

Crawley Borough Council, Horsham District Council & Mid Sussex District Council

At Crawley Study 2009

Final Report: October 2009



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1. INTRODUCTION

- 1.1 This Study examines the potential for strategic development 'at Crawley.' It explores the potential to bring forward strategic development, including a new neighbourhood and/ or strategic employment, in the period to 2026. It assesses the suitability of a number of potential locations for development in line with sustainable development principles, together with the availability of sites and their deliverability. This includes an assessment of social, energy, utilities and transport infrastructure necessary to support strategic development.
- 1.2 The Study has been undertaken by a multi-disciplinary team of consultants, led by GL Hearn, on behalf of Crawley Borough Council, Horsham District Council and Mid Sussex District Council. GL Hearn have been supported by Parsons Brinkerhoff (providing sustainability, energy and utilities expertise) and AECOM (transport planning). The project has been managed by a Steering Group comprising forward planning officers from the three local authorities.
- 1.3 The Study develops a previous iteration of the At Crawley Study prepared by Atkins in 2005. Building on this previous work, it takes a fresh look at the potential for strategic development at Crawley to contribute to meeting the objectives of the South East Plan as published by Government in May 2009. It provides a consistent assessment of the suitability, availability and achievability of strategic development locations in line with national Planning Policy Statement 3: Housing (PPS3). It considers what infrastructure would be necessary to support strategic development in line with national Planning Policy Statement 12: Local Development Frameworks (PPS12).
- 1.4 The Study will inform the first Local Development Framework (LDF) Core Strategy in Mid Sussex District, and the early reviews of Core Strategies of Crawley Borough Council and Horsham District Council in order to meet the requirements of the South East Plan. It will inform policy formulation regarding the most appropriate manner and location to accommodate strategic development to meet the Gatwick sub-region's development requirements.

- 1.5 The Study is intended to ensure that future strategic development at Crawley is highly sustainable, properly planned and supported by timely provision of adequate infrastructure. It aims to ensure that future strategic development is of a high quality and supports the town as a whole.

Objectives

- 1.6 The Study Area comprises areas contiguous to Crawley's Built-up Area Boundary. It includes land which falls within the boundaries of Crawley Borough together with Horsham and Mid Sussex Districts in West Sussex.
- 1.7 The Study area together with the site 'options' considered previously as part of the 2005 'Atkins' Study are shown in Figure 1.1.
- 1.8 The objectives of the Study are as follows:
- A thorough examination and exploration of strategic development locations at Crawley;
 - The formulation of a matrix and hierarchy outlining the suitability, availability and deliverability of the strategic development locations identified.
- 1.9 The matrix, which is contained herein, considers natural and environmental constraints to development; physical constraints, including the noise shadow of Gatwick Airport, together with other infrastructure constraints and requirements.
- 1.10 For potential strategic development locations, the Study identifies potential infrastructure, transport, highways and masterplanning requirements and considers potential delivery phasing and mechanisms. It includes an assessment of the potential impact of strategic infrastructure requirements on development viability and considers how this might be addressed.

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Figure 1.1: Study Area

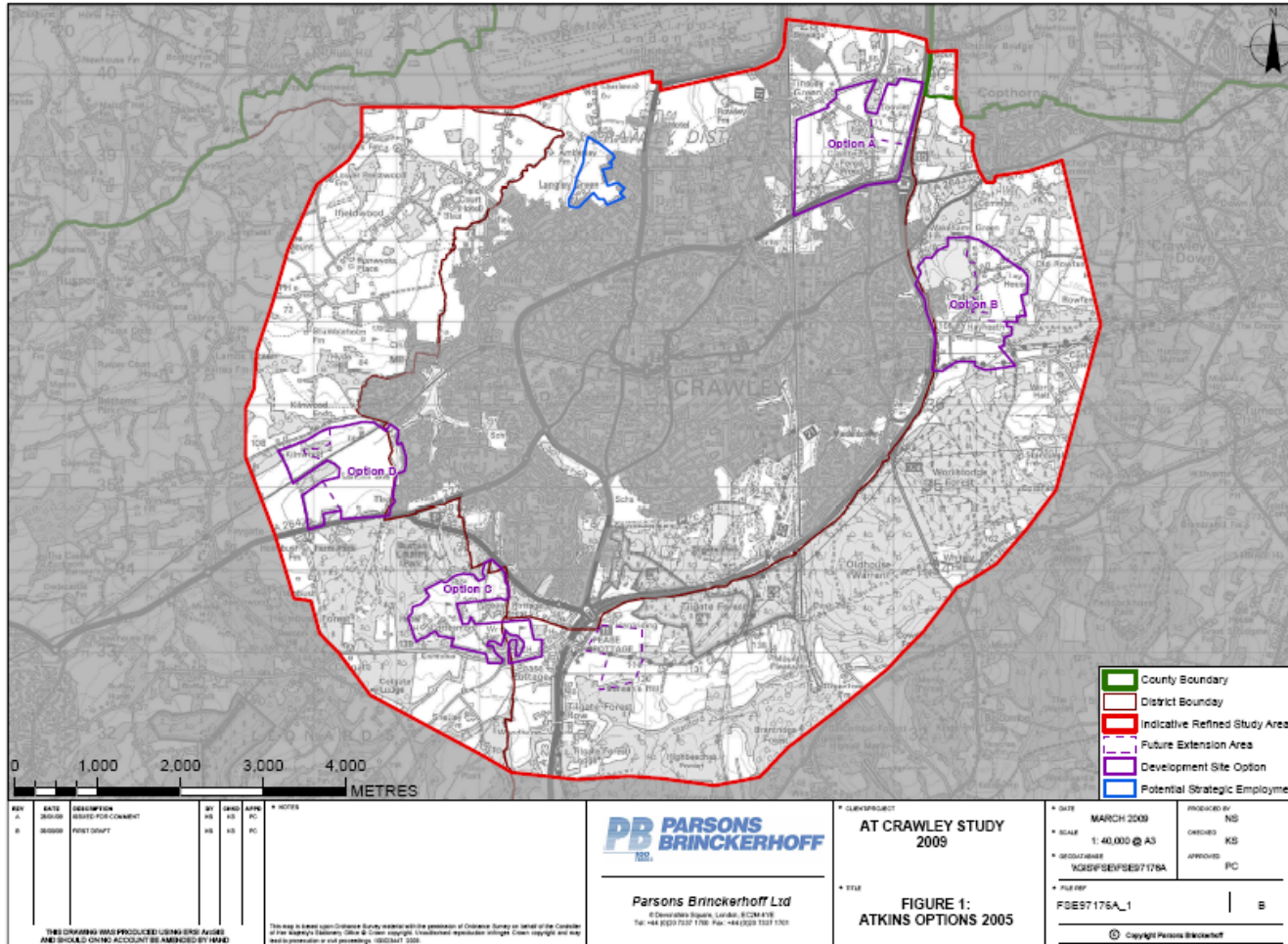
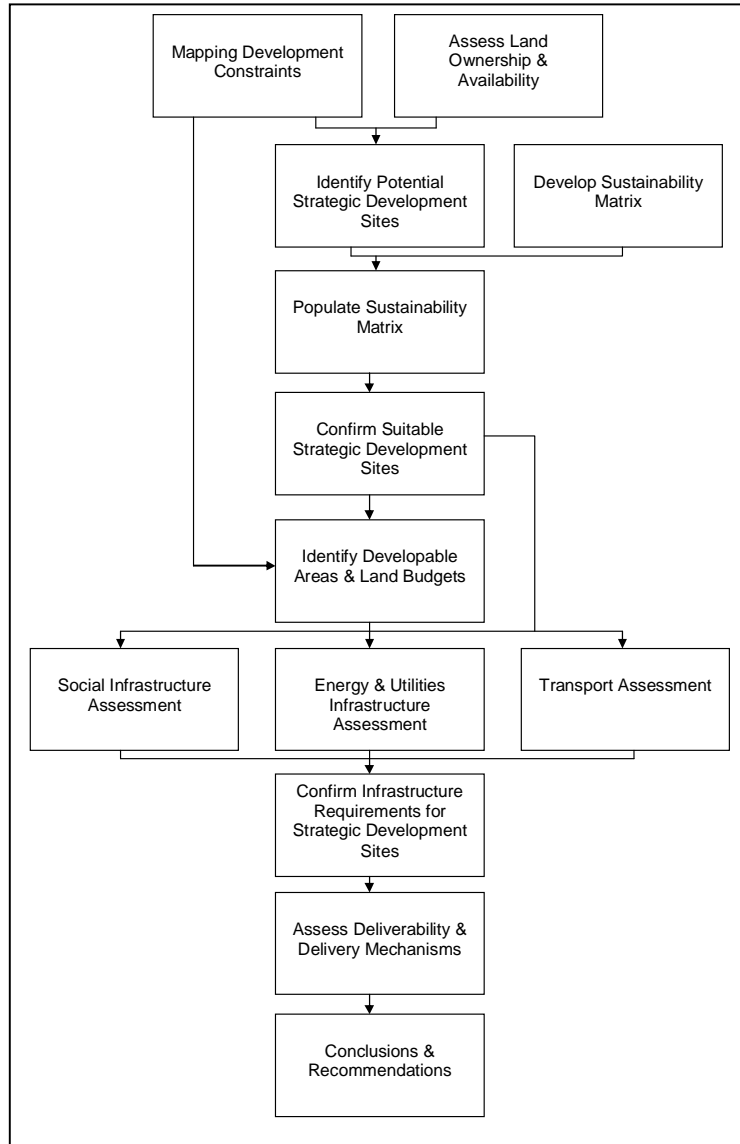


Figure 1.2: Study Approach



Approach

1.11 The approach used has been structured around two stages. The first stage has assessed the suitability of potential sites. This is presented in the Sustainability Assessment. Several sites have then been taken forward for more detailed assessment in Stage II, which has assessed their availability (taking into account land ownership patterns), infrastructure requirements and viability, to establish whether strategic development is achievable.

1.12 The approach used is summarised in the flow diagram opposite.

Report Structure

1.13 This report is structured as follows:

- Section 2: Study Context
- Section 3: Sustainability Assessment
- Section 4: Development Options
- Section 5: Social Infrastructure Assessment
- Section 7: Transport Infrastructure Assessment
- Section 7: Energy & Utilities Assessment
- Section 8: Achievability
- Section 9: Key Findings

1.14 This report presents the conclusions of the At Crawley Study. It is informed and supported by a number of technical reports, which comprise:

- Appendix A: Sustainability Assessment
- Appendix B: Social Infrastructure Assessment

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- Appendix C: Energy & Utilities Assessment
- Appendix D: Transportation Assessment
- Appendix E: Development Appraisals

2. STUDY CONTEXT

- 2.1 The original At Crawley Study prepared by Atkins (henceforth referred to as the 2005 Study) focused on identifying the most appropriate location for accommodating strategic development. The 2005 Study was commissioned by the three Councils and intended to inform both their input to the preparation of the South East Plan and their own LDF Core Strategies. The Study pre-dated publication of the draft South East Plan in March 2006.
- 2.2 The 2005 Study identified land West of Bewbush (Option D) as the most appropriate location for strategic development at Crawley. This has been taken forward through preparation of a Joint Area Action Plan for development West of Bewbush. This was recently adopted by Horsham District Council and Crawley Borough Council (2009).
- 2.3 Since the publication of the 2005 Study, Crawley Borough and Horsham District Councils have progressed the preparation of their LDF Core Strategies. Both were adopted in 2007. Mid Sussex has also been progressing the preparation of its LDF Core Strategy.
- 2.4 In May 2009 the Government published the final South East Plan. This confirms development requirements for the 2006-26 plan period.
- 2.5 This Study will inform the first LDF Core Strategy in Mid Sussex District, and the early reviews of Core Strategies which Crawley Borough Council and Horsham District Council are undertaking.

Policy Context

South East Plan

- 2.6 The Secretary of State published the South East Plan in May 2009.
- 2.7 Policy H1 identifies a provisional housing requirement for the Gatwick Sub-Region of 36,000 homes over the 2006-26 plan period. It identifies a requirement for 7,500 dwellings in Crawley Borough (375 pa). The housing requirement in Horsham District is for 13,000 dwellings (650 pa) of which 9,200 dwellings (460 pa) are to be delivered in the

Gatwick Sub-Region. In Mid Sussex, the district-wide requirement is for 17,100 dwellings (855 pa) of which 16,800 (840 pa) are to be delivered in the Gatwick Sub-Region. The Plan outlines that the majority of future development should be in the form of major developments at or adjoining Crawley and other main towns within the main north/south and east/west transport corridors.

- 2.8 A number of strategic development locations are identified where these have been already established either in the West Sussex or Surrey Structure Plans or adopted LDF Core Strategies in Crawley Borough and Horsham District. These include West of Bewbush (for 2,500 homes), West of Horsham (2000 homes), West and South of East Grinstead (2500 homes initially proposed), South East and South West of Haywards Heath (c. 1400 homes), North East and North West of Horley (c. 2600 homes) and Crawley's North East Sector (2700 homes). The Plan states that if these developments cannot be delivered, it will be for the relevant planning authorities to plan for alternative locations and strategies to deliver the scale of development required.
- 2.9 The Plan emphasises the importance of partnership working to deliver both economic development aspirations and to bring forward strategic development and associated infrastructure.
- 2.10 The strategy for the Gatwick sub-region is based on maximising the potential for sustainable economic growth, maintaining and enhancing connectivity (particularly with the South Coast and London), whilst maintaining and enhancing the character and distinctiveness of the area and its environmental assets (which include the High Weald AONB).
- 2.11 There is a specific focus on achieving high value-added growth and skills development. Key components of this strategy are expected to be town centre regeneration, provision of employment floorspace within mixed-use strategic developments, delivery of a university campus at Crawley, and continued functioning of Gatwick as a business airport.

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- 2.12 The Plan supports provision of high quality employment sites to support growth of existing businesses and attraction of high value-added inward investment.
- 2.13 Taking its lead from the Regional Economic Strategy, the South East Plan places a particular store on achieving 'smart growth:' whereby prosperity is increased, whilst reducing the rate of increase in the ecological footprint. This will require a focus on higher value added activity and increasing productivity (with associated investment in skills and ICT infrastructure to enable this) together with efficient use of land resources, enhancing travel choice and encouraging modal shift.

- 2.14 In this context, a second component of this Study is hence to consider and appraise the potential for strategic development locations to accommodate sustainable sub-regional or strategic employment development either solely, or in conjunction with strategic residential development, in line with 'smart growth' principles. The 'need' for strategic employment development is being considered separately through work on an Employment Land Review.

Crawley Borough's LDF Core Strategy

- 2.15 Crawley's LDF Core Strategy was adopted in November 2007. It makes provision for 4,040 net dwellings for the 2001-16 period.
- 2.16 The Core Strategy identifies specific sites capable of yielding 100 or more homes in and around the Town Centre and in the neighbourhoods. These are capable of yielding 2265 homes (net) to 2015/16. An allowance for windfall development to 2011/12 is made, which together with existing planning consents and the sites identified provide potential for 4,040 dwellings.
- 2.17 Crawley Borough Council argued at Examination in Public that due to uncertainty over development of the North East Sector it was not able to identify a 15 year housing land supply. This was accepted by the Inspector. The Core Strategy however identifies and safeguards land for the development of a new neighbourhood of up to 2,700 dwellings at the North East Sector.

- 2.18 The Council also successfully argued that it is premature to consider developer-led proposals for a strategic business park development at Gatwick Green.

- 2.19 Through the Core Strategy Review, Crawley Borough Council will consider the role of further strategic development, in addition to development West of Bewbush, to meet the requirements of the South East Plan. It will also consider the case for a strategic business park at Crawley.

Horsham District's LDF Core Strategy

- 2.20 Horsham District Council adopted its Core Strategy in February 2007. It recognises the role of the north-east part of the District in supporting the Gatwick Diamond Sub-Region and seeks to manage change constructively and proactively by bringing forward high quality, sustainable strategic mixed-use development West of Crawley and West of Horsham. These locations were identified in the West Sussex Structure Plan and are intended to include homes, employment land, community facilities and other infrastructure.

- 2.21 The Core Strategy clearly sets out that it is important that Crawley does not outgrow its overall infrastructure and that the distinctive identities of Crawley and Horsham and intervening communities are maintained. It is clear that there is a need to establish long-term limits to Crawley's westward expansion. These considerations remain relevant to this Study.

- 2.22 The Core Strategy is based on meeting the requirements of the West Sussex Structure Plan and covers the period to 2018. The Review of the Core Strategy is required to address the development requirements of the South East Plan to 2026.

West of Bewbush Joint Area Action Plan

- 2.23 Crawley Borough Council and Horsham District Council have worked together to prepare a Joint Area Action Plan for West of Bewbush. This was identified, through the JAAP process, as the preferred site for strategic development within an area of search to the West and North West of Crawley.

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2.24 Delivery of 2,500 homes over a seven year period to 2018 together with employment floorspace, community facilities and supporting infrastructure is proposed. The scale of development proposed together with key supporting infrastructure is set out in Figure 2.1.

Figure 2.1: Proposals for West of Bewbush

Phase	Proposed Development	Key Supporting Infrastructure / Cost Items	Delivery Timescale
1	600 homes	Primary A264 Junction Secondary A264 Access Link road to south of Pondtail Shaw Eastern Railway Crossing Remediation of Inert Landfill Site Development of Fastway and bus access	2011/12 – 2013/14
2	1050 homes Neighbourhood Centre	Central Railway Crossing CHP Plant Railway Station Primary School	2013/14 – 2016/17
3	850 homes	Western Railway Crossing	2015/16 – 2017/18

2.25 The JAAP has been considered at a Public Examination. The Inspector's Report was published in April 2009 and found the Plan to be sound. The JAAP was adopted on 31st July 2009.

Crawley North East Sector

2.26 A developer-led consortium submitted a planning application to Crawley Borough Council for development of 2,200 homes in the North East Sector in 1998. The application was however not considered because the Secretary of State intervened to prevent the planning permission being issued.

2.27 The North East Sector Consortium appealed the planning application to the Planning Inspectorate on the grounds of non-determination. A

Planning Inspector opened a Public Inquiry into the application on 5th October 2006. This upheld the decision to refuse planning permission.

2.28 The Secretary of State in May 2007 concluded that in light of housing supply at that time; and the potential noise exposure of the site given the safeguarding of land for a possible second runway; that there was no immediate need to grant planning permission.

2.29 The Consortium have though challenged this position, and in 2008 won a ruling quashing the Government's decision to refuse planning permission. The Secretary of State has been ordered to reconsider the case.

2.30 A public inquiry was held in June 2009 to reconsider the 1998 planning application for the North East Sector. A decision is expected by late November 2009.

2.31 In October 2008 the Consortium successfully argued at the High Court that Crawley Borough Council's LDF Core Strategy policy in relation to the North East sector was unsound. This found that the Core Strategy Inspector had misunderstood the Secretary of State's 2007 refusal of planning permission for the North East Sector and overstated the extent to which development at the North East Sector was precluded by the possible requirement for a second runway at Gatwick. Crawley Borough Council has therefore removed references in the Core Strategy precluding residential development in advance of a definitive decision from Government regarding the requirement for a second runway at Gatwick.

Mid Sussex LDF Proposed Submission Core Strategy

2.32 Mid Sussex District Council published a Pre-Submission Core Strategy document in January 2008. This sought to meet housing requirements through a combination of town centre regeneration (the Council has established a joint venture with Thornfield Properties to regenerate the three main town centres), small scale housing allocations, and delivery of housing at a number of strategic development locations.

2.33 The Council's preferred approach, as set out in January 2008, was to progress major extensions to Burgess Hill (3,000 homes), East

Grinstead (2,500 homes) and Haywards Heath (1,500 homes). The potential to bring forward these strategic developments is being assessed in further detail.

- 2.34 Provision of an A22/A264 Relief Road is critical to delivery of the scale of growth proposed at East Grinstead. There are however notable risks to the delivery of this including current opposition from East Sussex County Council, the transport planning authority covering part of the route. A number of alternative options are hence being considered, including options for a reduced development of c. 1,500 homes west/south west of East Grinstead and a number of contingency sites which could be brought forward to address reduced or non-delivery of housing at this and other strategic development locations.
- 2.35 Delivery of an urban extension to the east of Crawley at Crabbet Park is one of a number of potential urban extensions being considered. This was identified in the Pre-Submission Core Strategy document (Jan 2008) as a contingency site with potential for c. 2,200 homes. It was anticipated that this would not be brought forward before 2021 because of the need for Crawley to assimilate existing growth commitments and deliver additional sewage treatment capacity.
- 2.36 The site at Crabbet Park has since been identified as 'developable' in an 11+ year period by the Council's Strategic Housing Land Availability Assessment (August 2009). This reflects the need to bring forward sewage works prior to development.

Key Strategic Issues

Housing Targets

- 2.37 It is likely that additional development land will need to be identified to meet the requirements of the South East Plan through the three respective LDF Core Strategies.
- 2.38 The purpose of this Study is however not to be too concerned with matching numbers, but to explore the potential for strategic development within the At Crawley study area and to recommend and provide a relative ranking of suitable, available and achievable sites,

irrespective of the local authority boundaries. Strategic development includes both new neighbourhoods and strategic employment.

The Neighbourhood Principle

- 2.39 The assessment has been primarily used to identify locations capable of accommodating 2,000 – 3,500 dwellings and associated uses based on the neighbourhood principle, or on the basis of locations which could form a neighbourhood as urban extensions to existing areas of development.
- 2.40 The neighbourhood principle is based on several simple but critical objectives. The first is the neighbourhood centre/ local self sufficiency which provides key social infrastructure including top-up retail, services and facilities, such as medical facilities, community facilities and religious establishments. The second criteria is the provision of green infrastructure in the form of play space, playing fields/ pitches and informal open space such as green corridors between neighbourhoods. Thirdly neighbourhood identity is a masterplanning objective. The fourth objective is sustainability which is defined as the opportunity for a community to be self-sufficient on a 'day-to-day' basis, with good access to the town centre and centralised services and facilities, and is sustainable in reducing the need to travel and providing communities with a sense of place and identity.

Employment Provision

- 2.41 The At Crawley Study has focused on identifying the potential for new neighbourhoods. However it has also considered the potential to accommodate strategic employment development on sites which are considered commercially suitable.
- 2.42 The Gatwick Diamond Partnership, working with Consultants GSK, have developed an economic vision and Futures Plan for the Gatwick Diamond. This is based on three themes of 'inspire, connect, grow' emphasising the need to enhance levels of innovation and high value-added activity, to improve internal and external connectivity and support smart growth principles. The Study identifies the need to investigate the potential for a strategic business and innovation district

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incorporating a science park, incubator facilities, a conference centre and hotel provision close to Gatwick Airport.

- 2.43 The Gatwick Diamond LDF Group, involving local authorities in Surrey and West Sussex, commissioned GVA Grimley in Summer 2008 to consider the spatial implications of the Futures Plan and provide evidence and recommendations for the future delivery of employment space across the sub-region.
- 2.44 This Study recommended that partners work to develop a diversified employment offer with two levels of intervention necessary to achieve the aims of the Futures Plan. This included provision of employment space in mixed-use urban extensions and town centres, but suggested that a higher tier of intervention was necessary to achieve enhanced or transformation growth of a level necessary to raise overall performance of the sub-region relative to the South East region as a whole. This second tier of intervention involved delivery of a Strategic Business Hub and accelerated growth at other key centres, including Crawley.
- 2.45 The Strategic Business Hub was considered to be a campus-style business environment for both office and R&D activities, located at a highly-accessible location with strong access to the Gatwick Express, other rail services and Fastway; and in a high-quality environment with strong quality of place and environmental standards.
- 2.46 The three Councils are working jointly to undertake an Employment Land Review which will appraise whether provision of Strategic Business Hub is necessary and justified. This Study considers potential suitable locations to meet this requirement.

Gatwick Airport Expansion

- 2.47 The suitability of a range of strategic development locations will be influenced by levels of noise associated with flight patterns to/from Gatwick Airport.
- 2.48 In 2003, the Government published the *Future of Air Transport* White Paper. This identifies an urgent need for additional runway capacity in the greater South East, concluding that two additional runways will be

required by 2030. It suggests delivery of additional runways at Heathrow and Stansted, but recommends safeguarding of land for a wide-spaced second runway option at Gatwick.

- 2.49 BAA Gatwick produced an Outline Masterplan in 2006 which provides two scenarios for 2030, with and without a second runway. The Masterplan identifies new potential noise contours in 2030 resulting from a two runway operation.
- 2.50 BAA signed an agreement in 1979 with West Sussex County Council pledging not to build a new runway for 40 years. On this basis, it is envisaged that even if a new runway is brought forward, work would not start until 2019.
- 2.51 If a second runway is found to be necessary, and if construction commenced in 2019, a second runway could be operational by 2023/4. Land for provision of this (as defined by the revised Airport boundary in the Gatwick Interim Masterplan) remains safeguarded.
- 2.52 The potential for delivery of a second runway remains uncertain. In 2008 the Competition Commission recommended that BAA sell two of its three London Airports. Whilst BAA is contesting the Competition's recommendations, it has put Gatwick Airport up for sale.
- 2.53 Notwithstanding the planning constraints, it is likely that the successful bidder for Gatwick will wish to maximise the value of their asset through growth of the Airport. Indeed we understand that all three bidders have included a second runway within their plans for the Airport. Delivery of a second runway hence remains possible.
- 2.54 Crawley Borough Council believes that development of the North East Sector should be conditional on a second runway not being required; and therefore the neighbourhood being able to accommodate development satisfactorily in terms of noise exposure, whilst remaining of an appropriate scale to satisfy the neighbourhood principle. The potential provision of a Second Runway would also influence the identification of other potential strategic development locations to the North West and North East of Crawley.

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- 2.55 For the purposes of this Study, it has been assumed that 60 L_{eq} represents the upper limit acceptable for residential development in accordance with PPG24.

3. SUSTAINABILITY ASSESSMENT

- 3.1 The Sustainability Assessment has considered the suitability of potential locations within the defined Area of Study (see Figure 3.1) for accommodating Strategic Development.
- 3.2 The suitability of potential locations has been assessed against specific sustainability objectives contained within the local authorities' LDF Core Strategies. It considers specifically sustainability objectives which are considered useful in identifying locations for strategic development and differentiating between them. Figure 3.2 sets out the sustainability indicators adopted.
- 3.3 Given the uncertainty regarding the future development of Gatwick Airport, the Assessment contains two scenarios which consider the suitability of locations with and without expansion of the Airport and delivery of a second runway.
- 3.4 A two tier assessment has been undertaken. The first stage involved the identification of key sustainability constraints to development where planning approval for development within a viable timescale would be at higher risk. The defined Tier 1 constraints (Figure 3.1) were considered most significant given the relative sensitivity associated with these areas and their legal status.

Figure 3.1: Tier 1 Constraints

- | |
|--|
| <ul style="list-style-type: none"> o Noise: Location in area > 60dBa o Flooding: Location in Flood Zones 2 and 3 as identified in SFRA o Ecology: Location within an SSSI, SAC*, SPA*, National Nature Reserve* or RAMSAR*¹ o Landscape: Location within an AONB |
|--|

¹ * Not present in Study Area

- 3.5 Assessment of Tier 1 constraints and patterns of landownership and options informed the identification of potential options. Each of the options identified was considered to provide potential to accommodate either residential-led development with capacity to accommodate c. 2,500 dwellings and associated uses as a sustainable urban extension in accordance with the neighbourhood principle – or, particularly where not suitable for residential development, to accommodate strategic employment.
- 3.6 The second tier of assessment evaluated the options against the sustainability criteria in Figure 3.2. Each option was ranked positive, neutral or negative against each sustainability objective.
- 3.7 The resulting Assessment considers the potential for strategic development of 11 locations, Options A – I. Figure 3.3 identifies the Tier 1 constraints and the 11 potential strategic development locations which have been assessed.
- 3.8 In a scenario without expansion of Gatwick Airport, the potential for residential-led development of Options A – G is assessed. As a substantial proportion of Options H and I lie within the existing noise shadow of Gatwick Airport the potential of these sites for strategic employment only has been assessed.
- 3.9 Should a second runway be delivered at Gatwick, a substantial proportion of Sites H and I would likely fall within the revised Airport Boundary, based on BAA's Interim Masterplan. Options A and G would be rendered unsuitable for residential development as a result of unacceptable noise levels. In this scenario, Options A and G might be suitable for strategic employment development. This however has not been assessed specifically as part of this Assessment.

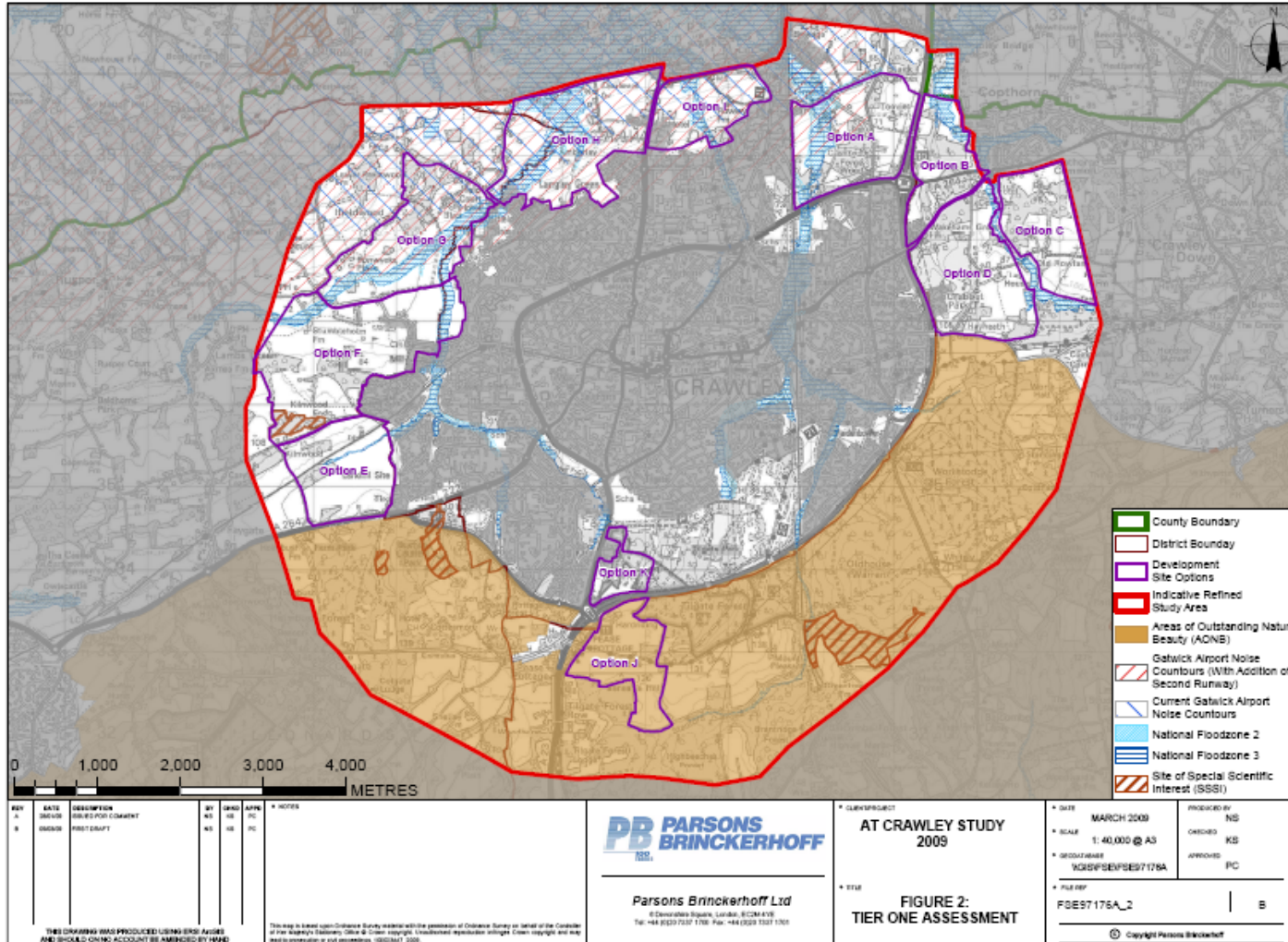
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Figure 3.2: Sustainability Objectives

Sustainability Objective		Indicator
Community	To ensure development contributes to maintaining and enhancing the vitality and viability of the neighbourhood	Location in an area which favours connectivity to Crawley or is more optimal as a result of less severance effects caused through obstructive features such as motorways, flood plain or green space.
Employment and Economic Growth	To ensure development maintains, supports and promotes a diverse employment base to serve the local and sub-regional economy To sustain economic growth and competitiveness	Location in proximity to employment areas more favourable
Water Quality and Flooding	To reduce the risk of flooding To maintain and where possible enhance water quality levels	In terms of surface water run-off, locations near an open water course or water body less favourable Location within a Flood Zone less favourable
Access/Transport	To ensure everyone has access to the health, education, leisure and recreational facilities they require To reduce road congestion by improving travel choice, which reduces the need for travel by car	Location in proximity to existing transport links, employment areas, retail areas and school (state secondary) more favourable
Land Use	To make the most efficient use of land	Location on previously developed land more favourable
Air	To maintain and where possible enhance air quality	Location in an Air Quality Management Area (AQMA) less favourable
Noise	To minimise the impact of noise on residents and the wider environment	Location within the existing or future noise shadow of Gatwick Airport less favourable
Ecology	To conserve and enhance Biodiversity	Location of locally designated sites (RAMSAR, SNCI, SPA, SAC, SSSI, LNR, NNR and areas of Ancient Woodland) falling within the site boundary less favourable
Landscape	To maintain and enhance landscape and townscape character	Higher surface area of Ancient Woodland falling within the site boundary less favourable Proximity to, or higher proportions of an AONB within the site less favourable Lower landscape capacity less favourable
Cultural Heritage	To conserve and enhance the historical and cultural environment, including important green spaces	Higher proportions of designated sites (Conservation Areas, Historic Parks and Gardens, Scheduled Ancient Monuments, Listed Buildings) falling within the site boundary less favourable

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Figure 3.3: Tier 1 Constraints & Identified Potential Strategic Development Locations



Assessment of Sites

- 3.10 Option A (North East Sector) is most favourable in terms of its location. Strategically located near Gatwick Airport, rail, roads and bus routes, and major employment areas, the site is well connected and will support the sustainability objectives for employment and economic growth as well as access and transport. The constraints of this site are the Gatwick Stream and the potential flood risk that this presents, which is a Tier 1 constraint. Noise, which is also a Tier 1 constraint, is an issue for the Gatwick Second Runway scenario which would result in part of the site falling within the future Gatwick noise shadow from the additional runway. The M23 in particular has been identified as a potential air quality exceedence and this is a constraint on the site and the layout. In addition, the ecological and cultural designations on the site include Ancient Woodland, Listed Buildings and Scheduled Ancient Monuments.
- 3.11 Option B (West of Copthorne) is favourable as it is located in proximity to strategic employment areas, namely Manor Royal and Gatwick Airport. The other key benefit is that the site includes areas of previously developed land, including two historic landfill sites. The constraints on the site are the poor integration potential with the existing town of Crawley, areas of flood risk, which is a Tier 1 constraint, and poor accessibility to public transport. There are ecological designations (Ancient Woodland) and a low landscape capacity (in terms of the ability of the landscape to absorb the visual impact of development) which would constrain development in this location.
- 3.12 Option C did not positively contribute to any of the sustainability objectives. There were a number of negative features of the site in relation to the sustainability objectives which make it less favourable for development. These include severance from existing communities, poor connectivity and accessibility to employment, retail and educational facilities, location within greenfield land, and the presence of ecological designations (Ancient Woodland and SNCI) with a low landscape capacity for development. There are no Tier 1 constraints.
- 3.13 Option D (Crabbet Park) does not score positively on any of the sustainability objectives however a large number of neutral scores and a small number of negative scores indicate limited constraints to sustainable development. The key constraints include severance from existing communities, a number of ecological designations (Ancient Woodland) and an overall low landscape capacity. It is bound to the south by the High Weald AONB. There are no Tier 1 constraints.
- 3.14 Option E (West of Bewbush) is a favourable site in terms of the potential for integration with existing neighbourhoods, the high levels of accessibility and public transport provision, and the nature of previous land uses - in that the site is predominantly landfill site and will not require a large land take from greenfield land. The disadvantage of this site in terms of sustainability is that it is not located in close proximity to employment areas and has a lower potential to contribute to the economic sustainability objective. Although the actual site does not have a low landscape capacity, it is constrained to the south by the High Weald AONB. The presence of the A264 is likely to cause noise and air quality constraints on the site. There are no Tier 1 constraints.
- 3.15 Option F (West of Ifield) is favourable in terms of good accessibility to public transport and educational and retail facilities. The constraints of this site are that it will require land take from greenfield land and there are existing ecological designations on the site such as a SSSI, SNCI and Ancient Woodland. Part of the site falls within a landscape classified as a having a low capacity for development. There are no Tier 1 constraints.
- 3.16 Option G is considered to have an advantageous location with respect to the key employment areas as well as community facilities (e.g. secondary schools and supermarkets) and public transport. However the site is severed by the River Mole and associated areas of flood risk, which is a Tier 1 constraint. This would affect the degree of integration with the existing urban area. Ecology, landscape and cultural constraints also hinder the potential for addressing sustainability on the site. These include areas of Ancient Woodland, SNCIs and a Conservation Area and Scheduled Ancient Monument as well as landscape characteristics which provide a constraint to development. The second Tier 1 constraint is the fact that one third of the site falls within the current Gatwick noise shadow and two thirds of the site falls within the noise shadow of a possible second runway, if required.

- 3.17 Option H (Langley Green) is considered to have an advantageous location with respect to the key employment areas as well as community facilities and public transport. The sustainability constraints of the site include the severance of the area by the River Mole and associated extensive flood plain, which is a key Tier 1 constraint, the existing greenfield nature of the site, and the SNCI located within the site.
- 3.18 Option I is favourable in terms of its proximity to existing key employment areas and the Airport. It also has good overall road and public transport links and accessibility to the employment areas and town centre. The shortcomings of the site with regards to sustainability include the poor potential for integration with existing communities as a result of severance, the Crawters Brook and the potential for flood risk on the site (a Tier 1 constraint), the potential loss of greenfield land, and the presence of ecological designations which include Ancient Woodland and SNCI.
- 3.19 Option J (Pease Pottage) does not positively contribute to achieving the sustainability objectives and has a number of constraints such as poor levels of integration with the existing neighbourhoods as a result of the severance effect of the Motorway, and poor accessibility to employment areas, the town centre and other community facilities. The site is predominantly greenfield and would result in a loss of agricultural land and this would also have landscape implications. The site has a low landscape capacity and is also located within the High Weald AONB which is a key Tier 1 constraint.
- 3.20 Option K is similar in constraints to Option J although it is slightly better connected with the town and existing communities and is not located within the AONB. It will however require landtake from a SNCI and an Ancient Woodland. It is located within an area of low landscape capacity which would present a constraint to development. There are no Tier 1 constraints. However an assessment of the development potential of the site indicates that it would not be possible to accommodate development of a neighbourhood scale (i.e. 2000 – 3000 homes).

Conclusions of the Sustainability Assessment

- 3.21 The matrices and summary above highlight the key social, economic and environmental opportunities and constraints to sustainable development, based on information currently available.
- 3.22 Although Tier 1 constraints generally represent a sustainability constraint, in certain circumstances they can be mitigated, for example appropriate design can reduce the risk of flooding and, if undertaken in close liaison with the Environment Agency, may allow for development on areas of land which currently fall within the flood risk zones 2 and 3. Tier 1 constraints have therefore not been the sole basis upon which options have been excluded from the next stage. The conclusions have been drawn from an overall assessment of both Tier 1 and Tier 2 constraints and opportunities, as well as options which have a neutral impact, in determining which options are overall the most sustainable.
- 3.23 Option E (West of Bewbush) is favourable and does not impact on any Tier 1 constraints. Furthermore, it has beneficial impacts on sustainability in terms of access and land use. The site has been allocated for delivery of a new neighbourhood of 2,500 homes through the West of Bewbush Joint Area Action Plan (JAAP).
- 3.24 Option F (West of Ifield) is favourable in terms of its neutral impact on sustainability. In addition it does not contain any Tier 1 constraints. It is considered to relate well to the existing urban area, providing access to existing health facilities, schools and other community facilities.
- 3.25 Option D (Crabbet Park) is favourable in terms of its neutral score on sustainability and the fact that it does not contain any Tier 1 constraints. Although it does not deliver any beneficial impacts on sustainability, its neutral impact indicates that it is better in terms of sustainability than options such as J. Challenges to development include the severance effect of the M23 and low landscape capacity.
- 3.26 Option A (North East Sector) is favourable in terms of its neutral and beneficial impacts (access and employment) however is constrained by potential future noise at Gatwick and flood risk (both Tier 1 constraints); it is therefore only recommended for further assessment should the Without Gatwick Scenario be progressed.

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- 3.27 Options B, H and I have a number of constraints to sustainability, with Option B having one Tier 1 constraint (flooding) and Options H and I both having two Tier 1 constraints (noise and flooding). Options H and I have noise constraints as a result of both the existing and the proposed Gatwick noise shadow in both the With and Without Gatwick scenarios and therefore may present a significant constraint to sustainable development. However, these options do also provide some benefits (Option B - access and land use; Options H and I - employment and access). There may be the potential for these options to be considered in the context of strategic employment rather than land for housing purposes.
- 3.28 Option J has similar constraints to Options H and I, however the Tier 1 constraint relates to the location of an AONB within its site boundary. There are also no beneficial impacts on sustainability as a result of this option.
- 3.29 Options C and K are constrained by a number of negative impacts in terms of sustainability and do not provide any beneficial impacts and are therefore not favourable for development. Option G also has a large number of negative impacts on sustainability, including two Tier 1 constraints (flooding and noise) though does score beneficially in terms of access and employment. The favourability of this site will therefore depend on the degree to which mitigation measures can be employed.
- 3.30 On the basis of this assessment, it is recommended that Options F (West of Ifield) and D (Crabbet Park) are progressed to the next stage of evaluation together with Option A (North East Sector) but with the caveat that this option could only be brought forward if and when it was confirmed that a Second Runway would not be required at Gatwick, and the safeguarding removed.

4. DEVELOPMENT OPTIONS

- 4.1 The previous section identified that the most suitable locations at which strategic development could be accommodated at Crawley are Site A, the North East Sector, should it be confirmed that a second runway would not be required at Gatwick; Site D, Crabbet Park; or Site E, West of Ifield.
- 4.2 The second stage of this Study considers the *availability* of land for development at these locations, and the *achievability* of bringing forward strategic development in accordance with the neighbourhood principle. It considers land ownership, infrastructure requirements to support strategic development and development viability.

Development Potential

- 4.3 To inform this process, GL Hearn has undertaken an assessment of the development potential of each of the three suitable sites identified. This assessment has involved the following stages:
- Establishing the developable area – mapping development constraints (environmental, historic environment, existing development etc.) to identify development parcels and determine the developable area of the site;
 - Identifying development capacity – providing a headline assessment of development capacity, based on high level assumptions regarding development density, and the land-take of necessary social, physical and green infrastructure.
- 4.4 The developable area of the three sites identified is set out in Figure 4.1 opposite. This is based on identifying land parcels as shown in Figures 4.2 to 4.4 and high-level assumptions regarding the development mix, residential development densities, and land take for infrastructure and non-residential development. It should be regarded as indicative only. The assessment is not based upon a full masterplanning process or current developer proposals for the sites, but takes account of infrastructure requirements considered elsewhere in this Study.

- 4.5 The assessment of development potential indicates that West of Ifield (Option F) has the largest developable area, of 147ha. This is 60% greater than the developable area of 90ha for the North East Sector (Option A).
- 4.6 The residential development capacity is influenced by the land-take of other uses, as well as the land left over to open space and green infrastructure. It is also influenced by the development density.

Figure 4.1: Indicative Land Budgets

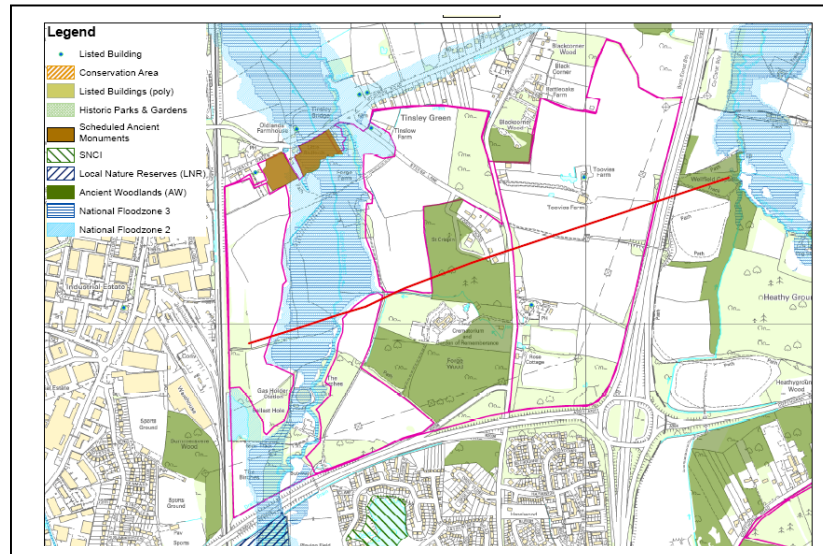
	A. North East Sector	D. Crabbet Park	F. West of Ifield
Total Site Area (ha)	151	187	214
Developable Area (ha)	90	112	147
% Developable	60%	60%	69%
Residential (ha)	50	60	74
Education (ha)	12	5	4
Employment (ha)	2		
Hotel/ Leisure (ha)		7	
Neighbourhood Centre (ha)	1	1	1
Outdoor Play Space (ha)	14	17	21
Green Grid (ha)	11	22	47
Residential Capacity @ 45 dph	2250	2700	3330
Residential Capacity @ 40 dph	2000	2400	2960
Residential Capacity @ 35 dph	1750	2100	2590

- 4.7 If built-out at 40 dwellings per hectare, it is estimated that the North East Sector could accommodate 2000 dwellings, Crabbet Park 2,400 dwellings and West of Ifield almost 3,000 dwellings.

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- 4.8 As the plan shown overleaf demonstrates (Figure 4.2), environmental, landscape and historic environment constraints divide the North East sector into around 4 development parcels. There are five potential development parcels at Crabbet Park (Figure 4.3).
- 4.9 The site West of Ifield has less specific environmental or historic constraints which would influence the masterplanning of any development. This is reflected in its larger potential developable area as a proportion of the total site.

Figure 4.2: Developable Area – Site A: North East Sector

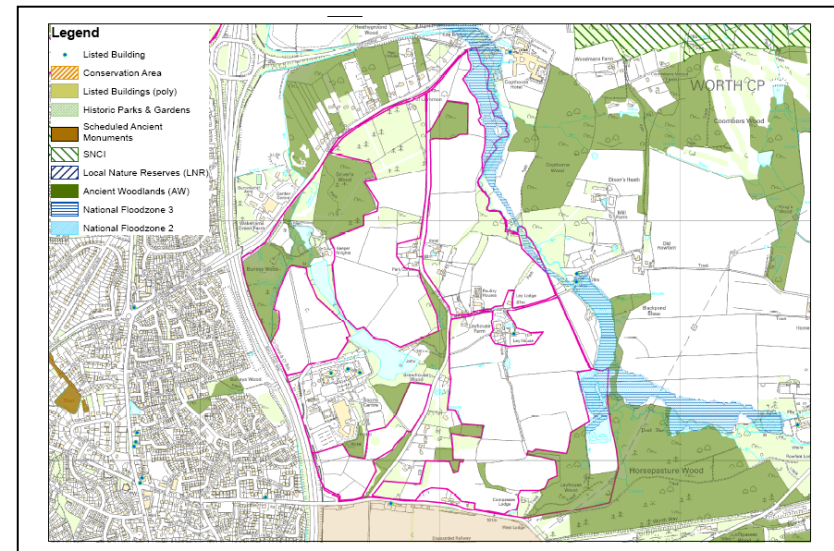


- 4.10 Key development constraints within the North East Sector comprise Flood Zones 2 and 3 of the Gatwick Stream which runs north-south through the site; Forge Wood which is designated Ancient Woodland; and the potential for aircraft noise should a second runway be brought forward at Gatwick. Parts of the site are already developed. Other constraints include a blast zone which surrounds the Gasholder station

in the south-west of the site, two Scheduled Ancient Monuments and a number of listed buildings.

- 4.11 Any development solution will need to mitigate noise from the M23 and main rail lines which form the western and eastern boundaries of the site. It will also be necessary to address access issues of severance or restricted access associated with the motorway and railway, as well as Crawley Avenue to the south; to enhance permeability and links to a new neighbourhood.
- 4.12 Constraints divide the site into four development parcels, of which the western-most sectors offer potential for employment development which could act as a noise barrier between residential development and the rail line.

Figure 4.3: Developable Area – Site D: Crabbet Park



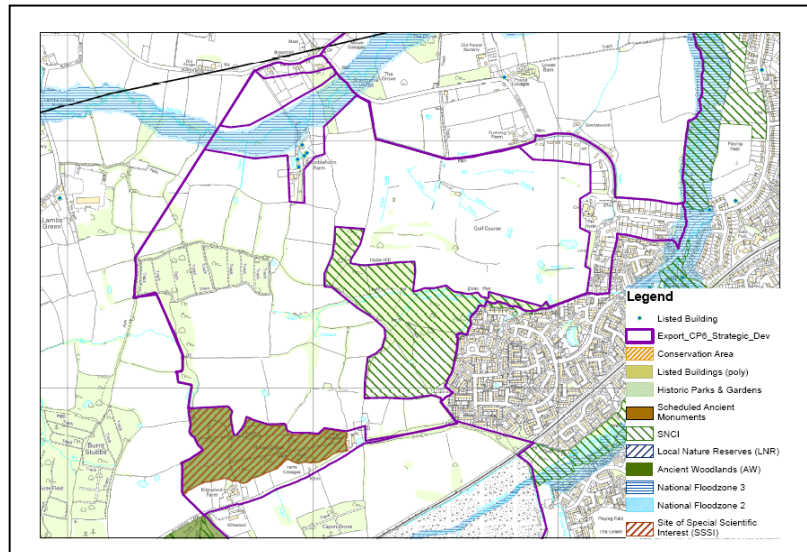
- 4.13 Crabbet Park is located to the east of the M23 which divides the site from Crawley's existing urban area. It contains a number of areas of

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Ancient Woodland, including Driver's, Burleys and Layhouse Woods. There are also a number of watercourses present, particularly adjoining the eastern extent of the site. Listed buildings are present at Crabbet Park and Ley House and the setting of these will influence the form of any development.

- 4.14 Any development solution will need to mitigate noise from the M23 and address the severance effect of the motorway. It will also be important to design a scheme which integrates with the environmental and landscape features of the site. A neighbourhood centre would need to be carefully located to be accessible to residents.
- 4.15 For both the North East Sector and Crabbet Park, existing environmental and landscape features are likely to be a strong influence on development solutions.

Figure 4.4: Developable Area – Site F: West of Ifield



- 4.16 In contrast, West of Ifield contains fewer environment or historic features. It will be particularly important to establish a strong edge to the development if this site is brought forward.
- 4.17 Integration of new development West of Ifield with the existing neighbourhood will be particularly important. Potential access points include Rusper Road, Perevil Road and Kilnwood Lane to the south.
- 4.18 Key development constraints include a Site of Special Scientific Interest at House Copse and designation of land at Hyde Hill as a Site of Nature Conservation Importance. Towards the north of the site, the River Mole floodplain will not be developable, and there exist a number of existing drainage channels on Ifield Golf Course. A number of buildings at Stumbleholm Farm are listed.
- 4.19 The site excludes areas in which noise levels would exceed 57 dbA L_{eq} should a second runway be brought forward at Gatwick. The delivery of a second runway would therefore not preclude the future delivery of residential development at this location.
- 4.20 A larger proportion of the total site area for this Option can be regarded as developable, reflecting lower proportional coverage of environmental designations relative to the other two options. The developable area for the site is therefore greater, as indicated in Figure 4.1. It would however be important that any masterplanning process, if taken forward, properly addressed the integration of new development with existing neighbourhoods and defined a strong urban edge.
- Availability**
- 4.21 A site can be considered 'available' for development when, according to Government Guidance on Strategic Housing Land Availability Assessments, "on the best information available, there is confidence that there are no legal or ownership problems, such as multiple ownerships, ransom strips, tenancies or operational requirements of landowners. This means that it is controlled by a housing developer who has expressed an intention to develop, or the land owner has expressed an intention to sell" (CLG, July 2007).

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Option A: North East Sector

- 4.22 A Development Consortium controls the majority of the land covered by the North East Sector proposals. The Consortium comprises Persimmon Homes (South East) Ltd and Taylor Wimpey, whom have acquired the interests of Beazer Homes (Reigate) Ltd and Laing Homes Ltd. They control 128 ha of land.
- 4.23 Some areas of land within the site are owned by Crawley Borough Council and the Homes and Communities Agency (HCA). It is understood that the Homes and Communities Agency control land necessary to provide the main access off Crawley Avenue. It is unlikely that the developer would proceed in the absence of a deal with the HCA. However given the HCA's remit to drive forward housing delivery, it is not anticipated that the Agency would hold back development from coming forward.
- 4.24 While there are a number of parcels of land on the periphery of the proposed neighbourhood which are not under the control of the Consortium, these are not included within the Consortium's proposed Masterplan and do not compromise the delivery of a comprehensive development solution. The outstanding ownerships do not compromise the potential for strategic development.
- 4.25 The North East Sector can hence be regarded as available for development.

Option D: Crabbet Park

- 4.26 The site at Crabbet Park is made up of a number of landowners, ranging from householders, to those owning woodland, pasture or business premises.
- 4.27 The development promoters, Miller Strategic Land, have argued that all land shown for development in their outline masterplan is "within the ownership of their supporters" clarifying this to state that "all landowners within the site are committed to delivering the proposed development, apart from the small number whose intentions are as yet unknown or whose intentions are not yet finalised." It is argued that

land that is not held by Miller Strategic Land or its supporters is not essential to the delivery of a suitable and effective scheme at this site.

- 4.28 The site contains over 20 landownership interests. We understand that Miller has a signed agreement or verbal agreement with over 90% of landowners, with those with whom there is no formal or informal agreement identified on their masterplan (areas hashed red). It is estimated that these could contribute an additional 150-200 dwellings.
- 4.29 Of those areas identified as within the developers' control, it is unclear what form of agreement the developer has with landownership interests. It is clear that there is not a formal agreement in place with all interested parties, and this represents a risk to delivery of a comprehensive development solution as there can be no certainty that all landowners will eventually sell.
- 4.30 However, the test of availability relates to land "controlled by a housing developer who has expressed an intention to develop, or the land owner has expressed an intention to sell." It could therefore be argued that an in-principle agreement is sufficient.
- 4.31 In our view, it is sensible to consider the Crabbet Park site as available for development but to note that the number and complexity of landownerships, and uncertainty regarding the nature of the agreement of the developer with these owners, represent a risk which could delay or inhibit delivery of a comprehensive development solution.
- 4.32 Mid Sussex District Council should request further information from the developer regarding the nature of the agreements with landowners, and the extent of the land controlled by the developer in order to evaluate the risk to delivery of a comprehensive strategic development solution.

Option F: West of Ifield

- 4.33 This site includes land owned by Ifield Golf and Country Club, Welbeck Land, Wates, Rydon Homes, Persimmon Homes and the Homes and Communities Agency (i.e. the Consortium).

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- 4.34 Welbeck Land, Wates and Rydon Homes have acquired a 15 year option over Ifield Golf Club (50ha). This forms a key part of the wider site which includes land controlled by the HCA and Persimmon. The parties have signed a collaboration agreement, through which Welbeck, Wates and Rydon would lead on site promotion and take on the planning risk.
- 4.35 The number of ownerships and status of agreements means that we would ascribe a lower level of risk to a comprehensive solution being brought forward on this site relative to Crabbet Park.
- 4.36 This said, there is a potential issue regarding the lease held by the Ifield Golf and Country Club. This is not due to expire until 2022. The Consortium is starting discussions regarding the potential to relocate or buy-out the Golf Club, but as yet no alternative site has been identified. While the Consortium hope to be able to persuade the Club to relocate, it cannot be guaranteed that this will be achieved and that this part of the site can be brought forward before 2022. We consider that it is unlikely that this situation will progress, thus providing greater certainty, in advance of their being greater certainty regarding the site's allocation.
- 4.37 The questions regarding the Golf Club are a potential risk to the delivery of development, and could for instance affect questions over the delivery of a Western Relief Road within an early phase of development (as identified in the Transport Assessment). This significantly impacts upon the developable area of the site in the period to 2022, the potential for integration with development West of Bewbush; and the overall delivery of a comprehensive phased development solution.
- 4.38 In our view, it is sensible to consider the West of Ifield site as available for development but to note that uncertainty exists regarding the timing of acquiring possession of the Golf Club, which represents a risk that could delay delivery or inhibit delivery of a comprehensive development solution.

Summary

- 4.39 We have considered in this section the availability and development potential of the three potential strategic development locations identified as "suitable" through the sustainability assessment.
- 4.40 These sites can be regarded as "available" for development where there are no legal or ownership problems which could prevent them coming forward for development. This is considered to be the case where a housing developer controls the land, or where a landowner has expressed an intention to sell.
- 4.41 Each potential strategic development location considered – North East Sector, Crabbet Park and West of Ifield – is being promoted by a separate developer consortium. In each case we consider that they have acquired land or entered into positive discussions with landowners to enable them to bring forward a comprehensive development solution.
- 4.42 The nature of landownerships, options and in-principle agreements to sell are however complex and have not been investigated in detail. From the Assessment undertaken, we would ascribe greater risk to bringing forward comprehensive development at Crabbet Park – which contains over 20 separate ownerships – and at West of Ifield, where there is a risk that the Consortium may not be able to bring forward development of the Golf Club, which represents a significant tranche of the site, prior to 2022. Given its existing planning status, the North East Sector should be regarded as available for development although uncertainty regarding provision of a Second Runway means that it cannot be regarded currently as 'suitable.'

5. SOCIAL INFRASTRUCTURE ASSESSMENT

- 5.1 In this section we assess what social infrastructure is necessary to support the delivery of a new neighbourhood of 2,500 homes at Site A: North East Sector, Site B: Crabbet Park; or Site F: West of Ifield.
- 5.2 The Assessment defines social infrastructure as including education, healthcare, library provision, community facilities, fire and waste services, affordable and supported housing together with open space and green infrastructure.

Assessment Approach

- 5.3 The Social Infrastructure Assessment has been informed by Crawley Borough and West Sussex County Council's current S106 Strategies and discussions with the four local authorities regarding assumptions. At the direction of the client team, some assumptions are consistent with those adopted in the Social Infrastructure Assessment for West of Crawley prepared by URS Corporation as this has informed recent planning for strategic development West of Crawley.
- 5.4 GL Hearn has met with representatives of West Sussex County Council and West Sussex PCT and reviewed 'Position Statements' supplied by these and other social infrastructure providers to inform the authorities respective Core Strategies.
- 5.5 The assessment comes with the caveat that this is a 'high level' assessment undertaken at an early stage in the planning process to inform the identification of suitable, achievable and developable sites. Further detailed assessment of social infrastructure requirements and dialogue with infrastructure providers will be necessary as part of the detailed development planning, such as through the process of developing a Masterplan/ Area Action Plan and detailed Planning Applications for sites to be taken forward.

Education

- 5.6 GL Hearn has assumed that neighbourhoods will be 'self-sufficient' in terms of nursery and primary school provision. For secondary and post-16 education, it is expected that pupils may travel across town to a school, and that the assessment of additional provision required should take account of the capacity of existing secondary schools. This is assessed on the basis of the Audit Commission's recommendation that local authorities plan for an occupancy rate of 95% within an education planning area.
- 5.7 In both cases, we have been cognisant of the potential level of housing and population growth which is expected to arise as a result of development within the existing built-up area and from the proposed new West of Bewbush neighbourhood.
- 5.8 The following pupil ratios have been used, derived from the County Council's Planning Obligations Strategy:
- Early Years (ages 0-4): 14 pupils per year of age per 1000 population for houses; and 5 per year of age per 1000 population for flats
 - Primary (ages 4-11): 25 pupils per 100 dwellings
 - Secondary (ages 11-16): 18 pupils per 100 dwellings
 - Post-16 (ages 16-18): 4 pupils per 100 dwellings

Early Years Provision

- 5.9 If we assume that a strategic development of 2500 homes includes 1500 houses (60% of total dwellings) and 1000 flats, it could be expected to yield 225 children aged 0-4 or 112 aged 3-4.
- 5.10 There are a number of potential delivery models for early years provision. Nursery provision could be included within primary schools, within free standing nurseries or within children's centres.

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- 5.11 A realistic size of a nursery form is 60 children for a nursery form attached to a primary school and 100 children for a free standing nursery (based on guidance from West Sussex County Council, as the Local Education Authority). We estimate that a strategic development of 2500 homes would hence require 1-2 nursery forms at a primary school or a free standing nursery. The assumptions on site sizes for primary schools included herein (2.7ha) includes sufficient capacity to accommodate pre-school provision; albeit that this would likely be operated by a third party provider.
- 5.12 Childrens' Centres are an alternative model for early years provision. These are service hubs for children under five and their families which may include a variety of services, such as early education and childcare, support for parents, health services and support helping parents into work.
- 5.13 West Sussex County Council currently seek contributions towards delivery of Children's Centre places, using a formula of £1079 per child. A Children's Centre would typically accommodate 800 children.
- 5.14 It therefore appears unlikely that a Children's Centre would be delivered in every neighbourhood. It is however possible to use the above formula to calculate a potential contribution of £243,000 for a strategic development of 2,500 homes towards early years provision.
- Primary School Provision*
- 5.15 In consultation with West Sussex County Council, this Study assumes that planning for primary school provision should be based on schools servicing the neighbourhood specifically, and integrated within or close to the community hub.
- 5.16 Based on the pupil ratio set out, the primary school pupil yield from a 2500 dwelling development is estimated at 625 pupils.
- 5.17 West Sussex guidance for a primary school in an urban area is for a minimum of 210 pupils for a one form of entry school (1FE) and a maximum of 630 pupils where there are three forms of entry (3FE). On this basis a strategic development would require either a single 3FE primary school; a 2FE Primary School and 1FE Primary School; or a 2FE Primary School where there is some capacity or potential for extension of existing local schools.
- 5.18 Primary schools in the north of Crawley are currently over-capacity. On this basis it is considered that a new school in the North East Sector, if brought forward, would be required within the first phase of development, before completion of the 1000th dwelling. Planning for this would need to be progressed at an early stage given that there is an approximately three year lead-in time to delivery.
- 5.19 If proposed development was brought forward West of Ifield, there might be potential for some integration of school provision with the development West of Bewbush. West Sussex County Council has advised that a 3FE school could be constructed to serve homes to the north of the rail line within both the West of Bewbush and potential West of Ifield development. Within the early phases of development West of Ifield, it might be possible to extend provision at the West of Bewbush Primary School.
- 5.20 At Crabbet Park, it is likely that one or two schools would be required within the development site as primary age children should not have to cross the motorway to schools within Crawley's existing urban area. We have assumed for the basis of this assessment that two primary schools are provided, one 1FE Primary School and one 2FE Primary School. This is consistent with the developers' proposals for the site.
- 5.21 The County Council estimate that a 2FE primary school would require a 2.7ha site. This includes provision for playing fields, early years provision and extended services. It is based on 60 pupils per year of age. We estimate that a 3FE primary school would require 3.5-4ha.
- 5.22 It is expected that school sites are provided on a free and serviced land basis and that the developer contributes to the cost of construction. The cost of construction is likely to vary depending on the sustainability credentials of the school development but it is estimated at £7-12million based on recent new schools delivered in the County.

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Secondary School Provision

- 5.23 Crawley contains six secondary schools of which four were operating in 2008 at below the 95% capacity threshold. We estimate that there are currently 468 surplus places.
- 5.24 A single strategic development site of 2,500 homes is estimated to result in a pupil yield of 450 pupils aged 11-15 and 100 pupils aged 16-18.
- 5.25 It is estimated that existing commitments, allocations and proposed development West of Bewbush will yield 923 pupils aged between 11-16 and a further 205 pupils aged 16-18. This is expected to more than soak up existing surplus place capacity, and additional capacity will need to be delivered.
- 5.26 While a development of 2500 homes is not sufficient in itself to justify development of a new secondary school, considering wider development expected to occur in Crawley it is likely that investment in further capacity or a new school would be required.
- 5.27 Within the town there is currently some capacity within the north-west, but particularly in the south-east and south-west education sectors. However there is limited capacity in the north-east of the town.
- 5.28 If the North East Sector is brought forward, the County Council has indicated that it would undertake a review of pupil places at secondary level. It is expected that this would highlight that additional capacity was required. This would lead to a contribution being sought from the developer. There is a possibility that additional places could be accommodated at Oriol High School.
- 5.29 If the Crabbet Park development is delivered, but the North East Sector is not, the County Council would potentially seek provision of a new secondary school in Crawley Down, to serve the Crabbet Park development and wider rural area. The County Council consider the proposal at Crabbet Park more beneficial 'educationally' than other options for strategic development in Mid Sussex. We are however not aware that any site has yet been identified for a new school.
- 5.30 Development West of Ifield could potentially be accommodated by extending existing schools. However the potential to extend some schools in Crawley is constrained in some instances. This is particularly the case for the schools which formed part of the Crawley Private Finance Initiative (PFI) Improvement Scheme, namely Oriol, Thomas Bennett and Ifield. While extensions to these schools are not unfeasible, it would be costly as the County Council would have to renegotiate PFI contracts.
- 5.31 We understand from the County Council that there is land at Ifield and Thomas Bennett schools which the County Council are currently looking to dispose of, but which (at a cost) could be retained to support expansion.
- 5.32 The County Council has indicated a secondary school including sixth form would require a site area of between 7.25 – 8.25 ha.
- 5.33 West Sussex County Council would seek financial contributions for secondary school places. The County Council's Planning Obligations Strategy indicates a contribution of £19,393 per school place for secondary school provision and £21,032 per school place for post-16 provision in Crawley. However given inflation in build costs and higher sustainability standards, contributions required per place could be greater than this.

Healthcare

- 5.34 Our assessment assumes that primary healthcare provision is provided at a local level, taking into account the growth in population which is expected to result from strategic development.

Primary Healthcare

- 5.35 There are currently 12 GP practices in Crawley with overlapping catchments. West Sussex Primary Care Trust (PCT) have also recently delivered a new GP-led Health and Wellbeing Centre (a polyclinic) which provides extended services from 8am-8pm, 7 days a week. This is currently located in Crawley Hospital, with the intention that it will move to converted premises opposite Crawley station in

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- October 2009. The PCT have advised that there is no current shortage of facilities.
- 5.36 The URS Neighbourhood Assessment identifies that the lists of GP practices in Crawley vary between 1,200 – 3,000 patients with the majority having 1,600 – 1,800 patients. A GP list of 1,800 – the national average – is regarded as a reasonable standard. On this basis, a new development of 2,500 homes would result in demand for 3 – 4 GPs. West Sussex PCT have advised that this could be provided either through development of a new GP Practice or development of a branch surgery to an existing practice.
- 5.37 Changes in the way in which primary healthcare is being organised could however reduce the number of GPs and types of facilities required. The PCT has not yet produced their Primary Care Strategy, however their Estates Team have estimated that a development of 2,500 homes might require just 2.5 GPs. This would likely be met either through providing GPs at existing surgeries or delivery a new branch surgery within a new neighbourhood.
- 5.38 The PCT has advised that:
- West of Ifield – primary healthcare requirements could be met either through provision of a branch surgery, or expansion of Bewbush Medical Centre, Gossops Green Medical Centre and potentially Ifield Drive Practice.
 - North East Sector – primary healthcare requirements could be met either through provision of a branch surgery, or expansion of the existing Pound Hill Surgery and Saxonbrook Medical Centre.
 - Crabbet Park - primary healthcare requirements could be met either through provision of a branch surgery, or expansion of the existing Saxonbrook Medical Centre and possibly Pound Hill Surgery.
- 5.39 In accordance with the neighbourhood principle, we would expect development of a new GP practice or branch surgery to occur within the neighbourhood centre as part of any new strategic development.
- 5.40 In broad terms, a GP practice at a neighbourhood level could include 4 consulting rooms for GPs, 2 consulting rooms for nurses together with a waiting room and back office space. We estimate that this would be c. 1400 – 1500 sq.m in size.
- 5.41 The PCT would expect a site developer to provide a surgery on the basis of free and serviced land and a contribution (ideally a full contribution) towards the build cost. Delivery timescales would be linked to that of the neighbourhood centre.

Secondary Healthcare

- 5.42 Crawley Hospital, a Community Hospital, includes an Urgent Treatment Centre which provides some emergency services but not full Accident & Emergency provision. Current acute care is provided at Queen Victoria Hospital in East Grinstead and the East Surrey Hospital in Redhill.
- 5.43 West Sussex PCT's North East Review (Jan 2009) identifies no requirements for new hospitals in north-east West Sussex. It suggests that acute patient medical numbers would not support a two-site general hospital model.
- 5.44 West Sussex PCT pays the secondary care provider, Sussex and Surrey Healthcare NHS Trust, to provide hospital services. Strategic developments of 2,500 homes will incur additional secondary care costs to the PCT. The PCT might look to recover part of this through planning obligations.
- 5.45 The PCT's North East Review indicates that there is sufficient physical capacity to provide new acute beds at East Sussex Hospital in East Grinstead; and to accommodate new other care beds at Crawley Hospital where capacity exists from the potential to convert current office and administration space.

Library and Community Facilities

Libraries

- 5.46 West Sussex County Council have recently delivered a new Central Library in Crawley which opened in December 2008. The 2,800 sq.m public library, is approximately three times the size of the previous facility. There is also a neighbourhood library in the Broadfield neighbourhood.
- 5.47 West Sussex County Council however wish to see provision of new local library provision integrated into community buildings within the neighbourhood centres of any new neighbourhoods in Crawley.
- 5.48 West Sussex County Council has adopted a standard of 32 sq.m of library provision per 1000 population based on the International Federation of Library Associations and Institutions recommended standard.
- 5.49 Based upon an estimated population of 6,425 for a new neighbourhood of 2,500 homes, this would result in a requirement for new library space of 206 sq.m. Taking account of space requirements for front desk facilities, meeting rooms and book storage we estimate a requirement for c. 300 sq.m of library provision in a new neighbourhood.
- 5.50 The County Council would seek provision of a library on a free and serviced land basis together with a developer contribution towards the build cost (ideally of the full build cost). Delivery timescales for library provision would likely be linked to that of the neighbourhood centre.

Community Facilities

- 5.51 Crawley Borough Council's Planning Obligations and Section 106 Agreements SPD (August 2008) indicates that in the case of very large strategic sites, such as new neighbourhoods, the developer and/or landowner will be expected to provide land and buildings or a financial contribution towards the provision of a new community centre within

the development. It sets out that for indicative purposes the cost of provision is currently considered to be c. £750,000.

- 5.52 The Western Neighbourhood Position Statements indicate that a new neighbourhood should include a floorspace of 450 sq.m for a community centre and a youth centre of 250 sq.m. The total floorspace of the community facility would hence be 700 - 800 sq.m (taking account of circulation space).
- 5.53 The community facility could be integrated with library provision and the health centre to provide a central community hub to the neighbourhood.

Open Space and Green Infrastructure

- 5.54 Strategic developments are assumed to be self-sufficient in respect of open space with provision of formal and informal open space and play space provided to serve the neighbourhood's population integrated within the neighbourhood centre in line with the 'neighbourhood principle.'
- 5.55 We have assessed open space requirements with regard to Sport England's Playing Field Standards. These provide a consistent basis against which to consider open space requirements at a strategic level. These are set out below.

Figure 5.1: Sports England Playing Field Standards

	Hectares per 1000 Population
Playing Pitches	1.2
Informal Open Space	0.4
Local Play Space	0.4
Locally Equipped Areas of Play	0.2
Neighbourhood Play Space	0.2
Total Outdoor Play Space	2.4

Source: Sport England

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- 5.56 Applying these ratios to the population which is expected to arise from a strategic development of 2,500 homes results in the following indicative requirements for open space.

Figure 5.2: Open Space Requirements for a 2500 home Strategic Development

	Area (Hectares)
Total Outdoor Play Space (ha)	15.4
of which	
Playing Pitches	7.7
Informal Space	2.6
Local Play Space	2.6
Locally Equipped Area of Play	1.3
Neighbourhood Space	1.3

Source: GL Hearn

- 5.57 The analysis identifies an indicative requirement for 15.4ha of outdoor play space to be provided within a strategic development of 2500 homes. Part of this requirement may however be met in conjunction with other land uses, such as provision of playing pitches on school sites which are available for wider community use out-of-hours. It may also be possible to provide elements of this outdoor play infrastructure on sites which are liable to flooding.
- 5.58 Each of the three local authorities has undertaken an Open Space, Sport and Recreation Study in accordance with Planning Policy Guidance Note 17 (PPG17). These Studies consider existing access to open space, sport and recreation facilities at a local level. They should inform the detailed masterplanning of any strategic development location which is taken forward.

Supported and Affordable Housing

- 5.59 Policies regarding affordable housing provision vary somewhat across the three authorities: Crawley Borough Council's adopted LDF Core Strategy currently has a 40% affordable housing requirement. Horsham District Council's adopted LDF Core Strategy seeks to

achieve a target of 40% affordable housing. Mid Sussex District's Local Plan has a requirement for 30% affordable housing, however the Council's Pre-Submission Core Strategy proposes that this is increased to 40%.

- 5.60 The Northern West Sussex Strategic Housing Market Assessment provides an assessment of housing need. It recommends that over the longer-term the local authorities work to adopt a consistent 40% affordable housing requirement. It suggests that 70% of affordable housing provision over the long-term should be social rented and 30% intermediate affordable housing.
- 5.61 West Sussex County Council have indicated that they would seek to secure provision of extra care housing within strategic development sites. The County has produced a Commissioning Strategy for Supported Housing which considers the available supply of accommodation and demand trends, arguing for increased provision of extra care housing as an alternative to residential care.
- 5.62 The County Council has indicated that provision of extra care housing within strategic developments would be dealt with as part of the 35/40% affordable housing requirement. It has suggested that the level of provision should be consistent with that proposed within the West of Bewbush Strategic Site.

Fire & Waste

Fire

- 5.63 West Sussex County Council is the fire authority for the Crawley area. The County Council has indicated that new fire infrastructure requirements associated with strategic development are likely to include provision of fire hydrants connected to water mains (which is the responsibility of the developer); coupled with contributions to fire station infrastructure.
- 5.64 A new fire station is proposed at Cheals Roundabout in Crawley. It is considered that this would be able to serve Crawley, including new neighbourhoods. Funding for this new infrastructure is in place. This site would serve potential strategic development sites at West of Ifield

and North East Sector. No additional fire service infrastructure would be required in Crawley.

- 5.65 Crabbet Park however would likely be served by East Grinstead Fire Station. There are proposals to relocate this Fire Station to a new site, at a cost of £6-8 million. If development at Crabbet Park was to come forward, the County Council expect that East Grinstead Fire Station would either be moved to a new site or the existing site upgraded and improved.
- 5.66 The County Council has also mooted the potential for a new or relocated Fire Station to be provided in Mid Sussex, south of Crawley, which would be located nearer to the A23 than existing infrastructure.
- 5.67 Notwithstanding specific physical infrastructure requirements, West Sussex County Council undertake fire infrastructure planning on a County-wide basis and would require proportional contributions from all strategic development brought forward in line with their S106 Strategy. This is currently a contribution of £92 per person for fire station infrastructure for the projected population increase.

Waste

- 5.68 We understand from West Sussex County Council that there is no current requirement for additional waste infrastructure, such as a Household Waste Recycling Centre (HWRC), in Crawley. There is currently sufficient capacity at the existing Crawley facility at Metcalf Way with an additional recycling facility to be provided within the proposed West of Bewbush strategic development.
- 5.69 Waste requirements from the proposed Crabbet Park development would be met at the County Council's existing HWRC in East Grinstead which is due to be improved this year. The improvements include design capacity to take account of up to 2500 additional households.
- 5.70 The County Council is not presently requesting a contribution to waste services in Crawley, however we understand that it might expect proportional contributions to waste services in accordance with its

S106 Strategy (which we estimate would be £180,000 for a strategic development of 2,500 homes).

Summary

- 5.71 The table overleaf summarises the social infrastructure requirements necessary to deliver strategic development of 2,500 homes.
- 5.72 It is not envisaged that social infrastructure will constrain delivery of any of the potential strategic development options being considered.
- 5.73 We consider however that it will be necessary for some infrastructure providers to demonstrate a stronger evidence base in support of the contributions requested, for instance in relation to health or library facilities; to justify why contributions are required, such as for waste provision; or to provide greater clarity regarding the form / scale of provision sought, such as for education and health.

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Figure 5.3: Social Infrastructure Requirements Summary

Theme		Infrastructure Requirement - Strategic Development of 2,500 Homes
Education	Pre-School	1 or 2 nursery forms attached to a primary school; 1 free standing nursery; or contribution towards Childrens Centre provision
	Primary	1 3FE primary school, or a 2FE and 1FE primary school or a 2FE school where there is existing capacity. Likely requirement for provision in early phase at North East Sector; and for 3FE school in later phase West of lfield with extension to provision at West of Bewbush.
	Secondary	<ul style="list-style-type: none"> • Potential requirement for additional secondary school capacity within existing schools to support development at the North East Sector if progressed; • Provision of a Secondary School at Crawley Down, if a suitable site can be identified, to support strategic development at Crabbet Park if progressed; • Development West of lfield would require extension of existing PFI schools if progressed.
Health	Primary	1500 sq.m GP surgery located within neighbourhood centre or extension of existing practices.
	Secondary	Potential developer contribution to secondary care.
Community	Library	300 sq.m library provided within neighbourood centre.
	Community	800 sq.m community facilities provided within neighbourhood centre. Incorporates youth and community provision.
Open Space		15.4ha outdoor play space
Affordable Housing		40% affordable housing with 70/30 split between social rented and intermediate tenures.
Fire & Waste	Fire	Potential developer contribution to fire infrastructure.
	Waste	No contributions currently required for waste

6. TRANSPORT INFRASTRUCTURE ASSESSMENT

6.1 AECOM has undertaken an assessment of transport infrastructure requirements to support the three potential development options being considered, namely:

- Option A: North East Sector
- Option D: Crabbet Park
- Option F: West of Ifield

6.2 Transport impacts are assessed in each case for a 2022 base year. A further option has been developed which considers the combined impacts of all three options being brought forward. The latter assumes a 2026 base year.

Approach and Methodology

6.3 The Transport Infrastructure Assessment is high level and builds upon the work undertaken in the original 2005 At Crawley Study. The approach adopted has been informed by a review of existing transport studies, transport models and transport assessment work undertaken by the various developers promoting the sites in question.

6.4 There is an existing Saturn dynamic multi-modal transport model for Crawley. This has however been updated periodically over time and does not provide a consistent baseline across the town. It does not provide a robust basis to provide a comparative assessment of the relative transport impacts of the various options being considered.

6.5 In consultation with the client team, it was determined that the spreadsheet transport model developed by Atkins for the 2005 Study would provide the best high-level comparative basis for considering the relative transport merits of the options.

6.6 AECOM have developed and updated the 2005 Atkins Transport Model to consider in further detail the transport impacts and requirements of the three potential development options, to assess issues of junction capacity and to consider both highways and public transport improvements necessary to support delivery of the options.

6.7 The Atkins Model uses the TRICS database, 2001 Census data, National Travel Survey data for the period 1998-2000 and a gravity model methodology to identify the multi-modal trip generation and distribution for the development options considered.

6.8 AECOM has applied background traffic growth rates, and assumptions regarding mix and phasing of development to determine transport impacts in 2022 for individual development options scenarios and 2026 for the combined options scenario.

6.9 The 2005 Study considered the capacity of individual links. Junction impacts were not identified. However given the congested nature of the highways network in and around Crawley, junctions represent the most significant network constraints.

6.10 The junctions which are predicted to suffer pressure under base conditions have been identified from available data. In addition, junctions which are predicted to suffer capacity issues for each individual site assessment were identified. Using the link capacity assessment, junction capacity issues which are expected to be exacerbated under the development scenarios during both the AM and PM peak are highlighted.

6.11 Informed by the 2005 Study, proposals for strategic development of 2,500 homes West of Bewbush have been taken forward through preparation of a Joint Area Action Plan which has now been adopted. This Study hence includes West of Bewbush within the 'base case' and the Atkins spreadsheet transport model has been updated accordingly. All of the options considered hence assume bringing forward more than one strategic development of 2,500 homes in Crawley.

6.12 The Transport Assessment undertaken hence considers the combined impact of bringing forward several strategic development locations,

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considers junction capacity rather than just the capacity of links, and assesses both highways and public transport improvements necessary to support delivery of the options.

- 6.13 To inform the assessment of developability it is also necessary to provide an indication of the order of costs necessary to deliver highways and public transport infrastructure improvements for each option.
- 6.14 The cost estimates identified in the previous At Crawley Study are now out-of-date and many of the current proposals relating to each of the sites differ from those included under the previous study. No costs for Option A (North East Sector) were identified in the previous study or subsequent submissions.
- 6.15 A tested and fully costed package of infrastructure measures in relation to potential strategic development at Crawley is only available for the West of Bewbush site, which was developed as part of the JAAP evidence base. The costs identified in this work vary quite significantly from those identified in the At Crawley 2005 Study for the West of Bewbush Site.
- 6.16 Identifying a reasonably accurate order of cost when undertaking a comparative assessment and in determining the overall developability of the options is important. Based on the knowledge available in relation to each option regarding accessibility and likely infrastructure requirements, the West of Bewbush costs have informed an assessment of the proportional costs for highways and public transport infrastructure improvements for the remaining options.
- 6.17 The detailed assumptions on which costs identified are based are set out in the Transportation Assessment (Appendix D).

Assessment Assumptions

- 6.18 Crawley contains a major concentration of employment and, according to the 2001 Census, retains 60% of commuter journeys within the urban area. There are current delays to peak-time travel in the town, especially on the approaches to the Town Centre and on other key routes. Key areas of congestion include the M23 Junctions 10 and 11,

the A23 London Road, the A264 and the Town Centre. The existing network is constrained in these areas.

- 6.19 From the review of existing transport studies and transport modelling undertaken, it is clear that delivery of a further strategic development to the west of Crawley, in addition to development West of Bewbush, would require delivery of a Western Relief Road. Moreover delivery of a Western Relief Road would be necessary to support the delivery of more than one of the options being considered to address local network capacity constraints.
- 6.20 The Transport Infrastructure Assessment assumes:
- Delivery of 2,500 at each strategic location over a five year period between 2014-21 for the individual site options, alongside delivery of housing West of Bewbush and within the existing urban area in accordance with Crawley Borough Council's Housing Trajectory. For the combined option delivery of strategic development is phased over the plan period to 2026;
 - A design year of 2022 for individual options and 2026 for the combined options scenario. Generic traffic growth has been assumed up until 2013 in all scenarios.
 - A public transport modal shift, as agreed with West Sussex County Council, of 1.5% increase in the bus mode share and 2.6% in the rail mode share between now and 2022.
 - That Option E (West of Ifield) will require delivery of a Western Relief Road (WRR). Trip assignments for Option D (West of Bewbush) without the WRR were incorporated into the capacity assessments for Options A and B (North East Sector and Crabbet Park). Trip assignments for Option D with the WRR were incorporated into capacity assessments for Option E.
- 6.21 The Assessment comes with the caveat that traffic flows identified in the spreadsheet model are cumulative and so do allow for dynamic assignment (to reflect people changing their routes or journey patterns because of congestion) nor account for any reduction in base flows resulting from staff working in Crawley who currently commute into the

town but might move to the one of the new sites. The analysis does however provide an understanding of the relative trip demands from each scenario.

- 6.22 The Assessment comes with additional caveats that it does not allow for diversion of base traffic to the Western Relief Road if constructed, which would likely occur, helping to alleviate existing congested junctions in central Crawley. In regard to public transport, no assessment has been undertaken of the capacity of the public transport network and its ability to support the assumed levels of modal shift.

Transport Issues in Base Case

- 6.23 The Assessment identifies the following link capacity issues in Crawley for the base case (which includes delivery of Option D: West of Bewbush) during the AM peak:
- A264 approaching Crawley Bypass eastbound;
 - Haslett Avenue westbound;
 - Southgate Avenue northbound.
- 6.24 The AM peak hour is identified as the critical case, and no PM peak link capacity issues are predicted.
- 6.25 The literature review undertaken indicates that the main junctions in Crawley Town Centre will suffer capacity issues in the future, with specific link capacity issues along the A264 and the London Road. Junctions 9, 10 and 11 on the M23 are all expected to suffer capacity issues during peak hours, along with key junctions on the Crawley Town Bypass under base conditions.

Option A: North East Sector

Site Access & Highways

- 6.26 The Transport Assessment assumes delivery of 2,500 homes supported by four all-purpose access points to the development,

including a signalised access off Crawley Avenue and additional accesses off Streers Land and Balcombe Road. A new north-south link road is provided from Streers Lane to Crawley Avenue through the development site.

- 6.27 The Assessment indicates link capacity issues during the AM peak consistent with the Base Case at A264 approaching Crawley Bypass (eastbound); Haslett Avenue (westbound); and Southgate Avenue (northbound). This Option exacerbates capacity issues at the latter two, albeit that the impact is only marginally greater than the base case. No individual link is expected to be at or approaching its carriageway capacity in the PM Peak.
- 6.28 Traffic impacts are predicted to be most significant on Balcombe Road and Crawley Avenue and mitigation measures are proposed. No mitigation measures are proposed at the Crawley Bypass junctions (A264).
- 6.29 This option will increase traffic through the A2011/A23/London Road Junction, the A2011/A2004/Gatwick Road Junction and Junction 10 of the M23, which are identified as being under pressure. The A2004 junction with College Road is predicted to encounter an additional 150-500 trips during the AM peak which is likely to cause issues.
- 6.30 All transport proposals, on and off-site, proposed by the Development Consortium have been agreed with the Highways Agency as specified in the Inquiry Statement of Common Ground. This assumes delivery of 1,900 dwellings.
- 6.31 In accordance with the Transport Statement of Common Ground, it is assumed that improvements to 11 external junctions are undertaken including M23 Junction 10 and existing bus services extended into the site. On and off-site cycling facilities are provided to tie into the existing network, together with pedestrian links on adjacent roads and from adjacent areas.
- 6.32 The estimated costs of highways infrastructure (internal and external) is £29 million.

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Public Transport

- 6.33 A large proportion of trips are expected to be to Three Bridges, Langley Green and Northgate wards. These cover the main employment areas of the town including Three Bridges, Manor Royal and the Town Centre.
- 6.34 Existing bus services, nos 10,20 and 200 operate along Gatwick Road and provide coverage to these areas which are expected to be the key bus desire lines from the site. There is however a lack of existing bus services from the site to the north (to Horley).
- 6.35 The Development Consortium propose diversion of a single bus service to support the development. We are concerned that the proposed new bus service is quite indirect and could find difficulty competing with the car as a mode of choice. The proposed routing would represent a considerable detour and achieving a high quality service is questionable. In its current format, it is unclear whether this service will be viable and whether a public transport operator has been involved in the identification of this solution.
- 6.36 The current developer proposals indicate a £2.5 million contribution to finance the provision of a quality bus service from development opening until the service is viable. However public transport requirements are expected to be more than current proposed. Given the urban location and proximity to employment areas, public transport costs of £3.75 million are assumed.

Walking & Cycling

- 6.37 There is a relatively good cycle network to these areas albeit that Crawley Avenue and the railway line provide barriers to pedestrian and cycle connectivity. Achieving pedestrian and cycle linkage across the railway line would greatly enhance this option. Existing cycleways to the north, east and south-east are poor.

Overall Assessment

- 6.38 The proposed site offers the potential to offer sustainable access options and is unlikely to lead to significant re-routing of traffic. Highways impacts can be mitigated.
- 6.39 Achieving a viable high-quality public transport service is however more problematic. The site would be a good location for a Park & Ride site to attract inbound trips from the north and east. This would further support the rerouting of bus services through the site. The need for Park & Ride requires further exploration.
- 6.40 The option would be enhanced by provision of pedestrian and cycle links across the rail line.
- 6.41 It is estimated that the total cost of transport infrastructure necessary to support this development option would be £32.75 million based on the highways and public transport measures set out in Figure 6.1

Option D: Crabbet Park

Site Access & Highways

- 6.42 The Transport Assessment assumes delivery of 2,500 homes supported by a main vehicle access off Copthorne Road, two secondary vehicle accesses off Turners Hill Road and pedestrian and cycle links from these and via a bridged access linking across the motorway to Worth Way. Improvements would be made to the underpass to Linfield Drive.
- 6.43 The Assessment indicates that delivery of strategic development at Crabbet Park exacerbates link capacity issues at Haslett Avenue (westbound) and Southgate Avenue (northbound) relative to the Base Case. Link capacity issues also arise along the A2220 Copthorne Road (westbound) during the AM peak.
- 6.44 Development of this option is not however predicted to impact upon already congested junctions along A2011 Crawley Avenue (westbound), to the west of London Road and A264 (eastbound).

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- 6.45 No link capacities are predicted to be in excess of desirable operational capacity during the PM Peak.
- 6.46 The A264 junctions within the A220 (the Copthorne Roundabout) and M23 Junction 10 both currently experience congestion during peak hours. The M23 Junction 9 is also expected to be over capacity for the 2022 completion year for the base case (i.e. with delivery of development West of Bewbush but without any further strategic development having come forward). Development of Option B would result in additional traffic passing through these junctions.
- 6.47 The developer proposes a contribution to off-site highway improvements to M23 Junction 10 and the A264 Copthorne Roundabout. This is supported by the Highways Agency.
- 6.48 Other junctions affected include the A2011/A2005/Gatwick Road and the A2011/A23/London Road. Additional traffic is also likely to route on the A220 resulting in potential issues at junctions through Pound Hill and Three Bridges.
- 6.49 It will be necessary to undertake detailed dynamic multi-modal modelling to assess the necessary junction improvements. Should both Options A and B be brought forward, it will be critical to ensure that the combined impacts on Junction 10 and other eastern Crawley junctions can be mitigated against. This could highlight the need for access through Junction 10a.
- 6.50 It is assumed that off-site improvements would cost £17 million. Delivering site roads, accesses and pedestrian and cycle linkages are estimated at £14 million. Total highways infrastructure costs of £31 million are assumed.

Public Transport

- 6.51 Existing bus routes 82, 84, 281 and 291 currently operate along Copthorne Road to Three Bridges and Crawley Town Centre. Routes 4 and 5 also operate in Pound Hill North in close proximity to the site.
- 6.52 The Development Consortium currently proposes provision of a new bus service through the site, including some bus-only sections of road.

It is proposed to integrate bus services with the Fastway network either through extending Fastway Route 100 or through interchange at Three Bridges Rail Station. The Development Consortium's public transport proposals include a contribution towards improving Three Bridges Rail Station as a public transport interchange.

- 6.53 Proposed extensions of existing bus services or provision of a new service from the site provide the potential for a good bus service to Three Bridges Rail Station, Maidenbower and Crawley Town Centre. However there is a relatively poor synergy between the site and the existing Fastway bus network.
- 6.54 Running a self-financing quality bus service from this site would however be difficult given its more remote location from the town. It would most likely be the end or beginning of a route.
- 6.55 It will be important to deliver good bus links to key employment locations, such as Manor Royal and Gatwick Airport.
- 6.56 It is assumed that public transport costs would be similar to Option E, West of Bewbush; estimated at £5.4 million.

Walking & Cycling

- 6.57 There is potential to provide a pedestrian and cycle connection between the site and Crawley across the M23 via the Worth Way Bridge. This would provide a good cycle link to Three Bridges Rail Station and help to mitigate to some degree the significant severance effect of the M23.

Overall Assessment

- 6.58 Overall it is likely that considerable improvements to the highway network on the east side of Crawley could be required to support this option. This will include improvements to the M23 Junction 10 and Copthorne Roundabout.
- 6.59 Were both this Option and development at the North East Sector to be brought forward, the combined impact of development would need to be considered in detail and mitigated. This could result in a need to consider improvements to M23 J10a.

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- 6.60 Given the location of the development, it would also be more difficult to deliver sustainable/ viable good quality bus services. The site would however be a good location for a Park & Ride site and this could support bus service patronage. The need for Park & Ride requires further exploration.
- 6.61 The site offers potential to deliver pedestrian and cycle links to the existing town, which would help to mitigate the severance effects of the M23.
- 6.62 It is estimated that the total cost of transport infrastructure necessary to support this development option would be £36.4 million based on the highways and public transport measures set out in Figure 6.1.

Option F: West of Ifield

Site Access & Highways

- 6.63 The Transport Assessment assumes delivery of 2,500 homes accessed from Charlwood Road and Rusper Road. Based upon the strategic assessment of link and junction capacity undertaken, it is clear that delivery of a second strategic development site west of Crawley would require delivery of a Western Relief Road given the constrained nature of the network, and particularly junctions within the existing town.
- 6.64 The Transport Modelling undertaken indicates that delivery of Option E together with the Western Relief Road results in link capacity issues along the A264 approaching Crawley Bypass (eastbound); A2220 Haslett Avenue (westbound); and A2004 Southgate Avenue (northbound) during the AM peak. It also results in capacity issues along the A264 (westbound) and A2219 London Road (northbound) during the PM peak.
- 6.65 The A23/Ifield Avenue and A2011/A23/London Road junctions are predicted to be over capacity in 2022 in the 'base case' without delivery of any of the three strategic options being considered. Delivery of this Option could increase traffic flows through these junctions.

- 6.66 This assessment undertaken does not however allow for the rerouting of base traffic onto the Western Relief Road. This would free up capacity on links, particularly those displayed as being over capacity as these are key desire lines through the Town Centre which the relief road would help to ease.
- 6.67 A Western Relief Road has a number of positive benefits, including strategic benefits to Town Centre traffic and the potential for direct rapid access to Manor Royal and Gatwick.
- 6.68 It is likely that the additional traffic passing through the A23/Ifield Road and A2011/A23/London Road junctions could be addressed with junction alterations.
- 6.69 Delivery of this Option is also expected to increase congestion at M23 Junction 11 which would require mitigation.
- 6.70 The off-site highways improvements are assumed to be similar to Option E, West of Bewbush, with the addition of the Western Relief Road. The cost of the relief road is estimated at £26.6 million, excluding land costs and preliminaries. The total highways infrastructure costs are hence estimated at £47.67 million.

Public Transport

- 6.71 It is expected that the majority of bus trips will be towards Ifield and the Town Centre. Existing bus services in the vicinity of the site provide access to Ifield and the Town Centre, via Service No2, and to Manor Royal and Gatwick via Service No200.
- 6.72 The developers' public transport proposals in conjunction with existing services offer the potential to deliver a good bus service from the site to the main likely trip destination. There is potential either to extend Fastway Bus Service No10 into the site or to provide a new route linking the site to the Town Centre and Gatwick.
- 6.73 Ifield rail station is also close to the site, providing access to the local rail network. However currently, services to Ifield Station are limited and neither the existing or proposed bus services provide direct access to Three Bridges Station.

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6.74 Public transport costs of £5.4 million are assumed.

Walking & Cycling

6.75 The site provides good potential for pedestrian and cycle access to Crawley. There are existing off-road cycle tracks along Crawley Avenue. The proposed site integration with existing bridleways will improve cycle accessibility from the site, providing access to the Town Centre, Northgate and surrounding residential areas.

Overall Assessment

6.76 This option would require delivery of a Western Relief Road. This represents a substantial cost, estimated at £26.6 million excluding land costs and preliminaries. It is recommended that an independent study be progressed to assess the appropriate design, deliverability and costing of this proposal.

6.77 There is potential to integrate this option with the existing Fastway network or to deliver a new high quality bus service. There is also potential to deliver good pedestrian and cycle links.

6.78 The estimated total transport costs for this option amount to £53 million, based on delivering the highways and public transport measures set out in Figure 6.1.

Combined Option

6.79 AECOM have also undertaken a headline assessment of the transport infrastructure requirements necessary to support a combined scenario which includes delivery of all three strategic development options together with development West of Bewbush. This option assumes delivery of transport infrastructure as specified in the West of Bewbush Joint Area Action Plan to support this strategic development.

6.80 The Transport Assessment identifies the following link capacity issues:

- A264 Crawley Southwestern Bypass (AM eastbound; PM westbound);

- Southgate avenue northbound (AM peak);

- A2011 Crawley Avenue westbound (AM peak);

- A2219 London Road northbound (PM peak);

- Haslett Avenue westbound (AM Peak); and

- A2220 Copthorne Road westbound (AM peak).

6.81 Link capacity constraint in this option is most acute on Haslett Avenue and Southgate Avenue during the AM peak. Additional link capacity is likely to be required on both roads.

6.82 All junctions predicted to be over capacity without any development in 2022 are anticipated to suffer increased development traffic.

6.83 The above come with the caveat that it is highly likely that redistribution of traffic would alter the link and junction capacity assessments significantly, as motorists alter their routes to take account of congestion. Dynamic multi-modal transport modelling would be required to test this and confirm junction and link improvements necessary.

6.84 Moreover this option does not allow for rerouting of base traffic onto the Western Relief Road. This could potentially free up capacity on links where constraints have been identified.

6.85 Potential capacity constraints could arise with this scenario at a number of the M23 motorway junctions. The Junction 10 improvements identified by the Highways Agency do not include for cumulative delivery of all sites as proposed in this Option. Junctions 9, 10 and 11 would require detailed assessment under this scenario to ensure deliverability of feasible solutions at each of these junctions.

6.86 A co-ordinated travel planning approach would be required to support public transport usage. This option could though result in capacity issues on the public transport network.

Towards Detailed Assessments

- 6.87 The At Crawley Study represents a high-level assessment intended to consider the suitability, availability and achievability of potential strategic development sites. Further detailed work will be necessary – such as through masterplanning to inform the preparation of a Development Brief or Area Action Plan – to progress strategic development options. This will involve more detailed transport assessment work.
- 6.88 This Study has sought to provide an initial assessment of transport infrastructure requirements associated with bringing forward potential strategic development sites to inform assessment of their relative sustainability and achievability.
- 6.89 It is recommended that as the three local authorities progress with confirming the development strategy to be taken forward in their respective LDF Core Strategies that further transport assessment work is undertaken. There is a need specifically to take forward the following:
- Strategic multi-modal modelling – allowing assessment of how public transport investment and network capacity issues may alter journey patterns, including by mode and by route;
 - Public transport capacity assessment – considering whether the existing public transport routes, particularly buses, have sufficient capacity to support levels of modal shift assumed;
 - Strategic review of bus network – assessing how the Fastway network should be redesigned to take account of an enlarged town following delivery of strategic development;
 - Park & Ride – assessing potential provision of Park & Ride solutions in association with strategic development and the potential for this to both relieve traffic in Crawley and support viable bus service provision.
- 6.90 We recommend that modelling is undertaken at a strategic as opposed to site-based level. It needs to consider and address the collective impacts of delivery of strategic development at Crawley, including, potentially, several urban extensions together with strategic employment and/or investment at Manor Royal and in Crawley Town Centre. It may also need to consider the impacts of changes at Gatwick Airport should potential future development of the Airport become clearer.
- 6.91 Multi-modal modelling is essential to identify the changes to wider travel patterns arising from the provision of new development and infrastructure. It should allow for mode shift and route change arising from travel conditions. It could be used to assess junction capacity at a high level, but supported by detailed modelling at key problem areas to ensure that feasible solutions can be delivered.
- 6.92 The Crawley Transport Model does not account for capacity constraints within the public transport network. It will therefore be necessary to undertake a review of public transport capacity alongside strategic modelling to consider the level of modal shift which can be achieved.
- 6.93 Moving forward, further work will also be necessary to test the feasibility of infrastructure proposals, including considering land ownerships and land acquisition necessary to deliver infrastructure proposals. This is particularly the case for delivery of the Western Relief Road. Detailed assessment is also necessary to consider junction improvements required to M23 junctions, taking account potentially of the impact of delivery of more than one strategic development site if taken forward.
- 6.94 It will also be necessary to consider the relative phasing of development and infrastructure in further detail.

Key Findings

- 6.95 There is clearly significant further analysis necessary to support potential strategic development options. There are significant uncertainties embedded in this assessment, including the potential for a second runway at Gatwick, provision of strategic employment and development at East Grinstead which could alter travel patterns substantially.

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- 6.96 Moving forward, it is recommended that further work is undertaken including strategic multi-modal modelling, assessment of public transport capacity and the feasibility of infrastructure requirements. This work may need to consider a combined development scenario, and against this context it will not be sufficient to rely on developer-led assessments.
- 6.97 The key findings in regard to each scenario are summarised as follows:
- *North East Sector* – traffic impacts identified are manageable and the impacts on Town Centre congestion are less than for other options. The site is in a good location to encourage non-traffic access, despite barriers posed by Crawley Avenue and the rail line. The provision of Park & Ride facilities could support viable public transport services and reduce traffic within the existing town. Estimated transport costs are the lowest of the three options.
 - *Crabbet Park* – traffic impacts are more significant than for the North East Sector and significant transport improvements would be required. There is potential to establish a number of pedestrian and cycle links across the M23 which would mitigate against the severance effect of the motorway. There is further potential for a Park & Ride facility which is particularly relevant given the potential difficulty in providing a self-financing bus service from this location. The cumulative impacts of Options A and D will need to be considered in assessing improvements required to the Copthorne Roundabout and M23 Junction 10, and whether improvements are necessary to M23 Junction 10a.
 - *West of Ifield* – this option is accessed predominantly from the local road network. It would require delivery of a Western Relief Road to be brought forward. The potential for pedestrian and cycle linkage is good and the site could be accessed from a number of existing bus services, offering opportunities for quality bus service. The key issue with this site relates to the desirability, deliverability and funding of the Western Relief Road.
- 6.98 The Combined Scenario has explored the impact of bringing forward all three development options to inform assessment of potential constraints to growth at Crawley, and to consider combined impacts. Significant capacity issues are expected to result and further link capacity will likely be required in the Town Centre, in particular on both Hasslett Avenue and Southgate Avenue. Strategic modelling is likely to identify further capacity constraints. This is critical to ensure feasible solutions can be brought forward for key junctions.
- 6.99 Delivery of a Western Relief Road will be essential to support delivery of the combined option; with extensive mitigations works also required to key junctions within the town. There is also potential for public transport capacity issues which will need to be addressed. A co-ordinated travel planning approach would be required to deliver and promote sustainable growth targets. With a combined option, a strategic review of the bus network is also recommended.
- 6.100 Cumulative construction impacts would require consideration and a strategy put in place to manage construction impacts. The volume of HGV and other vehicular traffic is potentially considerable and should be carefully managed; with all construction phases including substantial mobility management measures to minimise the impacts on the local road network.
- 6.101 The table overleaf summarises key infrastructure requirements and estimates of costs for transport infrastructure associated with the individual development options.

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Figure 6.1: Outline Transport Infrastructure Costs

Site	Proposed/ Assumed Transport Measures	Highways Infrastructure (Internal & External Works)	Public Transport Subsidies	Total Estimated Transport Costs
Option A North East Sector	<ul style="list-style-type: none"> • Pedestrian & Cycle Linkages. • Extension of existing bus services into the site with provision of £2.5M to finance services from development opening until it is viable. • Quality bus facilities proposed within the site. • Internal site roads • 4 all-purpose access points to the development area including, a signalised site access off Crawley Avenue • Removal of the on/off slip from Crawley Avenue / Balcombe Road • Improvements to 11 external existing junctions including Junction 10 on the M23. 	£29M	£3.75M	£32.75M
Option B Crabbet Park	<ul style="list-style-type: none"> • Pedestrian and cycle links including improvements to Worth Way bridge and the underpass to Linfield Drive. • Provision of a new bus route through the site include bus-only sections • Integration with the Fastway; either extending Route 100 or interchange at Three Bridges Rail Station • Contribution towards improving Three Bridges rail station as a public transport interchange • 3 vehicular accesses proposed (Cophthorne Road, 2 onto Turners Hill) • Off-site highway improvements at M23 junction 10 and A264 Cophthorne Roundabout. 	£31M	£5.4M	£36.4M
Option E West of Ifield	<ul style="list-style-type: none"> • 2 site all-purpose site accesses required. (Charwood Road and Rusper Road) • Site would require the construction of the WRR • Potential to <u>either</u> extend Fastway Service 10 into the site or to provide a new route linking Gatwick, the town centre and the site • Pedestrian and cycle access would be adjacent to vehicle accesses 	£47.67M	£5.4M	£53.07M

7. ENERGY & UTILITIES INFRASTRUCTURE ASSESSMENT

7.1 This section considers the utilities demands and infrastructure required to support strategic development at Crawley. An initial utilities assessment has been undertaken to identify potential constraints together with capacity limitations on the utilities networks, covering gas, electricity, water and waste water. The application of Low and Zero Carbon (LZC) supply technologies are also appraised as these could reduce infrastructure demands.

Policy Context

7.2 The Planning System promotes delivery of sustainable development. The Government published PPS22 (Renewable Energy) in 2004 which promotes the conservation of energy through the planning system; and has since established a target for 10% of energy generation from renewable sources in 2010 with an aspirational target for 20% by 2020. More widely, PPS1 promotes efficiency in resource consumption.

7.3 The Government is driving forward energy and water consumption targets through implementation of the Code for Sustainable Homes (CSH), and the Code for Sustainable Buildings (for non-domestic buildings).

7.4 The CSH has set requirements for carbon emission reduction targets per dwelling that must be met through improvements to the building fabric, improvements in efficiency in terms of buildings controls and amounts of decentralised low or zero carbon energy supply. In addition the CSH requires a specific reduction of water consumption per person per day over time.

7.5 The Code is currently voluntary, but there is potential that its energy and water consumption requirements could be incorporated into Building Regulations. The Government's targets are to meet Code Level 3 by 2010, Level 4 by 2013 and Level 6 by 2016.

7.6 The Code may also be incorporated into local policy. Mid Sussex District Council for instance intend to adopt a minimum requirement for all new residential development to meet Code Level 3.

7.7 Implementation of the Code for Sustainable Homes will require improvements in energy efficiency, use of Low and Zero Carbon (LZC) supply technologies and reductions in potable water. In order to meet Code Level 6 a significant change in occupational behaviour will be required.

Low & Zero Carbon Energy Supply Options

7.8 Parsons Brinckerhoff (PB) has assessed suitability of a range of Low and Zero Carbon (LZC) technologies to support strategic development at Crawley and facilitate the delivery of sustainable development and the Code for Sustainable Homes.

7.9 The ability to include LZC technologies in new developments is dependent on site-specific factors, for example roof areas for solar thermal and Solar Photovoltaic (PV) collectors, land availability for ground source heat pumps, wind speeds as well as shading from adjacent buildings.

7.10 This section provides a high-level analysis of the options available and their potential impact on the peak and annual energy demands arising from the development. It provides an initial high-level assessment of potentially suitable technologies.

Potential Technologies

7.11 The following technologies have been assessed:

Renewable Heat Supply

- Solar Thermal
- Ground Source Heat Pumps
- Biomass Boilers

Renewable Electricity Supply

- Solar Photovoltaic
- Building-Mounted Wind Turbines

Other

- CHP with District Heating
- Land Fill Gas CHP with District Heating

7.12 A description of these technologies is outlined in the Utilities Assessment Report, which includes an assessment of the relative advantages and disadvantages of each. This is summarised below.

Renewable Heat Supply

- 7.13 Solar thermal technologies are a highly cost-effective way of saving energy and meeting requirements, especially for compliance with CSH Levels 3 and 4. While they do not generate energy at all times, they represent a highly-reliable, low maintenance systems with a relatively low unit cost of energy generated compared to other renewables.
- 7.14 Ground Source Heat Pumps (GSHPs) can provide a nearly constant source of heat, and can have lower running costs than oil, liquefied petroleum gas (LPG), coal or electric heating systems, but are typically more expensive than mains gas. Detailed assessment is required to determine technical feasibility and economic viability of installing a GSHP system including a detailed ground survey to identify soil type and latent heat capacity and an environmental impact review. There is typically a high upfront cost associated with implementation.
- 7.15 Biomass boilers are potentially carbon neutral and can represent a reliable and controllable source of low carbon heat. A reliable and preferable local source of fuel is vital if the boiler is to be cost-effective and able to deliver the required CO₂ reduction. The most effective solution is for a single large biomass boiler to supply energy via a district heating network, as opposed to individual building-based solutions.

Renewable Electricity Supply

- 7.16 The requirement for low and zero carbon electricity solutions is less than for heat; however options for meeting this requirement constitute a greater challenge as there are a limited number of cost-effective technology options.
- 7.17 Solar Photovoltaic (PV) systems are highly reliable and low maintenance; but do not work well with direct or indirect shading and have a low conversion efficiency, meaning a large area of PV cells is required to produce a significant amount of energy. The costs of solar PV electricity are considerable higher than for other renewable sources and have high capital costs and long payback periods. Visual impact is also often a consideration. Use of roof space for solar thermal is often preferable.
- 7.18 Building-mounted wind turbines are a zero carbon technology however there is generally low electricity generation potential in urban areas, they can be costly to install and maintain, and visually obtrusive. As they are weather-reliant, energy generation may not be harnessed in times of peak demand. There is also potential for electro-magnetic interference with telecommunications systems, particularly at Gatwick Airport. Lifetime costs for building integrated wind technologies make them very expensive.

Combined Heat and Power

- 7.19 There is potential to deliver Combined Heat and Power (CHP) solutions to strategic developments. CHP units operate by recovering the waste heat from an electricity generator.
- 7.20 The use of natural gas CHP will reduce carbon dioxide emissions but it may be necessary for additional renewable energy to be generated on site to achieve Zero Carbon development. If there is scope to install a biomass CHP this will reduce CO₂ emissions further, reducing the need for additional renewable generation.
- 7.21 The potential need to achieve zero carbon status for all buildings (from 2016 for dwellings and from 2019 for non-domestic buildings) may present significant challenges to all developers. Experience from

assessment of similar schemes has shown that larger-scale community solutions, such as larger scale biomass CHP or large scale wind generation are more economic and better achieve compliance with building codes than smaller or individual building solutions based on current technologies. Such community schemes do not need to be brought into existence within the initial phases of development; but can be developed later in the programme when there is already a critical mass of demand that will allow them to operate economically. They do however require overall development coordination to ensure that site layout is conducive to cost effective implementation of District Heating.

Energy Assessment

- 7.22 Parsons Brinckerhoff has considered the application of these LZC technologies to strategic development at Crawley.
- 7.23 The amount of energy consumed by new buildings is regulated according to Part L 2006 of the Building Regulations. PB has used Part L compliant benchmarks as a baseline against which the energy demand reductions required under the Code for Sustainable Homes is measured.
- To achieve Building Regulations Part L 2006, no reductions or application of Low or Zero Carbon Technologies are necessary.
 - It is assumed that CSH Level 3 (25% CO2 reduction) can be met mostly using energy efficiency measures. Any further reductions required can be met through renewable heat, such as solar thermal.
 - To achieve CSH Level 4, further CO2 reduction requirements are likely to be met through the application of CHP systems and/or renewable heat such as biomass boilers or ground source heat pumps with solar thermal.
 - In order to achieve the challenging CO2 reduction targets necessary to deliver 'zero carbon' homes it will be necessary to supply buildings using renewable heat and electricity to match the energy consumed. Examples of possible technologies include

biomass CHP and large wind turbine generators, or solar PV arrays (where technically feasible).

- 7.24 These conclusions are based on little or no information about the space available to install these technologies or detailed feasibility assessment.

Utility Requirements

- 7.25 The Utilities Assessment assumes that a new strategic development site of 2,500 homes is delivered over an eight year period between 2014/15 – 2021/22. Peak delivery would be 400 dwellings per annum but with a two year lead in and tail. Around 60% of dwellings would be houses and 40% flats.
- 7.26 The phasing of delivery influences the energy and water efficiency of the dwellings built and hence infrastructure requirements. The following headline development trajectory has been assumed:

Figure 7.1: Development Trajectory

	2014/ 15	2015/ 16	2016/ 17	2017/ 18	2018/ 19	2019/ 20	2020/ 21	2021/ 22
Total Delivery	150	250	400	400	400	400	300	200
CSH4								
Flat	60	100						
House	90	150						
CSH6								
Flat			160	160	160	160	120	80
House			240	240	240	240	180	120

- 7.27 The following energy benchmarks have been applied:

Figure 7.2: Energy Benchmarks – Residential

Space Heating & Hot Water (kWh p.a)				
Dwelling Type	Building Regulations	CSH L3	CSH L4	CSH L6
2-bed Flat	2,770	2,011	1,726	1,057
Semi-Detached House	6,766	4,881	4,126	2,236
Electricity Benchmarks (kWh p.a)				
Dwelling Type	Building Regulations	CSH L3	CSH L4	CSH L6
2-bed Flat	3,668	3,440	3,417	3,218
Semi-Detached House	4,789	4,555	4,517	4,237

Figure 7.3: Energy Benchmarks – Non-Domestic Buildings

	Heating (w/sq.m)	Electricity (w/sq.m)
Employment	166	87
Retail	129	148
Hotel	109	50
Education	114	70
Community	149	60

7.28 Once the annual energy consumption for each year of the build out has been calculated, profiles for each building type are developed for gas and electricity demand. The annual consumption figures are multiplied by the number of residential units each year, the peak consumption can then be calculated from the annual profile. The heating peaks calculated using this methodology should be considered to be average peaks and are not suitable for utility infrastructure sizing calculations. In order to produce a design peak it is necessary to multiply the peaks by a design peak factor. A factor of 2.5 has been used in this study in order to provide sufficient supply resilience in the sizing of infrastructure.

7.29 PB has not been able to ascertain the likely roll-out period for the non-domestic element associated with each of the three potential strategic development locations considered. PB has therefore assumed a single set of peak demand benchmarks for each of the building types and has not attempted to second guess what elements of the Code for Sustainable Buildings may or may not apply. This approach has been taken in order to remain conservative and to not underestimate the peak demands for the non-domestic element of the developments.

Figure 7.4: Non-domestic Heating and Electricity Benchmarks

Land use	Heating Benchmark (w/m ²)	Electricity Benchmark (w/m ²)
Employment	166	87
Retail	129	148
Hotel	109	50
Education	114	70
Community	149	60

7.30 The heating and electrical peak demands for each of the three developments, inclusive of domestic and non domestic buildings are shown below:

Figure 7.5: Heating and Electrical Peaks

Option	Heating peak (kW)	Electricity peak (kW)
A - North East Sector	13,425	3,476
B - Crabbet Park	13,425	3,476
F. West of lfield	13,425	3,476

7.31 In order to convert the heating peak into gas demand a boiler efficiency of 86% was assumed for all buildings. The peak figures in kW were then converted into m3 per hour, these results are displayed in Figure 7.5. The use of gas for purposes other than heating has been taken into account for non-domestic buildings. PB has used the

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following data to take the use of gas for cooking in residential units into account:

Figure 7.6: Cooking Gas Demand Data

Flats kWh p.a	House kWh p.a
1,156	1,332

- 7.32 For water, the application of benchmarks (Figure 7.7 and 7.8) provides an analysis of water usage for water intake and sewerage. It was assumed that occupancy levels are four people per house and two people per flat.

Figure 7.7: Domestic Water Benchmarks

Building Type	Unit - based on 24hr period	Water consumption (litres/person)
Residential (CSH CL3)	litres/person	105
Residential (CSH CL4)	litres/person	105
Residential (CSH CL6)	litres/person	80

Figure 7.8: Non-domestic Water Use Benchmarks

Land Use	Benchmark	Unit
Employment	45	l per person per day
Retail	45	l per person per day
Hotel	90	l per bed per day
Education	20	l per pupil per day
Community	0.000893151	M3 per m2 per day

- 7.33 It has been assumed that the above typical water consumption figures are applied across the whole development phasing. No allowance has been made at this stage for demand reductions due to onsite grey water/rain water recycling. It has been assumed that of the water intake, 84% is discharged to sewer with the remaining consumed onsite (e.g. cooking, drinking, gardening, etc.).

- 7.34 Based on the above energy and water demand assessment, Figure 7.9 summarises the utility requirements for each site.

Figure 7.9: Utility Requirements

Utility	Unit	A - North East Sector	B - Crabbet Park	F. West of field
Dwellings	No	2,500	2,500	2,500
Water	l/day	0.7	0.7	0.7
Sewerage	m3/day	589	568	564
Electricity ²	MW	4.90	4.93	4.72
Gas	m3/hour	1,725	1,739	1,682

- 7.35 PB has compared the utility figures shown above with industry benchmarks; the table below provides a comparison to see the impact that improved energy efficiency has on utility demands.

² The electricity demand only includes electricity requirements in dwellings and non-domestic buildings but excludes other uses such as street lighting and water treatment works, etc.).

Figure 7.10: Comparison between industry and PB calculated utility benchmarks

Utility	Example of Industry benchmark ³	Calculated PB benchmark
Electricity	1.6 kW per dwelling	1.39 kW per dwelling
Gas	7.5 kW per dwelling	6.26 kW per dwelling

Infrastructure Capacity Assessment

Electricity

- 7.36 EDF Energy is the incumbent Distribution Network Operator (DNO). They are obliged to provide and install the necessary assets to connect new premises to its distribution network, and they are entitled to make a charge for doing so. The magnitude of this charge reflects the complexity of the new connection in question.
- 7.37 As identified in the 2005 At Crawley Study, most of Crawley and its surrounding areas are supplied via the main transformer at Three Bridges. This distributes supplies either directly or via a number of 33/11 kV Transformer Stations e.g. in Southgate West and on the Crawley Business Quarter.
- 7.38 To meet the demands of small scale new developments, loads are re-organised to take up headroom capacity in the system and on occasions, reinforcement works or new sub-stations are introduced in to the network.
- 7.39 GL Hearn held a meeting with John Park and Simone Hirons of EDF Energy in April 2009 in order to discuss the potential reinforcements that will be required for the three development sites.

³ Source: EDF

Context

- 7.40 OFGEM discourages speculative expansion of the network so EDF do not build 'ahead of the game' although they do undertake network reinforcement works. There is also now a focus on securing developer contributions to infrastructure investment; particularly as this indicates an intent to progress with the development.
- 7.41 EDF have a 'Regional Strategy' as well as a Strategy for each of the three Local Authorities. These seek to bring together internal issues re existing plant/ network with the need for improvements to take account of development / growth. The Strategy development process includes load forecasting, which incorporates information from local authorities and developers. Their current Crawley Strategy includes proposed development at Pease Pottage, but not at Crabbet Park.
- 7.42 There are however some challenges to investment in new infrastructure. Real load is currently falling, and EDF are now having to reconsider proposed investment/ reinforcement projects. OFGEM are challenging current capital expenditure projects; and it is therefore necessary to have in place concrete proof that investment is necessary and that the design is robust.
- 7.43 Crawley is not overprovided for in terms of provision of major sub-stations; and hence new strategic development is likely to require delivery of new infrastructure. There is a rigorous funding and approval process to navigate, with lead-in times of 3 – 3.5 years to deliver investment projects/ new plant.
- 7.44 We consider below the electricity infrastructure requirements to support potential strategic development options.

North East Sector

- 7.45 A 132kV overhead line from Three Bridges to Smallfield major sub-stations passes through the North East Sector. Besides this there is little existing development/ infrastructure in the area.

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- 7.46 There are four potential electricity supply options for the NE Sector:
- Lay 33kV cables from Smallfield
 - Lay 33kV cables from Three Bridges
 - Put existing 132kV line underground and build new 132kV to 11kV Sub-Station
 - Supply 11kV to site from Sub-Station at Manor Royal
- 7.47 EDF believes that Option C would be cheapest and most power efficient solution. A suitable site would need to be identified and secured to take forward this option.
- 7.48 Assuming that the preferred solution discussed is taken forward a realistic lead-in time to delivery is 3 – 3.5 years. With an 8 year build-out of the development, the sub-station could be delivered in Year 4. Connections to the 11kV network, via the existing sub-station at Manor Royal, would provide an interim solution.
- 7.49 The cost of delivery of the preferred solution is estimated at £12 million. EDF would consider their own business case, but would expect the developer to contribute to delivery of new infrastructure and pay for connection charges.
- Crabbet Park*
- 7.50 Delivery of a new sub-station within the North East Sector, should this be brought forward, would support electricity demands arising from development at Crabbet Park.
- 7.51 Alternatively, EDF have a reserved site at Crawley Down. It is proposed to deliver a new 33 to 11kV Sub-Station here to service proposed development at Felbridge (between Crawley and East Grinstead). This would also service Crabbet Park and could help to justify the delivery of this sub-station to OFGEM.
- 7.52 Either of these solutions could support development at Crabbet Park. A key issue would be infrastructure crossing the Motorway. This would require a minimum of two service tunnels for electricity and gas.
- 7.53 EDF does not have the funding in place for Crawley Down, though is working towards this and has identified a route and undertaken refurbishment work to the existing overhead line.
- 7.54 Potentially if the Crabbet Park development came forward late in the plan period, the developer would only be faced with connection charges; as infrastructure capacity could already be in place.
- West of Ifield*
- 7.55 The existing major sub-station at Southgate (Southgate Primary), just to the south of Crawley Town Centre, is significantly overloaded. EDF's current proposal is to deliver a 3rd transformer, 3rd 33kV cable connecting to Three Bridges and to change the switch gear. This would enable Southgate Primary to supply development West of Bewbush but would not serve a further additional neighbourhood to the west of the town.
- 7.56 EDF have a reserve site at Crosskeys on the Boulevard in Crawley Town Centre. There is a proposal to deliver a new Major Sub-Station here, supplied from Three Bridges, which would take load off Southgate; and to lay a cable to Southgate via Crosskeys so they are linked together. The Crosskeys proposal is likely to be driven by network reinforcement needs, so EDF might meet the majority of the costs; coupled with the developer for Town Centre North.
- 7.57 The Southgate and Crosskeys sub-stations together would supply the proposed Strategic Developments at West of Bewbush and West of Ifield. There would be a need to lay cable and improve the 11kV network, including addressing the tapered network, for which EDF would expect developer contributions.
- 7.58 EDF has a design for Crosskeys and own the land. The proposal is deeply embedded within its Crawley Strategy. With a 3.5 year lead-in time, this infrastructure could be in place for an early phase of development.

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Summary – Electricity Infrastructure Requirements

- 7.59 Key electricity infrastructure requirements to support strategic development at Crawley are:
- North East Sector – new sub-station and undergrounding of overhead line;
 - Crabbet Park – new NE Sector or Crawley Down sub-station;
 - West of Ifield – Crosskeys sub-station together with new cabling and improvements to 11kV network.
- 7.60 For all potential options the developer would be required to pay connection charges. It is likely that should the North East Sector be brought forward, the developer could be required to make a substantial contribution towards undergrounding of the existing 132kV power lines and delivery of a new sub station. In the case of Crabbet Park and West of Ifield, the contribution towards new infrastructure may depend on the timing of delivery.

Gas

- 7.61 The Crawley area domestic gas networks are supplied via pressure reducing stations from the medium pressure national grid network. The connection of additional dwellings to the exiting system results in a reduction in gas pressure, the magnitude of which is a function of the size of the new gas demand.
- 7.62 The most likely constraint to connecting a new development to the existing gas infrastructure would be an unacceptable reduction in gas pressure arising from the demands of the new development. The relatively high gas pressure carried by the medium pressure network makes the occurrence of an unacceptable pressure drop unlikely; however the feasibility of supplying a new development from the existing medium pressure network is entirely dependant on the point of connection.
- 7.63 PB has used Scotia Gas Networks utility maps for the three development sites to assess the location of the existing medium pressure network in relation to the proposed development sites:

North East Sector

- 7.64 This area is well serviced by medium, pressure gas infrastructure as a consequence of the density of non-residential land uses. It appears that there is scope to take a low pressure supply from the existing medium pressure network. The cost of this connection is likely to be borne by the gas transporting company.
- 7.65 Timescales of delivery are in the order of 2-5 years depending on resource availability and complexity of connection point.

Crabbet Park

- 7.66 Medium pressure gas is carried to the south of the site across the motorway via an underpass made for a minor road. The potential for supplying the requirements from this medium pressure supply is dependant on the loads currently supplied to existing customers, however there appears to be scope for supplying a low pressure network to supply the proposed development from this supply.
- 7.67 Timescales of delivery are in the order of 2-5 years depending on resource availability and complexity of connection point.

West of Ifield

- 7.68 The West of Ifield site is not currently serviced by medium pressure gas. Additional infrastructure would be required to supply the proposed development with low pressure gas.
- 7.69 Although the cost of the additional infrastructure is likely to be met by the gas transporter, with their costs recuperated through future sales, the lead time is anticipated to be around 5 years.

Summary – Gas Infrastructure Requirements

- 7.70 It does not appear to be particularly complex to connect any of the three potential strategic development locations to the medium-pressure gas network. It is likely that the cost of this connection would be borne by the Gas Transporting Company. Delivery timescales are slightly longer for development West of Ifield (c. 5 years) as this site is not close to a current medium pressure gas main.

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Water

- 7.71 The primary water sources in north Sussex are from river abstractions. Hence, the volume of water available in the area is dependant upon rainfall and must be considered as a finite resource. Water abstraction and wastewater discharge is regulated by the Environment Agency.
- 7.72 The 2005 At Crawley Study states that flooding and ironically water shortage were a significant problem at that time. The Environment Agency reported for January 2005 that Ardingly and Weir Wood reservoirs (both in the north east of Sussex) were only 72% and 54% full respectively. In 2009 Ardingly and Weir Wood reservoirs are 95% and 99% full respectively.
- 7.73 Southern Water (the water provider for Crawley) advise that they have allowed for capital investment to secure water supplies to all of its customers, including providing headroom for growth and uncertainty. They do not envisage problems supplying water to a new strategic development within the timescale.
- 7.74 In order to meet deficit during the period 2010-2015, the Southern Water Plan proposes a programme of river abstraction, which would be further assisted through offsetting take from the Weir Wood reservoir by supplying water from other sources within the Water Resource Zone.
- 7.75 It is proposed that in the following plan period (2015-2020), water supply will be further enhanced through the augmentation of flows in the Upper River Rother using recycled waste water. No further requirements are identified post 2020, though the Plan outlines that this will be subject to review.
- 7.76 The proposed works programme will ensure that sufficient service capacity is available to meet housing figures proposed within the South East Plan, and also provides an element of contingency for any increase in housing figures.

- 7.77 **It is not therefore envisaged that water supply will be a constraint to strategic development at Crawley**, despite pressure on water resources at a regional level.

Sewerage

- 7.78 The majority of wastewater from Crawley and surrounding villages is treated at Crawley Sewage Treatment Works (STW), which is operated by Thames Water.
- 7.79 The local authorities have held discussions with Thames Water in relation to the capacity of existing assets and their ability to cope with the proposed new developments.
- 7.80 Thames Water's current Asset Management Plan has capacity to meet development up to 2012, after which further works will be necessary to deal with the medium to long term capacity. The existing site of the Crawley STW does not offer the potential for expansion.
- 7.81 Of the three potential options being considered, Option D: Crabbet Park appears to be the most problematic with respect to accommodating expansion to existing sewerage infrastructure.
- 7.82 Thames Waters position regarding additional house numbers is as follows⁴:
- Thames Water is planning for additional flows equal to circa 7000 homes between now and 2021 at its Crawley STW (based on developments proposed in the Crawley and Horsham LDFs). This figure excludes any development at Crabbet Park.*
- 7.83 Thames Water has submitted its draft Business Plan for the AMP5 period (2010-2015) to OFWAT which includes provision for additional treatment capacity is to be made available at Crawley STW during the AMP5 funding period. Subject to the approval of funding (due by February 2010), the upgrades will take around three years to complete

⁴ Letter from Thames Water to Mid Sussex District Council, 25th June 2008

and therefore, at best, additional capacity will be available in 2013. There is a risk attached to funding approval which should be noted.

- 7.84 It is expected that c. 5,100 homes will be delivered in the period to 2021 on sites in Crawley with planning permission, its existing strategic allocations and development of a new neighbourhood West of Bewbush. There is therefore limited sewage infrastructure capacity (current or planned) to support further strategic development at Crawley. **Sewage treatment capacity, as currently identified, would only support the delivery of one additional strategic development site, in line with the neighbourhood principle.** This assumes no further windfall development within the existing built-up area.
- 7.85 Sewage infrastructure capacity represents a major potential constraint to development at Crawley. Thames Water's Asset Management Plan 2010-2015 (AMP5) is based upon the existing adopted Core Strategies in Crawley and Horsham: it hence makes provision for development of a new neighbourhood West of Bewbush and potentially for the delivery of the North East Sector. It makes no provision for additional development West of Ifield or at Crabbet Park.
- 7.86 It would normally take between 5 to 10 years to plan, design obtain necessary consents to deliver a new Sewage Treatment Works. **Sewage infrastructure could therefore potentially preclude development at Crabbet Park being delivered before 2021.**
- 7.87 Thames Water will need to start work on a new STW location early in AMP 5 (2010-2015) irrespective of the Crabbet Park site, as Crawley STW is reaching capacity with no room within the existing footprint to upgrade.
- 7.88 The Crabbet Park site may (if made a definite site allocation) have a significant effect on the proposed location of the new STW. This is where the Environment Agency's input is critical, as watercourses in the area are small (river catchments all drain North) and large STW discharges may not be allowed in some of them.
- 7.89 Thames Water might be able to accommodate the additional flows from Crabbet Park at Crawley STW post 2021 (as the upgrade would

have already occurred), but this would remove capacity provided for sites already identified in the Crawley/Horsham LDFs. Development West of Ifield would face similar challenges.

- 7.90 If Crabbet Park (or presumably more than one additional strategic development site) were to be brought forward, Thames Water consider that **a Water Cycle Strategy should be undertaken for development in and around Crawley** and this should be led by the Environment Agency and the Local Authorities, with input from Thames Water. This holistic view will facilitate a strategic decision regarding timing and location of development around Crawley to be made.
- 7.91 The Environment Agency support the views of Thames Water in this matter and reiterate that:
- "that a water cycle study be undertaken for Crawley. There are several potential scenarios for discharging treated effluent from any development in this area and they would need to be fully evaluated before we would be able to give a firm view on their acceptability or otherwise. We believe that a water cycle study may generate new sustainable options to accommodate effluent from growth that have not been considered by the developer."⁵*
- 7.92 The Water Cycle Strategy will:
- Assess the strategic capacity to accommodate growth at Crawley;
 - Identify the most sustainable way forward to accommodate growth beyond that already planned for;
 - Advise on the potential phasing of growth and limitations to growth to ensure that sewage provision is in place alongside new development;

⁵ Letter from the Environment Agency to Mid Sussex District Council, 12 August 2008

- Take into account aspects associated with water quality, water resources and flooding and the interaction between these elements of the water cycle.
- 7.93 **We recommend that the local authorities work together to prepare a Water Cycle Strategy as a matter of priority.**
- 7.94 Given the funding cycles, together with lead-in times for planning, designing and achieving regulatory consents, it is unlikely that new sewage treatment capacity could be delivered by the statutory provider before 2021. This could be a potentially major constraint to the level and phasing of development which can be brought forward at Crawley.
- 7.95 In response to these issues, the Masterplan for Crabbet Park proposes delivery of a private Sewage Treatment Works. This would be operated privately with the intention that it could be 'adopted' by the statutory sewage undertaker at a later date. There are however a number of practical and regulatory barriers to this.
- 7.96 The Environment Agency have stated that their preferred approach would be for the development of a new Sewage Treatment Works by a water company over the development of a private STW. Their primary concerns with a private STW are:
- Difficulties in guaranteeing the quality of effluent discharges and Environmental Quality Standards; and
 - Ownership and long-term maintenance (with influence on the quality of discharges).
- 7.97 To bring forward development of a private STW facility, it will be necessary for the developer to demonstrate the quality control mechanisms can be put in place and sustained to ensure the quality of discharges. This will be necessary to obtain a discharge licence, and the local authorities should attach a significant risk to this.

Key Findings

- 7.98 New electricity and gas infrastructure will be required to service a strategic development site. There is at least a 3 – 5 year lead in to deliver this in each case, hence the local authorities and developers will need to work with utilities providers to ensure that new infrastructure is delivered alongside strategic development.
- 7.99 Development at the North East Sector would require the undergrounding of the 132kV overhead power line and delivery of a new 132Kv to 11kV sub-station. We estimate a developer contribution to this of £6 million or more. Development at Crabbet Park could be served by this, or a new sub-station in Crawley Down. A potential new sub-station at Crosskeys, linked to Southgate Primary, could serve development West of Ifield; however developer contributions would be required to lay cable and improve the 11kV network.
- 7.100 Delivery of new gas infrastructure has a 3-5 year lead-in time, but would likely be funded by Gas Transporting Companies.
- 7.101 There is sufficient water capacity to support potential growth in the area. However sewage treatment capacity is potentially a major constraint to growth. Existing and planned capacity is only sufficient to support delivery of 7,000 homes to 2021. This could preclude more than one additional new neighbourhood being brought forward, in addition to development West of Bewbush unless a private solution can be agreed between site promoters and the relevant statutory authorities. There is some prospect of this at Crabbet Park. A Water Cycle Study should be undertaken as a priority to inform assessment of potential solutions. However it should be recognised that this is a key potential constraint to growth.

8. ACHIEVABILITY

- 8.1 A site is considered 'achievable' for development where there is a reasonable prospect that it will be developed at a particular point in time. As the Government's SHLAA Guidance sets out, this is "essentially a judgement about the economic viability of the site, and the capacity of the developer to complete and sell the housing over a certain period."
- 8.2 This section considers the development prospects of the three potential strategic development options being considered, namely:
- Site A: North East Sector
 - Site D: Crabbet Park
 - Site F: West of Ifield
- 8.3 Development prospects are influenced by a market, cost and delivery factors. Key factors affecting strategic development include:
- The potential of the development to support the level of infrastructure required to deliver a sustainable development scheme in accordance with the neighbourhood principle;
 - Delivery timescales for provision of key infrastructure which could prejudice the feasibility or phasing of delivery of strategic development;
 - Market factors including market capacity and potential build-out rates and their impact on values;
 - Cost factors related to site preparation, physical constraints and infrastructure requirements; and
 - The availability (or otherwise) of public sector funding.

- 8.4 Residual development appraisals can be used to determine whether development is economically viable for a particular site. In simple terms, a residual appraisal is structured as follows:

$$\text{Scheme Revenue} - \text{Costs} = \text{Residual Land Value}$$

- 8.5 'Scheme Revenue' represents the value generated by the development scheme (often termed Gross Development Value or GDV), including from the sale of houses as well as receipts from any commercial or other development.
- 8.6 Development costs include site preparation, professional costs (including planning and legal), construction, finance costs, marketing, contingencies and developer profit. It also includes the cost of planning obligations and infrastructure.
- 8.7 A residual land value is calculated by subtracting development costs from the revenue generated by a development scheme. Where the residual land value exceeds the current use value (or in this case landowners' 'hope value') the scheme can be considered viable.
- 8.8 In the context of this Study, it is necessary to consider whether the value generated by the proposed development schemes can support the level of infrastructure provision required to bring them forward.
- 8.9 This assessment comes with the important caveat that it has not considered in detail the phasing of investment and receipts and resultant cashflow, which can have significant effects on development viability. We have not made allowances for finance in our appraisal as it is impossible at this stage, without full knowledge of the land acquisition and development programme to do this. However we estimate that this could be up to 5% of the overall costs, being up to £20 million. Cashflow issues should be further considered as detailed development schemes emerge.
- 8.10 The development capacity of each of the sites varies. This has been considered previously. However to provide a consistent assessment of infrastructure requirements and deliverability, the At Crawley Study considers the potential to deliver a new neighbourhood of 2,500 homes in each case.

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8.11 The key variables in the development viability assessment are:

- Completed Development Value (Gross Development Value);
- Construction Costs
- Infrastructure Costs
- Profit

8.12 Given the existing use of the land, it is assessed that the land value generated should be positive and should exceed the current use value for agricultural land with some provision for hope value to incentivise release.

Appraisal Assumptions

Phasing

8.13 Figure 8.1 sets out the indicative build-out schedule assumptions for residential development. These assumptions are consistent with and informed by delivery of previous new neighbourhoods in the town and proposals for the new neighbourhood, West of Bewbush. The last new neighbourhood delivered in Crawley was Maidenbower. Here, over 3000 open market dwellings were completed over an eight year period. This period commenced during a market downturn, with sales rates rising gently over a five year period and peaking at over 500 dwellings per annum.

8.14 It is assumed that there is a lead-in time before new housing is delivered at any of the sites, reflecting the timescales in confirming allocation through Core Strategies; in preparing a planning application, securing planning consent and negotiating the S106 Agreement; and in site preparation and discharging pre-commencement conditions.

8.15 On the basis of the above, it is assumed that a new strategic development of 2,500 homes would be built-out over an eight year period between 2014/15 – 2021/22. This development trajectory takes account of Crawley Borough Council's existing Housing Trajectory, which includes development within the existing urban area and West

of Bewbush. It however does not take account of issues of market capacity and phasing should more than one additional urban extension (over and above West of Bewbush) be brought forward 'at Crawley.' Nor does it take account of any site specific circumstances, such as for instance critical paths to delivery of other infrastructure or the phasing of land acquisition.

Figure 8.1: Housing Trajectory for sites A, D and F

	2014/ 15	2015/ 16	2016/ 17	2017/ 18	2018/ 19	2019/ 20	2020/ 21	2021/ 22
Total Delivery	150	250	400	400	400	400	300	200

Development Mix

8.16 The appraisals are based on the following assumptions regarding dwelling mix:

Delivery of 2,500 homes with:

- 60% housing for open market sale (1500 homes)
- 40% affordable housing provision (1000 homes) of which:
 - 70% social rented (700 homes)
 - 30% intermediate – shared ownership (300 homes)

8.17 It is assumed that the mix of dwellings by bedsize is consistent with proposals for development of a 2,500 home neighbourhood West of Bewbush.

8.18 Affordable housing is expected to be delivered on a free and serviced land basis. Receipts have been calculated at 65% of Open Market Value.

8.19 The appraisals assume delivery of 3000 sq.m retail/ service floorspace within neighbourhood centre and 750 sq.m employment (B1a) floorspace.

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Sales Values

- 8.20 The appraisals are based on current sales values and build costs. GL Hearn has researched sales values and trends in the Crawley area.
- 8.21 Over the year to April 2009, the average price of all housing sold in Crawley fell by -13% to £186,800 (Q4 2008 & Q1 2009).
- 8.22 In establishing values for each of the proposed locations we have conducted general desk top research of Crawley and the current residential market. Furthermore we have reviewed the immediate surrounding areas of each proposed location to include existing housing stock, proximity to transport links and local infrastructure. The following values have been adopted:

Option A: North East Sector

- 8.23 Option A sits to the North East of Crawley Town Centre. As a residential location the largest negative aspect is the sites proximity to Gatwick Airport. There is an established residential area to the West but also a large industrial area. The site is separated from established housing stock to the South by the A2011.

Figure 8.2: Vale Assumptions – North East Sector

Type	Size	Price Adopted £	£ per sq ft
1 bed flat	495	130,000	262
2bed flat	644	165,000	256
2 bed house	775	225,000	290
3 bed house	904	250,000	276
4 bed house	1,200	310,000	258

Option D: Crabbet Park

- 8.24 Option D sits to the East of Crawley Town Centre and the M23. As a residential location the largest negative aspect is the M23 bordering the southern edge of the site. Whilst this is not an established residential location and there is clearly a lack of infrastructure we believe this site holds the best potential for maximizing any aspirational value.

Figure 8.3: Vale Assumptions – Crabbet Park

Type	Size	Price Adopted £	£ per sq ft
1 bed flat	495	135,000	272
2bed flat	644	170,000	263
2 bed house	775	230,000	296
3 bed house	904	255,000	282
4 bed house	1,200	315,000	262

Option F: West of Ifield

- 8.25 Site F is located to the west of Crawley Town Centre. Whilst the site borders an established residential location, existing housing stock is now dated by design and values are lower than those of the surrounding areas of sites A and D.

Figure 8.4: Vale Assumptions – West of Ifield

Type	Size	Price Adopted £	£ per sq ft
1 bed flat	495	120,000	242
2bed flat	644	155,000	240
2 bed house	775	210,000	270
3 bed house	904	235,000	259
4 bed house	1,200	295,000	245

Build Costs

- 8.26 Residential build costs are assumed at £1065 per sq.m in line with the Viability Appraisal for the West of Bewbush Site. Other build costs are based on GL Hearn's experience of mixed-use schemes. No assumptions have been made for cost inflation.
- 8.27 Build costs for domestic and non-domestic buildings will be affected by sustainability requirements. Currently the cost of delivering the highest Code for Sustainable Homes standards is prohibitive. It is likely that costs will reduce as technology becomes more mainstream. An addition of 10% has been made to build costs to account for sustainability measures.

Other Assumptions

- 8.28 We have excluded finance costs from the appraisals as there is no clear indication of the dates at which land would be purchased – however it should be noted that finance would comprise a significant additional costs to the scheme.
- 8.29 Infrastructure costs have been informed by the social, utilities and transport infrastructure appraisal undertaken and infrastructure

contributions agreed in regard to the West of Bewbush Site which informed the Viability Appraisal prepared to support the Joint Area Action Plan.

8.30 Other assumptions are as follows:

- We have allowed for development contingency of 10%;
- We have allowed for a 20% developers return on revenue in line with the latest comprehensive Viability Appraisal for West of Bewbush;
- Professional fees included at 12%.

Development Viability

8.31 The appraisals for each of the three sites are set out in Appendix E. These provide a high level overview of development viability.

8.32 The appraisals conclude that:

- If the full cost of delivery of a Western Bypass is borne by development West of Ifield (Option F), then this option is not viable. There is a funding gap of £17 million (excluding finance costs).
- Development at the North East Sector (Option A) is viable for 2,500 homes. After estimated finance costs based on 20% of total costs, it could result in a land value in the order of £4 million. This is considered sufficient to support land acquisition.
- Crabbet Park (Site D) is the most viable site if no requirement or contribution to delivery of a new Sewage Treatment Works is required. After estimated finance costs based on 20% of total costs, this could produce a land value in the order of £8 million.

8.33 The appraisals include estimated transport costs and an allowance for statutory connections and infrastructure (£17 million for each development site). GL Hearn has not at this stage included any allowance for variations in utilities infrastructure costs across the sites.

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- 8.34 Utilities infrastructure costs at Crabbet Park for delivery of a new Sewage Treatment Works (or provision of bridge funding until this can be adopted by Thames Water) could influence the viability of this site.
- 8.35 Similarly the costs of undergrounding the 132kV overhead power line and contribution to delivery of a new sub-station could influence the viability of development at the North East Sector if taken forward. Undergrounding of the 132kV line is not currently proposed by the Development Consortium.

9. KEY FINDINGS

- 9.1 The At Crawley Study has sought to assess the potential for strategic development including new neighbourhoods delivered in accordance with the neighbourhood principle together with strategic employment. The Study has included an assessment of the suitability, availability and achievability of potential strategic development locations. In this concluding section, we bring together the analysis undertaken.
- 9.2 The 2005 At Crawley Study identified Land West of Bewbush as the most appropriate location to accommodate strategic development at Crawley. Crawley Borough Council and Horsham District Council have worked together to prepare a Joint Area Action Plan (JAAP) to guide strategic development at this location. The JAAP has now been adopted, allocating land for delivery of a new neighbourhood of 2,500 homes plus supporting infrastructure to be delivered between 2011/12 – 2018/19.
- 9.3 This Study has therefore considered the potential for further strategic development at Crawley, in addition to that planned for West of Bewbush.
- 9.4 This Study has assessed the suitability of eleven potential strategic development locations, as shown in Figure 3.3. It has considered which locations are the most suitable for delivery of new neighbourhood, and where strategic employment development might be accommodated. The Study has identified three potential sites which might be regarded as suitable for delivery of a new neighbourhood. These comprise:
- Option A: North East Sector
 - Option D: Crabbet Park
 - Option F: West of Ifield
- 9.5 In the remainder of this section we consider first the potential to bring forward these sites individually. Issues of strategic infrastructure capacity and market capacity are then considered to inform

assessment of the potential to bring forward more than one of these strategic development locations, requirements for new strategic infrastructure and the potential phasing of delivery.

North East Sector

- 9.6 We consider that Option A is potentially the most sustainable location for a new neighbourhood and can be regarded as the optimum location *should a second runway at Gatwick not be required*.
- 9.7 We have assessed the suitability of the North East Sector for strategic development under two scenarios:
- The current scenario whereby land is safeguarded for the possible delivery of a wide-spaced second runway at Gatwick; and
 - A hypothetical future scenario whereby it is confirmed that a second runway will not be required.
- 9.8 If a second runway is brought forward at Gatwick, this will impact upon the noise contours. A significant proportion of the site will be subject to noise levels of over 60 dBA L_{eq} which can be regarded as the desirable upper limit for residential development in accordance with PPG24. This would preclude the comprehensive development of the site in accordance with the neighbourhood principle.
- 9.9 The prospect of delivery of a second runway, which would preclude the delivery of a development in accordance with the neighbourhood principle, is a severe constraint and it is not known when uncertainty regarding the possible requirement for a second runway might be overcome. It is therefore not possible to establish if or when strategic development could be brought forward at this location.
- 9.10 **The safeguarding of land for a possible second runway at Gatwick by the Secretary of State means that the North East Sector cannot currently be regarded as a suitable location for strategic development.**
- 9.11 A Public Inquiry was held in June 2009 into an appeal against non-determination of the 1998 Outline Planning Application for

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development of the North East Sector. The key issues considered at the Inquiry can be summarised as follows:

- Whether a five year land supply exists within Crawley and the wider sub-region which could justify development which would potentially be above the 60 dBA L_{eq} noise contour should a second runway be brought forward; and
 - The potential impact of delivery of development at the North East Sector on the operational use of a second runway at Gatwick if delivered.
- 9.12 The Secretary of State will assess the relative weight to ascribe to these factors and is expected to determine the appeal in November 2009. The outcome of the Inquiry may impact upon infrastructure capacity and the achievability of other potential options for strategic development.
- 9.13 Land for delivery of a second runway at Gatwick has been safeguarded indefinitely by the Secretary of State. It is instructive however to consider the suitability of the site should a second runway not be required.
- 9.14 The North East Sector represents a natural extension to the existing urban area, and is proximate to the town's main employment areas (Manor Royal, Gatwick Airport and the Town Centre). Delivery of a new neighbourhood at this location would have the least impact on the highway network and could support sustainable access, including a good, viable public transport service.
- 9.15 It has been demonstrated and agreed by West Sussex County Council that suitable accesses to the site can be delivered, and that impacts on the highway network of this site (in isolation) can be adequately mitigated.
- 9.16 Besides potential enhanced aircraft noise, there are a number of constraints to development which reduce the developable area of the site and influence masterplanning of development, including areas liable to flooding from the Gatwick Stream and Ancient Woodland at Forge Wood. Other constraints include a blast zone which surrounds

the Gasholder station in the south-west of the site, two Scheduled Ancient Monuments and a number of listed buildings. However should a second runway not be required, these would not preclude delivery of a new neighbourhood, and we have demonstrated that the site could accommodate 2000 homes at an average density of 40 dwellings per hectare (dph).

- 9.17 A development solution would need to work around these constraints and mitigate noise from both the M23, main rail lines and aircraft which could impact upon residential amenity. These factors can be addressed through masterplanning, including through provision of land use and landscape buffers to residential development and in the design of buildings.
- 9.18 It is therefore the prospect of enhanced noise levels should a second runway at Gatwick be brought forward in the future which renders this site unsuitable for strategic development.
- 9.19 A Development Consortium comprising Persimmon Homes (South East) Ltd and Taylor Wimpey (Ltd) have control of 128 hectares of land. There are some third party landholdings, including land owned by Crawley Borough Council and the Homes and Communities Agency, which would need to be acquired to bring forward development. However it is not expected that these landowners would prejudice delivery of residential development once suitably compensated given the priorities of these organisations.
- 9.20 There are a number of parcels of land on the periphery of the proposed neighbourhood which are not under the control of the Consortium, however the developer has demonstrated that a comprehensive development solution can be brought forward which does not require these landholdings.
- 9.21 While a detailed appraisal of landownerships has not been undertaken, based upon the information available, **the site can be regarded as available for development.**
- 9.22 A site is considered achievable for development where there is a reasonable prospect that it will be developed at a particular point in time. This is essentially a judgement regarding the economic viability

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- of the development and the capacity of the developer to complete and sell housing over a certain period.
- 9.23 This Study has included a modelling of infrastructure requirements and assessment of the economic viability of development to consider whether strategic development is achievable. To assess achievability, we have investigated infrastructure requirements and constraints, and considered the economic viability of a hypothetical development solution of 2,500 homes.
- 9.24 The infrastructure modelling has identified that social infrastructure necessary to support a new neighbourhood of 2,500 homes could be delivered on the development site. The neighbourhood would be expected to contain a primary school (or primary schools). It is likely that a contribution would be required towards provision of additional secondary school capacity within Crawley, given current capacity constraints in Crawley's North East education sector; and to pre-school provision.
- 9.25 The neighbourhood would be expected to contain a neighbourhood centre which would include key amenities, including retail/ service floorspace, a library, community and youth centre floorspace and a health centre of branch GP practice.
- 9.26 Assessment of utilities infrastructure requirements has indicated that it would be possible to connect the new neighbourhood to the gas and electricity and water grids. The medium pressure gas network is sufficient to support the development. It would however be necessary to deliver a new electricity sub-station; the preferred electricity supply option being undergrounding of the existing 132kV line which runs through the site alongside the motorway and construction of a 132-11kV sub-station. The developer would be responsible for electricity connection charges and a contribution would likely be required to delivery of the sub-station. It is estimated that the cost of the sub-station would be c. £12 million.
- 9.27 There is sufficient planned investment in water supply to support the proposed development. However there is a constraint to sewage capacity in the Crawley area. This is a strategic issue. The impact of this would relate to the timing of development.
- 9.28 While there will be lead-in times to designing, approving and implementing investment in utilities infrastructure to support the development, it is not considered that there are any absolute constraints which would preclude it, should planning consent be achieved prior to other options coming forward.
- 9.29 Significant transport investment is likely to be necessary to integrate a proposed new neighbourhood at the North East Sector with Crawley's existing public transport network and to mitigate its impacts on the highways network.
- 9.30 Key transport infrastructure required to support this development has been agreed between the Borough and County Councils and the Development Consortium. The improvements agreed however are based on assumptions that this is the only strategic development scheme brought forward: they are not based upon a scenario of more than one strategic development location being achieved.
- 9.31 Should a number of strategic development sites be progressed, it would be necessary to review infrastructure improvements necessary, particularly in terms of the nature of investment to mitigate peak traffic impacts at key junctions around the Town Centre. Should both this Option and Option D: Crabbet Park be progressed, the combined impacts on junctions on the east side of the town, including M23 Junction 10 will need to be assessed in detail and appropriate solutions identified.
- 9.32 Should this site, West of Bewbush and a further strategic development location be progressed, delivery of a Western Bypass would likely be required.
- 9.33 On the basis that only development of this option and Option E: West of Bewbush are progressed, the viability assessment has been progressed on the basis of implementation of the following transport improvements:
- Delivery of four all-purpose access points to the site, including a new signalised junction on Crawley Avenue;

- Removal of the on/off slip between Crawley Avenue and Balcombe Road;
 - Extension of existing bus services into the site, with provision of £2.5 million to finance services until viable and investment in quality bus facilities;
 - Internal site roads and improvements to 11 external existing junctions including M23 Junction 10;
 - Provision of pedestrian and cycle linkages.
- 9.34 The above are consistent with the Inquiry 'Statement of Common Ground' with regard to transport and highways. However these proposals are regarded as quite car-focussed, and it is assumed that further public transport subsidy might be required. This has been factored into the appraisal.
- 9.35 We consider that additional bus provision (over and above that currently proposed), pedestrian and cycle links across the rail line and consideration of the feasibility of Park and Ride at this location would improve this option. It has been estimated that total highways and public transport costs necessary to deliver strategic development at this site would amount to £32.75 million. This represents a significant cost to the development scheme.
- 9.36 While infrastructure improvements collectively are expected to represent a significant cost, the order of costs for this Option is lower than for the other two. However given the site's location, closer to the airport and between main road and rail corridors, the residential values which can be achieved are expected to be lower than for instance at Crabbet Park.
- 9.37 Our high-level assessment for 2,500 homes concludes that development at the North East Sector (Option A) is viable. After estimated finance costs based on 20% of total costs, it could result in a land value in the order of £4 million. This is considered sufficient to support land acquisition.
- 9.38 This however does not specifically take account of the costs of undergrounding the 132kV overhead power line (although not currently proposed by the Development Consortium) and contribution to delivery of a new sub-station nor the lower delivery of 1,900 homes proposed in the Consortium's Masterplan, which could influence the viability of development at the North East Sector. It may be necessary to work with the Developer Consortium to consider in detail potential planning obligations and the phasing of infrastructure in bringing forward development at this location.
- ### Crabbet Park
- 9.39 The prospect of strategic development at Crabbet Park to the east of Crawley and the M23 has been mooted in Mid Sussex District Council's Pre-Submission Core Strategy.
- 9.40 While Crabbet Park cannot be considered as an optimal location for an urban extension to Crawley, given its location on the opposite side of the M23 from the existing town, there are no high order environmental constraints to delivering strategic development. The site has a neutral score on sustainability, meaning that there are limited constraints but also limited relative benefits to development at this location, but does not contain any Tier 1 constraints.
- 9.41 The M23 would result in a significant degree of severance between a new neighbourhood at this location and Crawley's existing urban area. However there are a number of existing crossings, including pedestrian/ cycle links, which could be improved to support its development. A development scheme would need to mitigate noise from the motorway through appropriate urban design.
- 9.42 The site is however located in an area of low landscape capacity, meaning that development would be more visually intrusive than other development options.
- 9.43 The development site itself contains a number of listed buildings, areas of Ancient Woodland and floodplain. It also contains a number of farms and dwellings and is adjacent to the High Wild Area of Outstanding Natural Beauty. These influence the developable area of

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- the site, and it will be important to ensure that appropriate buffer zones are established to mitigate impacts of new development.
- 9.44 While the environmental and landscape impact of development at this location will be higher than for some of the other options considered and the site integrates less well with Crawley's existing urban area, **the site can be regarded, on balance, as a suitable location for a new neighbourhood.**
- 9.45 Any development solution would need to be carefully designed to preserve areas of ancient woodland, the settings of Crabbet Park and Ley House and minimise landscape impact. It will also need to address the severance effects of the M23 Motorway and ensure integration with Crawley's existing urban area.
- 9.46 The site is made up of a range of separate land holdings, totalling over 20 in number. The development promoters, Miller Strategic Land, argue that sufficient land is in the ownership of themselves, their development partners and others who support development to deliver a comprehensive strategic development solution as set out in their proposed Masterplan. Miller has a signed or verbal agreement with over 90% of landowners on the site. Those ownerships outside its control would reduce the development potential by just 150 – 200 dwellings.
- 9.47 The test of availability related to "land controlled by a housing developer who has expressed the intention to develop or a landowner who has expressed an intention to sell." It could therefore be argued that an in-principle agreement is sufficient.
- 9.48 In our view, **it is sensible to consider the Crabbet Park site as available for development** but to note that the number and complexity of landownerships, and uncertainty regarding the nature of the agreement of the developer with these owners, represent a risk which could delay or inhibit delivery of a comprehensive development solution.
- 9.49 Mid Sussex District Council should request further information from the Developer regarding the nature of the agreements with landowners, and the land controlled by the developer in order to evaluate the risk to delivery of a comprehensive strategic development solution.
- 9.50 A site is considered achievable for development where there is a reasonable prospect that it will be developed at a particular point in time. To assess achievability, we have investigated infrastructure requirements and constraints, and considered the economic viability of a hypothetical development solution of 2,500 homes.
- 9.51 The infrastructure modelling has identified the social infrastructure necessary to support a new neighbourhood of 2,500 homes could be delivered on the development site. The neighbourhood would be expected to contain pre-school provision and a primary school (or primary schools). The developer would likely have to contribute towards secondary school provision.
- 9.52 The neighbourhood would be expected to contain a neighbourhood centre which would include key amenities, including retail/ service floorspace, a library, community and youth centre floorspace and potentially a health centre or branch GP practice.
- 9.53 Assessment of utilities infrastructure has indicated that it would be possible to connect the new neighbourhood to gas, electricity and water networks. The medium pressure gas network is sufficient to support the development, which could be supplied from the south of the site. EDF have a reserved site for a new sub-station at Crawley Down to serve proposed development at Felbridge. Electricity could be supplied to support strategic development at this location from either a new sub-station at this location or in the North East Sector. The developer contribution towards electricity infrastructure would likely be influenced by the phasing of delivery, not withstanding payment of connection charges.
- 9.54 As with the North East Sector, there is sufficient investment in water supply planned to support strategic development at Crawley. However there is a constraint to sewage capacity in the Crawley area. This is a strategic issue, and this site is not included within Thames Water's infrastructure plans.

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- 9.55 Sewage infrastructure capacity would be a key constraint to delivery of this site should development of the North East Sector be brought forward in the short-term. Thames Water is planning for additional flows equal to circa 7000 homes between now and 2021 at Crawley Sewage Treatment Works, based on development set out in Crawley and Horsham LDFs. This excludes any development at Crabbet Park. It has submitted a draft Business Plan to OFWAT for the AMP5 period (2010-2015) on this basis.
- 9.56 Taking account of consented development, strategic allocations and a new neighbourhood West of Bewbush, there is hence **insufficient sewage capacity currently planned for to deliver a more than one further new neighbourhood in the period to 2021**. This is based on the existing housing trajectory and contains no provision for windfall development in the existing built-up area.
- 9.57 Thames Water is planning for additional flows equal to circa 7000 homes between now and 2021 at its Crawley STW (based on developments proposed in the Crawley and Horsham LDFs). This figure excludes any development at Crabbet Park
- 9.58 This current position could though change. Thames Water and the Environment Agency have argued that a Water Cycle Strategy should be undertaken to provide a holistic view of water resources, and to inform decision-making regarding the timing and location of development at Crawley. We strongly recommend that this Study is commissioned.
- 9.59 The developers have also mooted the potential to deliver a private Sewage Treatment Works on-site to facilitate its development. The feasibility of this solution requires further detailed assessment, and it would need to be supported by the Environment Agency who have identified reservations regarding quality control of effluent discharges.
- 9.60 Sewage treatment capacity, while a significant constraint, does not on its own render this option unachievable, as it is still considered that this option could be brought forward at a particular point in time, albeit potentially post 2021.
- 9.61 Given uncertainty regarding sewage treatment infrastructure requirement and the delivery and funding mechanism for this, the assessment of economic viability of this development makes no allowance for delivery of a new Sewage Treatment Works.
- 9.62 Utilities infrastructure costs at Crabbet Park for delivery of a new Sewage Treatment Works (or provision of bridge funding until this can be adopted by Thames Water) could however influence the viability of this site being brought forward before 2021.
- 9.63 Significant transport investment is likely to be necessary to support delivery of this Option, to mitigate highways impacts, integrate it with the public transport network and improve walking/ cycling links particularly across the M23.
- 9.64 On the basis that only development of this option and Option E: West of Bewbush are progressed, the viability assessment has been undertaken on the basis of implementation of the following transport improvements:
- Provision of 3 vehicular accesses to the site (Cophthorne Road and two on Turners Hill Road) plus internal site roads;
 - Off-site highways improvements at M23 Junction 10 and A264 Cophthorne Road;
 - Integration with the Fastway Bus System, either through extending Route 100 or another service which connects with this at Three Bridges Station. Provision of a new bus route through the site, including bus-only sections;
 - Contribution towards improving public transport interchange at Three Bridges Station;
 - Pedestrian and cycle links including improvements to Worth Way bridge and the underpass to Linfield Drive.
- 9.65 it is likely that considerable improvements to the highway network on the east side of Crawley could be required to support this option. This

will include improvements to the M23 Junction 10 and Copthorne Roundabout.

- 9.66 Given the location of the development, it would also be more difficult to sustain viable, good quality bus services. The site would however be a good location for a Park & Ride site and this could support bus service patronage. The need for Park & Ride requires further exploration.
- 9.67 The site offers potential to deliver pedestrian and cycle links to the existing town, which would help to mitigate the severance effects of the M23.
- 9.68 It has been estimated that total highways and public transport costs necessary to deliver strategic development at this location total £31 million.
- 9.69 Were both this Option and development at the North East Sector to be brought forward, the combined impact of development would need to be considered in detail and mitigated.
- 9.70 **Should a number of strategic development sites be progressed, it would be necessary to review infrastructure improvements necessary, particularly in terms of the nature of investment to mitigate peak traffic impacts at key junctions around the Town Centre and the M23 Motorway junctions.** Should both this Option and Option A: North East be progressed, the combined impacts on junctions on the east side of the town, including M23 Junction 10 will need to be assessed in detail and appropriate solutions identified.
- 9.71 From a transport perspective, the feasibility of this Option improves should development of the North East Sector not come forward. Should this site, West of Bewbush and a further strategic development site be progressed, delivery of a Western Bypass would likely be required.
- 9.72 Given the site's location within an attractive rural setting, it is considered that the residential values achievable are higher than for the two other sites being considered. Crabbet Park (Site D) is the most viable site if no requirement or contribution to delivery of a new

Sewage Treatment Works is required. After estimated finance costs based on 20% of total costs, this could produce a land value in the order of £8 million.

- 9.73 Currently, it is reasonable to conclude that **development at Crabbet Park can be regarded as achievable should a feasible solution to sewage treatment capacity be identified and assuming that no more than one additional strategic development site is taken forward.** The latter reflects the likely constraints to the highways network associated with bringing forward more than one strategic development site in addition to West of Bewbush.

West of Ifield

- 9.74 We consider Option F (West of Ifield) to perform moderately well in sustainability terms as a location. It has a neutral impact on sustainability and it beneficial score in relation to access. In addition it does not contain any Tier 1 constraints.
- 9.75 The site benefits from proximity to existing education and retail facilities. It has some environmental constraints, including areas designated SNCI, SSSI and Ancient Woodland which affect the developable area but do not preclude comprehensive development. Part of site assessed as having low landscape capacity. There are however no tier 1 constraints and the site has a neutral overall impact on sustainability. The site's northern boundary is delineated by the noise contour with Second Runway (57dB(A)), although HCA and Persimmon own further land to the north.
- 9.76 Relative to the two other options considered, there are less environmental features which would influence masterplanning of this option for strategic development. The potential developable area is greatest. It would however be important that any masterplanning process, if taken forward, properly addressed the integration of new development with existing neighbourhoods and defined a strong urban edge.
- 9.77 The site can thus be regarded as a **suitable location for a new neighbourhood.**

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- 9.78 This site can however certainly not be regarded as a deliverable site with the potential to contribute to a five year land supply.
- 9.79 The site includes land owned by lfield Golf and Country Club, Welbeck Land, Rydon Homes, Persimmon Homes and the Homes and Communities Agency.
- 9.80 Welbeck Land, Wates and Rydon Homes have acquired a 15 year option over lfield Golf Club (50ha). This forms a key part of the wider site which includes land controlled by the HCA and Persimmon. The parties have signed a collaboration agreement, through which Welbeck, Wates and Rydon would lead on site promotion and take on the planning risk.
- 9.81 The number of ownerships and status of agreements means that we would ascribe a lower level of risk to a comprehensive solution being brought forward in the longer-term on this site relative to Crabbet Park, notwithstanding difficulties in delivering access/ transport infrastructure. This said, there is a potential issue regarding the lease held by the lfield Golf and Country Club which could affect the timing of development of this option. The Golf Club's lease is not due to expire until 2022.
- 9.82 The Consortium is starting discussions regarding the potential to relocate or buy-out the Golf Club, but as yet no alternative site has been identified. While the Consortium hope to be able to persuade the Club to relocate, it cannot be guaranteed that this will be achieved and that this part of the site can be brought forward before 2022. We consider that it is unlikely that this situation will progress, thus providing greater certainty, in advance of their being greater certainty regarding the site's allocation.
- 9.83 The questions regarding the Golf Club are a potential risk to the delivery of development, and could for instance affect questions over the delivery of a Western Bypass within an early phase of development (as identified in the Transport Assessment). It significantly impacts upon the developable area of the site in the period to 2022, the potential for integration with development West of Bewbush; and the overall delivery of a comprehensive phased development solution.
- 9.84 In our view, **it is sensible to consider the West of lfield site as available for development** but to note that uncertainty regarding the timing of acquiring possession of the Golf Club, which represent a risk which could delay or inhibit delivery of a comprehensive development solution.
- 9.85 There are considerable remaining questions regarding access for strategic development of this option. If this is the only of the three sites to be taken forward, the Consortium must demonstrate that it can be effectively accommodated without the need for a Western Relief Road. This has not yet been achieved.
- 9.86 If more than one strategic development location is brought forward in addition to Land West of Bewbush, a Western Relief Road will be required. The feasibility and funding of delivery of a Western Relief Road has not at this stage been considered.
- 9.87 The infrastructure modelling has identified the social infrastructure necessary to support a new neighbourhood of 2,500 homes could be delivered on the development site. The neighbourhood would be expected to contain a primary school (or primary schools). The developer would likely have to contribute towards delivery of extra capacity in secondary schools on the west side of Crawley and pre-school provision.
- 9.88 The neighbourhood would be expected to contain a neighbourhood centre which would include key amenities, including retail/ service floorspace, a library, community and youth centre floorspace and potentially a health centre or branch GP practice.
- 9.89 Assessment of utilities infrastructure has indicated that it would be possible to connect the new neighbourhood to gas, electricity and water networks. The West of lfield site is not currently serviced by medium pressure gas. Additional infrastructure would be required to supply the proposed development with low pressure gas. Although the cost of the additional infrastructure is likely to be met by the gas transporter, with their costs recuperated through future sales, the lead-in time is anticipated to be around 5 years.

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- 9.90 EDF have a reserved site for a new sub-station at Crosskeys in Crawley Town Centre. EDF has a design for Crosskeys and own the land. The proposal is deeply embedded within its Crawley Strategy. With a 3.5 year lead-in time, this infrastructure could be in place for an early phase of development.
- 9.91 The Southgate and Crosskeys sub-stations would supply together the proposed Strategic Developments at West of Bewbush and West of Ifield, if brought forward. EDF would be a need to lay cable and improve the 11kV network, including addressing the tapered network, for which EDF would expect developer contributions.
- 9.92 The developer contribution towards electricity infrastructure would likely be influenced by the phasing of delivery, not withstanding payment of connection charges.
- 9.93 As with the North East Sector, there is sufficient investment in water supply planned to support strategic development at Crawley. However there is a constraint to sewage capacity in the Crawley area. This is a strategic issue, and this site is not included within Thames Water's infrastructure plans.
- 9.94 Sewage infrastructure capacity is a key constraint to delivery of strategic development at Crawley. Thames Water is planning for additional flows equal to circa 7000 homes between now and 2021 at Crawley Sewage Treatment Works, based on development set out in Crawley and Horsham LDFs. This excludes any development at West of Ifield. It has submitted a draft Business Plan to OFWAT for the AMP5 period (2010-2015) on this basis.
- 9.95 Planned investment in sewage infrastructure, subject to funding approval, is sufficient to support delivery of one strategic development location in addition to a new neighbourhood West of Bewbush.
- 9.96 Given the lead-in times to delivery of new sewage infrastructure by the statutory provider, it is considered that strategic development at this location (or more broadly delivery of more than one strategic development site in addition to development West of Bewbush) could not be brought forward prior to 2021 (unless a privately-funded solution was found, as for instance proposed at Crabbet Park).
- 9.97 Thames Water and the Environment Agency have argued that a Water Cycle Strategy should be undertaken to provide a holistic view of water resources, and to inform decision-making regarding the timing and location of development at Crawley.
- 9.98 Given uncertainty regarding sewage treatment infrastructure requirement and the delivery and funding mechanism for this, the assessment of economic viability of this development makes no allowance for delivery of a new Sewage Treatment Works.
- 9.99 However the key constraint to delivery of this option related to the ability to achieve suitable access to support delivery of strategic development.
- 9.100 The Transport Assessment undertaken indicates that delivery of this option will require delivery of a Western Bypass to the town. The West of Ifield Development Consortium contends that it may be possible to bring forward this site without the Relief Road, based on a modal shift of 60%. Detailed transport assessment work is required to test this. However the Transport Assessment undertaken by AECOM is clear that should more than one strategic development location be delivered in addition to West of Bewbush, then a Western Relief Road to the town will be required to address strategic capacity constraints in the local highway network.
- 9.101 The feasibility of delivery of a Western Relief Road has not been assessed to date. Detailed assessment is required to consider the design, delivery and costing of a Relief Road including the route, land acquisitions, funding and delivery mechanism.
- 9.102 **In advance of detailed transport assessment to confirm or negate the requirement for a Western Relief Road, and to assess the feasibility of its provision, this option cannot be considered achievable.**
- 9.103 On the basis that only development of this Option and Option E: West of Bewbush are progressed, the viability assessment has been undertaken on the basis of implementation of the following transport improvements:

- Delivery of 2 all-purpose site accesses at Charlwood Road and Rusper Road and internal roads;
- Construction of a Western Relief Road (for which this development currently foots the full cost);
- Either extension of Fastway Service 10 into the site or provision of a new high quality bus link to the Town Centre and Gatwick.
- Pedestrian and cycle accesses, adjacent to vehicle accesses.

- 9.104 It is likely that improvements to the highway network on the west side of Crawley could be required to support this option. It is estimated that total transport costs to deliver this Option would amount to £53 million.
- 9.105 Should a number of strategic development sites be progressed, it would be necessary to review infrastructure improvements necessary, particularly in terms of the nature of investment to mitigate peak traffic impacts at key junctions around the Town Centre.
- 9.106 If the full cost of delivery of a Western Bypass is borne by development West of Ifield (Option F), then this option is not viable. There is a funding gap of £17 million (excluding finance costs).
- 9.107 **This option can therefore not be regarded as achievable for strategic development unless it is confirmed that this is the only one of the three options to be taken forward and that suitable public transport investment and access can be achieved, without a need to deliver a Western Bypass to the town; or that a feasible mechanism can be found to delivering and funding of a Western Bypass.**
- 9.108 This site is in close proximity to the strategic development location West of Bewbush. There are prospective significant lead-in times to delivery of gas infrastructure (5 years) and to a Western Bypass, if required. Moreover the lease of the Golf Club land does not expire until 2022 which could potentially inhibit or delay comprehensive development of the site. Combined, we consider that it is unlikely that

this site could be brought forward before 2018 at the earliest even if outstanding issues regarding access and sewage be resolved.

- 9.109 Figure 9.1 overleaf summarises our assessment of the suitability, availability and achievability of strategic development at the three potential locations identified.

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Figure 9.1: Summary Assessment of Suitability, Availability & Achievability of Potential Strategic Development Sites

Location:	Suitability:	Availability:	Achievability:
A. North East Sector	Unsuitable: Cannot be regarded as a suitable location for strategic development given safeguarding of land for possible second runway at Gatwick. This would result in noise exposure above 60 dBA L _{eq} and preclude comprehensive development of the site in accordance with the neighbourhood principle. However, should it be confirmed that a second runway is not required, this site represents the most favourable location for a new neighbourhood.	Available: Can be considered available for development. Would require the Development Consortium to negotiate a development agreement with or acquire land owned by Crawley Borough Council and the Homes and Communities Agency. There are however the least risks to bringing forward a comprehensive development solution at this location.	Achievable: There is a reasonable prospect that strategic development could be brought forward at this location. A high-level assessment confirms that the development is likely to be viable albeit that costs of undergrounding the overhead power line (if progressed) and contribution to delivery of a new sub-station could influence S106 contributions to other infrastructure. This assumes it is brought forward early in the plan period and does not contribute to sewage infrastructure or a Western Relief Road.
D. Crabbet Park	Suitable: There are not any Tier 1 constraints to delivery of strategic development at this location however the environmental and landscape impact would be more substantial. The severance effect of the motorway and landscape impact would require mitigation. Significant highways and public transport investment would be required.	Available: While on balance this site can be regarded as available for development, we attach greater risk to the delivery of a comprehensive development solution compared to the other options. This reflects the number of ownerships and nature of agreements with the Consortium who are promoting the site.	Achievable: This site can be regarded as potentially achievable if a feasible solution can be found to provision of sewage infrastructure to support the development and no more than one strategic development site is taken forward. This location will potentially command higher values than other strategic developments which support viability of development at this location.
E. West of Ifield	Suitable: There are not any Tier 1 constraints to delivery of strategic development at this location, and it benefits from the potential to achieve a good integration with Crawley's existing urban area.	Available: Can be regarded as available for development given Collaboration Agreement between key landowners. However the lease of Golf Club, which expires in 2022, could preclude delivery until late in the plan period.	Unachievable: There are considerable questions regarding access to this site. If this is the only of the three sites to be taken forward, the Consortium must demonstrate that it can be effectively accommodated without the need for a Western Relief Road. If more than one additional strategic development site is brought forward, a Western Relief Road will be required. The feasibility and funding of this must be resolved before development at this location can be regarded as achievable

Strategic Employment

- 9.110 This Study has considered the potential for strategic employment development at Crawley, albeit that it has focused to some degree on the delivery of new neighbourhoods.
- 9.111 A Development Consortium is proposing delivery of a major business park at Gatwick Green, close to M23 Junction 9. This falls outside of the At Crawley Study Area. This Study has considered the potential to accommodate strategic employment development within the At Crawley Study Area.
- 9.112 Other Studies (GVA Grimley 2008; GL Hearn 2009) have considered the need or demand for strategic employment development. It has been proposed that strategic employment development is necessary to deliver an enhanced or transformational level of economic growth necessary to raise the overall performance of the sub-regional economy relative to the South East Region as a whole.
- 9.113 It is considered that strategic employment development would comprise a high quality business park located at a highly accessible and visible location, with strong connections both to the motorway, rail and local road networks.
- 9.114 There are a number of potential sites which could accommodate strategic employment development. Options H and I are close to Gatwick Airport and unsuitable for residential development. They are affected by some environment constraints, including flooding and areas of Special Nature Conservation Interest. Development of neither can be regarded as 'achievable' given that land at both locations would be included within the revised airport boundary should a Second Runway be delivered.
- 9.115 From a commercial perspective, neither is considered an optimal location. While these sites benefit from proximity to Gatwick Airport and the Airport rail hub, neither is visible from the motorway network. It is likely that this would be branded as a Gatwick location, as opposed to Crawley, reducing the potential benefit of development in improving the profile of the town.
- 9.116 Availability of these sites has not been considered in detail, save that Site H is currently being marketed for development.
- 9.117 Delivery of employment development of either Site H or I could support the feasibility of delivery of a Western Relief Road to Crawley.
- 9.118 In our view however, the North East Sector (Option A) can be regarded as the most suitable location for strategic employment development should residential development be precluded. The site can be considered potentially available, however a detailed assessment of viability would be required to consider whether delivery of a business park and associated uses would support the level of infrastructure investment necessary to support it. The sustainable development of this site would likely require improvements to both highways and public transport network.
- 9.119 The North East Sector is also advantageous from a commercial perspective. It is visible from the motorway network and the main rail line which will help to establish the profile of the development and support values which can be achieved. It also benefits from good accessibility from the strategic road network and proximity to the Gatwick rail hub. It relates well to the existing urban area and Crawley's existing main employment location, Manor Royal, promoting the potential for its development to improve the profile of the town as a business location.
- 9.120 The other key potential site for strategic employment development in our view is Site B, West of Copthorne, While relatively smaller in size, this site benefits from visibility from the M23. There is potential to link it to the Fastway network (and potentially development at the North East Sector) through provision of a bus route under the motorway. This site is partly previously-developed land but has a low landscape capacity.
- 9.121 As with employment development at the North East Sector, this option would likely require investment in improving M23 Junction 10 and potentially the Copthorne Roundabout. If brought forward in conjunction with other options, it could also necessitate appraisal of the need for improvement to Junction 10a.

9.122 Delivery of strategic employment development will contribute to capacity issues identified, including sewage, electricity and highways. However it could support deliverability by contributing towards delivery of strategic infrastructure.

Strategic Infrastructure Capacity Issues

9.123 There are a number of strategic constraints to development at Crawley which have been identified. These are:

- Capacity of the highways network – particularly key town centre and motorway junctions and links approaching the town centre;
- Western Relief Road – the potential requirement for delivery of a Western Relief Road to support delivery of more than one strategic development location in addition to Land West of Bewbush or potentially strategic employment development;

9.124 Sewage infrastructure capacity – which is potentially only sufficient to support delivery of one additional strategic development site, alongside West of Bewbush. It is appropriate, in our view, to consider these as strategic issues. They represent strategic constraints to growth at Crawley.

9.125 The Transport Assessment undertaken has identified strategic peak time network constraints within the town, including the A23 London Road, Haslett Avenue and Southgate Avenue as well as the approaches to the town centre, the A264 and M23 junctions. Investment will be required to address these issues to support further strategic development.

9.126 Delivery of more than one additional strategic development site will be contingent on addressing sewage infrastructure capacity, provision of a Western Bypass and improvement to other junctions within the town.

9.127 The infrastructure capacity assessment undertaken indicates that it may be possible to deliver strategic development at Crabbet Park or the North East Sector in addition to West of Bewbush.

9.128 Planning for an enhanced level of growth, over and above this, is likely to require:

- Strategic multi-modal modelling of combined development scenarios;
- Delivery of a Western Bypass to Crawley;
- Improvements to M23 Junctions 9, 10 and 11;
- Feasibility assessment of junction and link improvements and potential for Park and Ride;
- Review of public transport capacity and strategic review of the bus network.

9.129 We recommend that the potential for provision of a Park & Ride scheme be investigated, including an assessment of the potential impact and value for money.

9.130 A strategic review of bus services in the town should also be progressed once clarity regarding locations for growth is achieved. This will ensure that the bus network effectively serves the enlarged town.

9.131 A Water Cycle Strategy is to be prepared to provide a holistic view of water resources, and to inform decision-making regarding the timing and location of development at Crawley.

9.132 However based on current understanding, given the lead-in times to delivery of new sewage infrastructure by the statutory provider, it is considered that delivery of more than one strategic development site in addition to development West of Bewbush could not be brought forward prior to 2021.

9.133 It may also be appropriate to consider strategic solutions to energy and transport linked to the scale of growth planned at Crawley.

9.134 It may also be appropriate to consider the potential for large scale solutions for sustainable energy/ heat.

- 9.135 Assessment is recommended of strategic options to support funding and delivery to address these constraints, such as through a tariff or Community Infrastructure Levy, to which all development contributes – or alternatively through a negotiated approach with developers of strategic development sites. This could help to support the sustainable development of the town.
- 9.136 It will continue to be important that the three local authorities work together to address these issues, including through commissioning strategic multi-modal transport modelling and a Water Cycle Strategy, to address these strategic issues.

Market Capacity

- 9.137 There is clearly a limit regarding the level of housing development which the market can support at any one time. This is likely to impact upon the potential phasing of strategic development at Crawley.
- 9.138 Delivery of development West of Bewbush is anticipated to commence in 2011/12. Delivery of 2,500 homes is expected to be phased over eight years. We would expect a peak output of 400 dwellings per annum at a strategic location. This is consistent with past delivery rates for new neighbourhoods. We also assume a two year build-up and two year phase-out in terms of delivery rates, when delivery will fall below the peak.
- 9.139 While there is likely to be some annual variation in delivery rates, we would estimate the market capacity of the town to be for delivery of a maximum of 650 dwellings per annum. This represents 1.3% household growth per annum.
- 9.140 Our assessment is cognisant of the strong policy support for focusing development at or adjoining Crawley in the South East Plan, demographic drivers, the town's economic performance and potential future economic drivers, including development and growth at the Airport, strong private sector business base and accessibility, delivery of Town Centre North and the potential delivery of a major new Business Park.

- 9.141 If the North East Sector planning application is granted at appeal, this site could be brought forward early in the plan period. The developers anticipate that delivery could commence in 2010/11. This could potentially result in two strategic development locations being brought forward broadly concurrently. This could have a significant impact on the market. It could result in the re-profiling of delivery phasing at these locations, which might be built out over a longer period; or might inhibit the delivery of other Strategic Allocations in Crawley's Core Strategy.
- 9.142 Highways and sewage capacity issues, in addition to market capacity issues, could preclude further strategic development being brought forward before 2018 at the earliest. The achievability of further strategic development would depend upon the feasibility (including funding) of delivering additional sewage infrastructure, a Western Bypass as well as significant other social, utilities and transport infrastructure.

Delivery Phasing

- 9.143 Taking account of both market capacity and the lead-in times to delivery of key infrastructure, Figure 9.2 overleaf sets out our findings regarding the achievability of bringing forward more than one strategic development location, in addition to development West of Bewbush, and the potential phasing of strategic development sites.
- 9.144 We do not consider that development West of Ifield could be brought forward before 2018 at the earliest. This reflects the need to assimilate development West of Bewbush, market capacity (particularly given the proximity of this site to the new neighbourhood West of Bewbush), and lead-in times for delivery of gas infrastructure and potentially a Western Relief Road. Further transport assessment work is required to assess the feasibility of bringing forward this option, and these timescales may be optimistic.
- 9.145 Should the North East Sector appeal be refused, there may be potential for development at Crabbet Park to be brought forward earlier in the plan period. We consider that delivery of development at this location could commence in 2014, given the lead-in times for

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assembling a planning application, achieving consent, discharge of pre-application conditions and development of an initial phase.

- 9.146 It may be that if development of the North East Sector is not brought forward prior to 2021, then sewage capacity might not constrain delivery of Crabbet Park (or that a privately-funded solution to provision of additional capacity is achievable). An appropriate solution would need to be agreed with Thames Water and the Environment Agency.
- 9.147 We do not consider that delivery of more than one additional strategic development site in addition to West of Bewbush is achievable before 2018 at the earliest, given the capacity of the market for new homes at Crawley and the lead-in times for delivery of additional sewage infrastructure and particularly a Western Relief Road.
- 9.148 The achievability of further strategic development post 2018 would depend upon the feasibility (including funding) of delivering additional sewage infrastructure, a Western Bypass as well as significant other social, utilities and transport infrastructure.

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Figure 9.2: Assessment of Combined Development Options and Phasing

Location:	West of Bewbush & this Site	West of Bewbush, North East Sector & this Site	Potential Delivery Phasing
A. North East Sector	There are limited constraints to delivery of this scenario. The impact on key town centre junctions will need to be addressed. Contributions to provision of additional secondary school capacity would likely be required.	N/A	This site could be brought forward early in the plan period (2010/11 – 2018/19) if the Consortium achieves planning consent at Appeal.
D. Crabbet Park	There are some constraints to delivery of this scenario. Considerable improvements will be required to the highways network on the east of Crawley, as well as measures to provide good quality public transport, walking and cycling links.	Delivery of three urban strategic development locations at Crawley would likely require provision of a Western Relief Road and additional Sewage Treatment Capacity as well as considerable investment in other transport, utilities and social infrastructure. This option cannot be regarded as achievable unless a feasible solution to funding and delivering a Western Relief Road and a new Sewage Treatment Works is agreed.	This site could be brought forward early in the plan period (2014 – 2020) as an alternative to delivery of strategic development in the North East Sector. If the North East Sector Consortium achieves planning consent at appeal, it is unlikely that this site could be brought forward before 2018.
F. West of Ifield	There are longer lead-in times to delivery of gas infrastructure. Further work is required to examine the potential to accommodate development of this site without provision of a Western Relief Road. It is unlikely that significant development at this location could be supported at the same time as development West of Bewbush given the relative locations of the sites, construction impacts and market capacity.	It is unlikely that delivery of a third strategic development location would commence before 2018.	It is unlikely that delivery of this site could commence before 2018