight wider difficulties in securing and delivering appropriate infrastructure that matches the additional demands of the development. An example at Ashford is given below, and cases such as this highlight the reasons behind the Government’s commitment to improving the mechanics and delivery of infrastructure, be it through proposals for an Infrastructure Planning Commission, National Policy Statements, or the Community Infrastructure Levy.

Junction 10 of the M20 – Ashford

In 2002 the Highways Agency invoked Article 14 powers to halt development around junction 10 of the M20 near Ashford in Kent. A number of sizeable new housing developments with a total capacity of circa 5,000 new homes were planned close to the junction. According to the Highways Agency assessment the combined effect of these plans would overload road capacity. Exercising its statutory responsibility, the Agency felt it appropriate that these developments pay for the required expansion to road capacity. Because there was no established mechanism for forward funding this investment nor for dividing the costs among several different developers no agreement could be reached to carry out the necessary road works. This prominent case, cited in the Barker Review, highlighted the need for new ways to deliver infrastructure funding.

The Agency is constantly reviewing the nature of its involvement in the development control process, including its use of Article 14 powers. The publication in 2007 of both Circular 2/2007 and the DfT/CLG 'Guidance on Transport Assessments' have gone some way towards clarifying the Highways Agency's role and objectives for its partners, including local authorities, Regional Planning Bodies and prospective developers.

The Agency followed the issuing of the Circular with a series of regional events with the development industry to highlight the Agency's role in the planning process and how it works with regional and local bodies to deliver sustainable development proposals. The Highways Agency also published a leaflet to encourage developers to enter into pre-application discussions with the Highways Agency, the aim being to facilitate the planning application process and agree the transport implications before planning applications are lodged with local authorities. It is hoped that these initiatives will be matched by an improvement in the way in which some developers perceive the importance of transport infrastructure and reduce the necessity for the Agency to object to proposals through its Article 14 powers.

In an interview conducted as part of this research a Highways Agency representative stressed that the Agency itself is not a constraint on the provision of appropriate levels of development infrastructure, and it continues to improve and extend the strategic road network through its own spending programme. But when engaging with the spatial planning system, the Agency can find itself, for good reason, having to resist certain proposals that are deemed to be unsatisfactory in sustainable transport terms.

This can have significant repercussions, and senior planning and development officers and officials in all of England's regional assemblies interviewed for this research revealed road capacity to be one of the primary constraints which needed to be overcome if raised new build targets were to be achieved. However concrete evidence quantifying the likely magnitude of constraints in terms of housing numbers was not provided. To get beyond these general statements it is necessary to trawl for evidence at the local and sub-regional levels. Two case study examples are presented concerning the Thames Gateway and North Northamptonshire growth areas.

3.3 Case study – The Thames Gateway

With 160,000 new homes targeted for completion between 2001 and 2016 the Thames Gateway is Europe's largest regeneration project. According to the Interregional Planning Statement issued by the Thames Gateway Regional Planning Bodies (2004) "the speed and quality of delivery of transport improvements will be a make or break issue for the timely and full realisation of the Gateway's capacity" (p. 29).

According to the Interregional Planning Statement achieving the housing target would be dependant on the delivery of a number of key transport infrastructure components as quickly as possible within the 2016 timeframe, with the Channel Tunnel Rail Link, the Thames Gateway Bridge, Crossrail and a Lower Thames Crossing being identified as particularly vital.

Since the release of this Statement the Thames Gateway Bridge has been embroiled in a prolonged series of planning inquiries and to date there is no certainty if and when this vital project will be granted planning permission. In May 2007 the National Audit Office produced the report 'The Thames Gateway: Laying the Foundations' which was critical of the programme management systems in place. Reporting on evidence obtained from interviews the National Audit Office (NAO) found that major sites were being delayed due to a lack of joined-up infrastructure investment.

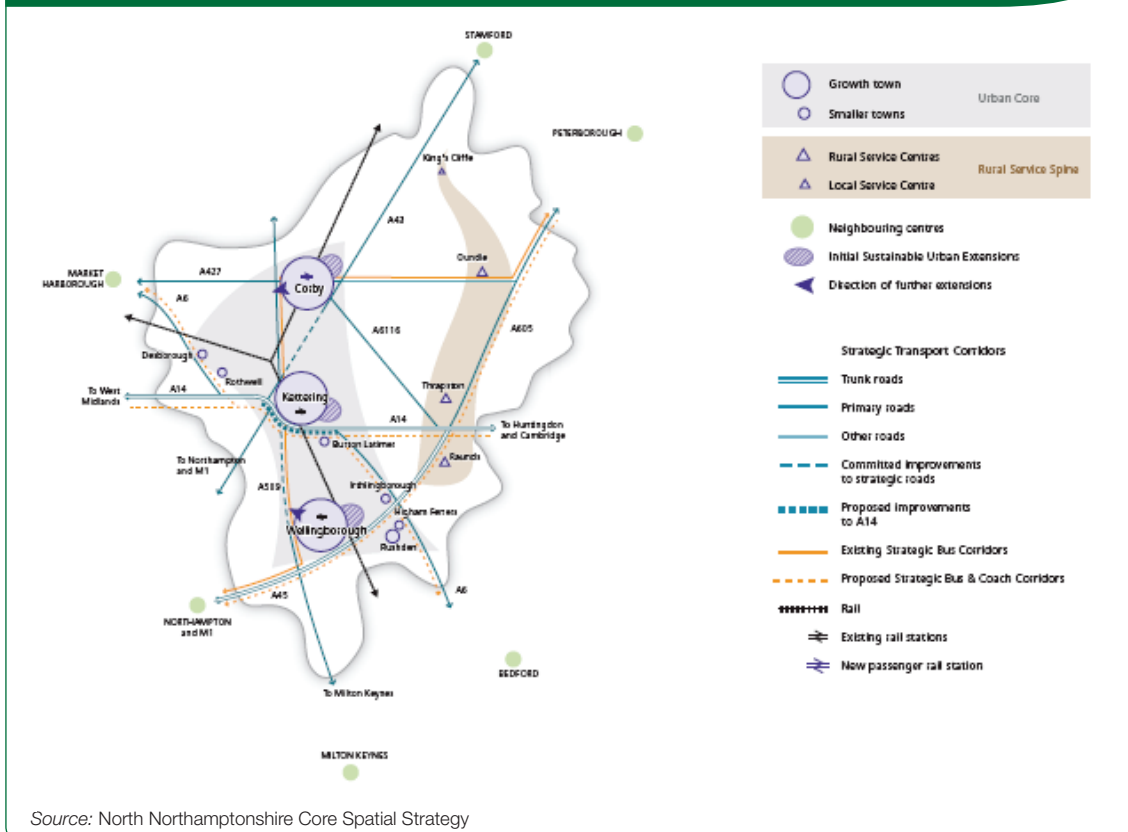
The case studies cited in the report included Barking Riverside where 9,400 projected homes were reliant on additional transport infrastructure that was not included in either Transport for London or DfT spending plans. A second example was Kent Thameside where 30,000 planned new homes were still seeking the required agreement from the Highways Agency concerning road capacity some 12 years after the overall scale of the proposed development had been identified. The Highways Agency found itself having to object to major planning applications until a solution to capacity problems on the A2 was found.

A comprehensive overview of progress on the Thames Gateway as a whole is not available but the NAO report states that 24,000 new homes have been built between 2001 and 2005. This rate of 6,000 dwellings per year is just a little over half the rate required to achieve the target of 160,000 new homes by 2016. The evidence presented here suggests quite strongly that infrastructure related issues are causing slippage which are endangering the growth area's long term completion targets. The need for improved monitoring systems is also highlighted.

3.4 Case Study – North Northamptonshire

There are plans to build 52,100 new homes between 2001 and 2021 in North Northamptonshire, which is part of the Milton Keynes South Midlands (MKSM) growth area. The majority of these dwellings are to be located in or adjacent to the area's three largest towns – Corby, Kettering and Wellingborough.

Table 3.2 North Northamptonshire Transport Strategy



The North Northamptonshire Core Spatial Strategy (2007) states explicitly that “planning permission will not be granted for new or expanded Sustainable Urban Extensions until solutions to infrastructure constraints have been agreed with the appropriate delivery body” (p 42). Key strategic infrastructure constraints identified in North Northamptonshire are the limited capacity of sewerage infrastructure and levels of congestion on the A14. Studies have identified how these constraints can be overcome to allow planned levels of development to 2021. This is likely to entail:

- Improvements at the existing sewage treatment works plus a new treatment works at Corby;
- Expansion of Broadholme sewage treatment works, (which serves the settlements of Wellingborough, Irchester, Rushden, Irthlingborough, Kettering, Desborough and Rothwell) and associated infrastructure; or alternatively a new sewage treatment works at Kettering;
- Increased sewage pumping capacity in the Rothwell/Desborough areas;
- Provision of a separate carriageway to take ‘local’ traffic off the A14 between Junction 7 (A43 Northern Bypass) and Junction 9 (A509), together with widening the A14 to three lanes in the section from Junction 9 to 10 (or new Junction 10A).

The Core Spatial Strategy acknowledges that because of the timescales involved in planning, funding and delivering these major infrastructure projects improvements may not be made on time resulting in delayed housing provision. A case in point is the expansion of Broadholme sewage treatment works which is unlikely to be achieved before 2013. Also stage one of the A14 improvement may not be complete until 2017. The North Northamptonshire Development Company's Spatial Investment Strategy looks at these issues in more detail, finding that interim solutions will be needed to enable growth to continue prior to infrastructure projects being completed. Specifically, the interim solution to the A14 constraint may involve a range of measures to manage local travel patterns, together with the DfT relaxing its congestion targets.

The North Northamptonshire Core Spatial Strategy concludes that "if the market supports rates of development as set out in the housing trajectory ... but acceptable interim solutions to infrastructure constraints cannot be found, around 7,000 homes planned prior to 2017 will need to be deferred until later in the plan period or beyond" (p 40). Planning permission for Sustainable Urban Extensions additional to the initial developments east of Wellingborough and North-West of Corby will not be given until infrastructure solutions have been identified.

3.5 Additional Evidence from the South East

Roger Tym & Partners were commissioned by the Office of the Deputy Prime Minister and the Government Office of the South East to provide independent technical advice to the Examination in Public of the Draft South East Plan. In May 2006 the report 'Augmenting the evidence base for the examination in public of the South East Plan' was produced. The core task of the research was to conduct a Sustainability Appraisal of various housing options.

Using assumptions about the availability of brownfield land, the density of development and the distribution of new housing across the region five alternative growth options were developed. These involved housing growth ranging from 33,000 dwellings per annum to 46,000 dwellings per annum, significantly higher than the 28,900 dwellings per annum proposed in the draft South East Plan. The research set out to assess what the additional impact of these five scenarios was likely to be, over and above the Draft South East Plan baseline. A number of different constraints and potential impacts were modelled, concerning:

- The use of aggregates in construction;
- Construction waste and domestic waste generation;
- Carbon Dioxide emissions;
- Trunk road stress;
- Water resources
- Water quality, and
- Implications of Greenfield land requirement.

Seven different models or assessment methods were used to inform the Sustainability Appraisal. Of greatest relevance to this study are the findings concerning trunk road stress, water resources and water quality.

Concerning roads the Highways Agency/Parsons Brinkerhoff model employed, showed that even with the lower South East Plan housing allocations, a number of trunk roads in the region are likely to have a Ratio of Flow to Capacity of greater than 120% and hence will be unable to cope with the predicted flows. These included trunk roads in Central Oxfordshire, the Western Corridor and London Fringe, South Hampshire, the Sussex Coast and the approaches to the Kent Thames Gateway. The report noted “improving the road transport network to accommodate additional growth may be capable of addressing some or all of these problems but this is subject to both investment funds being available and obtaining planning approval” (p. 29).

With regard to water supply an Environment Agency model was employed which found that without demand and supply above those already planned before 2011, all scenarios would result in infrastructure deficits in the medium or long term. Additional housing growth over and above the South East Plan baseline scenario could only be accommodated if efficiency savings of between 8 and 21% were achieved and a number of new water supply schemes were successfully implemented over the next twenty years. These included four new reservoirs in the region, the enlargement of an existing reservoir and the transfer of water between Water Resource Zones.

The analysis of waste water treatment capacity drew on previous research undertaken by The Environment Agency. This work had already identified constraints concerning 63 of the in total 523 sewage treatment works (SWTs) using the South East Plan base line housing figures. The Roger Tym report concluded that there was uncertainty relating to the results of this study in relation to the higher housing numbers.

The Roger Tym study does not quantify the impact of infrastructure constraints on new build levels. While making clear that capacity will need to be expanded to accommodate growth, the research does not reveal whether a failure to do so will place a cap on completions at a certain level, or what the possible effects of allowing growth to take place in advance of increases to infrastructure capacity might be. Additional exploratory research into these issues is therefore recommended.

To forge consensus around some of the challenging issues facing the South East Region the Institute for Public Policy Research (IPPR) established the Commission on Sustainable Development in the South East, bringing together representatives from the business, voluntary and environmental sectors and cross-party political representatives from the South East and London. The Commission produced a final report in 2005 which brought together a range of research papers covering various aspects of the sustainable development agenda including economic growth, quality of life, transport, water supply, flood risk and the affordability of housing.

The research brought together evidence relevant to the topic of infrastructure constraints, although none of it enables the effect of constraints on levels of new build housing to be directly quantified. The report stated for example that “by 2010, road traffic is expected to grow by 25% in the South East, in part due to falling motoring costs but also because of deficiencies in public transport” (IPPR 2005, p. 5). It was also found that there has been a legacy of under-spending on transport, citing significant declines in public spending as a proportion of GDP from the early 1990s. In arguing the case for increased funding of infrastructure the Commission pointed out that

the £200 million Community Infrastructure Fund was little more than 1% of public sector expenditure on transport in 2004-05 and it would be insufficient to meet the future additional transport infrastructure costs associated with the growth areas (IPPR 2005, p. 6).

Environmental Infrastructure

4.1 The Role of the Environment Agency

The Environment Agency is a non-departmental public body which leads on the protection and improvement of the environment in England and Wales and is accountable to Parliament through Ministers. The Agency provides, regulates and advises on environmental infrastructure with responsibilities concerning clean water, waste, drains, sewage and flood risk. Empowered by the Water Framework Directive and Water Act, the Environment Agency regulates abstractions from, and discharges to the water environment. The Agency's Water Resources Strategy sets out a 25-year framework for planning for water demand and new resources.

The Environment Agency is a key advisory body to the government on environmental issues including pollution, water and flood risk. It is therefore a key stakeholder in advising and inputting into regional level planning strategies and local development frameworks. The provision of infrastructure to support regional and local level strategies is a key element to their delivery and the inability to carry out the advanced provision of services could act as a barrier to longer term growth plans.

As a stakeholder, the Environment Agency has a critical role in working with partners (at the regional and local level) to identify barriers to implementation and to work with partners to overcome these barriers. Such engagement can take many forms including the development of a shared evidence base to inform and support appropriate interventions, an alignment of key strategies and investment strategies to ensure that the key priorities are taken forward and inform the investment decisions and Management Plans of the Agency and other service/utility providers.

Involvement of the Environment Agency in the West Midlands RSS Revision

In the West Midlands the Environment Agency oversees a Water Management Group which includes the various functions within the Environment Agency, the Assembly and the two Regional external water providers – South Staffordshire and Severn Trent. This group has been significantly strengthened during the course of the RSS revision process to provide key input for the Phase Two Preferred Option. The Group is working on Water Strategy plans based on the emerging housing growth numbers, looking at how they can implement provision through their own management plans.

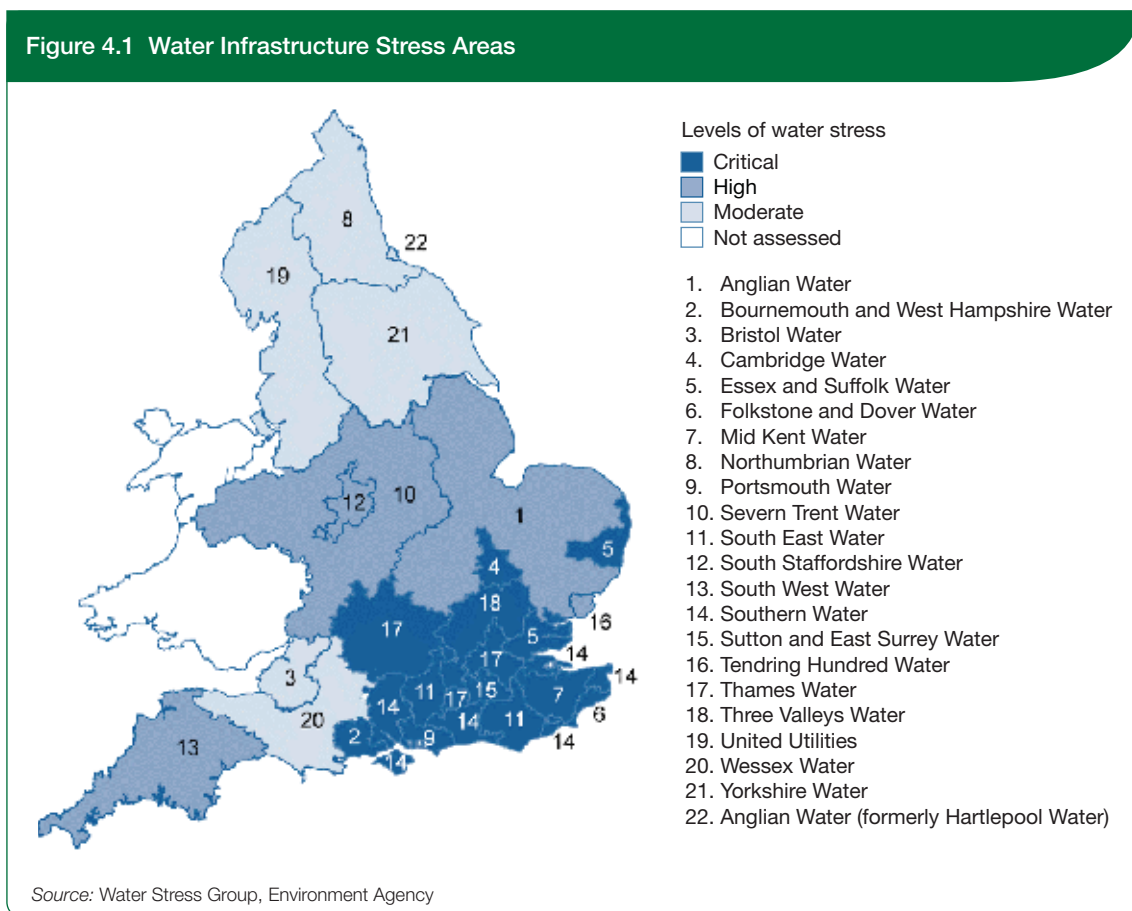
A second group has been established called the Flood Risk Group again involving the Environment Agency, the Assembly and the water authorities. The role of this group has been further strengthened in the light of the Emerging Phase Two Revision and has a key role to play in inputting into the Regional and Sub-regional Flood risk assessments and the RSS revision process.

The Agency's main areas of operation are split up into eight regions, namely Southern, South West, Anglian, Midlands, Thames, North West, North East and Wales. These regions do not follow the boundaries of the nine Government Office Regions. The Environment Agency's Thames region for example covers 100% of the GLA area, 30% of the South East, 20% of the East of England and 5% of the South West. Only in the North West do regional boundaries coincide. This situation adds complexity to the interface between the Agency's activities and those of the Regional Assemblies.

Each region has a set of documents describing and prioritising challenges to be met. Current corporate strategies run until 2011 and there will then be an opportunity to align updated Environment Agency strategies with the RSSs which are currently being revised.

4.2 Constraints identified by the Environment Agency

The Agency's Policy Brief on Environmental Infrastructure (2007) states that "accelerated development in the South and East of England, in particular, will stretch the capability of some environmental infrastructure to cope" (p. 5).



The Policy Brief goes on to state that there has been a historic legacy of under-investment and maintenance in public and private water and sewer capacity which has resulted in leakage, collapse, overloading and sewer flooding. The fact that existing environmental infrastructure is in need of additional investment is limiting the capability of the system to accommodate future expansion.

The Brief warns against the assumption that it is always possible to manage the environmental impacts of housing growth through investment in new or expanded environmental infrastructure. "Where growth threatens to exceed absolute environmental limits there may be barriers, in terms of cost effectiveness or the limits of current technology, which mean that growth is impossible to

accommodate. Therefore rigorous assessment of the environmental impacts and the viability of infrastructure dependent solutions are essential before plans for growth are adopted” (Environment Agency 2007, p. 7).

Of particular concern to the Agency is the location of housing in high flood risk areas and in areas where water quality is under pressure and water resources are already fully committed. The policy paper referred to initial assessment work carried out on New Growth Points which found that there was increased flood risk in 80% of cases, a lack of sewerage capacity in 72% of cases and potential breaches of water quality standards in 62% of cases.

Concerning waste management the Environment Agency policy brief notes that increasing populations will mean more domestic waste, leading to higher costs and potentially greater difficulty in diverting waste from landfill. Again, this issue is particularly prominent in the wider South East where landfill capacity is under pressure. The brief states that, assuming business as usual, the total capacity gap for the treatment of Municipal Solid Waste in 2012/13 for England is projected to be 20.1 million tonnes per annum (p. 17). The Agency recognises that the delivery of waste management infrastructure is problematic, sighting the fact that there were no major planning approvals for new waste management facilities in 2004/05. Quantifiable evidence concerning the potential impact of this infrastructure bottleneck on new housing supply is not available.

In ‘Four pillars for sustainable housing growth’ (2007) the Environment Agency stated that an average of £20,000 will be needed for each new home in the south east of England to protect water quality and provide water, waste management and flood protection. In ‘Hidden Infrastructure, the pressures on environmental infrastructure’ (2007) the Agency made the point that reducing the demands placed on infrastructure is cheaper than building new infrastructure, and that this was to be achieved by encouraging people to change their behaviour.

4.3 Water Supply, Waste Water and Solid Waste Management

In support of RSS Revision the South East Regional Authority commissioned a number of technical studies to identify potential infrastructure constraints, producing findings that echo those of the Environment Agency presented above. Concerning water supply, the Regional Planning Body found that around five new reservoirs needed to be built in the South East during the next 20 years to meet projected demand. SEERA’s work also established that it is necessary to secure initial funding for preliminary technical studies now in order to ensure new capacity is available 15 years hence. According to interview evidence OFWAT will not provide advance funding until a full case for future need has been properly made. To gauge future capacity accurately and match it with future need, SEERA has recognised the need to work intensively with the Environment Agency and water companies. It is felt that this groundwork has made forward funding possible and an important step has been set to ensuring that capacity issues will not constrain development in the long term.

SEERA also carried out an inventory of waste water treatment capacity. It was found that most of the regions 520 treatment works had enough capacity to cope with projected growth, but for 60 plants capacity constraints were identified. Of these, research revealed that capacity could be sufficiently extended through new investment and technological improvement. This left 30 waste water treatment facilities with projected capacity constraints for which no easy solution was at hand. This information was fed into the RSS planning process as well as Local Development Frameworks through which it will have a bearing on development plans. SEERA believes its proactive and detailed approach to identifying infrastructure bottlenecks will help to reduce the chance of future planning delays.

During consultation senior GLA planners stated that London also faces long term capacity issues concerning water supply and sewerage. In particular the Thames Tideway Sewage Scheme is a major infrastructure project required to modernise waste treatment in the city. It was asserted that problems associated with the current outdated sewage system were delaying sites coming forward, although more detailed research at borough and site level would be required to unearth details on specific examples. The Government gave the green light to the Thames Tideway Sewage Scheme after the funding request was initially refused by water regulator OFWAT.

Water in the North West region is largely supplied by United Utilities. In the EiP Response to the North West Draft RSS it was brought to the attention that the regional authority's plans had been based on the old housing figures contained in RPG13. The question of whether capacity was sufficient to meet the significantly higher housing target contained in the Draft RSS led the Panel to ask for a paper to be produced. The primary conclusion of this paper stated that 'it should be possible to accommodate the proposed growth, provided there are strong policies in RSS to provide an effective and co-ordinated strategic framework. This must facilitate increased building standards and ensure growth is planned where infrastructure capacity exists or can be delivered in time to serve the development' (quoted in EiP 2007, p 193).

4.4 Flood Risk

Government policy recognises the importance of taking full account of flood risks when planning and consenting to new development and this has been reinforced by the large scale flooding that occurred during the summer of 2007. Planning Policy Guidance Note 25 (PPG25) entitled Development and Flood Risk was published in July 2001 and superseded by Planning Policy Statement 25 (PPS25) in December 2006. PPS25 aims are to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas of highest risk according to the so-called Sequential Test.

In October 2006 the Government amended planning regulations to extend the Environment Agency's statutory consultee role in relation to flood risk. Local Planning Authorities in England are now required to consult the Agency on most development proposals at risk from flooding. Furthermore these changes increase the role given to the Environment Agency to offer advice on any development proposal where there is a risk of flooding. The Agency provides technical advice to Local Planning Authorities and developers on how best to avoid, manage and reduce the adverse impacts of flooding. When commenting on spatial plans and sustainability appraisals, the

Environment Agency aims to ensure they are 'sound' by encouraging decision-makers to:

- carry out Regional and Strategic assessments of flood risk as part of sustainability appraisal;
- include suitable flood risk objectives and indicators;
- correctly apply the sequential test – steering new development to the lowest risk flood zone appropriate to the proposed use – and the exception test;
- reduce flood risk through making space for water;
- when climate change is expected to mean that some existing development may not be sustainable in the long-term, use regeneration to help relocate existing development to lower risk locations, and
- include policies that reflect PPS25's Key Planning Objectives.

That the Agency seeks a rigorous application of the sequential test is made clear in 'Hidden Infrastructure, the pressures on environmental infrastructure'. To back this up the Environment Agency is highly active in assessing flood risks associated with development proposals. According to the report *High Level Target 5: Development and Flood Risk in England 2006/07* (EA, 2007) the Agency sustained 1,067 objections on flood risk grounds to planning applications in England during the 2006/07 financial year. Because the policy changes noted above occurred midway through the monitoring period the effect of these changes are not yet fully visible.

Table 4.1 Environment Agency sustained objections on flood risk grounds

Type of development	2006/7 Major	2006/7 Minor	2006/7 All	2006/7 %	2005/6 %	2004/5 %	2003/4 %	2002/3 %
Residential	127	558	685	64%	63%	66%	71%	68%
Mixed development	52	42	94	9%	7%	6%	5%	2%
Infrastructure & waste	7	14	21	2%	3%	2%	4%	2%
Other	91	176	267	25%	27%	26%	20%	28%
Total	277	790	1,067	100%	100%	100%	100%	100%

Source: High Level Target 5: Development and Flood Risk in England 2006/07

685 objections (64% of all cases) concerned plans for residential development, 127 of which were for 'major' planning applications – these being developments in which 10 or more dwellings are to be constructed. In addition 94 objections were raised to mixed use schemes and 21 objections to infrastructure and waste related plans. A number of these objections will no doubt also impact on residential new builds, either directly or indirectly.

The lack of a Flood Risk Assessment was the most common reason for the Environment Agency to lodge an objection – this was the case in 43% of objections. In 20% of cases the Flood Risk Assessment was considered to be unsatisfactory and in 21% of cases the area was considered to be at risk of flooding.

The Local Planning Authority is the final decision-maker on planning applications, but if it grants permission for a major development which the Agency has advised against, it must notify the Secretary of State in accordance with PPS25. The effect of this 'call-in' is to encourage Local Planning Authorities to follow Environment Agency advice. In 96% of cases where the Environment Agency knows the outcome of its objections to individual planning applications, the final outcome was in line with its advice. If taken to mean that the planning application was rejected then this will clearly have a significant impact on new build numbers, as some plans concern the construction of hundreds of dwellings. But the evidence does not provide a detailed quantitative picture of the full effect of planning permission refusals due to flood risk in terms of numbers of dwellings.

The figures in Appendix 4 of the above mentioned Environment Agency report indicate that the highest number of objections to 'major' residential development occurred in the East of England, followed by the South East, the South West, the North West and the East Midlands. These five regions accounted for nearly three-quarters of all such objections in 2006/07. These figures reinforce anecdotal evidence provided by consultees of this study – interviews with senior regional planners⁸ revealed major concerns regarding flood risk in all regions with the exception of the North East and the North West.

Citing an Association of British Insurers report (ABI, 2005), the Commission on Sustainable Development in the South East (IPPR, 2005) noted that 10% of development planned in the Growth Areas of the South East for 2016-2021 had been allocated in flood risk areas with an annual probability of flooding higher than 1.3%. Aylesbury and Kent Thameside are the two growth areas most at risk within the region.

Indeed, flood risk has been identified as an issue of major importance in the Thames Gateway. A series of Strategic Flood Risk Assessments and site level assessments have been carried out in the Gateway, with the Environment Agency taking a lead role in working closely with planning bodies and development partners to ensure that development takes place responsibly. Despite this there have been numerous media reports suggesting that flood risk in the Thames Gateway is still too high⁸. According to a consultee at the GLA the effect of the identified flood risk constraint has already been factored into the Mayor of London's Housing Capacity Study (2005).

Among the areas identified as having a high risk in other parts of the country were the East Coast of Lincolnshire in the East Midlands, the city of Hull in the Yorkshire and Humber region and several areas in the West Midlands including Shrewsbury and Warwick-Leamington. Although

⁸ See for example The Guardian 01/02/2005 'Flood risk could make 300,000 homes uninsurable'.

interviewees in most regional assemblies highlighted the importance of flood risk considerations, no clarity was given concerning the likely magnitude of the constraint in terms of housing completions in the future. The evidence presented above seems to indicate that flood risk is a greater impediment to new build activity than roading constraints.

4.5 Evidence from the West Midlands Infrastructure Study

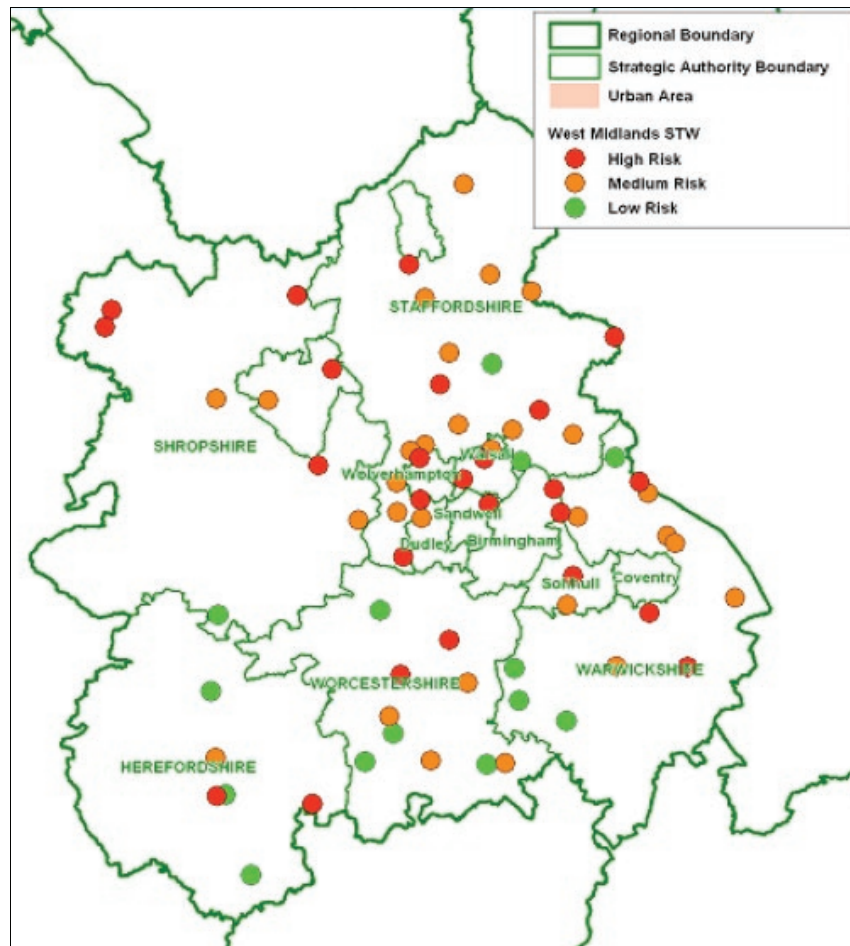
To support the West Midlands RSS Phase 2 revision Mott MacDonald and GVA Grimley were commissioned to investigate the degree to which infrastructure might represent a constraint to the achievement of the RSS housing projections. This work resulted in the 'West Midlands Regional Spatial Strategy Infrastructure Review report' which was finalised in November 2007. The research was focused on the identification of 'showstoppers' and serious constraints to aid the selection of a preferred RSS Option.

The research methodology consisted of a desk-top review of available data. Following an initial stakeholders workshop it was agreed to focus on the areas where the largest potential constraints were deemed to lie, these being water and transport related issues.

Concerning transport the study identified a clear need for targeted major investment including an upgrade of the West Coast Mainline, additional highway capacity in the M6 Corridor and improved links between the M54 and the M6. Input from the Highways Agency suggested that extended implementation of Advanced Traffic Management and fiscal measures such as local and national road user charging on the motorway network may help to alleviate congestion, and this was necessary because further major capital investment was unlikely. No major constraints on RSS were identified concerning the rail sector although it was felt some investment was needed to achieve targets concerning modal shift.

The main conclusion with regard to transport was that there were many identified constraints, but the majority of these are already "owned" either by the national or local responsible authorities. A clear link suggesting transport issues would constrain new housing supply was not established.

Figure 4.2 West Midlands Sewage Treatment Capacity Risk



Source: Environment Agency/Mott MacDonald

Regarding the provision of water in West Midlands, the Mott MacDonald study looked exclusively at the potential impacts of growth in demand on strategic water resources and treatment capacity and did not consider the more localised capacity constraints in the existing water distribution system. It noted that current Water Company Water Resources Plans dated from 2004 and were based on lower rates of housing growth than those being considered in the RSS Revision Options. The study concluded that the development of new water supply capacity will be required in the future to serve the projected housing growth rates.

In conclusion, water capacity was found to be a key issue and there was a clear need for early planning by Local Authorities, Water Companies, the Environment Agency and others to safeguard future supply. This was particularly true in the Severn, Birmingham and South Staffordshire Zones.

The study called on planners and developers to engage in timely discussions with the water companies as early as possible in the development plan process about water infrastructure constraints when considering locations for new houses. Another recommendation the report made was that the RSS revision should include policies on water efficiency, such as requiring all new houses to meet level 3 of the Code of Sustainable Buildings as a minimum.

Additional infrastructure constraints of a more localised nature revealed by the study include:

- The Black Country: dealing with contaminated brownfield land;
- Hereford and Nuneaton: road capacity constraints
- Shrewsbury: road capacity constraints, water supply constraints, limited capacity at the Monkmoor Sewage Treatment Works, flood risk from the River Severn and its tributaries;
- Telford: poor rail connectivity;
- Warwick/Leamington: traffic congestion within the urban areas, flood risk from the Rivers Avon and Leam and sewerage and drainage capacity issues post 2012;
- Worcester: insufficient capacity in the transportation, a lack of sufficient waste and limited headroom for sustainable supply of water from the Severn region and aquifers in the north west of the county.

With regard to the other main utilities – gas, electricity, and telecommunications – the infrastructure study revealed that providers of these services all indicated that provided they receive adequate notice and planning support, they are confident that they can meet emerging demand.

5.1 Utilities Providers and the Regulatory Framework

Utilities such as gas, electricity, water, drainage and telecommunications are provided to new housing developments by private companies operating in a private sector market. The Callcutt Review (2007) noted that “companies involved in infrastructure provision work to long financial and planning horizons, and seek to make a return on their investment. They are driven by the profit motive and in most sectors competition is strong. The utilities providers work to their own business cycles, and any development site, however large, will only represent a small part of their future business” (Callcutt p. 57).

The utilities markets are regulated by public sector economic focused bodies, these being OFWAT – regulator of utility water and the sewerage industry, OFGEM – regulator of the gas and electricity networks and OFCOM – regulator of communications industries, which includes television, radio, telecommunications and wireless communications services. These regulators are charged with setting price limits for the private sector utilities providers and have powers of price limitation which are designed to protect consumers from the monopoly position held by providers in each locality.

Price limits are set once every five years, with typically two years being spent on preparation for each cycle. OFWAT for example began initial preparations for price review PR09 in March 2007, the full operational period of which will run from 2010 to 2015. OFGEM's current price cycle runs from 2004 to 2009. Companies submit assessments of supply and demand over the longer-term for the purposes of business plans, which are fed into price reviews.

5.2 Evidence from the Callcutt Review

The Callcutt Review, published in November 2007, looked into how the supply of new homes is influenced by the nature and structure of the house building industry, its business models and its supply chain, including land, materials and skills. The Review also touched on the issue of infrastructure constraints on new housing supply, noting that constraints arise on two fronts: planning and funding (p. 57). Concerning utilities, the Review referred to problems arising from a mismatch between the planning cycles of the public and private sector infrastructure providers which were creating difficulties for house builders when trying to engage with those providers.

The Review illustrated the mismatch between private and public sector planning horizons by quoting an example put forward by a contributor from the London Thames Gateway Development Corporation. This example concerned Thames Water which has a seven year planning horizon but only has access to detailed Local Development Framework data for the first three years of that cycle. This, according to the contributor to the review, inhibits the organisation's ability to correctly forecast the funding requirements to branch regulator OFWAT.

The following diagram originating from work done in the South East Region was included in the Callcutt Review to further illustrate the point about varying time horizons impeding integrated infrastructure planning.

Figure 5.1 Planning Cycles in the South East

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
		Economic Development – SEEDA Corporate Plan												
		Economic Development – SEEDA Regional Economic Strategy												
		Housing – RHB allocates over 2 years												
		Education & Training – LSCs Capital Investment Strategy												
		Education & Training – HEFC Corporate Strategy												
Education & Training – HEFC Business Plan														
Health – NHS funding cycle														
		Arts & Culture												
Sport														
		Ofwat – Business plans based on a five-year investment schedule												
Waste – Regional Waste Strategy on a 20–25 year basis														
	Electricity Price Control Review				Gas Price Control Review	Electricity Price Control Review				Gas Price Control Review	Electricity Price Control Review			
		Gas & Electricity – Ofgem Corporate Plan												
Flood Defences – Coastal and river strategies have a 50 year time horizon														
	Rail – Access Charges Review price setting					Rail – Access Charges Review price setting								
	Roads – Highways Agency Corporate Plan													
		Roads – Highways Agency Business Plan		Roads – Highways Agency Business Plan		Roads – Highways Agency Business Plan		Roads – Highways Agency Business Plan						

Source: Originally produced in May 2006 by SQW Consulting for the South East of England Regional Assembly and reproduced in The Callcutt Review, p. 58

5.3 Evidence from the Manchester City Region

The Centre for Sustainable Urban and Regional Futures (SURF) was commissioned by the Northern Way Sustainable Communities Team to examine infrastructure provision in the North West. Its report entitled ‘City-Regions and Critical Infrastructure: Meeting growth targets sustainably’ (2007) looks specifically at growth related infrastructure issues in the Manchester City Region. One of the research findings was that many infrastructure providers were working on outdated assumptions that assume low levels and spatially uniform growth in demand for infrastructure. This resulted in investment strategies that failed to meet the needs of the new city-regional growth agenda (SURF 2007, page 5). This is backed up by the Environment Agency report ‘Hidden Infrastructure, the pressures on environmental infrastructure’ (2007) which makes the case for better forecasting of new housing development in water company plans, taking account of growth area and new growth point proposals.

The SURF research also reported on anecdotal evidence suggesting that the utility regulators OFGEM and OFWAT were preoccupied with keeping costs down during the price review process which was detrimental to advance investment in the expansion of capacity to facilitate growth.

The SURF report concluded that the current state of play, in terms of the coordination of territorial priorities and network infrastructures, is variable. The research found there to be mechanisms in place in Manchester City-Region to consider the relationships between territorial and network planning processes for transport, waste and flooding, however for water, sewage and energy little consensus about the problems to be tackled at city-regional level was found to exist. This is summarised in Table 5.1.

Table 5.1 Manchester City Region comparative summary of infrastructure planning

	Transport	Waste	Flooding	Water	Energy
Shared understanding of problem				?	?
Joint development of options			?		
Selection of solution		?			

Source: SURF 2007, p. 6

In the short term, across most infrastructure networks there is a ‘temporary fix’ until 2009/2010 that can ‘sweat’ infrastructural assets to meet growth priorities over that period. But there is a consensus that such fixes do not provide a longer-term strategy for managing territorial and network priorities. Consultation carried out as part of the research suggested that in the wider North West Region power supply was currently not constrained, but there had been some examples of development being slowed down.

The Manchester City Region study concluded that whilst Local Authority working with the utility companies is useful, it is resource hungry and the process of engaging with them is possibly constrained by lack of staff resources.

5.4 Additional evidence from consultations

The points made in the Calcutt Review about utilities were echoed by a number of senior planners interviewed for this research. It was felt that the protracted framework used by industry regulators to plan the future funding of utilities made it difficult for regional and sub regional bodies to plan for future housing growth.

One consultee in the North West expressed the view that the absence of accurate information was a major obstacle when planning for future infrastructure provision at the regional level. The point was made that utility companies, driven by commercial considerations, are not open with information and will generally not admit to possible future capacity constraints when asked about them. Utility company organisational structures were described as being complex, making it

difficult for public sector planners to know who they needed to talk to within the utility company to address the issue of future capacity planning. An established culture of cooperation between the public and the private sectors was felt to be lacking. This was also found in the West Midlands – engaging with people at the right level within these organisations to be able to influence their internal/corporate strategies was a real issue for the Region during the RSS revision process.

From the evidence gathered it appears that it is only when specific sites come forward for development that some infrastructure constraints, particularly those associated with utilities, become apparent. Anecdotal evidence from the North West Region pointed to the experience of some developers being given advance assurances by utilities companies that their services would be provided promptly, to be subsequently let down when the utility connection was actually required. The reason given was that utilities companies tend to operate on a ‘first come, first served’ basis and too many requests for new provision at the same time can overload the short term capacity of the provider, causing some plans to be delayed.

According to the same source some developers may find themselves being charged the full cost of providing a network extension (a new electricity sub-station for example) even though the overloading of existing capacity was caused incrementally through the combined effect of a number of developments.

Difficulties of this type commonly concern the provision of sewerage, water and electricity. Localised capacity constraints concerning utilities are more likely to crop up on high density developments due to the concentrated demand that such development places on parts of the network. This study has not found any primary evidence which could be used to quantify the effect of these small scale utility constraints on completion rates and information is likely to be only available on a case by case basis at the site specific level.

An additional problem identified by some of the regional planners consulted was associated with the dynamic nature of private sector development. House builders responding to changes in the market may bring sites forward at their own discretion making it difficult for the public sector to effectively provide long term infrastructure planning.

The picture emerging from the evidence is that constraints concerning utilities are largely localised ones. Development on individual sites, particularly brownfield ones, may be temporarily delayed or made more expensive due to bottlenecks in the technical or organisational capacity to deliver the necessary infrastructure on time. When added together these delays are certainly having an impact on the overall supply of new housing, although the evidence does not allow the extent of this impact to be gauged.

Potential improvements to help facilitate the timely delivery of extensions to utilities networks include improved coordination between planners and providers, and better forward planning and funding mechanisms. The evidence would seem to suggest that constraints concerning utilities are generally of a lesser magnitude than those concerning roads, water supply, waste treatment and flood risk.

Examples of Best Practice

The evidence review and consultations revealed a range of knowledge positions concerning potential infrastructure constraints on future housing supply. Understanding of constraints and possible bottlenecks was generally found to be greatest in London and the South East Region, coinciding with the areas of greatest housing demand. The research also examined overseas experiences from which lessons could be learned, with a particular focus on the Netherlands. The 'best practice' lessons arising from this work is presented here.

6.1 Information Gathering and an Integrated Approach

The London Plan, the name given to the Mayor's spatial development strategy, was finalised following a comprehensive review of infrastructure constraints including those associated with transport, utilities, flood risk and soft infrastructure such as health and education facilities. This was done primarily through the 2004 Housing Capacity Study (published in July 2005) which gauged the probability of each major site in the city proceeding within a 10 years planning horizon.

Detailed input was gathered from the various London Boroughs and centralised to provide complete coverage of the city. In addition issues facing utilities providers on large brownfield sites, the so-called 'opportunity areas', were explored in quite some detail using input from utilities providers themselves. Cooperative working is seen to be beneficial to both public sector planners and private sector infrastructure providers, helping to focus the direction of future development.

Housing densities on each site were set according to the level of identified constraints and the aggregate numbers were used to inform the housing targets of the London Plan, helping to ensure that the plan is deliverable. This work has been incorporated in London's five sub regional development frameworks, which take a highly integrated approach to development. This also extends to the integration of diffuse sources of public sector funding including contributions from Transport for London, the London Development Agency and Homes & Communities Agency.

In common with London, demand for new housing is extremely high in the South East region. Referred to at 2.5 and again at 4.3, SEERA has commissioned some quite detailed work exploring infrastructure capacity issues while preparing the Draft South East Plan. Highways, rail, telecommunications and utilities were all examined. Technical research into both water supply and waste water treatment has been particularly thorough. This includes the Environment Agency study on waste water treatment outlined in section 3.5. The central question that guided SEERA's investigations was "what does the regional assembly need to do to ensure adequate delivery of infrastructure to support future development?".

Through this technical work understanding of the infrastructure capacity required to facilitate growth was greatly expanded. This concerned technical delivery issues as well as a better understanding of the relationship between planning and funding mechanisms. Taking the example of water supply, SEERA learnt that preliminary technical studies were immediately required in order to ensure new capacity will be available 15 years into the future. Yet OFWAT will not commission such studies until a convincing case for future need has been made. By unravelling the interdependencies of forward planning and funding regional planners were in a better position to strategically direct their resources to preclude potential delays further down the line.

To gauge future capacity accurately and match it with future need, SEERA has recognised the need to work intensively with the Environment Agency and water companies. It is felt that this groundwork has made forward funding possible and an important step has been set to ensuring that capacity issues will not constrain development in the long term.

Achieving the required level of understanding with regard to future infrastructure provision is a major challenge and SEERA has committed significant resources to this end. With a staff of between 40 and 50, the regional authority's planning team is one of the largest in the country. Partnership working is also a feature of SEERA's approach. Close working with local authorities is important as they provide the requisite level of detailed input. While there is a need for a top down policy-driven regional planning agenda, bottom-up feedback is important to ensure that plans are well founded and feasible. By recognising practical constraints, effective measures can be taken to overcome them.

In another example the work carried out in the Manchester City Region by SURF, introduced in the previous chapter, contains commendable best practice elements. The approach taken was a pragmatic one drawing heavily on the expertise of those working in the field. By examining in depth technical, organisational, planning and funding issues concerning all types of infrastructure the study went a considerable way to identifying the root causes of infrastructure related problems.

The research found that the current approach to matching critical infrastructure to growth aspirations was not well coordinated, due in particular to:

- Disconnections between the processes and institutions of territorial and network planning;
- Differences in both the spatial scales and temporal dimensions of territorial and network planning;
- The absence of a governance framework for systemically and more effectively integrating network and territorial planning.

Furthermore, the study found that a series of issues and tensions needed to be addressed in terms of governance – concerning the appropriate governance scale, between incremental and strategic approaches, proactive and reactive approaches, long-term and short-term timeframes, and between public good and commercial pressures (SURF 2007, p. 42).

The study made a number of recommendations pointing the way forward for the City-Region, its ten Local Authorities and infrastructure providers. Many of these revolved around better co-ordination and improved information sharing. A key recommendation was that a 'City-Regional Infra Lab' be established to promote shared understanding, options and infrastructure solutions. The Lab would have three priorities:

- To develop mutual understanding of the organisation of critical infrastructures and city-regions;
- To develop mutual understanding of how the key infrastructure providers and territorial planners currently 'think' prospectively about the development of their systems and places;
- and

- To develop a combined view of networks and territory – to understand where there are opportunities for the combined planning of networks and territory.

The SURF study concluded that an intensive joined-up process was required to tackle infrastructure constraints as the nature of the problems were not just technocratic.

6.2 New ways of Funding Infrastructure

This evidence review unearthed a great deal of information pointing to the vital importance of effective funding mechanisms to overcoming infrastructure obstacles. This is particularly topical, especially given the proposal for the Community Infrastructure Levy contained in the new Planning Bill introduced into Parliament in November 2007 (briefly discussed in Chapter 2). It goes beyond the primary scope of this study to fully explore the evidence on funding, but a few salient examples of innovative practice are presented here.

Firstly, the need to perform a catalyst role by facilitating the provision of infrastructure to pave the way for development is also recognised by senior planners at SEERA. This became evident in a number of cases in the South East, one of which was junction 10 of the M20 by Ashford in Kent, which has been covered in chapter 3 of this report. A second example, cited by a consultee, is in East Kent where the Regional Development Agency set up a development company to forward fund new electricity supply. This was necessary because utilities companies are prohibited from investing “speculatively”. This means they will not take steps to anticipate future growth but will instead wait until there is absolute certainty about the construction of new houses. By waiting for the moment of certainty, infrastructure may end up being delivered ‘late’, leading to delivery delays. To circumvent this problem SEEDA established a company to ‘pre-order’ electricity in East Kent, and recouped the money from the private sector developer later in the development process. In this case the developer was not unwilling to pay, but could only do so once income was being generated from the sale of new homes.

Based on these learning experiences SEERA and SEEDA, together with the Assembly and Development Agency in the South West Region, are currently setting up a Regional Infrastructure Fund (RIF) to provide a more permanent footing for the forward funding of infrastructure. The Regional Infrastructure Fund is regarded as an essential mechanism for ensuring the timely delivery of critical infrastructure to support housing growth as set out in the RSS. A prospectus has been submitted to the Treasury, DCLG and the DfT. It is hoped that the Fund will be operational before the end of 2008.

Case Study: Thames Basin Heaths

The Thames Basin Heaths cover a large area to the west of Greater London Heaths where precious wildlife habitats are threatened by housing growth. SEERA, local authorities, developers and Natural England have been working together on a trade-off scheme to levy £5-6,000 from developers for each new dwelling. The money is to be used to fund the purchase and maintenance of a recreational area between the new build areas and the high-quality habitat which will function as a buffer zone. The green belt's development value is tapped in to in order to fund the protection and improvement of the most precious wildlife areas. The Regional Infrastructure Fund is to be used to forward fund the scheme.

The Milton Keynes Tariff is another often cited example of an innovative approach to funding infrastructure from development returns in the South East. Operating within a Section 106 framework, agreement was reached between the Local Delivery Vehicle and private developers ensuring that 75% of the infrastructure costs of large scale development in the district will be covered by the private sector. Described in the document 'The Milton Keynes Tariff – an overview of the infrastructure tariff and how it works' (English Partnerships and Milton Keynes Partnership, 2007) the Tariff is projected to raise some £310 million within a 10 to 15 year period which will be spent on infrastructure in the widest sense. This equates to development contributions of £18,500 per new dwelling and £260,000 per hectare of employment space.

6.3 Lessons from Abroad – The Netherlands

In overcoming infrastructure constraints and pursuing a step change in housing supply valuable lessons can be learnt from recent experiences in the Netherlands. In relative terms the level of housing production in the Netherlands has been consistently higher than that achieved in England. Nevertheless, Dutch new builds have fallen short of both demand and Government targets in recent years contributing to house price inflation and affordability issues. According to the 'VINEX'⁹ new build targets set in 1993, approximately 635,000 houses were to be constructed between 1995 and 2005 on 30 large scale sites throughout the Netherlands. By 2005, the majority of the 30 locations were some way from completion.

To tackle the house building deficit the Dutch Government set up a Task Force for Housing Production in 2001¹⁰ and an investigation into factors constraining levels of construction was launched. The Task Force's report¹¹ identified a number of factors causing delays in the delivery of new builds, including the failure of local parties to make timely arrangements for the delivery of infrastructure during the planning phase. The central Government also had to shoulder some blame for delays on a number of the VINEX sites because, although funding for infrastructure was promised at the outset, a timetable for delivery of this funding was not agreed. In practice, all planning activities had to be completed by local parties without certainty concerning the disbursement of central government infrastructure funding, causing unnecessary complexity in the planning process and ultimately leading to postponement. Specific examples here include delays

⁹ VINEX: Vierde Nota Ruimtelijke Ordening Extra

¹⁰ Taskforce Woningbouwproductie.

¹¹ 'Achterblijvende woningbouwproductie problematiek en maatregelen', Final report of the Taskforce Woningbouwproductie, January 2002.

in the delivery of the largest green field site in the country '*Leidsche Rijn*' (near Utrecht) as well as on sites in and around The Hague, and in the Twente conurbation.

To improve coordination between the provision of new housing and infrastructure projects the report stressed the importance of timely agreements between the various levels of government. In particular the Taskforce recommended that binding performance agreements concerning the delivery of infrastructure (*'prestatieafspraken'*) be made at the same time that house building targets are agreed. This would provide clarity at the outset on the amount of funding to be available as well as on the timing of disbursement, which should be according to a 'cash upfront' principle. Further to this the Task Force report found that:

- From the outset, the various parties involved needed to be clear on their own roles and responsibilities regarding infrastructure provision;
- Within organisations, the importance of infrastructure provision had to be recognised, backed by the (political) will to ensure that timely and appropriate action was taken;
- The nature and quality of communication between parties needed to be improved;
- The central government's Multi-annual Programme for Infrastructure and Transport (MIT¹²) should be partially decentralised, providing operating funds at the regional level. This would enable closer working with local parties and greater responsiveness to local developments and planning timetables.

The Task Force also recommended the establishment of special 'impulse teams'¹³ consisting of leading experts, each with a wealth of practical experience in the field. In essence these teams were to be trouble shooters, identifying bottlenecks and intermediating between parties (including national government, provinces, water boards, urban regions, local authorities, developers and housing associations) to overcome problems as quickly as possible. This recommendation was quickly put into place and by 2004 'impulse teams' were at work in 19 locations across the country. The teams brought with them a sense of urgency and their effectiveness in raising production levels has been reported on positively.

So called 'high value public transport' (HOV¹⁴) was to be provided on all large scale VINEX sites but this infrastructure was delivered significantly later than originally planned. This meant that some households had to wait years before the promised public transport finally arrived, leaving them with little other choice than to use the car. This problem was widely publicised at the time and the reputation of the VINEX neighbourhoods suffered as a result, which in turn impacted on new build sales causing further delays because developers found it more difficult to sell off-plan. By 2008 most of the long awaited 'HOV' had been provided to the new neighbourhoods making them considerably more attractive and popular places to live. A lesson to be taken from this is the importance of fast-tracking the provision of infrastructure (including 'soft' infrastructure and amenities) on large scale sites rather than wait until most houses have already been built.

¹² Meerjarenprogramma Infrastructuur, Ruimte en Transport

¹³ 'Aanjaagteams'.

¹⁴ 'Hoogwaardig Openbaar Vervoer'; commonly dedicated bus-lanes, tram-lines, light-rail and new stations on the existing (heavy) rail network.

While (transport) networks of national importance are funded directly by central government in the Netherlands, local level infrastructure including access roads to new build sites, public transport and utilities are funded by local authorities themselves. They receive some funding from government (in the form of bulk funding) but beyond this the Crown has made it quite clear it will not foot the bill for local or regional level infrastructure. Most of the revenue for new infrastructure must therefore be channelled directly from new development.

To do this the Dutch have a long established tradition of cooperative working between public and private parties – local authorities, developers and housing associations. Central to the cooperative process is a spreadsheet¹⁵ taking account of all costs associated with the plan (including infrastructure and social/affordable housing) and all revenues (primarily generated by the sale of property). Private sector developers will obviously be looking to minimise risks and safeguard profits while local government aims include ensuring the project serves the long term public good (e.g. by having high quality and the optimal mix of dwelling types and other land uses) and that it pays for itself. The parties need to come to agreement on the division of costs and revenues and enter into a binding contract to bring the plan to fruition.¹⁶ Clearly this requires local authorities to be intensively engaged in the development process from the outset until completion, a role that goes beyond responsibility for the planning framework. In order to work in this way, local authorities need to field a team of well trained staff capable of dealing effectively with financial aspects of development planning.

Given the recent discussion in England on how best to capture land value uplift to finance infrastructure and affordable housing, the Dutch development method could offer useful lessons¹⁷.

¹⁵ This is called an 'exploitatie', which is a common term in Dutch spatial development practice but has no English equivalent.

¹⁶ This agreement is termed an 'exploitatieovereenkomst'.

¹⁷ The system is detailed in the following two Dutch publications: 'Reiswijzer Marktpartijen & Gebiedsontwikkeling – een praktische routebeschrijving' (Min. VROM 2006) and 'De Prijs van Kwaliteit – handreiking voor gemeentelijk grondprijsbeleid bij woningbouw' (ECORYS, 2006).

Findings and Recommendations

7.1 Findings

This study was concerned with the role of the utilities and the Highways and Environmental Agencies in the delivery of new housing. A rapid appraisal of existing evidence was carried out augmented by a limited number of expert interviews.

The issue of infrastructure and housing delivery has become more topical due to the need to rise to the challenge set by the government's housing growth agenda. Because it is a developing area there is not a ready body of well defined literature providing understanding of the current dynamic situation. This was anticipated at the outset of the research. Due to the paucity of academic material it has instead been necessary to mine the numerous policy and planning documents, technical studies, minutes and memos being produced at different levels across the country to gain insight into the extent and nature of infrastructure constraints. Undoubtedly of greatest value to understanding the subject are the interviews that have been held with experts in the field.

In conjunction with the RSS revision process all regions have to a greater or lesser extent conducted work, or are in the process of conducting work, on infrastructure capacity and constraints. The picture that has emerged from an assessment of the available evidence is that problems connected with the provision of infrastructure are undoubtedly forming a major constraint on the provision of new homes. However, the direct effect of infrastructure constraints in terms of new build numbers is impossible to quantify clearly due to the complex nature of the issue. Much of the work done at the regional level is general in nature. Only at the local level is there fragmentary evidence allowing conclusions to be drawn for some localities. The evidence base as a whole is therefore inconclusive.

The reviewed evidence indicates that the intensity and nature of constraints varies across England, with London, the South East and the East of England – those areas where demand for housing demand is highest – facing the greatest infrastructure constraints on housing supply. The evidence indicates that in many parts of these three regions the environmental limits to growth are being reached. Potential infrastructure constraints appear to be less severe in the two most northerly regions, particularly in the North East.

The type of infrastructure most commonly cited as being problematic is Highways. Consultees from all regions pointed to problems associated with traffic congestion and the need to invest in new road capacity to facilitate growth. An exception to this is in London where rail transportation plays a much more important role in facilitating mobility. The level of constraint associated with other types of infrastructure differs between regions and sub-regions. Capacity problems associated with water and waste water were frequently named, especially in the greater South East. Flood risk was identified as a major issue facing low lying areas in all regions with the possible exception of the North East and the North West. The research indicated that constraints associated with utilities were less of a threat to overall levels of new housing provision, and no constraints were identified concerning telecommunications infrastructure.

Infrastructure constraints are inextricably connected to questions concerning the planning system, the division of responsibilities within government, the funding and regulatory framework and the relationship between the public and private sectors.

The power given to the Highways Agency to both determine its own priorities for road investment and control land use planning consents through its article 14 powers can have a strong bearing on housing development outcomes. Whilst there has been criticism levelled from some quarters that the Agency is not aligning its priorities to support the growth agenda, there is also recognition that the Agency, in acting to prevent the overloading of the road network, is only carrying out the statutory responsibilities it has been charged with. It has also recently taken action to improve communication with local authorities and private sector developers in the hope that this will reduce the number of occasions it is compelled to rule negatively on planning applications.

The under-funding of infrastructure projects is a frequently cited problem. A number of regions drew attention to the need for *additional* corrective investment to address the funding deficit of the past. Another frequently raised point of concern is the lack of clear guiding principles on the question of 'who should pay' for new infrastructure provision. Is this a statutory duty or should funding be provided through enhanced development values when they exist? An important point is that even when there is a willingness on the part of the private sector to contribute, the money is not available until sales income is generated. As a result, the forward funding of infrastructure by the public sector can play a vital role in speeding the delivery process. Good examples of this forward funding principle being put into practice have been cited in this report, most notably the Regional Infrastructure Funds being established in the South East and South West regions which are designed to provide catalyst investment that will be recouped at a later date.

A number of consultees felt that the regulatory bodies responsible for overseeing private utilities, such as OFWAT and OFGEM, are not sufficiently engaged in the growth agenda. Anecdotal evidence suggests they are primarily concerned with managing demand and keeping costs down through their price review process rather than being proactive in ensuring future growth will be adequately supported. Also, private utilities companies were found to be difficult planning partners, particularly when it comes to sharing information. Their organisational structures and internal commercial prioritisation tend not to be attuned to the strategic planning requirements of the growth agenda. The differing planning horizons adopted by various agencies (in both the public and private sectors) involved in the provision of infrastructure can make strategic planning difficult.

Although excluded from the scope of this study, the provision of rail and light-rail is clearly felt to be important to the sustainable development of new housing sites. This is also true of the so-called 'soft infrastructure' – such as nurseries, schools, doctors' surgeries and community buildings. Although less of a constraint on crude housing numbers, the provision of these facilities are essential to ensuring the attractiveness and marketability of new neighbourhoods.

The research has made it clear that gathering sufficiently detailed information on infrastructure capacity and constraints to support effective planning at the regional and sub-regional levels is a resource intensive exercise. The issues are complex, there are no easy answers and detailed local and site specific technical work is required. Some regions, most notably the South East and London, have well staffed planning teams with sufficient levels of expertise to consult with relevant agencies, gather technical inputs and comprehensively match requirements with constraints in order to identify shortfalls and finally plan an effective strategy to address them. Planning teams elsewhere in the country may not be sufficiently resourced to fully carry out this work.

An important finding of this research is that although in the past the nature of the relationship between planning and delivery was not well understood, the situation appears to be improving. The introduction of the current system of regional spatial planning has led to more joined up thinking and a greater focus on delivery issues. Moreover there is now a greater sense of urgency as the various agencies involved in the planning process realise the enormity of the challenge set by the Government's growth agenda.

7.2 Recommendations

To address the knowledge gaps identified by this review the following additional research is recommended:

- At the national scale, research which makes use of available data such as the Highways Agency Development Control database and Environment Agency data on areas at risk of flooding;
- At the regional and/or sub-regional scale, explorative research into the likely consequences of housing growth if infrastructure capacity is not expanded. Detailed work concerning roads, water and waste water is recommended;
- At the local level, either case studies or surveys to gather information concerning infrastructure constraints to identified development. Large samples would allow robust conclusions to be drawn.

Furthermore, it is recommended that effective monitoring should be put in place at the regional level. This would provide a yearly overview of the numbers of dwellings being planned, started and completed by district and by site, allowing progress against targets to be measured. The monitoring system should also seek to identify the nature of any bottlenecks in a consistent way so that timely and appropriate action can be taken if and when problems become structural in character.

This research has identified a number of examples of good practice, including suitably detailed work underpinning the London Plan, the South East Plan and initiatives in the Manchester City Region. The brief review of practice in the Netherlands also distilled valuable lessons that might be applicable to the English situation. It is important that forums are created so that practitioners across the country are able to learn from each other, and local and regional planners are supported in their efforts to address infrastructure constraints. To take this forward it is recommended that consideration be given to:

- Providing new planning guidance focused on infrastructure provision. This should be based on best practice to assist regional and local planners to take timely and effective measures to ensure the necessary infrastructure to support growth is delivered. Infrastructure should be widely defined to include 'soft' infrastructure and all forms of public transport;

- Establishing 'impulse teams' made up of experts with extensive practical experience of infrastructure provision, development economics and planning processes. Following the Dutch example, these teams would be given a roving commission to advise local and sub-regional planning agencies on how best to tackle bottlenecks and facilitate closer coordination between the various parties that make up the planning and development chain.

Achieving a step change in housing supply has necessitated a shift to new forms of joined up working for which there is no established template. The evidence reviewed in this research indicates that policy makers and planning practitioners at the central, regional, sub-regional and local levels of government as well as private sector companies are going through a steep learning curve in search of pragmatic solutions to meet the task they have been set.

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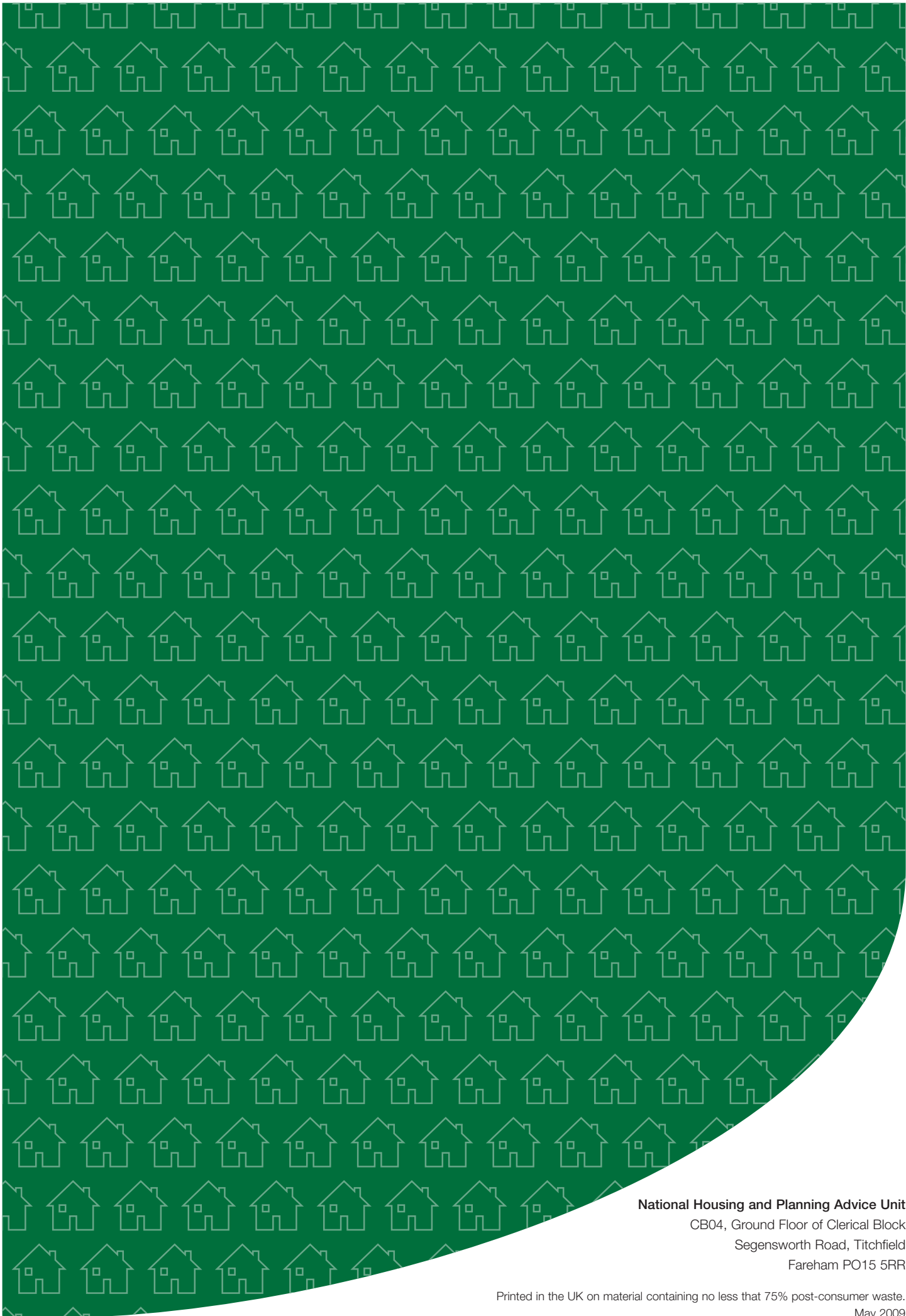
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