Newark and Sherwood District Council

Infrastructure Delivery Plan

13 May 2010

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1 INTRODUCTION

1.1 INFRASTRUCTURE DELIVERY PLAN OBJECTIVES

1.1.1.1 Newark and Sherwood District Council (NSDC) has commissioned WYG to undertake an Infrastructure Delivery Plan (IDP) that will provide a detailed evidence base to support the production of the Council's Local Development Framework, in particular the Core Strategy, Development Policies Development Plan Document (DPD) and the Site Allocations and Policies DPD.

1.1.1.2 The IDP has been undertaken in two stages. Stage 1 was to review the available baseline data to:

- Identify the current infrastructure provision within the District;
- Identify the geographical variations in infrastructure across the District; and
- Provide a level of understanding of the growth that can be supported by the existing infrastructure.

1.1.1.3 Stage 2 was to identify the shortfalls in infrastructure against the proposed growth in the District and to:

- Identify where and when that infrastructure may be required.
- Identify the outline costs of such infrastructure.
- Identify how that infrastructure is provided and funded.
- Provide a funding strategy and delivery plan.

1.1.1.4 This report is the combined output of stages 1 and 2 of the study and will be used to inform the submission DPD.

1.2 CONTEXT

1.2.1.1 The District Council has produced the Core Strategy which is the principal development plan document of the Local Development Framework. This document sets out the basic principles and policy direction for planning and development in Newark and Sherwood up to 2026. Work on the Allocations and Development Management Development Plan Documents (DPD) will commence later in 2010 and these will set out site allocations and policies for determining

planning applications. Collectively, these DPDs will form the Local Development Framework (LDF) - the basis for decision making on new development and the use of land

1.2.1.2 Over the plan period, there will be significant levels of growth in the District both in terms of housing and employment. This plan will be informed by the East Midlands Regional Plan (EMRP) which has set an overall new housing target of 14,800 for the District between 2006 and 2026. The Regional Plan also endorses the District as a New Growth Point and Newark on Trent as the sub-regional centre will be the focus of the District's growth, with other growth focused on Service Centres and Large Villages across the District. The Regional Plan is largely silent on the amount of employment land that should be provided however the Northern Sub-Region Employment Land Review (March 2008) states that the District should plan for a net increase of between 30 and 50 hectares over the same period.

1.2.1.3 To enable and serve these growth areas, infrastructure will need to be provided. For the purpose of the IDP, infrastructure was defined in NSDC's commission brief as:

- Social and Culture; health, education, emergency services, play facilities, libraries and other cultural facilities
- Transport; public transport and highways
- Flood Prevention
- Utilities - gas, electricity, water, wastewater, telecommunications
- Green Infrastructure; biodiversity and open spaces.

1.2.1.4 This IDP has been set out such that there is a chapter for each of the above infrastructure disciplines, preceded by chapters on the general scope of the study and planning legislation, with a closing chapter summarising the key infrastructure required.

2 SCOPE OF STUDY

2.1 OBJECTIVES

2.1.1.1 The purpose of the IDP is to identify the various forms of infrastructure that are required to meet the level of growth anticipated in the Newark and Sherwood District over the plan period (2006 to 2026.) A baseline assessment of the existing infrastructure within the District has been carried out to identify the current infrastructure provision, variations of the level of provision across the District and the level of growth that can be supported by that existing infrastructure. Where a shortfall exists to meet the forecast growth, the required infrastructure has been identified. The IDP also identifies a cost estimate for that infrastructure, the appropriate funding mechanism and an outline programme for delivery.

2.1.1.2 Inputs to the IDP have been provided by NSDC in the form of studies and reports undertaken by themselves and their consultants. A schedule of that data can be found in Appendix 1 of this report.

2.2 STUDY AREA

2.2.1.1 The study area comprises the administrative boundary of Newark and Sherwood District as indicated in Appendix 2. The District is the largest in Nottinghamshire, covering nearly one third of the County. Nottingham and Mansfield conurbations are situated to the south west and west of the District respectively. Lincolnshire adjoins the eastern boundary, with Lincoln to the north east and Grantham to the south east.

2.2.1.2 The District is predominantly rural in nature with most areas open countryside in agricultural use. There is a dispersed pattern of Settlement. Newark on Trent is the largest town but most of the Settlements are small; 58 parishes having a population of less than 500.

2.2.1.3 The Settlement pattern of the eastern part of the District is dominated by the market town of Newark on Trent (pop 35,000). The town acts as the main shopping and service centre for the surrounding rural area. Most of the jobs in this part of the District are located within Newark, with a significant proportion of these in the manufacturing sector. The largest Settlement in the eastern side of the District outside the Newark urban area is Collingham (pop 2870) which acts as a rural service centre.

2.2.1.4 In the north-western part of the District the main Settlements are those which grew as a result of the exploitation of the area's coal reserves from the 1920s onwards. The principal colliery Settlements are Ollerton/Boughton (pop 10250), Rainworth (pop 6520), Edwinstowe (pop 4860), Blidworth (pop 4245), Clipstone (pop 3405) and Bilsthorpe (pop 3095). The decline of the coal industry in the 1980's saw the loss of many jobs and the collieries at Ollerton, Rainworth, Blidworth and Bilsthorpe have all since closed.

2.2.1.5 The Mansfield Travel to Work Area covers most of the western part of the District. In the south-western part of the District the small market town of Southwell (pop 6595) is the main shopping and service centre. Farnsfield (pop 2540) and Lowdham (pop 2315) also have a limited range of facilities. The southern part of the District has a number of villages, which are popular as a place of residence for people working in Nottingham but there are few local employment opportunities.

2.3 NSDC BASELINE STUDIES

2.3.1.1 A number of studies have been provided by NSDC for use by WYG in producing the IDP. These are listed in Appendix 1.

2.4 NSDC CONSULTATION OUTPUTS

2.4.1.1 NSDC have carried out two related consultations with stakeholders and infrastructure providers.

2.4.2 INFRASTRUCTURE DELIVERY PLAN CONSULTATION OUTPUTS

2.4.2.1 Between July and November 2008, NSDC issued an Infrastructure Delivery Plan Questionnaire to key infrastructure providers, neighbouring local authorities and Parish Councils within the District. This sought information about; current infrastructure capacity, specific new or improved infrastructure requirements over the plan period up to 2026 and potential funding sources.

2.4.2.2 The responses to these questionnaires have been reviewed to identify key infrastructure issues across the District, and where appropriate, have been incorporated into this report.

2.4.3 NSDC SHLAA CONSULTATION OUTPUTS

2.4.3.1 NSDC have undertaken a number of consultations on the SHLAA and have forwarded those key responses from the Parish Councils and Infrastructure Providers.

2.4.4 DEVELOPMENT SCENARIOS

2.4.4.1 Residential and employment development scenarios have been provided by NSDC and are detailed in Appendix 3.

2.4.4.2 The proportion of new houses at each settlement is based on meeting the aims of the principles assigned to the settlement and an assessment of the capacity of each settlement to support growth, including its function, scope for future growth, known infrastructure constraints and potential for future improvements.

2.4.4.3 The employment scenario identifies the split by net developable area of employment land by settlement. NSDC is keen to ensure an appropriate distribution that provides a good range, mix and choice of suitably located employment sites and premises. This will address the needs of existing and future businesses, and enable a readily available supply of land to be maintained over the Plan period.

2.4.4.4 The starting point for determining the future employment land requirement were the recommendations of the Northern Sub-Regional Employment Land Review. In line with the methodology of the Review, estimates of additional land needed to compensate for anticipated losses of employment land up to 2026 and additional employment land to facilitate the development of the New Growth Point were then factored in. The current amount of employment land available and future prospects of economic growth and new housing provision were also taken into account.

2.4.5 INFRASTRUCTURE DELIVERY PLAN SITES

2.4.5.1 NSDC have provided a schedule of sites for consideration for the Infrastructure Delivery Plan study which can be viewed in Appendix 4.

2.4.5.2 These sites are a rationalisation of the sites considered under the NSDC Strategic Housing Land Availability Assessment (SHLAA), grouping SHLAA sites of close proximity together to reduce the overall number to 71 clustered sites of proposed development.

2.4.5.3 Each IDP site also identifies the percentage split of land use; residential, employment and open space.

2.4.6 ASSUMPTIONS

2.4.6.1 For the purposes of calculating potential infrastructure loadings on a specific IDP site with residential use, WYG and NSDC agreed an assumption for residential density across the District of 30 dwellings per hectare. An assumption of 2.49 people per future residential dwelling has also been used, unless a different assumption has been provided by the Infrastructure Provider.

2.4.6.2 For the purposes of calculating potential infrastructure loadings on a specific IDP site with employment use, WYG and NSDC agreed the following assumption:

2.4.6.3 A ratio of Gross Floor Area to Site area of 40% for all employment sites. The 40% ratio of GFA to site area is a common approximation for employment proposals.

2.4.6.4 The majority of employment sites are assumed to be B1 Use-Class Business Parks in line with NSDC advice. For those sites already in the Local Plan this appears to be the type of use envisaged. The only higher infrastructure loading generation would be to assume all B1 Office. However, this would result in an over-estimate of infrastructure loading and would not accurately reflect the proposed land uses.

2.4.6.5 An assumption for the working population of 1 person per 29sqm of floor space has been used.

3 PLANNING

3.1 INTRODUCTION

3.1.1.1 The statutory system of Planning and Compulsory Purchase provides the over-arching context and rationale for the preparation of the IDP. Under the provisions of the Planning and Compulsory Purchase Act, the District Council has produced its Core Strategy. This document sets out the basic principles and policy direction for planning and development in Newark and Sherwood up to 2026. Work on the Allocations and Development Management DPD will commence later in 2010 and these will set out site allocations and policies for determining planning applications. Collectively, these Development Plan Documents will form the Local Development Framework (LDF) - the basis for decision making on new development and the use of land.

3.1.1.2 The context for the IDP is framed by central Government's commitment to a step change in new house building. In order to facilitate this, 29 areas were named as New Growth Points in December 2005 with the aim of contributing towards a new target to deliver 240,000 additional homes a year by 2016 – an increase of 32% on previous plans for housing supply in these areas. Newark and Sherwood District Council was successful in its bid to become a New Growth Point which is a non-statutory designation. The Council aims to ensure that the entire District will benefit from Growth Point status.

3.1.1.3 This growth is reflected in the provisions of the East Midlands Regional Plan (EMRP). The EMRP covers the period 2006 to 2026 and confirms Newark's status as a Growth Point. Newark is also identified as a sub-regional centre and sets an overall housing target for the District of 14,800 new homes over the plan period, equivalent to an annual average of 740 new homes. In addition to significantly strengthening the sub-regional role of Newark, the Plan aims to promote the regeneration of smaller settlements in a way that achieves a more sustainable pattern of development.

3.1.1.4 The Plan sets out sub-regional strategies for each of the sub-regions and Newark and Sherwood District lies within the Northern sub region. Economic, social and environmental regeneration remain a priority for the Northern sub-region. Policy Northern SRS 1 advises that the significant levels of growth to be provided for in Newark (and the other identified sub-

regional centres) will, subject to levels of urban capacity, require locations for urban extensions to be identified in Local Development Frameworks.

3.1.1.5 The Plan comments that the agreed Newark Growth Point Programme of Development establishes that around 500 dwellings per annum should be concentrated at Newark. Other urban areas in the District noted in Policy Northern SRS1 to be considered for expansion are Ollerton-Boughton and Rainworth.

3.1.1.6 In relation to the provision of infrastructure, the Plan identifies regional transport priorities. The Plan does not set out details of funding that may be available through CIF, Growth Area finding or other sources to support new development. Policy 57 advises that local Authorities should work with developers, statutory agencies and other local stakeholders to produce delivery plans outlining the infrastructure requirements needed to secure the implementation of local Development Documents. Paragraph 3.5.7 states that there needs to be an agreed menu of required infrastructure provision (including green and cultural infrastructure) that considers strategic requirements but is also locally owned.

3.1.1.7 The scale of planned housing and employment development in Newark and Sherwood, presents great opportunities as well as challenges. Well planned and targeted growth and the investment in supporting transport infrastructure has the potential to improve services, facilities and the quality of life for both new and existing communities. It presents an opportunity for a step-change in the long-term sustainability of settlements, built development and lifestyles. Without a robust IDP it is likely that the projected growth will not take place or that it will happen spasmodically and be sub-optimal in terms of its sustainability.

3.1.1.8 The IDP will therefore be crucially important in shaping the options for growth, its location and the design and sustainability aspects of that new development. It will inform and underpin many of the strategic and detailed decisions which will be taken in formulating the LDF and provide an on-going reference, in realising sensitive, beneficial and sustainable growth. In terms of a new approach through 'Spatial Planning', the IDP will be an influential part of the evidence base, supporting and shaping the Core Strategy and indeed other studies and Supplementary Planning Documents (SPDs).

3.1.1.9 National Planning Policy Statements PPS12 (Local Spatial Planning) and PPS3 (Housing) advocate the importance of a robust 'evidence-based policy approach' in the preparation of

LDFs. In particular these statements provide guidance for the preparation of infrastructure studies. PPS 12 states in section 4:

> *'4.8 The core strategy should be supported by evidence of what physical, social and green infrastructure is needed to enable the amount of development proposed for the area, taking account of its type and distribution. This evidence should cover who will provide the infrastructure and when it will be provided. The core strategy should draw on and in parallel influence any strategies and investment plans of the local authority and other organisations.*
>
> *4.9 Good infrastructure planning considers the infrastructure required to support development, costs, sources of funding, timescales for delivery and gaps in funding. This allows for the identified infrastructure to be prioritised in discussions with key local partners. ……The infrastructure planning process should identify, as far as possible:*
>
> *• Infrastructure needs and costs;*
>
> *• phasing of development;*
>
> *• funding sources; and*
>
> *• responsibilities for delivery.'*
>
> [Planning Policy Statement 12: creating strong safe and prosperous communities through Local Spatial Planning; CLG, 2008]

3.1.1.10 This IDP for Newark and Sherwood is being prepared within the context of these strategic terms of reference, with the aim of providing a robust assessment of current deficiencies and future requirements, costs, potential funding sources, phasing and delivery issues.

3.2 PLANNING REFERENCES AND DATA SOURCES

3.2.1.1 Whilst not an exhaustive list of data sources, the following documents have provided the principal legislative, policy/guidance and local study background with respect to the planning considerations for the preparation of the IDP:

3.2.2 LEGISLATION

- EU Directive 2001/42/EC - The Assessment Of The Effects Of Certain Plans And Programmes On The Environment [The Strategic Environmental Assessment Directive] (European Parliament And Council, 2001)
- Town & Country Planning Act 1990 (As Amended)
- Planning & Compensation Act 1991
- Planning & Compulsory Purchase Act 2004
- Planning Act 2008
- Countryside And Rights Of Way Act (HMSO, 2000)
- Natural Environment And Rural Communities Act (HMSO, 2006)
- Statutory Instruments – Various, as appropriate

3.2.3 NATIONAL POLICY STATEMENTS/GUIDANCE

- Planning Policy Statement 1: Delivering Sustainable Development (Office Of The Deputy Prime Minister, 2005)
- Planning Policy Statement 1: Planning and Climate Change – Supplement to PPS1 (Communities And Local Government, 2007)
- Planning Policy Statement 3: Housing (Communities And Local Government, 2006)
- Planning Policy Statement 4: Planning For Sustainable Economic Growth (Communities and Local Government, 2009)
- Planning Policy Statement 5 : Planning for the Historic Environment (Communities and Local Government, 2010)
- Planning Policy Statement 7: Sustainable Development In Rural Areas (Office Of The Deputy Prime Minister, 2004)
- Planning Policy Statement 9: Biodiversity And Geological Conservation (Office Of The Deputy Prime Minister, 2005)
- Planning Policy Statement 10: Planning for Sustainable Waste Management (Office Of The Deputy Prime Minister, 2005)

- Planning Policy Statement 12: Local Spatial Planning (Communities and Local Government, 2008)
- Planning Policy Guidance 13: Transport (Office Of The Deputy Prime Minister, 2001)
- Planning Policy Statement 22: Renewable Energy (Office Of The Deputy Prime Minister, 2004)
- Planning Policy Statement 23: Planning and Pollution Control (Office Of The Deputy Prime Minister, 2004)
- Planning Policy Guidance 24: Planning and Noise (Office Of The Deputy Prime Minister, 1994)
- Planning Policy Statement 25: Development And Flood Risk (Communities and Local Government, 2010)
- Circular 05/2005 - Planning Obligations (Office Of The Deputy Prime Minister, 2005)
- Sustainable Communities: Building For The Future (Office Of The Deputy Prime Minister, 2003)
- Sustainability Appraisal Of Regional Spatial Strategies And Local Development Documents (Office Of The Deputy Prime Minister, 2005)
- Code For Sustainable Homes (Communities And Local Government, 2006)
- Infrastructure Delivery: Spatial Plans In Practice - Supporting The Reform Of Local Planning (CLG, 2008)
- Final Report: Spatial Plans In Practice - Supporting The Reform Of Local Planning
- Using Evidence In Spatial Planning: Spatial Plans In Practice - Supporting The Reform Of Local Planning (CLG, 2007)
- Policies For Spatial Plans: A Guide To Writing The Policy Content Of Local Development Documents (Planning Officers Society, 2005)
- Planning Together: Local Strategic Partnerships And Spatial Planning - A Practical Guide (CLG, January, 2007)

3.2.4 REGIONAL/SUB-REGIONAL GUIDANCE AND PUBLICATIONS

- East Midlands Regional Plan (March 2009)

- Local Studies And Publications

3.2.4.1 The following studies, some of which are in the process of preparation as part of the LDF evidence base will provide valuable information for the preparation of the IDP:

- Strategic Flood Risk Assessment;
- Strategic Housing Land Availability Assessment (SHLAA);
- Housing Needs Survey;
- Retail and Town Centres Study;
- Nottingham Outer Sub – Regional Housing Strategy;
- Northern Sub – Regional Employment Land Review;
- Water Cycle Study;
- Transport Study;
- Open Space and Community Facilities Studies;
- Playing Pitch Strategy;
- Green Infrastructure Plan;
- Newark and Sherwood Retail and Town Centres Study, 2010 (GVA Grimley)
- Newark and Sherwood Partnership Community Plan (N&S LSP); and
- Newark & Sherwood Local Plan 1999.

4 SOCIO-ECONOMIC INFRASTRUCTURE

4.1 INTRODUCTION

4.1.1.1 Aspects to be considered within the remit of socio-economic infrastructure are health, education, emergency services, retailing, libraries and cultural community facilities. Whilst retailing is not customarily considered as 'infrastructure' it is important to gain an overview of the hierarchy and functions of existing retail centres for two reasons. Firstly, town, district and local centres often contain a broader range of commercial and public services e.g. banks, police stations, libraries, civic functions, food-stores; all of which provide essential or important functions. Secondly, there is a sustainability dimension to these functions in terms of their provision, distribution and accessibility which will be important to the IDP and Core Strategy in terms of the location of new development. It is important therefore in a broad sense to understand the functioning of the District in terms of these centres.

4.2 HEALTH

4.2.1 PRIMARY HEALTHCARE

4.2.1.1 The Nottinghamshire County Teaching PCT, (which is within the East Midlands Strategic Health Authority), commission primary healthcare facilities throughout Newark and Sherwood District. Several published documents have been provided:

Nottinghamshire County Teaching PCT – Local Operational Plan

4.2.1.2 The Nottinghamshire County Teaching PCT (NCT PCT) covers the majority of Nottinghamshire County, with its geographical boundary coterminous with six of the seven Districts, i.e. Ashfield, Mansfield, Newark & Sherwood, Rushcliffe, Gedling and Broxtowe. There is little useful information in this document in terms of describing the existing physical infrastructure through which health services are delivered (e.g. hospitals and health/medical centres) or personnel provision for how population growth would translate to increased need for services.

NHS Nottinghamshire County Strategic Plan 2009-2014 and the Organisational Development Plan 2009-2014

4.2.1.3 These are high-level, strategic documents dealing primarily with the development of future clinical policy and the delivery of health services. Whilst there are policy statements in terms of future commissioning and delivery, there is little spatial or local dimension to the

documents. It is noted that, increasingly, specialist facilities for example, trauma, stroke and heart services are likely to be concentrated in Nottingham and will move away from the surrounding general hospitals. At the same time the PCT plans to expand direct access for some services such as physiotherapy and podiatry by commissioning small contracts through Practice Based Clusters (see below) and this should enable more people to access these particular services locally in some cases.

NHS Pan Nottinghamshire Strategic Service Development Plan 2008 –2018

4.2.1.4 This is the most pertinent health related document to the Core Strategy and the IDP. It examines population growth and outlines the priorities for further development for the three PCTs across Nottinghamshire. Whilst the Sustainable Urban Expansion of Nottingham is recognised in this report, there is no reference to Newark's Growth Point status.

4.2.1.5 The three Nottinghamshire PCTs commissioned Estates Surveys in 2008, the outcomes of which were not reported in this SSDP document. This comprehensive audit of all NHS estates within the PCT, including PCT owned and leased premises; LIFT buildings and GP owned premises. The purpose of this audit was to ensure that all premises from the legacy PCTs were surveyed to inform the development of a PCT Estates Strategy.

4.2.1.6 The estates audit will inform the development of the Nottinghamshire County Teaching PCT (The PCT) Estates Strategy, including priorities for capital investment.

Practice Based Commissioning

4.2.1.7 The NCT PCT commissions Primary Care by local NHS independent contractors including: GP practices, Dental Practices, Pharmacies and Optician Practices. The commissioning and development of local services is clinically-led through Practice Based Commissioning Clusters and independent practices. The PBC Clusters have been instrumental in identifying local priorities and in developing plans that meet local needs. Newark and Sherwood is one cluster (excluding Middleton Lodge (practice), Ollerton).

Health Facilities in Newark and Sherwood

4.2.1.8 The following settlements in Newark and Sherwood District have health facilities as follows:

Table 4.1 Health Facilities in Newark and Sherwood

	GP Practice	Dental Practice	Pharmacy
Newark/Balderton	√√√√	√√√√√	√√√√√√√√
Bilsthorpe	√		√
Blidworth	√		√
Clipstone	√		
Collingham	√	√	√
Edwinstowe	√		√
Farnsfield	√		
Lowdham			√
New Ollerton	√	√	√√
Rainworth	√√	√	√√
Southwell	√	√√√	√
Sutton on Trent	√		

[Source: NHS Pan Nottinghamshire Strategic Service Development Plan 2008 –2018]

Newark Healthcare Review 2009

4.2.1.9 In 2009 the PCT set up the Newark Strategy Group to consider the impact of population changes (in terms of growth in numbers, and other changes such as population ageing and predicted increases in some conditions such as obesity and heart disease).

4.2.1.10 The group is composed of senior healthcare professionals including clinicians, representatives from GP services, Community Health, Council of Voluntary Services and also representatives from Nottinghamshire County Council and Newark and Sherwood District Council.

4.2.1.11 The outcome from the work of the group has been the publication in November 2009 of the Newark Healthcare Review, which is a public consultation document seeking views on a number of options for the future provision of healthcare to meet the challenges of meeting increased demand and providing improved services.

4.2.1.12 The Review emphasises that the existing Hospital in Newark will remain with some services expanding and others changing to meet modern clinical needs.

4.2.2 HOSPITAL PROVISION

4.2.2.1 Sherwood Forest Foundation Hospitals NHS Trust (SFFHT) provides District General Hospital services and services for the elderly in Central Nottinghamshire, including Newark and Sherwood District. SFFHT became a Foundation Trust in February 2007 and runs King's Mill and Newark Hospitals, as well as providing services at Mansfield Community Hospital.

4.2.2.2 Nottingham University Hospitals NHS Trust provides acute services on two campuses in Nottingham, the City Hospital and the Queens Medical Centre. Between the two sites, the Trust provides 1,664 beds. The hospitals provides a range of specialist services including the Nottingham Breast Institute, Children's Services, spinal surgery, neurosurgery and neurology, transplant surgery, neonatal care, genetics, cardiothoracic surgery, stroke, burns and plastic surgery.

4.2.2.3 Newark Hospital is the only hospital within the District and currently provides 102 beds. It is currently the subject of a £7m investment involving major refurbishment and expansion of services. The hospital is provides a limited range of services, for example it does not have an Intensive Care Unit , children's or maternity services or major trauma facilities. It does however provide a gateway to other services, with patients being referred to Kings Mill Hospital or the hospitals in Nottingham.

4.2.2.4 Kings Mill provides a greater range of services than those available at Newark Hospital and many of its consultants operate outpatient services at Newark. King's Mill is a £320m 'super-hospital', the first phase of which has recently opened with completion of all phases planned for 2011. However more specialist requirements will continue to have to be referred to the Nottingham Hospitals.

4.2.2.5 Whilst Newark Hospital is convenient for and very popular with many residents in the District, many patients have to travel outside the District, particularly for the more specialist services. This will continue to be the case, although the on-going review referred to above will in due course determine the strategy for providing local healthcare for the existing and future population.

4.2.2.6 As is the case at present, some patients may choose the Nottingham Hospitals, especially those who live in the south and east of the District. There is some complexity around patient flows and this depends on a number of factors apart from the type of health care required.

For example, currently there is an inflow of patients from Lincolnshire where waiting times are longer but this may change over time.

4.2.2.7 The Hospitals Trust is committed to providing as wide a range of facilities at Newark Hospital as possible, future plans are dependent on a number of factors including the outcome of the work of the Newark Project Group and the consultation exercise recently undertaken.

4.2.2.8 There is some scope for expansion on the Newark Hospital site and adjacent land (believed not to be in Trust ownership) should this be needed.

4.2.3 FUTURE PROVISION – PRIMARY HEALTHCARE

4.2.3.1 As a general rule, provision of GP services is based on there being a need for 1 doctor for 1,800 people. In practice existing surgeries may have larger patient lists. A typical new 4/5 doctor GP practice would serve approximately 7,200 - 9000 patients. Any significant increase in population would require additional GP provision[1].

4.2.3.2 How this is provided will be dependent on individual circumstances and also the location and scale of development proposed. In some cases population growth could be catered for by expansion of an existing practice (subject to the premises being suitable and/or capable of extension). In other cases a new surgery/practice may be required. In terms of premises, some GP Practices are owners of the premises, whilst others are leased to the Practice by the PCT.

4.2.3.3 In the case of the growth in and around Newark, the increased population generated could ultimately create a need for up to 10 additional GP's. This could be provided as two new 5 doctors GP practices to serve the new strategic development areas or, alternatively, a mix of expansion of existing surgeries, perhaps with one new practice, well located to meet the needs of new residents.

4.2.3.4 Elsewhere, the cumulative growth in the four service centres could generate the need for one or maybe two additional GP's ultimately but there is unlikely to be a need initially in any of the individual settlements unless existing services are already overstretched.

[1] For the purposes of this study the requirement for the provision of new GP practices has been based on a ratio of 1 doctor for 1,800 people, with 2.3 persons on average assumed per dwelling, which is taken from the 'Newark and Sherwood Developer Contributions Supplementary Planning Document' dated October 2008.

4.3 EDUCATION

4.3.1 BACKGROUND

4.3.1.1 The following information has been provided by the education authority, Nottinghamshire County Council. A two tier system operates generally throughout Nottinghamshire with comprehensive schools offering secondary education from age 11. In a small number of cases, there are separate infant and junior schools. In Newark and Sherwood there are a number of Voluntary Aided schools (both C of E and Roman Catholic). These schools set their own admissions criteria and this, together with the exercise of parental choice, adds to the complexities of schools planning. All of the Secondary Schools in Newark and Sherwood District with the exception of the Minster School in Southwell are included in the Building Schools for the Future (BSF) programme and this will involve significant building/rebuilding projects between 2010 and 2013.

4.3.2 CURRENT POSITION – PRIMARY SCHOOLS -NEWARK (INCLUDING BALDERTON AND FERNWOOD)

4.3.2.1 A number of primary schools in the Newark area are currently oversubscribed. There is particular pressure on the eastern side of the town. There are currently issues with the following schools:

Coddington Primary School, Coddington

4.3.2.2 This school has experienced a growth in pupil numbers as a result of housing development at Beacon Heights, part of which falls within its catchment area. The school is now oversubscribed and is in need of additional land and additional accommodation but the existing site is constrained.

Chuter Ede Primary School, Balderton

4.3.2.3 Numbers have grown over the past few years, partly as a result of housing development at Fernwood. The site is considered to be over-developed and surrounding roads are unable to cope at the start and end of the school day leading to potentially dangerous traffic conditions.

Barnby Road Primary School, Newark

4.3.2.4 This is a recently opened new replacement school which is already oversubscribed despite the construction of an additional classroom. Any new housing developments in the catchment area would trigger a need for expansion; otherwise some children from within the catchment area will be refused admission.

4.3.3 CURRENT POSITION – PRIMARY SCHOOLS - SERVICE CENTRES

4.3.3.1 The Preferred Growth Option identifies four settlements as Service Centres: Ollerton and Boughton, Clipstone, Rainworth and Southwell. Current issues include:

4.3.3.2 St Joseph's Catholic Primary School in Boughton is full and over capacity and numbers on roll are growing. Parental preference for a catholic school education continues to put pressure on this school. However there are usually places available at Ollerton Primary School.

4.3.3.3 Samuel Barlow Primary School in Clipstone is not full but capacity is limited. The school was built to serve the former mining community and is somewhat dated and less popular with parents.

4.3.3.4 Rainworth's school catchments are split between Mansfield District and Newark and Sherwood. There are no current issues with regard to capacity at Lakeview Primary or Python Hill Schools. The latter was also built to serve the former mining community and would benefit from some upgrading.

4.3.3.5 In Southwell all of the primary schools have site constraints and there is therefore limited capacity to expand. Pressure on places in Southwell Schools is increased by the intake of children from outlying villages.

4.3.4 CURRENT POSITION – PRIMARY SCHOOLS - PRINCIPAL VILLAGES

4.3.4.1 The seven principal villages are identified in the Preferred Growth Option. These are: Bilsthorpe, Blidworth, Collingham, Edwinstowe, Farnsfield, Lowdham and Sutton on Trent. Current issues with schools in these settlements include:

4.3.4.2 Lowdham CE Primary is full and children moving into the catchment area often cannot gain admission and have to travel to an alternative school usually, Bleasby CE Primary.

4.3.4.3 John Blow County Primary School in Collingham is a one form entry school with little spare capacity and no scope for expansion.

4.3.5 CURRENT POSITION – SECONDARY SCHOOLS

4.3.5.1 There are five secondary schools serving the District. There is some outflow of secondary age pupils to schools in Lincolnshire which operates a grammar school system although large numbers of pupils go to a number of non-selective schools in Lincolnshire too.

4.3.5.2 As noted above the BSF programme is expected to have a major impact on secondary schooling in the district over the next few years. In order to commit funding, the government will agree pupil numbers with the authority and these are fixed at the point of entry to the BSF programme (May 2008). Only pupils generated as a result of housing developments which have planning permission at the time of producing the pupil projections will be included in the calculation of additional pupil numbers.

4.3.5.3 The timing of the BSF building programme means that developments planned as part of the growth point will not be taken into account in planning new/rebuilt schools.

Newark

4.3.5.4 There have been recent changes in Newark with the closure of the Newark High School in 2008 as a result of falling rolls in the area. The remaining secondary schools in Newark are The Grove in Balderton and The Magnus. The Grove is currently using the former Newark High School site.

4.3.5.5 There are no current problems with overall pupil numbers in Newark, particularly as parents living in some of the catchment area villages opt to send their children to grammar schools in Lincolnshire. Another option favoured by some parents is the Minster (CE) School in Southwell. However this does affect the balance of the intake.

The Minster (CE) School, Southwell

4.3.5.6 This school has been recently slightly enlarged and significantly rebuilt. The school is now oversubscribed and in the current (2009/10) academic year, some pupils from within the catchment area were not admitted.

The Dukeries, Ollerton

4.3.5.7 This school is proposed to become an Academy, funded through the BSF programme. The admission numbers will not allow scope for expansion other than to take account of any committed developments (i.e. with planning consent at the time of producing pupil projections).

Joseph Whitaker, Rainworth

4.3.5.8 This school is also included in the BSF programme and this will restrict flexibility in terms of pupil numbers. The academy in Mansfield could potentially have an effect on pupil numbers in the future.

4.3.6 IMPLICATIONS OF PREFERRED GROWTH OPTION FOR FUTURE EDUCATION PROVISION

4.3.6.1 Pupil numbers generated by new development are calculated by the Education Authority on the basis of:

- 21 primary places required per 100 dwellings
- 16 secondary places per 100 dwellings

Thus 1,000 new dwellings would generate a need for a 'one form entry' primary school (210 pupils) and one form per year for secondary school.

4.3.6.2 Parental choice and the admissions policies of individual schools often make it very difficult to maintain the principle of catchment areas. This is particularly the case for secondary schools in the District since all these schools operate their own admissions policies.

4.3.7 NEWARK AREA– FUTURE PRIMARY SCHOOL PROVISION

4.3.7.1 The Preferred Growth Option proposes a significant level of growth in and around Newark with strategic sites identified to the south and east of the town and at Fernwood (south east of Newark). These will accommodate 7,760 new dwellings in total with 6,000 new homes in the three strategic areas and a further 1,760 elsewhere within the town[2].

[2] Figures represent proposed growth within the plan period. Some sites have capacity for further growth beyond the plan period.

4.3.7.2 This level of growth will have major implications for both primary and secondary schools in the town. It will inevitably have an impact on existing provision in the town and, potentially, ramifications beyond the town as a result of the possible need to reconfigure catchment areas.

4.3.7.3 As far as existing primary schools in Newark are concerned, a number are currently oversubscribed and there is very limited scope to absorb any additional pupil numbers by expansion of existing schools.

4.3.7.4 In terms of primary schools, the County Council's preference is for one form or two form entry primary schools based on 30 or 60 pupils per year. This assists efficient operating arrangements and helps to ensure that schools can be embedded in the local community. Based on the County Council's formula, the proposed new housing will generate 1,630 new primary age pupils in and around Newark over the plan period. This is broadly equivalent to a requirement for four new 2-form entry primary schools (or eight 1-form entry schools) to accommodate the growth.

4.3.7.5 It is anticipated that new primary schools will need to be provided on accessible sites within each of the proposed strategic development areas and schools planning will need to be considered at an early stage. As noted above, early discussions will be needed with the education authority. This may also result in enlargement of existing schools (although scope for this appears to be limited), reconfiguration of catchment areas or rationalisation.

4.3.8 REMAINDER OF THE DISTRICT – FUTURE PRIMARY PROVISION

4.3.8.1 Although the main focus of growth is envisaged in and around Newark itself, significant levels of development are proposed in each of the four Service Centres giving rise to a need for just under 400 additional primary school places in total although these are not evenly distributed between the centres. Clipstone and Ollerton and Boughton will accommodate over half of the proposed development between them with Southwell, which is constrained by its location and the nature of its historic core will accommodate the smallest level of growth. Development is also proposed in the seven Principal Villages indicating a need for just over 200 pupil places in total, although again, not evenly distributed. Over half of the growth is proposed to be accommodated in Blidworth and Bilsthorpe.

4.3.8.2 In Clipstone there is likely to be insufficient spare capacity at Samuel Barlow Primary School to accommodate the amount of growth proposed and there may be a case for providing a single

new school in due course to replace the existing older school and cater for the expected growth. In Ollerton it is not clear whether the existing school would need to be expanded to accommodate additional pupils; however St Joseph's Catholic Primary School in Boughton is full and over-subscribed. Any expansion at this school (if there is scope) would be dependent on the views of the Diocese.

4.3.8.3 Rainworth's school catchments are split between Mansfield District and Newark and Sherwood. There appears to be capacity at primary schools in Rainworth to accommodate growth in pupil numbers.

4.3.8.4 In Southwell, all of the primary schools have site constraints and there is therefore limited capacity to expand. Accommodating the anticipated growth in pupil numbers (about 62 pupils) is likely to present some difficulties.

4.3.8.5 In terms of the Principal Villages, whilst there is some capacity in some of the schools, growth in pupil numbers at the levels indicated above is likely to give rise to a need for expanding schools in most if not all of these settlements. Particular issues are likely in Collingham where the existing school has no scope for expansion and Lowdham, where the existing school is currently over-subscribed. As noted earlier, even where there is scope for expansion of schools in physical terms, the admissions policies of individual schools could have an impact on the future picture.

4.3.8.6 Outside of Newark on Trent the proposed development will therefore not generate sufficient pupil numbers in any one settlement to justify entire new primary schools. Decisions will therefore need to be made as to where to place new school infrastructure to best capture the planned growth in pupil numbers, as well as alleviate the pressure on existing education infrastructure. This may be by extensions to existing infrastructure at each settlement, or positioning new schools in the centre of clusters of settlements, or a combination of both. For the purposes of this study it has therefore been assumed that in addition to the new provision already mentioned in Newark on Trent a new Primary School will also be required to accommodate the shared demand generated by Clipstone and Ollerton and Boughton.

4.3.9 NEWARK AREA – FUTURE SECONDARY SCHOOL PROVISION

4.3.9.1 The position regarding future secondary school requirements in the Newark area is complex. The BSF programme sets admission numbers to the existing schools that will not take account of development generated by the Growth Point and planned through the LDF. There could ultimately be a requirement for over 1,200 additional secondary school places as a result of the proposed growth in the town.

4.3.9.2 Whether expansion of the two existing schools could accommodate this level of growth once the BSF transformation has taken place without the need for a new school is unclear. Scope for expansion at The Magnus site is limited; however there may be opportunities at The Grove site. This would be dependent to some extent on a range of other factors that might significantly affect the site. These include the future of the Leisure Centre which currently occupies part of the site, and whether or not The Orchard Special School will relocate to The Grove site.

4.3.9.3 A further factor which causes uncertainties is that, whilst a number of pupils currently attend schools in Lincolnshire, it is not clear whether a similar cross boundary flow will continue once the BSF programme has effected major improvements to the secondary schools in the District. It is possible that some parents will choose schools in Newark in the future, thereby putting additional pressure on secondary schools.

4.3.9.4 It is very possible therefore that a new secondary school will be required. If this occurs, the choice of site for a new school will need to be assessed in relation to the location of the proposed areas for expansion of the town. It may be appropriate to consider allocating a site within one of the new development areas. The impact of a new secondary school on existing provision in the town would also need to be reviewed.

4.3.9.5 It is clear that the growth agenda raises particular challenges with regard to secondary school provision in and around Newark.

4.3.10 REMAINDER OF THE DISTRICT – FUTURE SECONDARY PROVISION

4.3.10.1 The Preferred Growth Option shows potential housing requirements for the remainder of the District of 2,854 dwellings. Using the Education Authority's formula of 16 secondary age pupils per 100 dwellings, this would generate a requirement for about 460 secondary school places.

For the purposes of this study it has been assumed that this could be accommodated through expansion of the three existing schools, therefore obviating the requirement for a new school. However, this would of course be subject to further detailed assessment and the following comments are offered on the practicalities of expanding the exiting schools.

The Minster School, Southwell

4.3.10.2 As the school is already over-subscribed and unable to admit all pupils within its catchment, any development within the catchment could only be catered for if the school site was suitable for expansion. The school has recently consolidated onto a single site and there is unlikely to be scope for any significant additional accommodation. In any event, as it is a Voluntary Aided School, expansion would only be possible with the agreement of the Diocese and it is possible that this may not be forthcoming.

The Dukeries, Ollerton

4.3.10.3 The Dukeries is a multi-use site; in addition to the school there is a library, and older persons and youth provision. There appears to be some potential for expansion; however, increasing the size of the school may require additional land and may be subject to the availability of adjacent land.

Joseph Whitaker, Rainworth

4.3.10.4 There could be some potential for expansion of this school. The school is located at the edge of the settlement; increasing the size of the school significantly may require additional land and would be subject to the availability of adjacent agricultural land.

4.3.11 TERTIARY EDUCATION – CURRENT PROVISION

4.3.11.1 The main Newark College campus occupies a corner plot on Friary Road, near the Newark town centre. Teaching provision can also be found at the Violin School on Appleton Gate and the Piano School at The Mount Annexe.

4.3.11.2 Following the merger with Lincoln College in January 2007, there has been significant investment into both the teaching provision and estate of the College. This has included new provision in construction and motor vehicle studies. Newark College draws many of its students from Newark and the surrounding villages. The larger subject offer at Lincoln means that the geographical sphere of influence is larger.

4.3.11.3 Newark College is significantly smaller than Lincoln College, and the available provision reflects this. As a general rule, Level 3 provision is offered at Lincoln, with feeder courses at Level 1 and 2 running at both Newark and Lincoln (and a third site: Gainsborough College). Transport from Newark to Lincoln is provided via a free bus service. Over the last academic year approximately 120 students took advantage of this offer daily.

4.3.11.4 In some isolated areas courses at Newark are not offered at Lincoln, and here too, students can take a free minibus from Lincoln to Newark. An example is Graphic Design.

4.3.11.5 The largest feeder schools to Newark College are The Grove and Magnus High. Some students are also drawn from Retford, Tuxford and Bingham to Newark. Smaller numbers travel from Grantham, and some travel from North Hykeham in Lincoln because of the good road access. The number of colleges in Nottingham and its size as an urban centre makes this an attractive proposition for some students in the District.

4.3.11.6 The College also manages a flourishing community education programme teaching short courses for adults in local community venues including:

- Bowbridge Primary School
- Coddington Primary School
- Barnby Road Primary & Nursery School
- Bishop Alexander School
- Lovers' Lane Primary School
- Mount C of E Primary School
- Newark Orchard School
- Hawtonville Children's Centre

4.3.11.7 The subject range on offer includes those on learning for pleasure as well as vocational courses, such as Teaching Assistants.

4.3.12 TERTIARY EDUCATION – FUTURE PROVISION

4.3.12.1 The role of the Learning and Skills Council in education for 16-19 year olds has been taken over as from 1st April 2010 by the Young People's Learning Agency (YPLA). The YPLA will support

local authorities in fulfilling their new duties for commissioning education and training for 16-19 year old learners in England. Responsibility for Newark and Sherwood now rests with the Local Education Authority, Nottinghamshire County Council.

4.3.12.2 Newark College estimates that last year 2% of the local population enrolled on a College course. Assuming that the proposed population growth was of mixed age, and that the 2% remains constant, there would be a forecast growth over time of up to 350 students. It is anticipated that Newark College would be able to accommodate this number of additional students.

4.4 EMERGENCY SERVICES

4.4.1 POLICE

4.4.1.1 The provision of police services in Newark and Sherwood is the responsibility of Nottinghamshire Police Authority. The Police Authority are divided into four divisions of which the largest, Bassetlaw, Newark and Sherwood serves over 250,000 people. The draft Nottinghamshire Policing Plan was published on 31st March 2010 and sets out the strategic vision for the next three years, with a detailed plan for the year ahead. The Plan gives an overview of strategic aims, objectives, priorities and targets, taking into account national perspectives and engagement with communities and partners and includes a statement of the outcomes the Force expects to achieve over the period of the Plan.

4.4.1.2 The Plan contains a Vision Statement which is underpinned by five strategic aims and objectives:

1. Partnership Working: working together with all our partners to improve services to communities

2. Protection and Reassurance: reducing the threat of crime, the risks posed by offenders and criminal groups, thereby reducing harm to the public

3. Visibility and Accessibility: providing local policing that is more visible and accessible to meet the needs of communities

4. Flexibility and Responsiveness: providing a truly flexible policing service that understands the needs of communities and adapts the service to meet those needs

5. Community and Individual Needs: listening, through effective community engagement, to ensure services meet local and individual priorities

4.4.1.3 Priorities for the next year are::

1. Deliver Neighbourhood Policing and the Policing Pledge.
2. Effectively work within communities and with partners to reduce antisocial behaviour.
3. Reduce the threat of violent and serious acquisitive crime.
4. Deliver improvements to protective services.
5. Support, promote and embed equality and diversity across all of our work.
6. Develop better and more efficient services through partnership and collaboration.
7. Improve efficiency and productivity, providing a service that represents Value for Money.

4.4.1.4 There is relatively little specific spatial dimension in the Plan, although it advises that more officers will be will be transferred from headquarters and specialist departments to A and B Divisions. B Division includes Newark and Sherwood. This is intended to provide the public with a better level of response, crime investigation and neighbourhood policing.

4.4.1.5 The provision of Police facilities or contact points has evolved to meet the needs of local populations and reflects the rural and spatially diverse spread of population within the Newark and Sherwood area. Overall, the level of policing reflects the generally low levels of crime experienced across the District.

4.4.1.6 The most significant police facilities known as Local Area Command (LAC) Stations are located at Newark and Ollerton. Both LAC's operate 24 hour response services and have custody suites. The Newark LAC is a purpose built £6.5M facility opened in 2006 and includes additional ancillary facilities such as training rooms. Ollerton Police Station comprises two buildings dating back to around 1950 with both buildings being of poor quality. The Ollerton LAC is identified within the Police Authority Corporate Plan for replacement over the next 5 years. It is proposed to replace the buildings with a new, purpose built Police Station suitable for 21st Century policing.

4.4.1.7 There is also a Police Station at Southwell which operates a front desk during designated hours of the day. At a local level the Police Authority operates a series of local contact points. Local contact points are designated spaces within other local community facilitates which the police lease or rent space regularly. These facilitates are operated as part of the safer neighbourhoods initiative and do not support a full time police presence but officers are available at specified times during the week. Local contact points are located at Balderton, Blidworth, Collingham and Farndon.

4.4.1.8 Nottinghamshire Police Authority and the County Council also operate a Mobile Policing Unit. The Mobile Policing Unit operates on a timetabled basis travelling to rural communities allowing a police officer to patrol the area whilst a member of the County Council's County Contact Team stays in the vehicle to be on hand to give advice to the public.

4.4.1.9 The LAC's, Police Stations, Local Contact Points and the Mobile Policing Unit provide a comprehensive police service focussed on delivering the aims of the Policing Plan.

4.4.1.10 The recent LAC development in Newark and replacement in Ollerton due in the next plan period are considered adequate to meet the needs of the additional growth, although there are no dedicated facilities serving Clipstone or Rainworth. The provision of additional Police Stations/contact points may be desirable to serve these locations and also the villages of Blidworth and Edwinstowe. Further consultation with the Police Authority will ne necessary to assess future needs. For locations around the district currently served by the mobile unit the provision of new facilities could be readily achieved by introducing additional local contact points by making use of existing community facilities.

4.4.1.11 Although funding for the Police is generated through the precept (local tax on businesses and households), increasingly there is a funding gap, particularly in areas of significant growth and many forces are looking to contributions from developers towards set up costs of new facilities, including premises, staff and equipment where appropriate.

4.4.2 AMBULANCE

4.4.2.1 The East Midlands Ambulance Service (EMAS) provide Accident and Emergency as well as non-emergency transport services in the 6 counties of Derbyshire, Leicestershire, Lincolnshire, Northamptonshire, Nottinghamshire and Rutland. This equates to an area of 6425 square miles, serving a population of 4,800,000. Evolving the service to meet the current population's

needs and governments drive to improve services has seen improvements in the number of additional support services beyond traditional ambulances to include paramedic response services.

4.4.2.2 EMAS Mobile Response Model is a key part of the Trust's business plan. The aims are to deliver call connect targets, ensure optimal vehicle locations and implement delivery frameworks based on supply and demand modelling. In relation to current and future planning strategies as they relate to Newark and Sherwood population growth there are two key services provided by EMAS which need to be taken into account. They are A&E and non-emergency transportation services. The key EMAS strategic policies all relate to meeting the national emergency response targets of 75% of Category A calls (potentially life threatening) within 8 minutes and 95% within 19 minutes and 95% of Category B calls (urgent but not immediately life-threatening) within 19 minutes. This will remain the number one priority for the ambulance service when considering how it will plan to meet the challenges of future population expansion.

4.4.2.3 Services in Newark and Sherwood are co-ordinated through control rooms based in Lincolnshire and Nottinghamshire. There are three main Ambulance Stations serving the Newark and Sherwood area although two at Worksop and Carlton are outside of the District with the main local ambulance station situated in Newark.

4.4.2.4 The day to day management and distribution of ambulances is an operational matter with vehicles responding to emergency calls or transportation services as required. This distribution is managed by the control centre located outside of the district. As such the requirement for permanent ambulance station facilities which are locationally based is not operationally critical. As the population grows any requirement for additional ambulances will be planned based on increasing demand.

4.4.2.5 The EMAS also provides transportation for non-emergency journeys for patients attending out patient appointments or respite/day care facilities, and also for patients being admitted to, discharged from or transferred between hospitals. These services provide an important function but place less locationally specific requirements in terms of ambulance service property infrastructure. Population growth will impact on the number of trips generated but is unlikely to place significant pressure in terms of planned new facilities for EMAS.

4.4.2.6 EMAS also operate 3 air ambulances. The service covering Lincolnshire and Nottinghamshire Air Ambulance facilities are based at RAF Waddington and it is not expected that further additional facilities will be required to meet planned population growth within the district.

4.4.2.7 In conclusion the current provision of ambulance services is regarded as sufficient to respond to the Newark and Sherwood growth agenda.

4.4.3 FIRE

4.4.3.1 The Nottinghamshire Fire and Rescue Service are the responsible authority for the delivery of all fire and rescue services in Newark and Sherwood District. The service covers an area of 834 square miles from a total of 25 fire stations which are situated to provide a fire and rescue service to every person within Nottinghamshire. There is also a Specialist Rescue Team, providing expert support at incidents such as rescues from height, water, multiple road traffic accidents or building collapse.

4.4.3.2 The control room function is due to transfer to the new East Midlands Regional Control Centre in 2011/12, as part of the national FiReControl project. This is designed to enhance the ability of all fire and rescue services to respond to a major incident, such as widespread flooding or a terrorist attack.

4.4.3.3 Within the District the only station which is manned 24 hours a day is located in Newark. This service is supported from Collingham, Southwell, Blidworth and Edwinstowe stations which are all part time facilities. Additional support from outside the district is provided from Worksop, Carlton and Tuxford. In April 2010 the final 4 appliances of a contract to supply 19 new fire appliances are being delivered. Two new rescue tenders are also being brought into service, designed to the requirements of the Specialist Rescue Team. These will be supported by two 4x4 utility vehicles.

4.4.3.4 There are no nationally recognised targets for emergency response times or standards relating to 'facilities per head' of population that would necessitate the need for new fire stations based solely on population growth in the district. The Nottinghamshire Fire Service has in place a Service Plan 2010-2013 that sets out high level objectives relating to a wide range of fire safety issues including emergency response. This is a strategic policy and management review document, which provides no detail of any existing infrastructure provision or consideration of Newark and Sherwood's growth status.

4.4.3.5 The current spatial distribution of Fire Stations is well located to provide a local emergency response within the District. These facilities are also well placed to respond to growth within the District.

4.5 LIBRARY SERVICES

4.5.1 CURRENT PROVISION

4.5.1.1 There are 14 libraries serving the District. These are:

- Balderton
- Bilsthorpe
- Blidworth
- Clipstone
- Collingham
- Dukeries (Boughton)
- Edwinstowe
- Farnsfield
- Lowdham
- Newark
- Ollerton
- Rainworth
- Southwell
- Sutton-on-Trent

4.5.1.2 Most of the smaller settlements in the District are served by mobile libraries.

4.5.1.3 In addition to providing books for children and adults, most of the libraries also stock CD's and DVD's.

4.5.1.4 The County Council assesses standards of provision with reference to the Museums. Libraries and Archives Council's (MLA) report "Public Libraries, Archives and New Development: a standard charge approach" (2008). The appropriate space standards are based on 30sq m of public space per 1,000 population and a stock requirement of 1,532 items per 1,000 population.

4.5.1.5 The County Council has assessed current provision against these standards and has identified that Balderton, Collingham, Lowdham, Newark and Sutton-on-Trent libraries all operate at over full capacity in terms of both the size of premises and the stock available for loan. Collingham library is over capacity based on the size of the building, and Bilsthorpe library has insufficient stock in relation to its catchment population.

4.5.2 FUTURE PROVISION - NEWARK AREA

4.5.2.1 Newark Library was built in 1986 and is now under significant pressure in terms of both premises and stock. To accommodate the additional growth envisaged, the County Council's preference would be to extend the library, given its relatively central location within the town. There is land immediately adjacent to enable this (although the ownership needs to be confirmed). Balderton library, by contrast is located in a converted chapel and its expansion would be problematic.

4.5.2.2 If the expansion of Newark library does not prove possible, there may be an opportunity to provide new library facilities within one of the strategic expansion areas in conjunction with either a new primary school or other community use to meet the increased demand.

4.5.3 FUTURE PROVISION - REMAINDER OF THE DISTRICT

4.5.3.1 Southwell library is recently built and it is expected that it could cope with the additional demands as a result of new development.

4.5.3.2 Both Collingham and Lowdham libraries operate from shared premises; Collingham library is in a Health Centre and Lowdham is in a GP surgery. Expanding these facilities in situ would be problematic and it is possible that new facilities may be required, particularly in relation to Collingham. Sutton-on Trent library is very small and operates form the front room of a residential property; however only limited growth is proposed in this settlement and this may be insufficient to justify a requirement for larger premises.

4.5.4 COST OF PROVISION

4.5.4.1 The County Council has indicated that they would be seeking £85 - £90 per person towards providing premises and stock.

4.6 CULTURE AND LEISURE

4.6.1 INTRODUCTION

4.6.1.1 Newark and Sherwood District Council runs a wide range of leisure and cultural activities across the District as noted below. In addition there is a range of commercially provided facilities such as health and fitness centres, bowling, bingo, snooker, cinema, and sports provision. Southwell racecourse is also a major attraction.

4.6.2 CURRENT PROVISION - LEISURE

4.6.3 LEISURE CENTRES

4.6.3.1 The District Council provides a comprehensive range of leisure facilities. There are three main Leisure Centres operated by the District Council – Grove Leisure Centre (Balderton, Newark), Dukeries Leisure Centre (New Ollerton) and the recently opened Blidworth Community Leisure Centre. The Dukeries Leisure Centre is owned by NSDC but the land is owned by Nottinghamshire County Council.

4.6.3.2 There is also an existing leisure centre at Rainworth which is operated by the foundation school.

4.6.3.3 The fifth leisure centre in the district is Southwell Leisure Centre owned by a Charitable Trust with some financial support from the District Council. The Council is also responsible for the Lincoln Road Sports Facilities in Newark.

4.6.3.4 Facilities currently provided at each of these comprise:

Grove Leisure Centre:

- 25 metre indoor swimming pool
- 12.5 metre learner pool
- Sports Hall - 5 badminton court size
- Activity area/gymnasium
- Steam room
- 104 station Fitness Suite
- Dance/Aerobic/Fitness Studio
- 2 Squash Courts
- Trim Trail
- Outdoor Grass Football and Cricket Pitches
- Under 16's Fitness Suite
- 400m Athletics Track (All weather surface)
- Sunbed

Rainworth Leisure Centre:

- 20 metre swimming pool
- 4 court sports hall
- Licensed bar, lounge and cafeteria
- Ancillary hall
- 2 Squash Courts
- Dance Studio
- 50 station Fitness Suite
- Sunbeds

Dukeries Leisure Centre:

- 20 metre swimming pool
- 4 court sports hall
- 2 gymnasia
- Covered games area
- 2 squash courts
- 74 station fitness suite
- Dance/Aerobic/Fitness Studio
- Steam and Sauna Suite
- Licensed bar
- Floodlit outdoor tennis and netball courts
- Floodlit full sized synthetic turf pitch
- Under 16's Fitness Suite
- 400m Athletics Track (All weather surface)
- Outdoor grass pitches

Blidworth Leisure Centre:

- 100 station fitness suite
- Spinning/fitness studio
- Activity studio
- Party room

Southwell Leisure Centre:

- 25 metre Swimming Pool
- 12 metre Learner Pool
- Sports Hall - 4 Badminton Court size
- Activity Hall
- Sauna (poolside)
- 3 Squash courts with movable walls
- 68 station Fitness Suite
- Trim Trail
- Floodlit 5-a-side all weather area
- Under 16's Fitness Suite
- Children's Softplay area room

Lincoln Road Sports Facilities:

- Single Court Activity Area
- Table Tennis Centre
- Kitchen/Tea Room
- Crafts Room
- Changing Rooms

4.6.3.5 The main swimming pools at Southwell and Dukeries leisure centres are considered to be towards the end of their lifecycle and will require replacement. The swimming pool at Rainworth is regarded as outdated and it is understood will not be replaced through the forthcoming Building Schools for the Future programme.

4.6.3.6 Outside of the District, the Garibaldi leisure centre provides services to the Clipstone community and good quality facilities in the Mansfield district are considered to provide water and sports facilities for schools and communities in the west of NSDC.

4.6.3.7 NSDC has recently undertaken a review of sports provision and produced a Sports and Recreation Facilities Improvement Plan including an exercise in modelling the impact of forecast growth in Newark during the plan period to determine the sub-regional centre's future strategy with regards to sports facilities.

4.6.4 COMMUNITY CENTRES

4.6.4.1 Community centres also provide a focus for leisure and cultural activities at a more local level. NSDC operate six community centres, which will shortly be reduced to five. Four of these NSDC owned community centres are in the Newark area:

- Bridge Community Centre (25% owned by St Leonard's Church)
- Coddington Community Centre (opened in 2007)
- Hawtonville Community Centre (leased to the Salvation Army for 2 years until April 2011)
- Fernwood Village Hall (opened in June 2008)

4.6.4.2 Millgate Community Centre in Newark has recently been transferred by NSDC to a local playgroup. In the remainder of the District here are two community centres based in Village Halls at Edwinstowe and Rainworth. Rainworth Village Hall has been recently refurbished. Edwinstowe Village Hall is in the process of being transferred by NSDC to the Parish Council.

4.6.4.3 There are a further 56 village halls and community centres across the District, operated by church groups, parish councils and charitable trusts. Many of these existing community buildings are old, but due to their age, refurbishment projects are typically successful in attracting grant funding.

4.6.5 CURRENT PROVISION - CULTURAL FACILITIES

4.6.6 THEATRE AND CINEMA

4.6.6.1 The 602 seat Palace Theatre in Newark operates as both a theatre and cinema and provides a varied programme of drama, dance, opera, comedy, children's events, cinema and music.

4.6.6.2 The Nottinghamshire Community Cinema Scheme uses portable equipment to provide community cinema screenings in a variety of venues such as village halls, libraries, community centres, schools and colleges. It is co-financed by a number of public sector bodies including Newark and Sherwood District Council. The scheme is understood to be currently under review.

4.6.7 MUSEUMS AND GALLERIES

Newark Millgate Museum

4.6.7.1 Newark Millgate Museum is run by the District Council and contains a range of exhibits primarily focussing on local Social History. It also houses a gallery space where local art works are displayed. The building is old and not fit for purpose, and a £4m project to renew this facility in another location is being planned, funded mainly by Heritage Lottery Funding.

The Resource Centre.

4.6.7.2 The centre is home to the District Council's resource service and collection exceeding 70,000 artefacts and members of the public can visit the site to research their family history, museum objects or look at over 12,000 photographs

The Gilstrap Centre

4.6.7.3 The Gilstrap Centre is located in the grounds of Newark Castle contains exhibits about its history and the town's Civil War heritage. There is also gallery space within the centre.

4.6.7.4 There are also the following independent and privately owned museums in the District:

- Newark Air Museum, Winthorpe Showground
- The Vina Cooke Museum of Dolls and Bygone Childhood, Newark
- Dukes Wood Oil Museum
- Beth-shalom, the National Holocaust Centre, Laxton.

4.6.7.5 In addition there is a National Trust property at Southwell, The Workhouse and Newark Town Treasures, a civil mayoral and art collection managed by Newark Town Council and displayed at the Town Hall.

4.7 RETAIL

4.7.1 NEWARK AND SHERWOOD RETAIL AND TOWN CENTRES STUDY, MARCH 2010

4.7.1.1 This study was undertaken on behalf of the Council by GVA Grimley and provides the evidence base for the LDF, particularly the Core Strategy, to inform retail planning in the District in the

period up to 2026. The study takes account of the national, regional and local planning policy context.

4.7.1.2 GVA Grimley estimated the current performance of the retail provision in the District of Newark and Sherwood and have forecast the capacity for additional convenience and comparison goods floorspace up to 2026. Two scenarios were considered – a 'baseline' position and a 'growth' scenario incorporating the additional expenditure that will be generated by population growth as part of Newark's Growth Point Status. It should be noted that the study predates the emergence of the Council's Preferred Growth Option but in broad terms its conclusions are likely to remain valid.

4.7.1.3 In the baseline position, for convenience goods, based on current market shares and taking into account commitments, GVA forecast that there is no capacity for additional convenience floorspace in Newark and Sherwood in the period 2009-2014, although this does rise to 1,336 sq m net by 2019, 2,485 sq m net by 2024 and 2,686 sq m net by 2026.

4.7.1.4 For comparison goods, in the baseline scenario, GVA have identified capacity for a further 430 sq m net of comparison goods floorspace up to 2019, rising to 7,379 sq m net by 2024 and 10,388 sq m net by 2026.

4.7.1.5 The quantitative modelling exercise generates capacity for convenience and comparison goods floorspace across the District. To take this a stage further, GVA Grimley undertook a scenario to consider the additional expenditure generated by the growth point population based on 70% of the growth being focused on the Newark urban area. This indicates that, provided the Growth Point population growth is implemented, Newark's Urban Area could support an additional convenience goods floorspace area of 3,415 sq m net by 2019, rising to 5,465 sq m net by 2024.

4.7.1.6 For comparison goods GVA forecast that the additional expenditure generated by the Growth Point population growth will see capacity increase to 4,911 sq m net by 2019, 15,040 sq m net by 2024 and 18,459 sq m net by 2026, across the District.

4.7.1.7 GVA concluded that the Growth Point population will generate additional capacity for new retail floorspace and it is important for the Council to ensure that an appropriate level of retail floorspace is provided to support both new and existing residents fostering sustainability, promoting social inclusion and reducing the need to travel by car. Not all of this additional

capacity will be met in this location, as it is expected that an element of this capacity will be met in other areas, but the Council should ensure that sufficient additional provision is delivered through an appropriate phasing strategy to keep pace with the potential growth in population.

4.7.1.8 Proposals for new retail development in these locations will need to be of an appropriate scale to that of the proposed type of centre, in accordance with the typologies contained at Annex B of PPS4. For example, a new District Centre may comprise groups of shops, often containing a supermarket or superstore, and a range of non-retail services, such as banks, building societies and restaurants as well as local public facilities such as a library.

4.7.1.9 GVA support the principle of a sustainable District / Local Centre at one or more of the Council's proposed strategic housing land allocations, and capacity figures indicate total convenience floorspace in Newark's Urban Area, above commitments, should be no more than 3,500 sq m net combined (in Newark's Urban Area).

4.7.1.10 GVA also carried out audits of the smaller town centres within the District. In general the study concludes that these centres are all vital and viable and in adequate health providing important local convenience and service provision to meets the everyday needs of local residents.

4.7.1.11 The study notes that Southwell, which has the largest centre of the Service Centres, is likely to experience further population growth as a result of Newark's Growth Point status and initial options regarding housing allocations. (This is confirmed as part of the Council's Preferred Growth Option). The study notes that future development opportunities within Southwell are limited due to the centre's historic core and it is therefore considered that that policy should focus on consolidating and enhancing the existing provision including the development of small scale infill sites where appropriate.

4.7.1.12 For the purposes of retail planning, GVA recommend that the Council define a clear retail hierarchy in the emerging Core Strategy to assist with development control decisions and to direct future retail floorspace to the most appropriately located centres in the retail hierarchy in accordance with PPS4.

4.7.1.13 Newark is clearly the highest order centre in the District and the study recommends it should be defined as a sub-regional or main town centre at the top of the retail hierarchy. It recommends that Southwell, Ollerton (excluding Boughton), Edwinstowe and Rainworth are

designated as District Centres, which are defined in PPS4 as "usually comprising a group of shops often containing at least one supermarket or superstore, and a range of non-retail services, such as banks, building societies and restaurants as well as local public facilities such as a library".

4.7.1.14 The study recommends that the centres of Boughton (excluding Ollerton), Balderton North, Balderton South, Clipstone, Collingham, Blidworth, Farnsfield, Lowdham, Bilsthorpe North, Bilsthorpe South and Sutton-on-Trent are designated as Local Centres. PPS4 defines local centres as including "a range of small shops of a local nature, serving a small catchment. Typically, local centres might include, amongst other shops, a small supermarket, a newsagent, a sub-post office and a pharmacy. Other facilities could include a hot-food takeaway and laundrette".

4.8 WASTE MANAGEMENT

4.8.1 BACKGROUND

4.8.1.1 In order to understand the position with the allocation of waste within Nottinghamshire at the present time and over the next 11 years to 2020, and what measures are in place to cope with existing and proposed levels of waste in the County, it is necessary to refer to existing regional and planning policy.

4.8.1.2 At a regional level guidance for the allocation of waste is provided for in the Regional Waste Strategy (January 2006) and at a local level, in the Nottinghamshire Waste Local Plan (January 2002). Advice has also been sought directly from Nottinghamshire County Council, and this is included below.

Regional Waste Strategy (January 2006)

4.8.1.3 The Regional Spatial Strategy, supported by the Regional Waste Strategy, gives a broad indication of the overall amount of treatment and disposal capacity Nottinghamshire will need by 2020.

4.8.1.4 For Nottinghamshire as a whole, including the City, this equates to an additional 1.2 million tonnes of treatment capacity and 2.3 million tonnes of disposal capacity by 2010. Looking further to 2020, these figures will translate to an estimated 1.6 million tonnes treatment and 1.9 million tonnes disposal. That results in a total infrastructure capacity of around 3.5 million

tonnes. This may increase as a result of proposed changes to the housing projections across the County, and indeed the additional 14,800 households proposed in the Newark and Sherwood District.

4.8.1.5 This is set out in full in Appendix 5 of the Regional Waste Strategy, which is reproduced below for ease of reference:

2009/10 Indicative Controlled Waste Treatment Capacity (000s tonnes)

Recycling Composting	Landfill Diversion	Re-use	Disposal	Total
213	128	0	369	710

2014/15 Indicative Controlled Waste Treatment Capacity (000s tonnes)

Recycling Composting	Landfill Diversion	Re-use	Disposal	Total
386	162	0	224	772

2019/20 Indicative Controlled Waste Treatment Capacity (000s tonnes)

Recycling Composting	Landfill Diversion	Re-use	Disposal	Total
386	214	0	172	772

4.8.1.6 Within the overall figure, on the municipal waste side, the County Council has in place its Municipal Waste Management Contract, which is designed to deliver high levels of recycling and increased energy recovery (formerly known as Energy from Waste or EfW) to minimise the County's future need for landfill. The contract proposals include provision for an 180,000 tonnes per annum energy recovery facility at Rufford, a new composting facility (possibly in the region of 35,000 – 50,000 tonnes per annum) near Bilsthorpe and a new Household Waste Recycling Centre and Transfer Station to serve Newark. The latter facility at Newark will replace the existing household waste recycling centre at Cotham. Depending on lead-in times, these are all expected to be in place in the next 2 – 3 years.

4.8.1.7 For commercial and industrial waste, along with construction and demolition waste, facilities are provided by the private sector. Therefore, there is not such a clear picture of likely infrastructure requirements in terms of size, type or location of appropriate facilities. However, Nottinghamshire does have a serious shortage of landfill capacity and would also expect there to be a need for more large scale recycling and recovery facilities to handle commercial and industrial waste, as recycling targets increase and landfill becomes more scarce across the

County, and indeed more expensive. The new joint Waste Core Strategy (which is currently being produced by Nottingham City and Nottinghamshire County Councils) will seek to identify broad locations for managing this waste, but the work carried out to date is not advanced enough to provide an indication of exact numbers and types of facilities.

4.8.1.8 In addition, the County would expect any increase in employment, retail and housing allocations to result in higher quantities of waste to be managed and a possible need for additional sewage treatment infrastructure to be provided.

Nottinghamshire Waste Local Plan (Adopted January 2002)

4.8.1.9 The existing Waste Local Plan covering the district of Newark & Sherwood is the Nottinghamshire Waste Local Plan, which was adopted in January 2002. The plan was intended to cover a 10 year period from 1st January 1995 to 31 December 2004. Under the Planning and Compulsory Purchase Act 2004, the government required local planning authorities to prepare new planning guidance in the form of a Local Development Framework. This is currently being produced jointly by Nottinghamshire County and Nottingham City Councils and until this document has been adopted, the majority of the existing policies in the Waste Local Plan have been saved by the approval of the Secretary of State.

4.8.1.10 At the time of the adoption of the Waste Local Plan, it was reported that Nottinghamshire produces in the region of 500,000 tonnes of household waste per annum. Of this, it was reported that 90% was sent to landfill, 5% incinerated and 5% recycled.

4.8.1.11 Newark & Sherwood district are looking at the feasibility of constructing 14,800 households over the next 20 years which will increase the level of waste generated in the County by between 3.2% and 3.6% per annum (assuming that approximately 1 tonne of waste is produced per household per annum). This does not take into account any residential development taken place since the plan was adopted in January 2002, nor does it take into account any other residential development that might take place elsewhere in the County over the next 20 years.

4.8.1.12 However, this figure has been reviewed in The Regional Waste Strategy document (January 2006), which reports that the total volume of controlled waste treatment/disposal capacity will increase to 710,000 tonnes per annum by 2009/10 and 772,000 tonnes per annum by 2019/20 (see below).

4.8.1.13 One of the biggest problems of planning ahead is future uncertainty. It is difficult to forecast with any precision when certain developments will take place or when schemes will be completed. Changing economic conditions will have an important bearing on the rates of construction and industrial waste generation, and the viability of incinerating and waste recycling waste materials.

4.8.1.14 Existing facilities, which deal with the County's waste, include recycling, energy generation by incineration and disposal into landfill. The market for recycled products and the capacity of recycling facilities are at present very limited. The price and availability of virgin raw material has always been a powerful commercial incentive for recycling, but market imperfections and barriers can discourage businesses from exploiting the potential of recycling to the full.

4.8.1.15 Encouraging recycling, where there are economic and environmental benefits, has been a key component of the Government's waste management policies for many years. The Government continues to encourage greater emphasis on recycling where this represents the "Best Practicable Environmental Option" for particular waste streams.

4.8.1.16 In 2002, it was reported that there were 19 Household Waste Recycling Centres (HWRC) within Nottinghamshire which take bulky household and garden waste delivered by the public. The waste is sorted on site and, where possible, recycled or re-used. The remainder is taken to nearby waste disposal sites.

4.8.1.17 Nottinghamshire County Council is actively looking to increase the number of HWRC's within the County in order to reach its target of 25% for the recycling of all household waste. To assist with this, the Council has also promoted the use of Mini-Recycling Centres (MRCs), such as bottle banks and paper collection points which can be found in most shopping centre and supermarket car parks. The County is again actively seeking to increase the number of MRCs available to the public in order to reach its 25% target and further reaching a recycling and composting level of at least 52% by 2020.

4.8.1.18 Further initiatives include:

- Improving on the statutory Landfill Allowance Trading Scheme (LATS) targets for Nottinghamshire, and having virtually no biodegradable material sent direct to landfill by 2012.

- Undertaking operations in a sustainable and environmentally friendly manner and minimising carbon emissions.
- Attaining minimum recycling and composting levels and improved customer satisfaction at the Household Waste Recycling Centres (HWRC).
- Providing appropriate infrastructure for the waste collection authorities with acceptable capacity and a minimum of delay to delivery vehicles.

4.8.1.19 HWRC's in the County, and in particular the District of Newark and Sherwood, currently exist at:

- Brailwood Road, Bilsthorpe
- Fiskerton Landfill Site
- Hawton Lane, Newark

4.8.1.20 Waste treatment and energy recovery from waste is also an important method of disposing of waste and generating power, without the need for landfilling. Nottinghamshire has a municipal waste incinerator at Eastcroft, which incinerates nearly 30% of the County's household waste. In February 2009, Eastcroft was granted planning permission at appeal, to add an extra 100,000 tonnes a year capacity to its existing 150,000 tonnes a year capacity, nearly doubling the amount of waste it can handle every year.

4.8.1.21 Other facilities in place or proposed include:

- The provision of a materials recovery facility in Mansfield which will handle and sort around 85,000 tonnes p.a. of recyclable waste; such as paper and cans collected by the District and Borough Council's.
- The development of a new composting facility in central Nottinghamshire and the use of other existing composting sites to handle a total of 100,000 tonnes of green waste p.a.
- The development of a new Household Waste Recycling Centre (HWRC) to serve Worksop and the upgrade and continuing operation of the council's network of other HWRC's.
- The development of a network of new transfer stations to receive and handle waste and recyclables from District and Borough Council collections to serve Newark and Worksop and the use of existing sites at Giltbrook and South Nottingham.

- The construction of an 180,000 tonnes modern energy recovery facility at the site of the former Rufford Colliery near Rainworth to convert - through incineration - waste which can't be recycled or composted economically into power. The 15MWh of energy recovered will be fed into the National Grid and is sufficient to power 15,000 homes
- The use of properly planned, constructed and licensed landfill sites to take waste which can't be recycled or composted.

4.8.1.22 Finally, landfill is considered as the least desirable option for dealing with waste, but is by far, the most common method of waste management, both in the UK and Nottinghamshire. Although safe disposal is placed at the bottom of the hierarchy, it will remain an essential and major component of the Waste Strategy in the County. This is because, even if the most optimistic assumptions on recycling and other more sustainable waste management options are achieved, large quantities of waste will still need to be disposed of. Current sites accepting household, commercial and non hazardous industrial waste in the county exist at:

- Daneshill, District of Bassetlaw
- Carlton Forest Quarry, District of Bassetlaw
- Bilsthorpe, District of Newark & Sherwood
- Rufford (inactive), District of Newark & Sherwood
- Sutton, District of Ashfield
- Fiskerton, District of Newark & Sherwood
- Burntstump, District of Gedling
- Staple Quarry (gypsum waste only until 1998), District of Newark & Sherwood
- Dorket Head Quarry, District of Gedling
- Barnstone, District of Rushcliffe

4.8.1.23 There is a clear shortfall of landfill capacity in the County, but options for further landfill capacity will be viewed favourable where they include the reclamation of mineral or other voids and/or incomplete colliery spoil heaps. In addition, applications for the reclamation of derelict and degraded land through waste disposal will be considered favourably.

5 TRANSPORTATION

5.1 EXISTING CONDITIONS

5.1.1 EXISTING MODES OF TRAVEL

5.1.1.1 Newark and Sherwood District exhibits a similar proportion of the population using private motor vehicles to travel to work as other areas within the East Midlands region. The areas of the District with the most private vehicle usage are found in the rural parts, to the west of the District where there are good links to Nottingham and Mansfield (Edwinstowe, Blidworth and Rainworth wards).

5.1.1.2 A significantly lower percentage of the District population uses public transport to travel to work with all wards having a lower percentage than the remainder of the county, region and England and Wales as a whole.

5.1.1.3 A slightly higher proportion of the District population travels to work on foot or by cycle than the remainder of the county, region and England and Wales as a whole. As could be expected the lowest percentages for these modes of travel are found in the rural parts of the District including Trent, Muskham and Farnsfield wards. Those wards with the highest proportion are all within the town of Newark on Trent.

5.1.2 JOURNEYS TO WORK

5.1.2.1 As could be expected the wards with the least distance to travel to work are found in the town of Newark on Trent with Castle Ward having the highest number of people located within 1km of their place of work. The areas with the furthest distance to travel to work are found to the west of the District where there are more rural wards. The wards with the most people travelling over 10km to work are Farnsfield and Lowdham.

5.1.2.2 Information on employment destinations provided in the 2001 Census Travel to Work data suggests that the key employment destinations for travel to work trips originating from within Newark and Sherwood District are within the District (54.8%) or travelling to work in other locations in Nottinghamshire (21.6%). The key origins for employees working in Newark and Sherwood District are also within Nottinghamshire (86.3%) with internal trips within the District being 68.2%.

5.1.2.3 The vast majority of commuter trips to/from the District are therefore between origins and destinations within Nottinghamshire and the majority of these are made by car.

Car Ownership

5.1.2.4 Newark and Sherwood has the third highest level of car/van ownership in Nottinghamshire (after Rushcliffe and Gedling) at an average of 1.2 cars per household (2001 Census data) which is approximately consistent with the county average.

Road Safety

5.1.2.5 Information supplied by Nottinghamshire County Council confirms that there were 6 accident problem sites (locations with 4 or more reported injury accidents in the last 12 months) identified within Newark and Sherwood District during 2008. These are:

- A1(T)/A17/A46(T) - Roundabout at Winthorpe (4 accidents)
- A1(T)/A46(T) - 'Brownhills' Roundabout, Newark on Trent (5 accidents)
- A46(T)/A616/A617 - Cattle Market Roundabout, Newark on Trent (5 accidents)
- A6097/Trentside – Gunthorpe (4 accidents)
- A614/B6034 - Old Rufford Road/Rufford Road, Ollerton (4 accidents)
- B6326 London Road/Baines Ave, Balderton (4 accidents)

5.1.2.6 The first three locations on the above list form part of the strategic trunk road network and are therefore the responsibility of the Highways Agency. The remainder are all located on county highways and are the responsibility of Nottinghamshire County Council.

5.2 HIGHWAYS

5.2.1 EXISTING CONDITIONS

5.2.1.1 For the purposes of this study all 'A' and 'B' Classification roads within the District as well as some unclassified roads close to the proposed growth areas (where suitable traffic flow data is available) have been considered.

5.2.1.2 Roads within the District fall into two categories; Trunk Roads (A1, A46) which are the responsibility of the Highways Agency (HA) and County Roads (all other roads in the District)

which are the responsibility of Nottinghamshire County Council (NCC). A summary of existing conditions for 'A' roads within the District is presented in Table 5.1 as follows.

Table 5.1 – Summary of Existing Highway Conditions for 'A' Road Network

Road	Standard	Average Annual Daily Traffic (AADT) (2-Way) Flow Range				
		<20,000	20,000 to 40,000	40,000 to 60,000	>60,000	HGV
A1(T)	Dual Carriageway		31,000 to 38,000			8,000 to 10,000
A46(T)	Single Carriageway (South of Newark on Trent)		22,000 to 23,000			2,000 to 3,000
A46(T)	Dual Carriageway (north of Newark on Trent)		29,000 to 33,000			3,000 to 4,000
A17	Single Carriageway	10,000 to 14,000				2,000 to 3,000
A612	Single Carriageway	4,000 to 15,000				300 to 1,000
A614	Single Carriageway		13,000 to 21,000			600 to 3,000
A616	Single Carriageway	4,000 to 9,000				300 to 600
A617	Single Carriageway (short section of dual)	8,000 to 18,000				900 to 2,000
A6075	Single Carriageway	4,000 to 19,000				300 to 2,000
A6097	Single Carriageway (2 short sections of dual)	6,000 to 19,000				500 to 2,000
A1133	Single Carriageway	4,000 to 8,000				400 to 900

Note: HGV flows are AADT HGV 2-way movements including Passenger Service Vehicles (PSV).

5.2.1.3 As can be seen from the table the roads with the highest volumes of traffic are the two trunk roads (A1 and A46) which is as would be expected because these both form part of the national strategic trunk road network and therefore tend to carry longer-distance through traffic, in addition to local movements.

5.2.2 TRAFFIC PATTERNS

5.2.2.1 2001 Census 'Journey to Work' data indicates that 45% of all employment trips have a destination outside the District and 55% are internal to the District. Of those with a destination outside the District the majority are travelling by car to a destination within Nottinghamshire.

5.2.2.2 32% of employment trips to the District originate from outside the District and 68% are internal to the District. The majority of trips internal to the District are made by car. Of the trips originating from outside the District the majority are travelling by car from Nottinghamshire.

5.2.2.3 The vast majority of commuter trips to/from the District are therefore between origins and destinations within Nottinghamshire and the majority of these are made by car.

5.2.2.4 Traffic flows on some of the main roads vary considerably along their length. For instance, the A46(T) south of Newark on Trent (around 23,000 AADT) is materially lower than north of the town (around 33,000 AADT). Likewise flows on the A612 of around 15,000 AADT reduce considerably north of the A6097 to less than 9,000, and the A614 flows of around 21,000 AADT south of Ollerton reduce to less than 10,000 north of the town.

5.2.3 NETWORK PERFORMANCE

5.2.3.1 Network performance for the rural road network within the study area (i.e. the network outside of the urban area of Newark on Trent) has been assessed based on link capacity using Congestion Reference Flow (CRF) as the prime indicator for road capacity and congestion.

5.2.3.2 Link "stress" levels have been identified where "stress" is defined as the ratio of the annual average daily traffic (AADT) flow to the Congestion Reference Flow expressed as a percentage.

5.2.3.3 A stress level of 100% (i.e. when the demand flow equals the CRF value) is the critical point at which link flows breakdown resulting in queuing and reduced throughput. Therefore for the purposes of this study the following stress thresholds have been applied to identify when links are approaching, or exceeding their theoretical maximum capacity:

- Less than 90% stress - the link operates within capacity, although journey times may become less reliable over 75% stress (see below).
- Between 90% and 100% stress - The link is approaching capacity and is increasingly susceptible to flow breakdown.
- Greater than 100% stress - The link operates over capacity and is likely to experience flow breakdown on a regular basis.

5.2.3.4 The above thresholds have been applied to easily identify when link capacity is approaching critical conditions (i.e. 100% stress). However, it should be noted that 75% stress is generally accepted as the threshold level for adverse effects on journey time reliability. Therefore, links with between 75% and 99% stress will still be operating within capacity but journey times are likely to be less reliable than on links with less than 75% stress.

5.2.3.5 A 'Stress map' is presented in Appendix 5 indicates that all rural links within the District currently operate at less than 90% stress except for the A46(T) south of Newark on Trent (102%). The following links have stress levels between 75% and 90% and whilst still within capacity could be expected to experience less reliable journey times:

- A617 between Newark on Trent and Kelham (81%)
- A6097 between East Bridgford and Oxton (89%)

5.2.3.6 There are known traffic capacity problems at the A614/A616/A6075 Ollerton Roundabout which struggles to cope with the large volumes of traffic passing through it, particularly in the peak hours.

5.2.3.7 There are also known safety and capacity issues at the A46(T)/A617/A616/B6326 'Cattle Market' roundabout at Newark on Trent where a recent study concluded that the roundabout will be over capacity by 2010 and recommended that an improvement scheme should be developed and implemented before then.

5.2.3.8 A recent study also identified that the single carriageway section of the A46(T) Newark Bypass between Farndon Road roundabout to the south of Newark on Trent and the A1(T) roundabout to the north of Newark on Trent is likely to be close to, or over capacity by 2010. The programmed dualling of the A46(T) between Widmerpool and Newark will mean that the A46(T) Newark Bypass will be the only section of single carriageway road on the A46(T) between Lincoln and Leicester.

5.2.3.9 Discussions with Nottinghamshire County Council have also highlighted the following locations within the District as experiencing existing congestion problems during the peak periods:

- A1(T)/B6326 London Road Roundabout at Balderton.
- A612 through Southwell.
- A612/A6097 junction at Lowdham.

5.2.3.10 For urban networks link capacity is a less reliable indicator of network performance because there are typically a greater number of junctions in urban situations and junction capacity is therefore usually the limiting factor. For the urban area of Newark on Trent data has therefore been obtained from a VISUM model which has been built to examine the likely traffic effects of new development proposed to the south of the town.

5.2.3.11 'Reference Case' model flows for a 2026 design year have therefore been obtained and these represent the 'do nothing' scenario (i.e. background plus committed development traffic flows). These form the basis for the assessment of the urban highway network within Newark on Trent. Traffic flows as a result of proposed growth have been assessed against the reference case flows and expressed as total 2-way flow increases on the urban highway network in the morning and evening peak hours in order to compare the effects of the proposed growth on the urban network.

5.2.3.12 Journey time surveys undertaken in 2008 by NCC suggest that the existing urban road network within Newark on Trent operates largely satisfactorily with no major congestion problems. Journey time surveys were undertaken on the main radial routes into Newark on Trent and confirmed average vehicle speeds of 21.36 mph in the AM peak hour, 20.5 mph in the inter-peak and 18.6mph in the PM peak with journey times to/from the town centre of 5 minutes or less on all routes.

5.2.3.13 The following extract from the North Nottinghamshire Local Transport Plan 2006/7 to 2010/11 is therefore still relevant:

> *"As a thriving market town, Newark does from time to time experience localised congestion, particularly close to the town centre where several radial routes converge, and near the large supermarkets. However, the journey time surveys show that congestion is not a problem overall. The town centre can be accessed along all the radial routes in less than 5 minutes. The exception is the B6326 through Balderton – which acts as the main route into town form the A1 south – along which journeys take 10 minutes in the peak."*

5.2.4 CAR PARKING

5.2.5 PARKING IN NEWARK ON TRENT

5.2.5.1 There are 12 Council run car parks within the District. 8 of these are in Newark on Trent, with a total of 1,152 spaces available. All of the car parks in Newark on Trent are pay and display. It is

understood that the District has recently reviewed car parking charges in its own facilities so that they now apply for 24 hours on all days of the week.

5.2.5.2 In addition to the Council promoted car parks, there are a further 1,300 off-street parking places provided in the town at locations such as the three major supermarkets, The NCP at St Mark's Place and the two railway stations. 'The majority of off-street parking places (1,400) have a pricing structure to discourage long stay commuter parking' (Source: Faber Maunsell Newark & Sherwood District car parking review, 2006).

5.2.5.3 In addition to the car parks, there is a 160 vehicle capacity lorry and coach park situated at Great North Road. Parking is free in the day for these vehicles; however an £8 charge applies for evening/overnight stays.

5.2.6 OTHER CAR PARKS IN THE DISTRICT

5.2.6.1 There are two Council car parks in Southwell, at Church Street and King Street, which provide 135 pay and display spaces. In addition there are 149 spaces available at 3 private car parks. In Ollerton 92 free spaces are available in the Council run Forest Road car park, with 38 spaces at the private Rufford Avenue facility. Edwinstowe has 174 off-street spaces at 4 sites, with 74 of these being council provided.

5.2.7 ON-STREET PARKING

5.2.7.1 The 2006 car parking review identified the following numbers of on-street car parking spaces which are within easy access of the respective centres; 120 in Newark on Trent, more than 75 in Southwell, 69 in Ollerton and 24 in Edwinstowe. The County Council has confirmed that these levels are still accurate and that no alterations to make the time-restricted, free and unlimited waiting spaces 'pay and display' are currently planned.

5.2.8 CIVIL PARKING ENFORCEMENT

5.2.8.1 Civil Parking Enforcement was implemented in Nottinghamshire on 12 May 2008. Newark & Sherwood District Council makes up part of the Notts Parking Partnership, along with Nottinghamshire County Council and all of the other district and borough councils within the County. This means that the partnership has taken over parking enforcement responsibility for all county roads and council owned car parks from the Police.

5.3 LOCAL PUBLIC TRANSPORT

5.3.1 EXISTING CONDITIONS

5.3.2 RURAL BUS SERVICES

5.3.2.1 Bus services within the District fall into two distinct groups. Some are provided commercially and these tend to be those which link the major Settlements. Conversely, in the rural area much of the bus network is financially supported by Nottinghamshire County Council. Lincolnshire County Council also supports some services which also operate into Nottinghamshire.

5.3.2.2 The commercial network has a tendency to be concentrated on bus services running during the core daytimes on Mondays to Saturdays, generally between 07:00 and 19:00hrs. The County Council is obliged to support evening and Sunday operations where they are deemed socially necessary.

5.3.2.3 Bus services within the rural District are also limited in number, due to the inherent economic feasibility of serving a scattered population living across an area with a low population density. Many smaller villages in the District have no regular bus service, making access to a private vehicle the only practical means of living in many parts of the county.

5.3.3 BUS SERVICES - NEWARK ON TRENT

5.3.3.1 During weekday daytimes, Newark on Trent has a relatively good bus network. There are trunk inter-urban services to Nottingham and Mansfield and a local town network provides frequent services to the main housing areas of the town. However the rural daytime network and evening town network currently requires financial subsidy from the County Council.

5.3.4 BUS SERVICES – SOUTHWELL

5.3.4.1 Southwell has a sparse bus network. The only core inter-urban services are to Nottingham and Mansfield.

5.3.5 OTHER BUS SERVICES WITHIN THE DISTRICT

5.3.5.1 The majority of bus services operating within Newark and Sherwood originate or terminate in either Newark on Trent or Southwell. However there are a small number of services in the

north of the District which are focused on the out-of-District centres of Mansfield; Worksop or Retford.

5.3.6 COACH SERVICES

5.3.6.1 Newark on Trent is served by two coach services, both operated by National Express. Service 447 runs once daily and links Newark on Trent to London via Grantham; Stamford; and Peterborough, whilst Service 339 also running once daily provides links to Grimsby; Cleethorpes; Louth and Lincoln (northbound) and to Leicester; Birmingham; Cheltenham; Bristol; Weston-super-Mare; Taunton; Barnstaple and WestWard Ho! (southbound).

5.3.7 BUS STATIONS

5.3.7.1 There is one bus station within the District which is situated in the Potterdyke area off Lombard Street, Newark on Trent. The existing station is operated by Stagecoach, has a total of 6 bus bays and is currently in a poor state of repair.

5.3.7.2 Planning permission was granted in November 2008 for a retail-led regeneration project for the Potterdyke area of Newark on Trent. The proposals include for the provision of a new bus station to replace the existing station which will be redeveloped as part of the project. The current timescale for development of the Potterdyke area will see the new bus station operational from approximately 2014.

5.3.8 ACCESSIBILITY TO SERVICES AND KEY DESTINATIONS

5.3.8.1 Existing bus services provide good coverage within the District, with all primary populated areas having a majority of households within 500m of a bus stop. As could be expected there are clear bus service corridors that follow major transport routes throughout the District. The areas where bus service coverage is at its highest include Edwinstowe, Ollerton and Boughton to the northwest, a corridor between Southwell and Rainworth and Newark on Trent. However, there are areas, mainly less populated rural areas, where walking distances to bus services are much greater.

5.3.9 PARK AND RIDE

5.3.9.1 There are no existing Park and Ride or Parkway facilities within Newark and Sherwood District. However, Nottingham has an excellent Park & Ride network with 7 sites located around the city, each of which is well-connected to the city centre. There are 4 sites which are considered

to be reasonably close to the District which could be used by commuters travelling into Nottingham. These are; Moor Bridge, Nottingham Racecourse, The Forest, Wilkinson Street.

5.4 PASSENGER RAIL

5.4.1 EXISTING CONDITIONS

5.4.1.1 The District is served by two existing passenger routes, the East Coast Mainline which runs north-south down the eastern side of the District and the East Midlands local network Nottingham to Lincoln line which runs in a southwest to northeast direction passing through Newark on Trent.

5.4.1.2 The East Coast Main Line (ECML) is the high-speed link between London, Yorkshire, the North East and Edinburgh. It also handles cross-country, commuter and local passenger services, and carries heavy tonnages of freight traffic, particularly over the northern sections. The route forms a key artery on the eastern side of the country and parallels the A1 trunk road. It links London, the South East and East Anglia, with the Yorkshire and Humber and North East Regions, and Eastern Scotland. It also carries key commuter flows for the north side of London.

5.4.1.3 The general frequency of long distance trains stopping at Newark on Trent gives 2/3 trains each hour southbound to London during Monday to Saturday daytimes. The fastest journey between Newark on Trent and London (King's Cross) is just 1 hour 17 minutes which is a very competitive journey time given the distance involved. Northbound services are approximately half-hourly.

5.4.1.4 Newark Castle station is on the East Midlands local network Nottingham to Lincoln line. Services between Nottingham and Lincoln also serve smaller stations at Carlton; Burton Joyce; Lowdham; Thurgarton; Bleasby; Fiskerton; Rolleston; Collingham; Swinderby and Hykeham. Some journeys continue beyond Lincoln to Cleethorpes also calling at Grimsby Town.

5.4.2 THE ROBIN HOOD LINE

5.4.2.1 The Robin Hood Line is the railway line which runs from Nottingham to Worksop. It does not serve Newark and Sherwood District directly but rather offers connections into the rail network at the nearby stations of Mansfield Woodhouse; Mansfield; Kirkby-in-Ashfield and Newstead. At Nottingham there are frequent onward connections to London, Birmingham, Derby, Leicester,

Manchester, Norwich and other centres, whilst at Worksop there are connections for Retford, Lincolnshire and Sheffield. At Retford there are connections into the East Coast Main Line for either London or Scotland and the North East of England.

5.4.3 OTHER RAIL LINKS

5.4.3.1 A section of the former Lancashire, Derbyshire and East Coast Railway (originally built in 1897), and running from Chesterfield to Lincoln, served Newark and Sherwood District, with Stations at Edwinstowe, Ollerton and Boughton. The line closed to passenger traffic in 1955, but remained in use for mineral traffic (mainly coal) until the late 1990's. Latterly coal was transported to High Marnham power station using this route. (High Marnham closed in 2003 after nearly 45 years in operation, and is currently undergoing demolition).

5.4.3.2 Currently Network Rail currently uses the eastern section of this line between Ollerton and High Marnham for rail maintenance training purposes. This project is referred to as "High Marnham RVCC".

5.4.3.3 Retention of the eastern section ensures that the western section between Ollerton and Shirebrook remains open and maintained and this presents an opportunity to reintroduce rail services to Edwinstowe and Ollerton.

5.4.4 RAIL STATIONS

5.4.4.1 Newark-on-Trent is unusual for a town of its size in having two rail stations. Newark North Gate is located on the electrified East Coast Main Line and has services provided by the East Coast Mainline Company Ltd (ECML Co Ltd), whilst Newark Castle station has services provided by East Midlands Trains between Lincoln and Nottingham.

5.4.4.2 Other stations within the District are all located on the Lincoln to Nottingham line and these are situated at Lowdham, Thurgarton, Bleasby, Fiskerton, Rolleston and Collingham.

5.4.4.3 North Gate station is managed by East Coast Mainline Company Ltd (ECML Co Ltd) and has two car parks. The north car park is managed by ECML Co Ltd and has 289 parking spaces. The daily car parking charge is £9 (Monday to Friday) and £5 at weekends. The south car park is managed by NCP and has 357 spaces. Charges here are £1 per hour or £9 daily. Information provided by Network Rail suggests that the existing station car parks already operate at capacity and any additional demand may require additional parking to be provided.

5.4.4.4 Newark Castle station is managed by East Midlands Trains (EMT) and has one car park which is managed by Newark and Sherwood DC and has 80 spaces. Car parking charges are from £2 per day. Information provided by Network Rail suggests that the existing station car park already operates at capacity and any additional demand may require additional parking to be provided.

Accessibility to Services & Key Destinations

5.4.4.5 A large proportion of the south eastern area of the District has reasonable pedestrian and cycle access to passenger rail, including the whole of the urban area of Newark on Trent and outlying areas, the majority of Southwell, Lowdham, Thurgarton, Bleasby, Fiskerton, Rolleston and Collingham.

5.4.4.6 As described earlier in this section the Lincoln to Nottingham Line only serves stations between Lincoln and Nottingham and therefore caters predominantly for local movements. The East Coast Mainline serves longer distance destinations between London and Edinburgh as well as linking into a wider network of cross-country, commuter and local passenger services.

5.4.4.7 The presence of stations on both of these rail lines in Newark on Trent therefore provides the opportunity for linked trips which greatly improves general accessibility to a wide range of key rail destinations nationwide.

5.5 CYCLING AND WALKING

5.5.1 EXISTING CONDITIONS

5.5.2 HIGHWAY CYCLE NETWORK

5.5.2.1 The focus of cycling provision in the District is around Newark on Trent. The town centre and its environs have a comprehensive network of dedicated cycling infrastructure, pedestrianised streets and quiet roads suitable for cycling on.

5.5.2.2 With a few exceptions, much of the rest of the District's cycling infrastructure is made up of leisure based facilities rather than within the highway boundary for commuter journeys. Longer distance leisure routes are described in more detail below, however in addition to the National Cycle Network and National Byways there are a number of other notable off-road cycle links. In the area around Clipstone and Edwinstowe there are numerous off-road trails through Vicar Water, Sherwood Pines and Sherwood Forest which are ideal for leisure cycling and walking.

There is also an attractive riverside cycle route between Newark Castle station and Lincoln Road Bridge in the town. It crosses the River Trent via a striking new foot/cycle bridge installed in the late 1990s.

5.5.3 NATIONAL CYCLE NETWORK

5.5.3.1 National Cycle Network (NCN) route 64 passes through the majority of the east of the District, joining NCN route 15 at Thoroton, before travelling to Lincoln via Newark on Trent. The section between Cotham and Newark on Trent is completely traffic free, along a high quality surfaced former railway line. Near Newark Northgate railway station the route rises to street level and cyclists travel north eastwards to Winthorpe, Holme, Collingham and South Scarle on a series of quiet roads.

5.5.3.2 NCN route 15 skirts the south of the District between Bingham (in Rushcliffe borough) to Bottesford (in Leicestershire). NCN route 6 is located within the north west of the District. It is found on signed quiet roads through Blidworth before joining off-road paths towards Rainworth and eventually through Sherwood Pines Forest Park. NCN route 6 continues northwards off-road to Old Clipstone and Edwinstowe, then through tracks within Sherwood Forest Country Park just north of the District.

5.5.4 NATIONAL BYWAY

5.5.4.1 The National Byway stretches 4,500 miles through the UK's natural environment, providing signed directions along quiet rural lanes. In addition to the main route, there are 50 circular loop rides. In Newark and Sherwood the National Byway travels from Cotham to Newark on Trent sharing the same route as NCN route 64, before travelling north-west through Newark on Trent town centre and onto South Muskham. The main route continues north through North Muskham, Norwell and Laxton, with an additional loop spurring westwards to Caunton, Hockerton, Southwell, Eakring before meeting the main route at Laxton.

Footways

5.5.4.2 Footways are provided in all of the main settlements and within many of the residential areas. As the District is largely rural, footways are not normally provided alongside carriageways in these locations. The reasons for this are due to the cost verses likely low levels of footfall, a lack of available width within the highway corridor to provide footways to current specifications and the aesthetic reason of not wishing to 'urbanise' the countryside.

Patterns of Movement

5.5.4.3 Newark & Sherwood has the second highest level of cycling and walking trips to work in Nottinghamshire based upon the 2001 Census results. 14.5% of trips are made by these modes, ranking it 117 out of 376 Districts in England and Wales. Cycling and walking is particularly prevalent around Newark on Trent town centre, with its wards having between 31% and 23% of trips to work being made in this way. In other parts of the District, however, there are significant fluctuations. Trent ward, towards the south of the District, has the lowest level of cycling and walking trips to work at 4.8%. Muskham and Farnsfield also have low levels of travel by these methods at 5.2% and 6.8% respectively.

5.5.4.4 Nottinghamshire County Council's traffic counts show Newark-on-Trent to have the highest levels of cycling within the County. The 2008 cycle counts show B6326 London Road to have an average of 326 cyclists (7-day average) present within a 9 hour period over the course of six separate monthly counts. B6166 Lincoln Road has an average of 351 (7-day average) over the same period. As a comparison similarly trafficked roads entering Worksop, Retford and Mansfield town centres had averages of 255, 171 and 97 cyclists (7-day averages) per 9 hours respectively.

5.5.4.5 In 2008 an average of 189 cyclists (7-day average) were recorded per nine hours using NCN route 64. It is worthwhile noting that only two of the twelve counts undertaken on this leisure cycling route were undertaken on weekend days. It may therefore be possible that average usage is actually higher than the survey suggests.

5.5.4.6 The Council also undertake annual cordon counts, although the latest calibrated data available was for 2006. This shows that the total number of cyclists entering and leaving Newark on Trent town centre is significantly greater than all comparable market towns within Nottinghamshire. With 2,103 cyclists recorded at the 8 cordon sites in Newark on Trent, compared to Worksop 922, Mansfield 731 and Retford 681.

5.5.5 NETWORK GAPS/DEFICIENCIES

5.5.5.1 Generally the District is well catered for in terms of cycling infrastructure, with a well connected network around Newark on Trent and the east of the District in particular.

5.5.5.2 A key missing link is between the southern side of Newark on Trent and Fernwood/Balderton. London Road is a busy cycle route to and from the town, yet the existing facilities cease prior

to reaching the approach to the A1. In order to accommodate existing as well as future development south east of the A1 it is vital that safe means of connecting cyclists and pedestrians are made.

5.5.5.3 It would also be desirable to provide a link between London Road and NCN route 64 using Hawton Road. At present this is not feasible because the carriageway is too narrow for cycle lanes and the footways too narrow for shared use.

5.5.5.4 There is a lack of river crossing opportunities suitable for non-motorised users available between Newark on Trent and Gunthorpe. Kelham Bridge is narrow and particularly unsuitable for pedestrians and cyclists, although the Kelham bypass mentioned as a future scheme in LTP2 may allow this section of the A617 to be downgraded and retained only as a quiet road.

5.5.5.5 The possibility of linking Lowdham with Burton Joyce by a new shared use footway/cycleway adjacent to the A612 is an interesting one as this would create a virtually continuous cycling route to Nottingham city centre from the south west of Newark and Sherwood. At present the A612 is well used by confident touring and commuter cyclists, although the section of the road where the new scheme is proposed is governed by a National Speed Limit and therefore may prevent more vulnerable cyclists from using the road and therefore the shared footway may allow greater usage of the corridor. However, it is understood that there are currently issues with the cost of works for the scheme.

5.5.5.6 Interestingly, Muskham ward, which is situated immediately north west of Newark on Trent town centre has one of the lowest levels of cycling and walking to work at just over 5% of trips. This is likely to be because it is a reasonably large and generally rural ward. However the fact that it is geographically close to the biggest Settlement in the District may make it possible to encourage more trips by sustainable modes. However, the existing road network and river are barriers between Newark on Trent and the north west at present.

5.5.5.7 Nottinghamshire County Council submitted a bid to the Big Lottery Fund in 2007 for Sherwood: The Living Legend, which was ultimately unsuccessful. One of the elements of the bid was to provide a comprehensive new leisure cycling and walking network to connect with the existing major routes such as the NCN. As part of this substantial preliminary route investigation was undertaken and it is understood that the authority will revisit these proposals to develop future cycling and walking infrastructure subject to a funding package being agreed and approved.

Nottinghamshire County Council proposes to make a planning application for the new visitor centre in 2010 and hope to begin construction in spring 2011. Therefore as part of the Newark and Sherwood Transport Study these proposals should be integrated with development sites as they are brought forward.

5.6 FREIGHT

5.6.1 EXISTING CONDITIONS

5.6.2 ROAD FREIGHT

5.6.2.1 Observation of 2009 HGV flows suggests that the main freight routes through the District are the A1(T), the A46(T), the A17. This is as could be expected as these routes form part of the wider strategic highway network, providing links between Nottingham, Lincoln, Leicester, Grantham, and the M1 to the north.

5.6.3 RAIL FREIGHT

5.6.3.1 The principal routes for rail freight through the District are the East Coast Mainline and the Nottingham to Lincoln local line both of which share track space with passenger services. In 2004/05 these had Annual Average Daily freight train frequencies of 10 to 19.9 trains per day and 5 to 9.9 trains per day respectively.

5.6.3.2 There is also a network of mineral rail lines linking the former collieries in the north western area of the District. These pass through Ollerton, Edwinstowe, Clipstone, Rainworth and Bilsthorpe. In 2004/05 this network had Annual Average Daily freight train frequencies of 0 to 4.9 trains per day and it is understood that a lot of the sidings infrastructure no longer exists.

5.6.4 WATER-BORNE FREIGHT

5.6.4.1 Newark and Sherwood District is connected to the Humber Estuary by the River Trent. The river runs approximately north-south through the east of the District passing through Newark on Trent town.

5.6.4.2 The tidal section of the River Trent (from Cromwell Lock to the Humber Docks) accommodates seagoing vessels and larger barges where channel widths and depths permit.

5.6.4.3 The non-tidal Trent (Nottingham to Cromwell Lock) is a Regulated River where the depth and flow variations are minimised by locks. Here vessel size and carrying capacity is determined

mainly by lock dimensions but also by sedimentation and dredging between locks. Key constraints on the non-tidal Trent are the locks at Newark, Stoke and Cromwell which impose both width and depth restrictions, Town Bridge in Newark on Trent which imposes height and width restrictions and navigation hazards imposed by the tight double bends in the river through Newark on Trent.

5.6.4.4 Bulk cargoes such as coal, fuel oil, aggregates, steel, timber, grain and waste are the commodities most suited to carriage on inland waters and historically sand and gravel extracted from Girton quarry (in the north east of the District) was transported to the Humber area by barge. However, this no longer occurs and aggregates from the quarry now supply more local markets and are therefore transported by road.

5.6.4.5 The availability of terminal facilities is a critical factor to the movement of freight by water. On the non-tidal Trent there are no wharfs other than private berths and this is acknowledged as a significant limiting factor for commercial craft.

5.6.4.6 Not withstanding this, recent movements of abnormal loads to Staythorpe Power Station in Nottinghamshire have been undertaken using a converted tanker barge. This was conveyed through the central arch of the historic Town Bridge at Newark on Trent, previously thought to have been impassable for a load of such size suggesting that it is practicable to transport abnormal loads into the centre of Nottingham.

5.6.4.7 Therefore the opportunity for water-borne freight exists within the District. However, it is likely to be limited to the movement of bulk goods loaded at private wharfs (i.e. sand/gravel) or the infrequent movement of abnormal loads. As such, the relevance of water-borne freight to this study is minimal, given the nature of the growth options being considered.

5.7 ASSESSMENT METHODOLOGY

5.7.1 COMMITTED INFRASTRUCTURE SCHEMES AND LAND-USE DEVELOPMENTS

5.7.1.1 For the purposes of this study committed infrastructure schemes have been assumed to be any proposed changes to existing transport infrastructure or transport services within the District where funding and/or delivery timescales have been confirmed. As this is a strategic study, smaller scale improvements that are unlikely to significantly alter existing transport conditions have been ignored.

5.7.1.2 Committed land-use developments within the District have been assumed to be proposed developments with planning permissions yet to be implemented, or developments already under construction but yet to be completed or occupied.

5.7.1.3 Only land-use development proposals that will result in a material changes to existing transport conditions within the District have been taken into account.

5.7.1.4 There is one committed highway infrastructure scheme within the District. This is the A46 Newark to Widmerpool Improvement (currently under construction) which will see this section of the A46 widened to dual carriageway standard.

5.7.1.5 Bus infrastructure improvements are included in the North Nottinghamshire Local Transport Plan 2006/07 – 2010/11 and these include measures to improve bus priority within Newark on Trent, update bus stops and on-street infrastructure within the District and generally improve accessibility safety and security for bus users. The Potterdyke redevelopment proposals will also see Newark on Trent bus station replaced with a new facility as part of a retail-led development scheme.

5.7.1.6 No major changes are proposed to the existing commercial bus network within the District and the County Council supported tendered network is to be reviewed in 2010 ahead of a major retendering exercise in 2011.

5.7.1.7 There are 6 major rail improvement schemes that will affect the District. These are; proposals to improve capacity on the East Coast Main Line through level crossing closures and rail infrastructure improvements; the 'Nottingham Hub' which will see improvements to journey speeds between Nottingham and Lincoln through signal improvements together with improvements at Nottingham station; station car parking capacity enhancements at Newark Northgate; an improved Lincoln to London service; a station improvement scheme which may benefit Newark North Gate and improvements to staffing levels at Newark Castle station.

5.7.1.8 Network Rail has a general policy of seeking to eliminate risk which, as far as level crossings are concerned, is best achieved by seeking their removal where possible. As such Network Rail has expressed a desire to achieve the removal of two existing level crossings located on Barnby Lane and Bullpit Lane in Newark-on-Trent, particularly if this can be achieved as a result of adjacent development. Failing this Network Rail would not wish to see any significant increase in traffic over either of these level crossings as any increase in use raises the potential

for accidents. Development Proposals in this area of Newark-on-Trent will therefore need to take this into account and should ideally seek to incorporate access and highway solutions that would facilitate closure of these level crossings.

5.7.1.9 Cycle route improvements include; a new route between Balderton and the Fernwood Business Park and provision of a shared cycle/footway on the A612 between Lowdham and Burton Joyce. The County Council also has proposals to redevelop the Sherwood Forest Visitors centre and provide comprehensive enhancements to cycle, walking and equestrian connections across the District as part of this project.

5.7.1.10 No specific committed infrastructure schemes or land-use developments have been identified that will materially affect road, rail or waterborne freight infrastructure or activity within or through the District.

5.7.1.11 Information has been obtained on all land-use developments, both within the District and in adjacent Districts/Boroughs, which have the potential to materially affect existing transport conditions within the District. Traffic flows as a result of these land-use developments have been estimated and distributed onto the highway network within the District.

5.7.1.12 With the addition of these traffic flows all roads within the District continue to operate within theoretical capacity at the 2026 assessment year. However, the A617 between the A46(T) and Kelham, the A6096 between the B6386 and the A612, and the A6097 between the A612 and the A46(T) are all forecast to be approaching their theoretical capacity.

5.7.2 PROPOSED DEVELOPMENT

5.7.2.1 Details of the proposed residential and employment development within the District have been supplied by Newark and Sherwood District Council. The distribution of proposed employment development within the District seeks to reduce the requirement for longer distance commuting to/from the District by meeting the employment needs of the proposed residential development.

5.7.2.2 The likely person trip generation as a result of the proposed residential and employment growth has been estimated and modal splits applied in order to estimate trips by all modes of travel (based on 2001 Census modal splits). Vehicle trips were distributed onto the highway network within the District in accordance with 2001 Census travel to/from work data.

5.7.3 IMPACTS OF GROWTH SCENARIOS

5.7.3.1 Impacts of growth on the highway network within the District have been assessed using a manual, spreadsheet based assessment. Due to time constraints it was not possible to undertake the type of comprehensive data collection exercise that would be necessary to build, calibrate and validate a detailed traffic model of the whole District. As a result a manual calculation methodology has been applied in this study using existing traffic count data, except for Newark on Trent where an existing VISUM model was made available.

5.7.3.2 On the rural highway network the implications of the proposed growth has been represented as 'network stress' and several highway links are forecast to be operating very close to, or over their theoretical traffic capacity at the 2026 assessment year with the addition of growth traffic.

5.7.3.3 It is likely that all new residential and employment sites will require enhancements to the existing bus network and infrastructure in order to meet the additional travel demands that will be generated. Details will need to be assessed on a site-by-site basis as developments are progressed through the planning process. However, the larger sites, particularly those already covered by, or on the edge of existing bus networks, are considered to offer the greatest potential to support new bespoke bus services, or extensions to existing services to meet demands.

5.7.3.4 Additional demand for passenger rail services is forecast to be relatively modest (using existing modal splits) and should be satisfactorily accommodated on existing/proposed services without the need for further improvements.

5.7.3.5 New cycle and pedestrian routes and infrastructure will need to be provided as part of all new developments in order to integrate with existing networks. In addition, on-site facilities such as secure and covered cycle parking, changing facilities and internal access routes will also need to be provided in accordance with current design standards and best practice guidance.

5.7.3.6 In general it is considered that the existing cycle and footway networks will have sufficient capacity to accommodate forecast additional demands. However, some improvements in the form of additional crossing facilities, access to public transport facilities etc are likely to be required and these should be assessed on a site-by-site basis.

5.7.3.7 No specific impacts in terms of road, rail or waterborne freight have been identified and it is anticipated that any general increases in road freight movements will be adequately accommodated on the existing/proposed highway network within the District.

5.8 TRANSPORT INFRASTRUCTURE REQUIREMENTS

5.8.1.1 This study has been produced following discussions with Newark and Sherwood District Council, Nottinghamshire County Council and the Highways Agency. It is a strategic study intended to identify the cumulative transport implications of growth options within the District in order to advise strategic transport infrastructure requirements.

5.8.1.2 There is insufficient detail to comment on access issues or the individual transportation impacts of each site. Detailed Transport Assessments and Travel Plans will be required in support of planning applications for each development site (where appropriate) and these should identify specific site access arrangements, on-site transport infrastructure requirements and specific off-site transport measures/infrastructure in order to mitigate the forecast impacts of each development.

5.8.1.3 This study has identified likely infrastructure improvements that will be required in order to address the cumulative impacts of the Council's preferred development option as detailed in the Core Strategy. Potential improvements have been described in outline only at this stage and more detailed assessments will be required in order to identify definitive improvement proposals.

5.8.1.4 Budget scheme costs have been identified in preliminary form and these are intended to give an approximate 'order of cost'. All scheme proposals and costs presented in this report exclude; land ownership/acquisition issues, environmental impacts, statutory procedure issues and detailed design, and are presented for information purposes only.

5.8.1.5 Potential sources of funding have also been identified as follows:

- Developer – funding provided in full by developers to address transport impacts as a result of development proposals.
- LTP – funding provided in full by the Local Transport Plan (LTP) budget to address existing transport issues on the County highway network.

- LTP/Developer – funding split between the Local Transport Plan (LTP) budget and developer(s) to address existing transport issues on the County highway network that will be exacerbated by development proposals.
- LTP/Central Gov' - funding split between the Local Transport Plan (LTP) budget and Central Government to investigate potential rail connection opportunities.
- HA/Developer - funding split between the Highways Agency (HA) and developer(s) to address existing transport issues on the Trunk Road network that will be exacerbated by development proposals.

5.8.1.6 Costs identified to be Nottinghamshire County Council (NCC), Highways Agency (HA) or Central Government funded, are subject to NCC, HA and Central Government approval. Future Regional Funding Allocations (RFA) and Local Transport Plan (LTP) funding levels are not guaranteed and any schemes put forward would need to be assessed and prioritised through the appropriate scheme programme process.

5.8.2 DEVELOPER CONTRIBUTION METHODOLOGY

5.8.2.1 It is expected that individual developers would fund any measures or infrastructure improvements required to mitigate the direct transport impacts of developments. This would include funding for items such as; Smarter Choices measures and initiatives, Travel Plans, on and off-site cycling and walking infrastructure, bus network/infrastructure enhancements and/or bespoke bus services, and any off-site highway infrastructure improvements required to mitigate direct impacts.

5.8.2.2 In addition to mitigating the direct transport impacts of developments (via S106 Agreements) it is recommended that developers also provide financial contributions through planning tariffs (Community Infrastructure Levy) towards the delivery of the strategic transportation improvements identified later in this section. Financial contributions would be made to Newark and Sherwood District Council as the planning authority and then passed to either Nottinghamshire County Council, or the Highways Agency to deliver improvements to their respective sections of the highway network within the District.

5.8.2.3 In terms of the apportionment of funding between developments the total value of the identified improvements would be split based on the size of the development proposal (i.e. on a pro-rata basis in accordance with employment floor area and residential units).

5.8.2.4 The aim of this methodology is to provide an equitable, transparent and fair system to enable developers to provide funding for the identified strategic infrastructure improvements. Clearly the list of improvements would first need to be worked-up in more detail and accurate construction costs identified. It is also proposed that this list would become a 'live document' which would be reviewed on a regular basis to take into account future changes.

5.8.2.5 It is proposed that this contribution framework would be used for any future developments in the District. This approach to calculating contributions is increasingly being used by a number of local authorities (for example Milton Keynes Council) and is considered to be consistent with the recently introduced Community Infrastructure Levy planning legislation.

5.8.3 IMPROVEMENT PROGRAMME

5.8.3.1 An approximate estimate of scheme delivery priority has been made based on a combination of estimated 'spare' traffic capacity on highway corridors, the need to address existing safety and/or capacity issues, the requirement to address the cumulative traffic impacts of development traffic and the relative difficulty of delivering the improvements required. Delivery priority has then been grouped into the following categories.

5.8.3.2 Delivery priority has then been grouped into the following categories:

- 2009 – 2015 or 'Short Term' - improvements required in the near future to address existing capacity/safety issues, or to permit future growth to proceed.
- 2015 – 2020 or 'Medium Term' – improvements required to meet future traffic demands associated with residential/employment growth.
- 2020 – 2026 or 'Long Term' – improvements required to meet future traffic demands associated with residential/employment growth.

5.8.4 DEMAND MANAGEMENT

5.8.4.1 From a traffic and highways perspective it is favourable to seek to reduce traffic impacts by managing travel demand thereby reducing/removing the requirement for highway improvement works.

5.8.4.2 Ideally residential and employment uses should therefore be complementary in order to provide local employment opportunities and reduce the need to travel, especially by private

motor vehicle. The proposed employment growth therefore seeks to complement the residential growth in terms of employment floor area and site locations.

5.8.4.3 Demand for travel by private car is also managed through the application of maximum car parking standards. By limiting car parking provision fewer trips are generated. However, there is a careful balance to be struck between limiting parking provision and meeting reasonable demand in order to prevent on-street parking in inappropriate locations.

5.8.5 MODAL SHIFT

5.8.5.1 Demand for car trips can also be reduced by encouraging use of sustainable transport modes (i.e. walking, cycling, bus etc) and in accordance with PPG13, Travel Plans will be required in support of planning applications for all major developments. It is expected that the Travel Plans developed and implemented for each site will complement the strategic infrastructure improvements detailed in this report in order to increase use of modes of transport other than the car.

5.8.6 MODAL SHARE TARGETS

5.8.6.1 It is expected that Travel Plans will set out mode share targets against which the effectiveness of the Travel Plans will be measured and enable corrective actions to be identified when targets are not met. Targets for each site will be different depending on the particular end-user and the travel plan measures identified.

5.8.6.2 Existing modal splits for the District already exhibits a higher proportion of trips on foot or cycle than the County, Region and England and Wales as a whole. However, it has a lower proportion of public transport use and a slightly higher proportion of car use.

5.8.6.3 Achieving modal shift away from the car is most likely to require an increase in use of public transport as the level of walking and cycling in the District is already relatively high (predominantly in Newark on Trent) and there is likely to be limited opportunity to further encourage walking and cycling in the rural areas of the District where longer journey distances are likely to discourage significant additional use of these modes.

5.8.6.4 It should be reasonable to assume that, as an initial target, car use should aim to be reduced from the existing level (68.20%) to the same level as the County average (64.28%) and a 4% increase in use of public transport within the District would achieve this if walking and cycling

remained constant at 14.53% (taking public transport use to approximately 9%), which is still below the County average of 12.33%.

5.8.7 NEW/IMPROVED BUS INFRASTRUCTURE

5.8.7.1 Improvements to bus services may take several forms. In most cases the extension of an existing route or increase in frequency of existing services will be sufficient to improve facilities. In other instances the addition of a new route to supplement the existing network may be required. It is recommended that improvements for each development site are formulated separately, but with an overview, so that where it might be possible to coordinate improvements to more than one site, economies of scale are not missed.

5.8.7.2 The larger developments will be able to justify and support the extension of existing bus facilities or the provision of new bespoke services. The exact requirements will vary from site to site, but for each location a range of options can be prepared.

5.8.7.3 In addition to new/improved bus services there will also be a requirement for new/improved supporting infrastructure in the form of additional bus stops, shelters, seating etc. Further enhancements such as real-time passenger information systems should also be explored as these offer good potential to further increase bus patronage.

5.8.7.4 Consideration should also be given to bus priority measures, where appropriate, in order to improve bus journey times and journey time reliability

5.8.7.5 With regard to timing it is essential to implement new and improved bus services and infrastructure very early in the life of a development, ideally before any units on the site are occupied, so that facilities are available and operational for new residents and employees to use immediately. This is an important aspect of establishing good, sustainable travel behaviour and should be a conditional requirement of planning permissions for new development.

5.8.7.6 Detailed investigations should be undertaken at the planning application stage in order to identify the appropriate level of new/improved bus services and complementary infrastructure improvements required in order to cater for forecast demands and achieve modal split targets. Delivery of an appropriate package of improvements should be a conditional requirement of planning permission and should be implemented prior to development occupation in order to encourage good, sustainable travel behaviour.

5.8.8 NEW/IMPROVED RAIL INFRASTRUCTURE

5.8.8.1 The predicted level of increased rail usage is not significant and should be comfortably accommodated by existing/proposed services.

5.8.9 POTENTIAL NEW RAIL LINKS TO NEWARK AND SHERWOOD DISTRICT

5.8.9.1 Reinstatement of rail services utilising the former mineral line between Ollerton and Shirebrook offers potential for greater connectivity to the wider rail network, particularly the Robin Hood Line, and offers a potential alternative to commuter travel on the A614. This should therefore be explored further.

5.8.10 POTENTIAL FOR IMPROVEMENTS TO SOUTHWELL RAIL SERVICES

5.8.10.1 There are committed proposals to improve services along the Nottingham-Newark-Lincoln corridor which will improve Nottingham to Lincoln journey times. As a result of these proposed improvements it is likely that rail services to Fiskerton and Rolleston stations will be reduced in favour of improved frequencies and reduced journey times for longer-distance passengers.

5.8.10.2 There would therefore appear to be limited potential to increase train stopping frequency at Fiskerton or Rolleston. However, consideration should be given to ensuring that those trains that do stop offer good connections to longer distance rail services from Nottingham and Lincoln thereby facilitating rail commuting to/from Southwell. Complementary improvements to provide additional car parking facilities at Fiskerton Station should also be considered to further encourage rail use by Southwell residents.

5.8.11 POTENTIAL FOR PARK & RIDE

5.8.11.1 To be commercially viable Park and Ride schemes typically require a significant resident population outside of the town centre who work and shop in the town centre. Park and Ride sites also need to be located on radial routes with public transport priority and serve a centre with high parking charges and/or limited parking supply.

5.8.11.2 Within the District, Newark on Trent is the largest town and it currently does not experience traffic congestion or parking demand problems to the extent that a Park and Ride facility would be warranted. However, with the provision of additional residential and employment development within Newark on Trent this situation could change and the potential for a future

Park and Ride site (or sites) should be examined in more detail as development proposals are progressed through the planning process.

5.8.11.3 As mentioned earlier in this report Nottingham already has a good network of park and ride facilities, several of which would be suitable for commuters travelling from the District into Nottingham city centre. As a result, it is unlikely that there would be a requirement for additional Park and Ride facilities within the District to serve Nottingham-bound journeys.

5.8.12 NEW/IMPROVED CYCLE/WALKING INFRASTRUCTURE

5.8.12.1 National, regional and local policy all encourages access to new residential and employment developments to be made by foot and cycling. The wards around Newark already have high levels of cycling and walking and the District as a whole has above National average levels of these users. The proposed growth will result in an increase in the percentages of trips made by these user groups, particularly in the urban area. Therefore, it is essential the developments incorporate principals which will make trips by pedestrians and cyclists safe and comfortable. Improvements are also likely to be required where the sites interface with the existing highway and pedestrian and cycle networks.

5.8.12.2 In addition to new cycle route infrastructure all new developments should also made adequate provision for on-site cycle-related infrastructure including; cycle parking, secure and covered cycle storage, cyclist shower/changing/storage facilities etc to fully encourage cycle use as a sustainable means of travel. Details will need to be identified on a site specific basis and designed and implemented in accordance with current standards and best practice guides. Provision of such facilities should be a conditional requirement of planning permission.

5.8.13 NEW/IMPROVED HIGHWAY INFRASTRUCTURE

5.8.13.1 Potential infrastructure improvements have been identified that could be implemented to provide additional traffic capacity at locations that have been identified to be operating close to, or over capacity with the additional traffic as a result of the growth scenarios.

5.8.13.2 Potential infrastructure improvements have been identified in preliminary terms only and will need to be subject to further detailed investigations and design. Budget scheme costs have been identified in preliminary form and are intended to give an approximate 'order of cost'. All scheme proposals and costs presented in this report exclude; land ownership/acquisition

issues, environmental impacts, statutory procedure issues and detailed design, and are presented for information purposes only.

5.8.13.3 Where possible/required all new highway infrastructure improvements should seek to incorporate bus priority measures and enhanced cycle/pedestrian routes and crossing facilities.

5.8.13.4 The key infrastructure improvements that have been identified to address the transport implications of proposed growth are summarised in Table 5.5.

5.8.14 NEW / IMPROVED HIGHWAY INFRASTRUCTURE - NEWARK ON TRENT

5.8.14.1 The VISUM modelling work undertaken for Newark on Trent has demonstrated that the provision of a Southern Link Road is required to; meet the demands for east-west traffic movements generated by development traffic, to help to mitigate the cumulative impacts of development traffic within Newark on Trent and to provide access for Land to the South of Newark. The provision of a Southern Link Road is therefore considered essential to allow future growth to occur within Newark on Trent and should therefore be developer funded.

5.8.14.2 Following the completion of the A46 Newark to Widmerpool Improvement scheme the Newark Bypass will be the only section of single carriageway on the A46(T) between Lincoln and the M1 at Leicester. A study undertaken by AMScott on behalf of the HA in April 2006 identified that the single carriageway section of the A46(T) Newark Bypass between Farndon Road roundabout to the south of Newark on Trent and the A1(T) roundabout to the north of Newark on Trent is likely to be close to, or over capacity by 2010.

5.8.14.3 The bypass is a wide single carriageway construction and is elevated on high embankments over much of its length to avoid adjacent floodplains. The bypass also crosses numerous structures including two bridges over the River Trent, three railway bridges and two road bridges. Widening the bypass to dual carriageway standard is therefore likely to be prohibitively expensive due to the number of structures involved. Any improvements are therefore likely to be based on making the best possible use of the existing carriageway width.

5.8.14.4 The VISUM modelling has identified a requirement for traffic capacity improvements at the A46 Farndon Roundabout which have been assumed to be delivered as part of the Southern Link Road. Improvements are also likely to be required at the eastern end of the Southern Link Road where it ties in with the A1(T).

5.8.14.5 Further detailed analysis will be required in order to identify the exact details of the junction improvements required within Newark-on-Trent. However, the modelling work undertaken so far has highlighted junctions on several key corridors through the town that, even with the provision of the SLR, will require some form of improvement in order to accommodate growth scenario traffic. These are summarised in Table 5.3 as follows:

Table 5.3 – Summary of Urban Junctions likely to require Improvement

Ref	Junction Name	Existing Junction Type
Farndon Road Corridor		
1	A46 / Farndon Road / SLR	Priority Roundabout
London Road Corridor		
6	A1 / London Road	Priority Roundabout
21	A1 Southbound off slip to B6326	Slip Road to Priority Roundabout
11	London Road / Main Street	Signalised
12	London Road / Bowbridge Road	Signalised
13	London Road / Portland Street	Signalised
Barnby Road/Barnby Gate Corridor		
14	Barnby Gate / Sherwood Avenue	Signalised
17	Barnby Road / Coddington Road	Priority Crossroads
Lincoln Road/North Gate/Castle Gate Corridor		
16	Lincoln Road / Brunel Drive	Signalised
23	Lincoln Road / Northern Road	Signalised
-	North Gate / Queens Road	Signalised
15	Great North Road/North Gate/Castle Gate	Priority Roundabout
24	Castle Gate / Stodman Street	Priority T-Junction
18	Castle Gate / Lombard Street	Priority T-Junction
Bowbridge Road Corridor		
19	Bowbridge Road / Boundary Road	Priority Mini-Roundabout
20	Bowbridge Road / Hawton Lane	Priority Mini-Roundabout
Beacon Hill Road/Sleaford Road/Queen's Road Corridor		
22	Beacon Hill Road / Northern Road	Signalised
25	Sleaford Road / Friary Road	Priority Mini-Roundabout
26	Queen's Road / King's Road	Priority Mini-Roundabout

Table 5.4 – Summary of Sustainable Transport Infrastructure Requirements

Description	Indicative Costs (£m)	No Development	With Development	Likely Funding Sources	Comments
Smarter Choices (e.g. Travel Plans etc)	N/A	X	✓	Developer/ LTP/ Sustrans	Delivered with developments
On and off-site cycling/walking infrastructure	N/A	X	✓	Developer/LTP	Delivered with developments
Bus network/infrastructure improvements	N/A	X	✓	Developer	Delivered with developments
Newark-on-Trent Park and Ride	N/A	X	✓	LTP/Developer	Potential future improvement
Rail link between Ollerton & Shirebrook	N/A	X	✓	LTP/Central Gov'	Potential future improvement
Parking improvements at Fiskerton Station	N/A	X	✓	LTP	Potential future improvement

Table 5.5 – Summary of Urban Highway Infrastructure Requirements

Location	Indicative Construction Costs (£m)	Possible Improvement
London Road / Main Street junction	0.20	Introduction of intelligent traffic signal control
London Road / Bowbridge Road junction	0.05	Provision of pedestrian nearside aspects and on-crossing detection.
London Road / Portland Street junction (Beaumond Cross)	0.05	Provision of pedestrian nearside aspects and on-crossing detection.
Barnby Gate / Sherwood Avenue junction	0.05	Provision of pedestrian nearside aspects and on-crossing detection.
Barnby Gate / Coddington Road junction	0.35	Provision of 'Ghost Island' & acceleration/deceleration tapers
Lincoln Road / Brunel Drive junction	0.25	Provision of localises widening, pedestrian nearside aspects and on-crossing detection.
Lincoln Road / Northern Road junction	0.20	Introduction of intelligent traffic signal control
Castle Gate / Lombard Street junction	0.25	Nature of improvements to be determined
Castle Gate / Stodman Street junction	0.25	Nature of improvements to be determined
Bowbridge Road / Boundary Road junction	0.50	Increase size of roundabout
Bowbridge Road / Hawton Lane junction	0.30	Increase size of roundabout
Beacon Hill Road / Northern Road junction	0.12	Introduction of intelligent traffic signal control
Sleaford Road / Friary Road junction	0.25	Nature of improvements to be determined
Queens Road / Kings Road junction	0.50	Introduction of signal control
Great North Road/North Gate/Castle Gate Roundabout (Beastmarket Hill)	1.00	Possible introduction of signal control and associated junction geometry revisions.
Queens Road/North Gate	0.20	Introduction of intelligent traffic signal control
Total	4.52	

Table 5.6 – Summary of Rural Highway Infrastructure Requirements

Improvement Location	Indicative Construction Costs (£m)	No Growth	With Growth	Timescale for Delivery	Likely Funding Sources	Comments
Newark on Trent Southern Link Road	20.00	X	✓	2009 - 2015	Developer	New link road
A46/B6166 Farndon Roundabout, Newark-on-Trent Bypass	0.00	✓	✓	2009 - 2015	HA/Devel'	Assumed to be improved as part of the SLR
A1/B6326 London Road Roundabout, Balderton	0.00	✓	✓	2009 - 2015	LTP/Devel'	Assumed to be improved as part of the SLR
A614/A6075/A616 Ollerton Roundabout junction	4.00	✓	✓	2009 - 2015	Developer	As per previously proposed NCC scheme
A46/A617 Cattle Market Roundabout, Newark-on-Trent Bypass	3.00	✓	✓	2009 - 2015	HA/Devel'	Introduction of signal control (safety/capacity improvement)
A1/A17 Winthorpe Roundabout, Newark-on-Trent Bypass	2.00	✓	✓	2009 - 2015	HA/Devel'	Introduction of signal control (safety/capacity improvement)
A1/A46 Brownhills Roundabout, Newark-on-Trent Bypass	2.00	✓	✓	2009 - 2015	HA/Devel'	Introduction of signal control (safety/capacity improvement)
A46 Link Capacity, Newark-on-Trent Bypass	0.50	✓	✓	2015 - 2020	HA/Devel'	Road space reallocation to make best use of available carriageway
A6097/Trentside, Gunthorpe	0.25	✓	✓	2015 - 2020	LTP/Devel'	Scheme to ban right turns
A6097/A612 junction, Lowdham	1.25	✓	✓	2015 - 2020	LTP/Devel'	Possible introduction of signal control and associated geometry revisions
A6097/B6386 junction at Oxton	0.50	✓	✓	2015 - 2020	LTP/Devel'	Possible widening of southern arm entry/exist and circulatory to allow 2-lane ahead movements north-south
A6097 Link capacity (A46 to A612), Gunthorpe to Lowdham	2.00	✓	✓	2015 - 2020	LTP/Devel'	Possible on-line carriageway widening and/or alternative capacity improvements, such as provision of 'Ghost-Islands'
A6097 Link capacity (A612 to B6386), Lowdham to Oxton	7.00	✓	✓	2015 - 2020	LTP/Devel'	Possible on-line carriageway widening and/or alternative capacity improvements
A617 Link capacity (A46 to C17), Kelham	5.00	✓	✓	2020 - 2026	LTP/Devel'	Possible on-line carriageway widening and/or alternative capacity improvements
Possible new bridge over River Trent	10.00	✓	✓	2020 - 2026	LTP/Devel'	Possible provision of a new road bridge over the River Trent
A614/C1 junction - 'White Post' roundabout	0.50	X	✓	2020 - 2026	Developer	Possible re-allocation of road space to provide 2 approach lanes from the south
A614/A617 junction (Lockwell Hill)	1.00	X	✓	2020 - 2026	Developer	Possible widening of entry/exists and circulatory to allow 2-lane movements
A614/Mickledale Lane junction	0.25	X	✓	2020 - 2026	Developer	Rationalise junction layout with possible closure of adjacent accesses
A614/C13 Eakring Road junction	0.10	X	✓	2020 - 2026	Developer	Provide standard acceleration/deceleration tapers

A614/B6030 junction (south of Ollerton)	0.30	X	✓	2020 - 2026	Developer	Possible introduction of signal control and associated geometry revisions
Church Gate/Westgate/King Street junction, Southwell	0.50	X	✓	2020 - 2026	Developer	Possible introduction of signal control and associated geometry revisions
A614 Link capacity (A6097 to C1 'White Post' roundabout)	2.00	X	✓	2020 - 2026	Developer	Possible on-line carriageway widening and/or alternative capacity improvements
A614 Link capacity (A617 to C13 Eakring Road)	3.60	X	✓	2020 - 2026	Developer	Possible on-line carriageway widening and/or alternative capacity improvements
A614 Link capacity (B6030 to A6075/A616 Ollerton Roundabout)	1.70	X	✓	2020 - 2026	Developer	Possible on-line carriageway widening and/or alternative capacity improvements
A612 Westgate link capacity, Southwell	0.40	X	✓	2020 - 2026	Developer	Possible traffic management scheme
Total Cost (£m)	67.85					

Notes:

1. Scheme costs are indicative only and are provided as an approximate 'order of cost'.
2. Timescales for delivery are indicative only and assume that growth within the District occurs at a steady annual rate between 2009 and 2026 and traffic flows are evenly distributed across the District.
3. It is likely that the junctions on the links identified above will exceed their capacity before the links do and these junctions should therefore be improved in advance of consideration of link widening/dualling.
4. Details of impacts at specific locations should be determined as part of Transport Assessments submitted in support of development proposals and appropriate improvements secured through the planning process.

6 FLOODING

6.1 BACKGROUND

6.1.1 DATA SOURCES

6.1.1.1 The assessment has been made through analysis of the Newark and Sherwood District Council Strategic Flood Risk Assessment (SFRA) Level 1 Report (written by WSP Group), Environment Agency (EA) policy and guidance given in Planning and Policy Statement 25 (PPS25). Following a review of the information made available, an assessment of the susceptibility of each key service area to flooding events has been made. The principal sources of flooding tend to be of fluvial origin or through failure of the local infrastructure to cope with flash flooding. Consequently this assessment concentrates principally to the consideration of flooding from these two sources, with additional applicable information included as appropriate.

6.1.1.2 The EA became a statutory consultee under the planning process in 2007, allowing them greater influence over the consideration of flood risks throughout the planning process. Areas of particular concern include locating more vulnerable land uses to the areas of least flooding risk, consideration of the impact of climate change and providing flood plain compensation where development within the flood plain cannot be avoided through the appropriate measures.

6.1.1.3 Generally, any development located within the 1:1000yr flood plain (Flood Zone 2 in accordance with PPS25) and the 1:100yr flood plain (Flood Zone 3a) is likely to incur additional expense and resistance during planning compared to sites that lie outside of these zones (Flood Zone 1). Flood Zone 3b is defined as the functional flood plain and development within this area for most types of land use will be strongly resisted.

6.1.1.4 Climate change is taken into account by modelling the predicted increase in flood plain volume for each watercourse, based on the anticipation that rainfall will increase in the future due to the effects of climate change. Therefore the current flood zone boundaries are subject to change in the future and this must be taken into account by considering the expected changes within the lifetime of the development.

6.1.1.5 The Sequential and Exception tests are designed to ensure that development sites are selected according to the flood risk hierarchy defined by Flood Zones 1 to 3. Sequential testing seeks

to push development to the lowest possible flood zone and Exception testing is used to ensure that any development that necessitates development within Flood Zones 2 and 3 can justify its location by providing wider benefits to the community that outweigh the increased flooding risks. In these circumstances flood plain compensation and a good level of protection from any flooding that may occur is usually required as part of the compromise. Flood plain compensation consists of excavating land for flood water to be stored in order to compensate for flood water dispersed from the flood plain due to new development.

6.1.1.6 Flash flooding generally occurs as a result of a combination of dense redevelopment in urban areas and a lack of suitable attenuation in order to regulate the rapid flow rates that are generated as a result. In areas where the infrastructure is already at or near capacity, future allowable discharge rates for surface water are likely to be set to very low levels and the use of soakaways promoted as an alternative where applicable, thus increasing development costs.

6.2 DEFINITION

6.2.1.1 Flooding infrastructure can take a number of different forms and can be incorporated either on a site specific basis or as part of a more wide reaching co-ordinated development approach. However all flooding infrastructure shares a common principle, namely to protect developments from the risks associated with flood water and poor surface water management.

6.2.2 SURFACE WATER MANAGEMENT

6.2.2.1 Historically, an unsustainable approach has been taken with regard to flooding during development, by dramatically increasing impermeable areas whilst discharging surface water from developments principally unattenuated through pipes directly into the surrounding watercourses. This has led to the proliferation of flash flooding during periods of heavy rain, due to the large volumes of water running through the drainage network within short time periods and the overloading that results.

6.2.3 FLOOD RISK

6.2.3.1 Fluvial flooding occurs during periods of heavy or sustained rainfall, where the associated runoff into the network of public sewers and watercourses increases the volume of water running through them beyond a level which they can safely cope with. Again the effects have been exacerbated through unsustainable development approaches, by locating buildings within floodplains, thus deflecting more flood water to the surrounding areas, making flooding more

prolific and dangerous within the vicinity. The effects of climate change are also a concern due to the anticipated increase in rainfall rates over time. Although usually more significant in costal areas, tidal flooding can also occur due to storm surges and high tides.

6.3 STANDARDS

6.3.1.1 The key flood risk mitigation measures that now form part of any development considerations and the associated impact on infrastructure provision relating to development within the District are as follows:

PPS25 Flood Risk Zones and Flood Vulnerability Classification

6.3.1.2 PPS25 segregates all developable land into four discrete Flood Zones, as follows:

Zone 1: Low Probability. This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%). All uses of land are appropriate in this zone.

Zone 2: Medium Probability. This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% – 0.1%) in any year. Water-compatible, less vulnerable and more vulnerable uses of land and essential infrastructure are appropriate in this zone. Subject to the Sequential Test being applied, highly vulnerable land uses are only appropriate in this zone if the Exception Test is passed.

Zone 3A: High Probability. This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year. Water-compatible and less vulnerable uses of land are appropriate in this zone. The highly vulnerable uses should not be permitted in this zone. The more vulnerable and essential infrastructure uses should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.

Zone 3B: The Functional Floodplain. This zone comprises land where water has to flow or be stored in times of flood. SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes). Only the water-compatible uses

and the essential that has to be there should be permitted in this zone. Essential infrastructure in this zone should pass the Exception Test.

6.3.1.3 PPS25 also classifies the flood risk vulnerability of certain land uses. The classifications of the proposed land uses for the District are as follows:

Residential – More Vulnerable. Residential development cannot therefore be located within Flood Zone 3B and is subject to Exception Testing if located within Flood Zone 3A. It is subject to flood plain compensation if located within Flood Zone 2.

Employment – Less vulnerable. Cannot be located in Flood Zone 3B. Suitable for all other flood zones without an exception test, however subject to flood plain compensation if located within Flood Zone 2.

Open space – Water compatible. Suitable for location in all flood zones.

Other – Unknown.

The Sequential and Exception Test

6.3.1.4 The sequential test is designed to ensure that development is concentrated within the areas of least flood risk wherever possible. The Exception Test seeks to justify the location of development within higher flood risk areas through demonstrating wider benefits to the community that outweigh the flood risks associated with its location. These tests limit the available space for development within higher flood risk areas (Flood Zones 2 and 3) unless infrastructure is provided to confine floodwater within tighter boundaries and allow development to take place in areas where it would previously not have been allowed. Even if the testing proves the location of the development to be satisfactory, flood plain compensation is still required within these zones (see below) which will escalate the costs associated with the development. It is also likely that tighter controls would be placed on discharge constraints.

6.4 CLASSIFICATION OF INFRASTRUCTURE

6.4.1 FLOOD DEFENCES

6.4.1.1 Provision of flood defences reduces the extent of floodplains by confining flood water within closer boundaries to watercourses. Traditionally this has taken the form of physical barriers to retain the water, however in recognition of this as an unsustainable approach; a more recent

push is being adopted for provision of 'soft defences' such as mudplains and seeking flood protection only as a last resort rather than a necessity.

6.4.2 FLOODPLAIN COMPENSATION

6.4.2.1 When buildings are situated within flood plains, they displace flood water onto the surrounding land. Floodplain Compensation consists of compensating for this displaced flood water, generally by excavating ground below the flood level within less critical parts of the site or as part of a co-ordinated approach to serve multiple developments. This becomes sacrificial land during times of extreme flood.

6.4.3 STORM WATER ATTENUATION.

6.4.3.1 During storm events, runoff from roofs and impermeable hard standing causes large volumes of storm water to enter the local drainage infrastructure if allowed to discharge at an uncontrolled rate. Under PPS25, constraints in discharge rates typically in the order of 20% to 30% are applied, however this varies depending on the outfall characteristics. The approach to discharge detailed in Building Regulations Part H is generally adopted, prioritising discharge via infiltration and if this is not possible to watercourses and public sewers respectively. The ability of the public sewer infrastructure to cope with flows varies considerably from region to region and often dictates the discharge rate if public sewer is the only viable discharge option.

6.4.3.2 In order to meet these discharge constraints, attenuation is required which can take many forms, however Sustainable Drainage Systems (SUDs) are increasingly being promoted. These consist of forming more natural storage/filtration mediums such as reed beds, swales and ponds which emanate the pre-existing conditions whilst providing support for the local ecology. Man made attenuation devices are generally favoured where allowable due to the savings in development space they provide. Underground cellular storage can be placed under roads, car parks or open space without impacting on operational needs and features such as porous paving provide additional oil filtration and incorporated reduced discharge characteristics which can make them preferable in certain situations. Again, attenuation can be incorporated on a site by site basis or as part of a wider ranging co-ordinated approach. Attenuation is a requirement under PPS25 regardless of location, however sites within higher flood risk areas are often subject to tighter constraints in this regards.

6.4.4 PUBLIC SEWERS

6.4.4.1 The effectiveness of the public sewer infrastructure varies greatly from region to region, depending largely on the strain placed on the system from developments within the catchment area. The ability of the public sewers to cope with storm water does not generally directly dictate whether development can take place in certain areas or not, however it will place more land within higher flood zones and financial implications will almost certainly result from reduced discharge constraints and greater attenuation volumes. This infrastructure is considered separately within the IDP report.

6.5 EXISTING CONDITIONS

6.5.1 FLOOD RISK - NEWARK BALDERTON & FERNWOOD

6.5.1.1 Situated within the South East of the District, the flood risks apparent in this area would appear to be medium to high. The proportion of land that lies within flood plains in this area is more significant and results from a number of subsidiaries of the River Trent. The River itself bisects Newark to the North West and renders a fairly large proportion of the land in Newark effectively unfeasible for residential development due to its location within the 1:100yr flood plain. Unless the required housing can be located away from the flood plains, it is likely that some sites within the settlement area will be subject to Exception Testing. It is also possible that flood plain compensation would be required. This could be achieved either on a site-specific basis or as part of a co-ordinated approach. Historical information suggests that flooding events do occur but would appear to be confined to particularly extreme weather conditions.

6.5.1.2 In general, the existing infrastructure would appear to be adequate to cope with the current development density in the region, however historic records of flooding from sewers and defences being overtopped detailed in the SFRA have identified some localised infrastructure issues. These would seem to be confined to the Newark and Balderton area, specifically inadequate capacity/flows in the sewers in the vicinity of Jericho Road. Attenuation costs are likely to be higher in these locations as a result unless soakaways prove to be a viable alternative for surface water discharge.

6.5.2 FLOOD DEFENCES - NEWARK BALDERTON & FERNWOOD

6.5.2.1 Flood defences do exist along the River Trent in the form of a network of embankments. Flood modelling indicates that these are overtopped during flood events with a probability of

less than 1:100yr, placing some of the surrounding land within Flood Zones 2 & 3. When taking into account climate change, the area of land affected is predicted to increase, in particular to the north of the District as shown in the Strategic Flood Risk Assessment. This may impact on future developable land within this areas, however the affected area is fairly confined

6.5.2.2 Although the flood risks are most apparent in the vicinity of the River Trent, the issues spread through the rest of the District along the subsidiaries of the Trent. Again, climate change is likely to extend the area of land falling within Flood Zones 2 and 3, leading to reduced potential development sites and increased development costs should development be proposed in these locations.

6.5.3 FLOOD RISK - OLLERTON & BOUGHTON

6.5.3.1 Situated within the North West of the District, this settlement would appear to be within a low to medium flood risk area. The majority of the land lies within Flood Zone 1, allowing all types of land use as suitable development. The River Maun bisects the settlement to the north west and any proposal for residential development within the 1:100yr flood plain of this river would be subject to Exception testing. The proportion of land affected by this is fairly minimal however. It is anticipated that development costs would be inflated in this area due to above average SUDS/storm water attenuation facilities that are likely to be pursued to allow development to take place due to some deficiencies with the existing Infrastructure, particularly with regard to public sewer systems.

6.5.3.2 Although no recent flooding events have been recorded in the area the infrastructure would appear to be in need of some upgrading to sustain further development in the area. This would consist of increasing the capacity in the sewer network, either by providing additional storage or through undertaking maintenance of the existing system if appropriate. A number of recent localised flooding issues from sewers have been reported. These are widespread although repeat occurrences have been recorded around Brake Lane in Boughton.

6.5.3.3 Away from the Maun (to the east and south of the area) flood risks are less onerous, with the principal affected areas being confined tightly to the Maun tributaries, namely Rainworth Water and Boughton Dyke, except for a further localised area of flooding caused by a bridge just downstream of the confluence of Rainworth Water and the Maun.

6.5.4 FLOOD DEFENCES - OLLERTON & BOUGHTON

6.5.4.1 The EA regularly maintain the River Maun channel, to compensate in part for the lack of formal flood defences in the area. Although this will undoubtedly ease any future flooding events, a number of structures are present along the length of the River which is known to impact on the flood plain of the Maun. In general, the effect of these is to concentrate flooding risks to localised areas along the banks of the Maun. Some existing properties to the east of the river are currently, or will be adversely affected in the future as a result; however the main areas to be affected are seen to be along the western boundary of the Maun, currently used for agricultural purposes.

6.5.5 FLOOD RISKS - RAINWORTH AND CLIPSTONE

6.5.5.1 Situated to the far west of the District, these settlements would appear to be at low risk from flooding. The vast majority of the land lies within Flood Zone 1. The flood risk situation is very similar in both Clipstone and Rainworth, with small tributaries of the River Maun intersecting the settlements and it would appear that drainage issues are localised along the boundaries of these tributaries. The River Maun itself runs across the north of the Settlement and development should be steered away from this area. The proportion of the Settlement affected by this is not considered to be significant.

6.5.6 FLOOD DEFENCES - RAINWORTH AND CLIPSTONE

6.5.6.1 There are no records of any formal flood defences in this part of the District, however no recent fluvial flooding issues have been recorded and it is unlikely that future development would require any significant flood protection measures.

6.5.6.2 Some drainage issues have been highlighted by the local planning authorities, who have indicated that possible objections may be raised to future planned development on grounds of insufficient infrastructure; however there is little evidence to suggest that the sewers in this area are insufficient.

6.5.7 FLOOD RISKS - SOUTHWELL

6.5.7.1 Situated fairly central within the southern part of the District, Southwell would appear to be at medium risk to flooding. The predicted 1:100yr flood level considering the effect of climate change extends significantly further than the current 1:100yr flood level. This will not only put

existing developments at greater risk but development opportunities will be pushed further away from the River.

6.5.7.2 Although no recent major fluvial flooding issues have been recorded, numerous localised flooding/drainage capacity issues have been identified by the Local Planning Authority.

6.5.8 FLOOD DEFENCES - SOUTHWELL

6.5.8.1 There are existing flood defences along the embankments to the River Greet. The existing flood plain extends up to approximately 200m in width although this is anticipated to increase due to the effects of climate change. This also extends to the subsidiaries of the Greet. This is likely to have some impact on the potential development areas in the District.

6.5.8.2 Although the western part of this Settlement would appear to be relatively trouble free, the River Greet bisects the settlement to the north east and would appear to exhibit little in terms of a natural flood plain.

6.5.9 FLOOD RISK - COLLINGHAM

6.5.9.1 Situated adjacent to the River Trent flood plain, the settlement would appear to be at medium to high risk of flooding; however the data available so far suggests that this is not necessarily the case.

6.5.9.2 Some historic flooding events have been identified although these are not recent events.

6.5.9.3 The sewerage infrastructure would appear to be generally adequate to cope with the present demand; however it is likely that improvements would need to be made to cope with increased demand from future development.

6.5.9.4 The eastern part of the settlement is at less risk of flooding and as such future planned development should be concentrated to the east as far as practicable, to avoid increased development costs likely to arise from more onerous SUDS/attenuation facilities. The tidal flood plain of the River Trent encroaches on a significant part of the western part of the settlement.

6.5.10 FLOOD DEFENCES - COLLINGHAM

6.5.10.1 Flood defences are present along the Trent to the west of Collingham; however they only provide protection up to the 1 in 3 year flood event, i.e. they are likely to be overtopped for

flood events with sufficient magnitude to only occur once in every three years on average. They therefore have little impact on the proportion of land within flood zones 2 and 3. This proportion is also likely to increase due to the effects of climate change, highlighting the inadequacies of the current defences to cope with future expansion.

6.5.11 FLOOD RISKS - BLIDWORTH, EDWINSTOWE, FARNSFIELD

6.5.11.1 These areas are subject to variable flooding risks. Blidworth appears to be at low risk of flooding. The settlement is located at the head of tributaries of the River Maun and Greet and the proportion of the settlement within flood plains is considered minimal. Farnsfield is subject to similar flooding risks being in a similar situation, however being further upstream along the same tributary of the River Greet, the flooding risks are likely to be slightly more onerous. The majority of the land in this area again lies within Flood Zone 1. Edwinstowe is located adjacent to the River Maun and although generally in a similar situation, flooding issues are likely to be higher. The effects of climate change would also appear to be more onerous in this location, indicating lower or flatter land levels in this location or a restriction in river flows upstream causing a concentration of floodwater in this location.

6.5.12 FLOOD DEFENCES - BLIDWORTH, EDWINSTOWE, FARNSFIELD

6.5.12.1 There are no records of any existing flood defences in this area. In general the sewer system would appear to be largely able to cope with current demand and there are currently no known problems with the capacity of the existing sewage treatment works and upstream sewerage network to accommodate existing flows, with the exception of Newark where parts of the sewerage network becomes overloaded during storm conditions. It has also been identified by Severn Trent Water that there are current sewer flooding problems within Ollerton & Boughton, Rainworth, Farnsfield and Southwell (Settlements 5, 9, 11, and 12), however Severn Trent Water expect to have these issues resolved by undertaking planned capital investment within the next 2 to 3 years.

6.5.13 FLOOD RISKS - LOWDHAM, SUTTON-ON-TRENT

6.5.13.1 Flood risks associated with this area appear to be medium to high. The 1:200yr tidal flood plain (Equivalent to the 1:100yr fluvial flood plain i.e. Flood Zone 3a in accordance with PPS 25) of the River Trent extends through this settlement and consequently flooding from rivers and sewers has been experienced in many areas.

6.5.13.2 Lowdham is principally affected by the Cocker Beck. This watercourse has been culverted, restricting maximum flows through the structure. Flood water is therefore concentrated in areas where water enters culverted sections from open channel flow. Culverted sections also cause issues when taking into account climate change, as they often have little spare capacity and once this is exceeded there is little or no provision for the additional water, concentrating flooding further. The EA are now trying to restrict construction works over culverted sections and may require these to be opened up as part of any large scale development where this may occur.

6.5.14 FLOOD DEFENCES - LOWDHAM, SUTTON-ON-TRENT

6.5.14.1 Flood defences have been incorporated along this watercourse; however they are largely in terms of increased channel capacity with some small scale concrete floodwalls.

6.5.14.2 Although a significant proportion of Sutton-On-Trent would appear to be affected by the tidal flood plain of the River Trent according to EA flood mapping, encroaching into the centre of the village from the eastern boundary, fluvial defences are in place along the river which are capable of coping with 1:100yr flood events.

6.5.14.3 The extreme weather events experienced in July 2007 caused widespread flooding and drainage problems in the area. Location of future development will need to be carefully considered as there is a lower potentially suitable area of land for development than that associated with the other Settlements in the District.

6.5.15 SUMMARY OF EXISTING FLOOD INFRASTRUCTURE PROVISION & CURRENT SHORTFALLS

6.5.15.1 In order to allow development within a particular location, flood defences would be required to protect the surrounding land up to and including the 1 in 100 year flood event (1:100yr). The current provision within each settlement is summarised on the following page:

Table 6.1 - Current Provision of Flood Defences

Parish	Existing Flood Defences	Comments
Newark	1:100YR	There is some discrepancy as to the level of protection offered. Defences do not extend to all areas of the parish.
Ollerton & Boughton	-	Informal defences exist but are not believed to offer significant protection from extreme flood events.

Rainworth	-	-
Southwell	-	Informal defences exist but are not believed to offer significant protection from extreme flood events.
Clipstone	-	-
Collingham	1:3YR	-
Blidworth	-	-
Bilsthorpe	-	-
Edwinstowe	-	-
Farnsfield	-	-
Lowdham	-	Informal defences exist but are not believed to offer significant protection from extreme flood events.
Sutton on Trent	1:100YR	There is some discrepancy as to the level of protection offered. Defences do not extend to all areas of the parish.

6.5.15.2 It is evident that there is widespread shortfall in terms of the flooding infrastructure in place to support future development; however it is not necessarily the case that this that flood defence infrastructure would be implemented to support the proposed development. The reasons for this are discussed in detail later in this chapter.

6.6 POTENTIAL AREAS FOR GROWTH

6.6.1.1 The River Trent is the main cause of concern in terms of flooding and consequently the western part of the District is significantly more desirable for proposed future growth than the eastern part.

6.6.1.2 The EA are currently pursuing and promoting the virtues of 'soft defences' to tackle flooding problems, such as mud plains for fluvial flooding and salt plains for tidal flooding, due to the expense of maintaining and building traditional retaining structures. It is anticipated that a push for the adoption of these systems will be encountered in the coming years and a drop off in the construction of retaining structures as a result. The construction of new traditional flood defences is likely to be confined to situations where there are significant flood risks and little room for incorporating these soft defences.

6.6.1.3 The River Trent may qualify under these criteria. Conversely if no further flood mitigating action is taken, proposed development within the settlements adjacent to the Trent may encounter the greatest difficulty and higher costs in order to implement due to the inherent problems in the area.

6.6.1.4 The western banks of the Maun provide a good location for utilising soft defences at relatively low cost. It is most likely that future flood mitigation would be tackled through minimising surface water discharge from new developments in combination with low level soft defence flood mitigation development in this area if required.

6.7 ASSESSMENT METHODOLOGY

6.7.1 IDENTIFYING FLOOD RISK TO IDP SITES

6.7.1.1 Consideration of flood risk varies depending on the nature of the development, as some land use types are more vulnerable to flood risks than others. In practice, this translates to certain types of development being subjected to more onerous constraints than others within a particular location, in accordance with the flood risks associated with that location. The consequences of this are pressure being applied to relocate the development to a safer area. If this cannot be achieved, increased costs will occur relating to the infrastructure required to ensure safety of the development within a flood risk region.

6.7.1.2 The boundaries of Flood Zones 2 and 3 in the District are derived from EA data and have been obtained electronically and plotted against the boundaries of each IDP site under consideration.

6.7.1.3 This allows identification of the extent of the 1:1000yr and 1:100yr floodplains within each site and the corresponding proportion of the site falling into Flood Zones 2 and 3. By comparing this data to the anticipated development potential in each site as provided by NSDC, an assessment can be made of the likelihood that development would be necessary within Flood Zones 2 & 3 and the associated infrastructure provision necessary to allow this. This infrastructure could either be implemented globally in terms of flood defences, regionally in terms of co-ordinated flood plain compensation and attenuation or locally on a site specific basis.

6.7.1.4 The preferred growth option provided by NSDC considers residential development allocations within each site, with set proportions for employment and other uses. For the purpose of flood

risk assessment, it has therefore been assumed that 100% development potential would be preferable for the 'employment' and 'other' areas, i.e. they can only be situated within Flood Zone 1 and there is no scope to distribute these allocations between settlements in order to tailor the development to the associated flood risks. These allocations are generally situated around features and services that are beneficial to their operational requirements and therefore cannot necessarily be located elsewhere. Although open space is also largely inflexible in that it is usually confined to particular locations due to the circumstances associated with those areas, it has been assumed that land within floodplains in the settlement can be utilised as open space due to the low vulnerability of open space to flooding risks. The likelihood of an office development being accepted for development within Flood Zone 3 is far less than for a park or landscaped area for instance.

6.7.1.5 The Council has confirmed the proposed residential growth within the District in terms of the number of dwellings required within each site. Peak residential development potential has been defined elsewhere in this study as 30 dwellings per hectare. This allows simple calculation of the minimum area required to locate the desired residential land use within each site.

6.7.1.6 In situations where the proportion of land within the site lying in Flood Zones 2 & 3 exceeds the proportion of allocated open space, it will therefore be necessary for some of the space allocated for residential use to encroach on the boundaries of Flood Zones 2 & 3.

6.7.1.7 To prevent the additional infrastructure requirements associated with this, it would be desirable to distribute the residential dwellings to areas outside of Flood Zones 2 & 3. The potential to achieve this principally depends on the ratio of the minimum residential development area as defined above compared to the available area within Flood Zone 1. In order to clarify this, consider the following example:

- Settlement Area = 10 hectares.
- Residential allocation = 50% (5 hectares), Open space =25% (2.5 hectares), Employment/Other =25% (2.5 hectares)
- 75 Dwellings required.
- 50% of the site lies within Flood Zones 2 & 3 (5 hectares)

6.7.1.8 In this scenario the minimum residential development area required as defined above would be 75 dwellings divided by 30 dwellings per hectare = 2.5 hectares. As it has been assumed that open space can be allocated within Flood Zones 2 & 3, the remainder of the land within Flood Zones 2 & 3 would be 5 hectares minus 2.5 hectares = 2.5 hectares. In order to protect the employment and other land uses as explained above, this remaining 2.5 hectares would have to be situated within the residential allocation.

The residential allocation can now be broken down as follows:

- Area within Flood Zone 1 = 2.5 hectares
- Minimum development area = 2.5 hectares.

The ratio of the minimum residential development area compared to the available area within Flood Zone 1 is therefore 1:1 in this example. In other words, to achieve the desired number of residential dwellings, these dwellings would have to be confined to specific areas within the site and developed at the maximum allowable density to negate the need for any additional infrastructure requirements or floodplain compensation measures. In practice, it would be highly unlikely for this to be achievable. Other factors such as the topography of the land, access to services and transport links etc. would prevent development in certain areas and force some development into flood zones 2 & 3. If the ratio of minimum residential development area to land within Flood Zone 1 was increased to say 1:2 the possibility of achieving development within flood zone 1 could be described as likely, as it is feasible that these external factors could be accommodated whilst still keeping the development within Flood Zone 1, whereas if the ratio was above 1:1 it would be impossible to achieve the desired development without upgrades to infrastructure or provision of floodplain compensation.

6.7.1.9 The classification of these risks has been incorporated into a traffic light system within flood risk matrices as described below:

6.7.2 FLOOD RISK CLASSIFICATION OF SITES

6.7.2.1 In order to provide meaningful data to incorporate into the traffic light system from a flooding perspective, an analysis of the capability of the existing infrastructure provision has been carried out, taking into account the limitations of the available data and scope of the assessment as described below.

6.7.2.2 Essentially, in terms of flooding, the green, amber and red categories can be defined as follows:

6.7.2.3 **Green** – The trigger for a green classification is when the percentage of the site area within Flood Zones 2 & 3 is less than the percentage allocated as open space. In this situation it has been assumed that the land within Flood Zones 2 & 3 can simply be allocated to open space, allowing all flood sensitive development to be located within Flood Zone 1, justifying its location and negating the need for flood defence upgrades or flood plain compensation.

6.7.2.4 **Amber** – The proposed development breakdown for the site can be implemented at risk of increased infrastructure provision. The percentage of the site area within Flood Zones 2 & 3 is greater than the percentage allocated as open space. Therefore, although areas of open space can be allocated within Flood Zones 2 & 3, some flood sensitive development such as residential and perhaps employment may also need to be located within Flood Zones 2 & 3. There is therefore some risk that flood defence upgrades or flood plain compensation would be required in order to meet the proposed land allocation breakdown. The magnitude of this risk and anticipated financial implications are reflected through the use of three shades of amber for increasing risks as follows:

6.7.2.5 Floodplain Compensation -

- **Light Amber (POSSIBLE)** – The ratio of the minimum residential development area to land available within Flood Zone 1 of the residential allocation in the site is less than 1:3. With careful land use allocation, it should be possible to locate the development largely if not exclusively within Flood Zone 1. Development costs are therefore not expected to rise significantly due to flood risk considerations. Any floodplain compensation that is required is likely to be small scale and provided on a site specific basis in order to achieve the desired development potential. Associated costs should be manageable.

- **Amber (LIKELY)** – The ratio of the minimum residential development area to land available within Flood Zone 1 of the residential allocation in the site is between 1:3 and 2:3. Even with careful land use allocation it would be difficult to confine the development exclusively within Flood Zone 1. Increased development costs are likely however it should be possible to avoid major floodplain compensation schemes in lieu of upgrades to flood defences. This could be achieved by minimising development in

locations where flooding is known to be prominent. If land use is not allocated efficiently, it is possible that developers would be dissuaded from some sites due to undue financial burdens associated with them.

- **Dark Amber (PROBABLE)** – The ratio of the minimum residential development area to land available within Flood Zone 1 of the residential allocation in the site is between 2:3 and 1:1. Floodplain compensation is likely to be a prominent feature of development within this settlement. This would reduce the usable land within many development areas by creating sacrificial areas of the site to store flood water during extreme flood events. The required development is unlikely to be achievable without significant upgrades to infrastructure in order to confine the boundaries of the floodplains and reduce the need for floodplain compensation and this could prove to be a more economically viable alternative.

6.7.2.6 A **Red** classification is given when the ratio is above 1:1, indicating that it would not be possible to reach the desired development potential in the site without significant flood plain compensation. Improvements to infrastructure and/or flood defence provision would be almost certainly unavoidable unless the proposed development within the settlement is scaled back.

6.7.2.7 Exception Testing -

6.7.2.8 **Light Amber (POSSIBLE)** – The ratio of the minimum residential development area to land available within Flood Zones 1 & 2 of the residential allocation in the site is less than 1:3. With careful land use allocation there should not be any need for Exception Testing in most if not all development proposals.

6.7.2.9 **Amber (LIKELY)** – The ratio of the minimum residential development area to land available within Flood Zones 1 & 2 of the residential allocation in the site is between 1:3 and 2:3. Some development will almost certainly require Exception Testing and it is possible that the wider benefits of these proposed developments may not be sufficient to justify their location. With careful land use allocation, this should not prove to be a widespread problem within the settlement however.

6.7.2.10 **Dark Amber (PROBABLE)** – The ratio of the minimum residential development area to land available within Flood Zones 1 & 2 of the residential allocation in the site is between 2:3 and

1:1 Even with careful land use allocation, exception testing to some extent would probably unavoidable. Some development would almost certainly be refused within particular locations and it would be advisable for the required development to be scaled back to some degree within the settlement without some form of flood defence upgrade provision and/or sewer system upgrades.

6.7.2.11 A **Red** classification is given when the ratio is above 1:1, indicating that it would not be possible to reach the desired development potential in the site. Some of the dwellings would need to be located in Flood Zone 3A or 3B. As a minimum, Exception Testing would need to be passed which would not necessarily allow the development in the proposed location. If the site lay within Flood Zone 3B it would be extremely unlikely that development would be allowed in that specific location. The only available option to allow the desired development would be to implement significant flood defence infrastructure to confine the boundaries of Flood Zone 3 outside of the proposed development area. This would not only have significant financial implications but it is also not certain whether this would be implemented as part of the proposals.

6.7.3 LIMITATIONS TO FLOOD RISK DATA

6.7.3.1 The available data is considered sufficient both to inform of the likely infrastructure provision/upgrades necessary to develop in each site and also to give a meaningful comparison of the likely provision in each site. There are a number of limitations involved in the analysis.

6.7.3.2 The available flood data is derived from the EA and does not all take into consideration any flood defences in the area. Detailed flood modelling taking defences into account is required in all areas to define the boundaries accurately. The Strategic Flood Risk Assessment carried out for NSDC does contain some of this data; however it is not available for all of the sites identified in the IDP. In order to take account of the impact of the flood defences, it has been considered most appropriate to carry out the analysis independently of the flood defences, together with a qualitative assessment of their impact on the results.

6.7.3.3 The available data concerning flood defences in the area is not comprehensive. It is unclear as to the standard of protection that the defences provide in most circumstances and some of the data is contradictory in this regard.

6.7.3.4 The available data for Flood Zone 3 does not indicate the boundary of Flood Zone 3A and 3B. Residential and employment land uses would not be allowable in Flood Zone 3B and residential

in Flood Zone 3A would be subject to the Exception test. A worst case scenario has been considered the most appropriate method to deal with this, considering the boundary shown to be that of Flood Zone 3B rather than 3A.

6.7.3.5 No data has been made available electronically for tidal flooding. Tidal flooding does occur in the northern region of the River Trent floodplain; however as this is an isolated area it has been considered inappropriate to attempt to assess this risk compared to others that occur globally though the District.

6.7.4 LIMITATIONS TO THE FLOOD RISK ANALYSIS

6.7.4.1 The flooding infrastructure requirements will vary greatly depending on the potential for relocation of development within each site. Many factors influence this, physically, socially, environmentally and economically such as the nature and topography of the land, the type and land use of the surrounding developments and supporting infrastructure which are being assessed independently as part of this analysis. The detail required to fully identify the necessary flood protection to a site would only be known at the outline planning application stage. It is possible however to give an overview of the likely requirements which is considered sufficient at this stage. The methodology used in determining the traffic light system is simplistic; however it does provide a means of comparing each site quantitatively as well as qualitatively against another in terms of flood risks. In practice, it may be that some employment/other land usage is allocated outside of Flood Zone 1 if the nature of the development does not require onerous flood mitigation. It may also be necessary for some forms of public open space to be allocated out of the floodplain for example which will have a bearing on the results.

6.7.5 EXCEPTIONS

6.7.5.1 Some of the development within IDP sites does not include residential land use. In these situations, as it has been assumed that 100% development potential is required for other land use types, the traffic light system adopted in these instances simply consists of green and red, depending on whether it is possible for the employment/other land to be contained within the boundaries of Flood Zone 1.

6.8 SUMMARY OF FLOODING INFRASTRUCTURE PROVISION

6.8.1 ASSESSMENT RESULTS

6.8.1.1 A matrix detailing flood risk and required infrastructure has been produced for each IDP site. Details can be found in Appendix 6 – Flood Risk and Infrastructure (Preferred Growth Option).

6.8.1.2 The matrix details the potential infrastructure requirements that would be necessary to allow proposed development to take place.

6.8.1.3 The required flood infrastructure provision for sites with a 'red' classification are summarised in the table below.

Table 6.2 – Required Flood Infrastructure Provision

Parish affected	Site Affected	Infrastructure required	Comments/Mitigating actions
Newark	Newark Cattle Market and Notts CC Depot	Upgrades to flood defences	'Other' development could be located in FZ3A/B if appropriate however it is unlikely that this would negate the need for flood defence upgrades to allow this development to take place.
Ollerton & Boughton	North of Petersmiths Drive	Significant floodplain compensation measures	Moderate reduction required to development within land in FZ 3A/B
Rainworth	South of Rainworth Bypass	Upgrades to flood defences	Minor reduction of employment allocation below desirable maximum should negate the need for upgrades however significant floodplain compensation still anticipated.
Southwell	Land North of Mill Park	Upgrades to flood defences	Minor reduction of employment allocation below desirable maximum should negate the need for upgrades however significant floodplain compensation still anticipated.
Lowdham	Land at Southwell Road	Upgrades to flood defences	Site is mainly within floodplain. Desired development is untenable for this site.

6.8.1.4 The potential for further flood infrastructure provision to fulfil development in other IDP sites has been summarised in the table below.

Table 6.3 – Possible Flood Infrastructure Provision

Parish affected	Site Affected	Infrastructure required	Comments/Mitigating actions
Newark	Quibells Lane	Probable upgrades to flood defences.	Careful development site allocation required to allow desired development to take place. Flood Plain compensation measures likely to be high.
Ollerton & Boughton	North of Petersmiths Drive	Probable upgrades to flood defences.	Careful development site allocation required to allow desired development to take place. Flood Plain compensation measures likely to be high.
Southwell	South of Potwell Dyke	Significant floodplain compensation	Careful development site allocation may alleviate the compensation measures but unlikely to eliminate them.
Southwell	Land at Brickyard Lane	Upgrades to flood defences/significant floodplain compensation	Careful development site allocation may alleviate the compensation measures but unlikely to eliminate them. Flood Defences likely but could possibly be avoided.

6.9 REQUIREMENTS FOR FLOOD INFRASTRUCTURE

6.9.1 FLOOD DEFENCES

6.9.1.1 Although potential locations for flood defences can be identified through flood risk analyses such as this, implementing them in practice relies on a number of external factors influencing the detailed design of the defences which fall outside the scope of this assessment. As discussed in the following paragraphs, funding is also a key issue, and wider investigations would be required to justify their location.

6.9.1.2 In order to implement the desired development, the matrix indicates that flood defences are likely to be required for sites at Newark, Ollerton & Boughton, Rainworth, Southwell, Farnsfield and Lowdham.

6.9.1.3 Geographically, these sites cover flood risks relating to the River Trent, Maun, Greet and some of their tributaries and it would be unrealistic to expect flood defences to be justified in all of these locations.

6.9.1.4 Areas such as Newark and Lowdham lie in the floodplain of the River Trent. Although flood risks from this River are widespread, flood defence infrastructure is likely to be expensive and

difficult to implement. Areas such as Farnsfield, Rainworth and Southwell are subjected to more localised flood risks for which flood defences may prove easier and cost effective to implement. The benefits of providing the flood defences will be more confined however.

6.9.2 SURFACE WATER ATTENUATION

6.9.2.1 Attenuation is required for virtually all new developments, irrespective of whether the site lies within a floodplain or not. The volume of attenuation needed for each site is driven by the allowable discharge rate from the site and can vary dramatically depending on a number of factors. However the susceptibility of the site to flood risks is the principal influence.

6.9.2.2 In areas where flood risks are low, attenuation is generally provided to account for future climate change, typically relating to a 20% reduction in discharge rates. In higher flood risk areas required attenuation may increase to restrict the discharge to greenfield run-off rates and sometimes even more onerous.

6.9.3 FLOODPLAIN COMPENSATION

6.9.3.1 Using this method, the greater the volume of flood water displaced by the development, the greater the volume of excavation/alternative storage required to allow the development to take place. Open space requirements can affect the floodplain compensation measures, where excavations become features of the landscape designed to enhance the aesthetics of the area rather than simple excavations, escalating costs. As such, identifying the location of floodplain compensation becomes a matter for masterplan design and outline planning application and depends on a suitable area of land being made available within the site and whether this can compliment open space requirements.

6.10 FUNDING

6.10.1 FLOOD DEFENCES

6.10.1.1 The provision and maintenance of formal flood defences are managed and funded by the EA through central government. A list of priorities for maintenance and upgrades dictates the scope and location of the works. The order of priorities may be influenced by new regional assessments of flood risks in the form of Strategic Flood Risk Assessments; however the nature, scope and date of implementation of works are constantly subject to change and cannot therefore influence decisions regarding allocation of land until they have been implemented.

6.10.2 SURFACE WATER ATTENUATION

6.10.2.1 The associated cost variance for attenuation could be as much as 500% in high flood risk areas, or up to £50,000 per developed hectare compared to £10,000 per hectare depending on the type of attenuation specified.

6.10.2.2 Surface water attenuation is usually funded by the developer through the satisfaction of Section 106 agreements as part of the planning process, although in some situations it can be implemented through community infrastructure levies as part of a co-ordinated approach.

6.10.2.3 In this case attenuation is provided globally for multiple developments, funded through local government with costs recuperated from developers through higher land values and levies imposed for the maintenance of the infrastructure. This approach often results in more economical and manageable infrastructure provision. Factors such as land ownership and topology will affect the viability of this approach however.

6.10.3 FLOODPLAIN COMPENSATION

6.10.3.1 Floodplain compensation measures are again generally site specific and funded by the developer through Section 106 agreements, however in areas where floodplains are widespread, there is scope to provide compensation for multiple developments through community infrastructure levies in a similar manner to attenuation.

6.10.3.2 Again, associated costs can vary, but are principally influenced by the flood risks associated with the area.

7 UTILITIES

7.1 BACKGROUND

7.1.1 OBJECTIVES

7.1.1.1 The objectives of this Utilities chapter to the IDP is to:

- Understand the baseline process and network characteristics for water, wastewater, electricity, gas, and telecommunications infrastructure within and supporting the District.
- Establish whether there are any existing constraints or deficiencies within these networks which would limit the employment and population growth identified within the Councils Preferred Growth Option as provided by NSDC.
- Identify the likely utility infrastructure reinforcement requirements for delivering the Council's Preferred Growth Option, the mechanisms for funding this infrastructure and the likely programme for delivery.

7.2 ASSESSMENT METHODOLOGY

7.2.1 IDENTIFICATION OF THE STATUTORY UNDERTAKERS

7.2.1.1 The water undertaker for the Newark and Sherwood District is Severn Trent Water although it is known that Anglian Water have two cross boundary bulk supplies serving the Newark and Sherwood District at Collingham and Newark.

7.2.1.2 The sewerage undertaker for the majority of the Newark and Sherwood District is again Severn Trent Water; however the Fernwood area of Newark on Trent is largely within the Anglian Water statutory sewerage boundary.

7.2.1.3 The incumbent gas transporter (GT) is National Grid Gas.

7.2.1.4 Central Networks is the host electricity distribution network operator (DNO).

7.2.1.5 BT Openreach (the incumbent regulated Open Access telecommunication network provider) and a Cable TV operator (Virgin Media) operate telecommunication services across the District and local to the highlighted development areas.

7.2.2 DATA SOURCES

7.2.2.1 The IDP encompasses 71 sites as identified within the 'schedule of key sites for Newark and Sherwood IDP' provided by Newark and Sherwood District Council (NSDC) (Appendix 4). For the purposes of consultation with the Statutory Undertakers, WYG further rationalised the 71 sites into 15 development clusters (settlements - refer to Appendix 7).

7.2.2.2 For each of the 15 settlements WYG have considered the following:

- The numbers of proposed residential properties for each site within the Councils Preferred Growth Option as provided by NSDC.
- Notional water, wastewater, gas and electricity loadings applied to the development using approved civil, mechanical and electrical standards (Sewers For Adoption 6th edition, BS6700: 1997, Chartered Institute of Building Service Engineers Design Data and BSRIA – the building services research and information association).
- Formal responses to specific load growth enquiries from each statutory undertaker during 2009 based on inflated growth data compared with the Preferred Growth Option (therefore it is recommended that the specific load growth data associated with Preferred Growth Option form the basis of a more contemporary consultation).

7.2.2.3 This report has additionally been formulated based on the information contained within the JMP Water Cycle Study: Detailed Strategy, Central Networks' Long Term Development Statement (LTDS) 2009 and extracts from National Grid Gas' Strategic Asset Data records.

7.2.2.4 Information received from Severn Trent Water and National Grid Gas in relation to applications made for previous development scenarios options 1 to 4 have also been used to assist with undertaking this IDP for the Councils Preferred Growth Options. It should be highlighted that the utility loads generated by the Preferred Growth Option are less than those assessed as part of the original IDP.

7.3 EXISTING CONDITIONS

7.3.1 WATER – EXISTING ASSETS

7.3.1.1 Severn Trent Water are the statutory water undertaker covering most of the Newark and Sherwood District, although it should be highlighted that Anglian Water has two cross

boundary supplies, which allow the bulk transfer of water from the Anglian Water Lincoln supply zone to the Severn Trent Water East Midlands water supply zone.

7.3.1.2 As highlighted within the JMP Water Cycle Study: Detailed Strategy Report, detailed discussions have not taken place with Anglian Water due to the fact that none of the settlements considered within the IDP are contained within Anglian Waters area of supply.

7.3.1.3 WYG have received asset information detailing the location of key strategic water infrastructure from Severn Trent Water, together with the JMP Consulting Ltd Water Cycle Strategy: Detailed Strategy document dated 11 September 2009, information published in Severn Trent Water's water resources management plan 2009 Volume 1 Draft, dated May 2008, and preliminary comments from Severn Trent Water which were obtained and minuted at a meeting held with WYG, JMP and Severn Trent Water on 15 May 2009 (minutes of this meeting are enclosed in Appendix 9).

7.3.1.4 It can be seen from Figures 7.1 and 7.2, that the Newark and Sherwood District is remote from the location of key supply resources within Severn Trent Water's East Midland water supply zone, with the nearest water treatment works and treated water strategic main located to the west of Mansfield and Nottingham. This means that current water supplies to the District from the Severn Trent Water strategic network (including water abstraction resources, water treatment works and trunk mains), are currently conveyed over long distances.

7.3.1.5 Additionally there is no Severn Trent Water strategic water infrastructure or water treatment works to the east or north east of Nottingham and therefore the distribution water network servicing the District (and in particular Newark) is derived from a very centralised source.

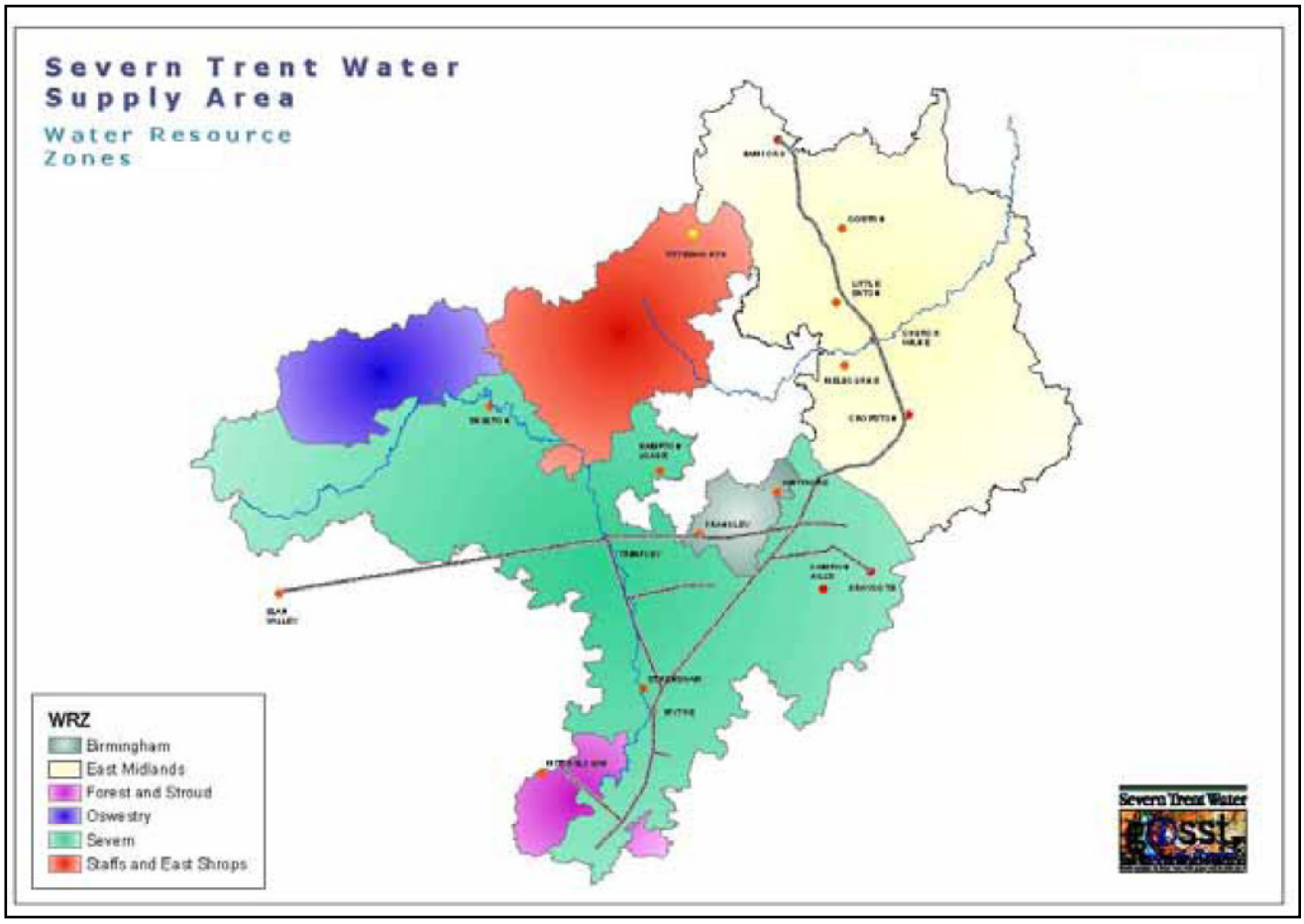


Figure 7.1 Water Resource Zones within Severn Trent Water Region from Severn Trent Water - Water Resources Management Plan 2009 - Volume 1 - Draft, May 2008

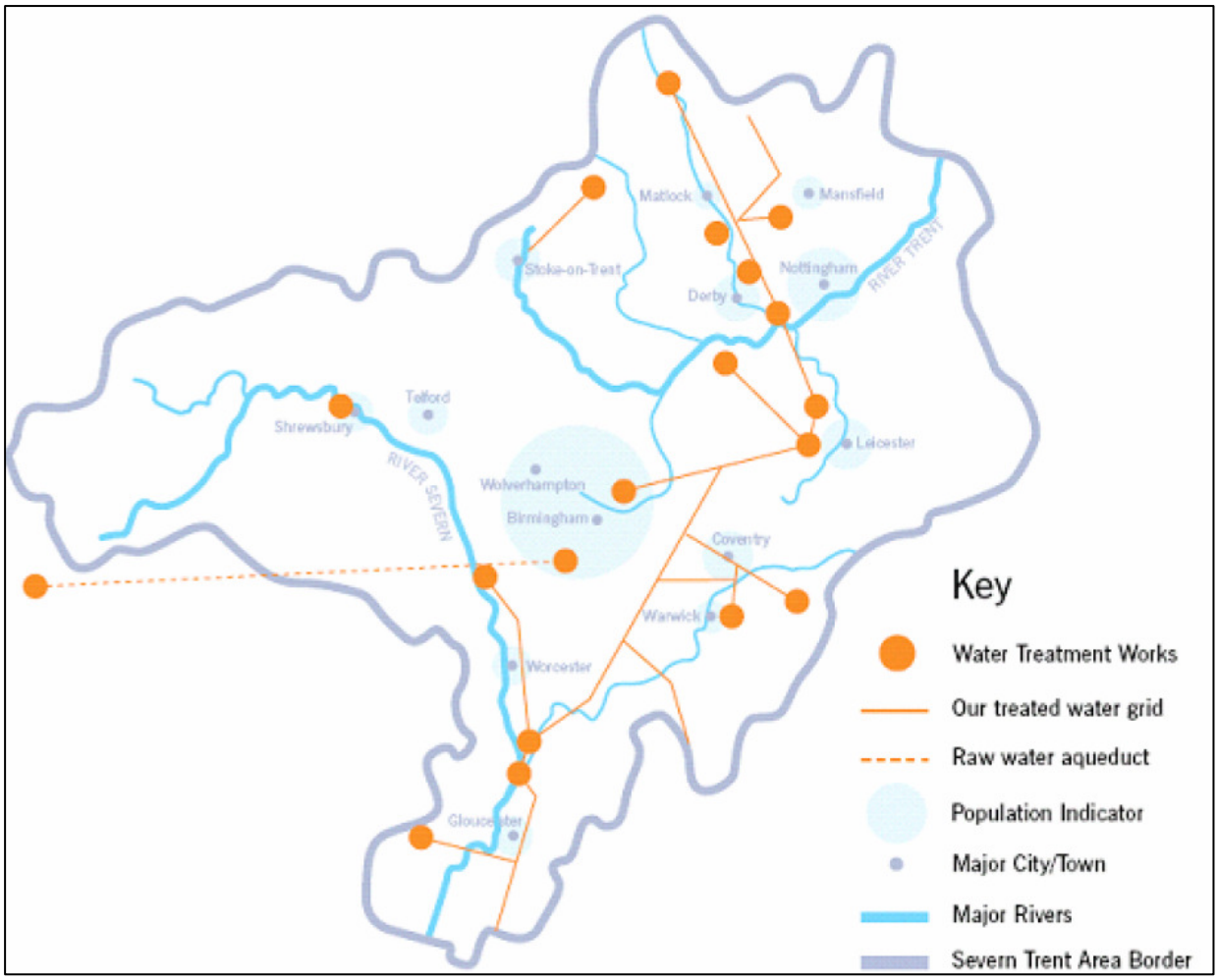


Figure 7.2: Water Demand Centres And The Treated Water Grid Of The Severn Trent Water Region Taken From Severn Trent Water - Water Resources Management Plan 2009 - Volume 1 - Draft, May 2008

7.3.1.6 The Anglian Water supply network is located close to the eastern boundary of the District, and is understood to utilise groundwater sources at Elkesley and Newton on Trent. Additionally there are water treatment works at Newton on Trent, Grove, and also east of Retford. In addition there are bulk supply mains between the Anglian Water and Severn Trent Water supply zones at Collingham and Newark.

7.3.2 WATER - EXISTING NETWORK CONSTRAINTS AND DEFICIENCIES

7.3.2.1 The JMP Consulting Ltd Water Cycle Strategy has identified that although the majority of the Newark and Sherwood District falls within the Severn Trent Water East Midlands Water Resource Zone, the District is remote from all ground water sources and water treatment

works, and therefore supplies from these strategic resources must be transported over considerable distances to reach the Newark and Sherwood settlements.

7.3.2.2 Furthermore it has been identified within Severn Trent Water's Water Resources Management Plan 2009 Volume 1 (Draft) (dated May 2008) that the current ground water supplies remote from the District are currently overworked, and future expansion of the District would exacerbate this situation further.

7.3.2.3 It has been identified within the Water Cycle Study that Severn Trent Water has confirmed that the East Midlands Water Supply Zone has sufficient water resources across the district to meet future demand, however local network capacity would likely be the limiting factor.

7.3.2.4 The District lies at the margins of two water companies' water supply zones. This means that the District is importing water from outside its boundaries which is not the most sustainable means of transporting water.

7.3.2.5 A meeting was held between Severn Trent Water, WYG and JMP on 15 May 2009 to discuss the strategic water infrastructure required to accommodate growth within the emerging LDF for original growth scenarios 1 to 4. The outputs from this meeting (ref meeting minutes within Appendix 9) and the Water Cycle Strategy – Detailed Strategy report prepared by JMP have been used to assess the impact of the Councils Preferred Growth Option on existing network capacity, and the following key issues are still likely to be relevant:

7.3.2.6 There is likely to be insufficient network capacity within the existing strategic water supply network around Newark and Balderton and Fernwood (Settlements 1A, 1B and 1C) to accommodate the growth identified within the emerging LDF.

7.3.2.7 There is currently insufficient capacity at a local distribution level to accommodate growth at Collingham, Sutton on Trent, Ollerton and Boughton, Farnsfield, Southwell, and Lowdham (Settlements 3, 4, 5, 11, 12 and 13); however this capacity restriction is primarily limited to the local water distribution network rather than a lack of water at strategic level and this shortfall has been considered by Severn Trent Water within their PR09 bid.

7.3.2.8 The Water Cycle Study identifies that only localised network reinforcement will likely be required to accommodate Edwinstowe, Clipstone, Bilsthorpe, Rainworth, and Blidworth (Settlements 6, 7, 8, 9 and 10) and strategic network reinforcement is considered unlikely.

7.3.3 GAS - EXISTING ASSETS

7.3.3.1 National Grid Gas has provided a strategic high level network diagram identifying the location of all medium pressure, intermediate pressure, local high pressure and national high pressure gas mains within the Newark and Sherwood District. The location of these strategic assets in relation to each Settlement is identified in Figure 7.3. Full reference should be made to GIS drawings contained within Appendix 8 for more detailed information.

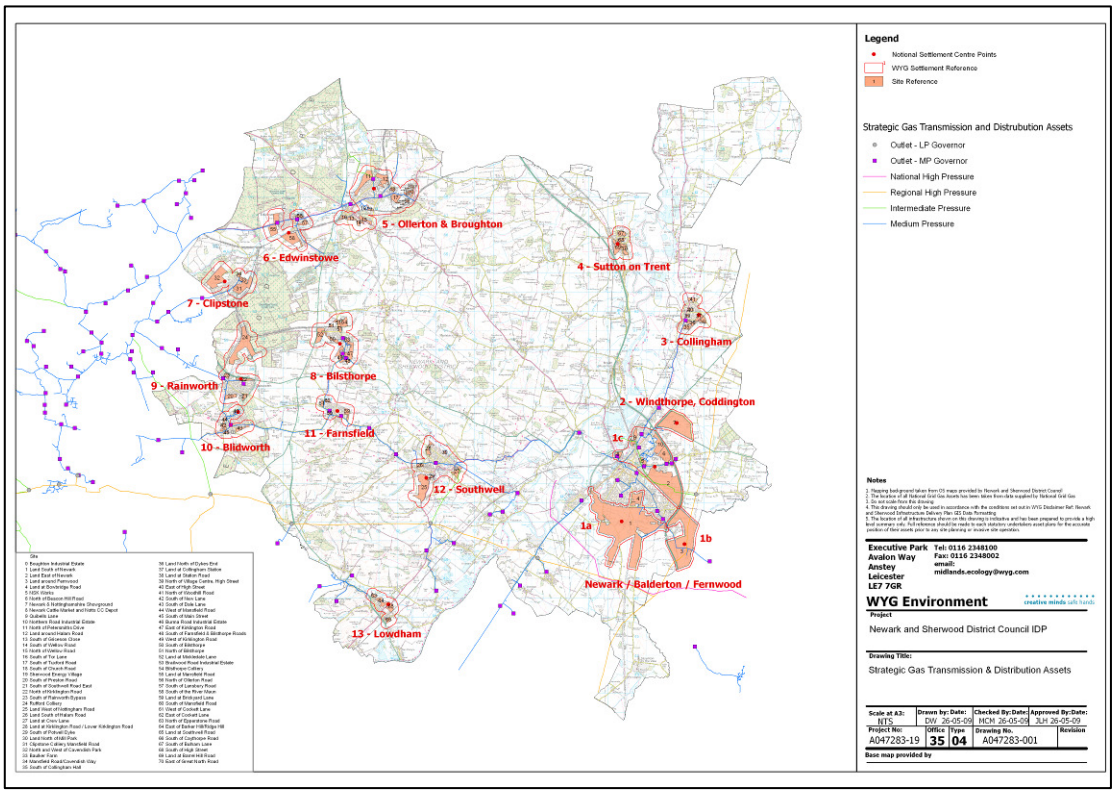


Figure 7.3: Schematic of National Grid Gas Strategic Infrastructure

7.3.4 GAS - EXISTING NETWORK CONSTRAINTS AND DEFICIENCIES

7.3.4.1 The comments in this section are based on analysis undertaken by National Grid Gas in relation to the original application made by WYG for development scenarios 1 to 4 during 2009 (these earlier scenarios provide enhanced levels of growth and therefore provided worst case solutions). However it should be noted that utility networks are dynamic and change over time, and it is therefore recommended that the utility loadings based on the Councils Preferred Growth Option might be issued to National Grid Gas in order that a more accurate assessment of infrastructure capacity can be assessed.

7.3.4.2 A review of the National Grid Gas strategic infrastructure map has identified that Settlements 1A, 1B, 1C (Newark, Balderton and Fernwood) and 2 (Winthorpe) are located in proximity to strategic medium pressure, intermediate pressure and regional high pressure gas infrastructure, and therefore capacity should not be a significant issue.

7.3.4.3 Settlement 4 (Sutton on Trent) is shown to be remote from all gas infrastructure, including strategic infrastructure, with the nearest strategic medium pressure gas main located approximately 5km from the settlement boundary, and the regional high pressure main located 6km from the boundary.

7.3.4.4 The remaining Settlements 5 (Ollerton & Boughton), 6 (Edwinstowe), 7 (Clipstone), 8 (Bilsthorpe), 9 (Rainworth), 10 (Blidworth), 11 (Farnsfield), 12 (Southwell), and 13 (Lowdham) are also shown to be in proximity to a strategic medium pressure network, and therefore capacity should not be significant constraint to population growth in these areas.

7.3.4.5 The National Grid Gas Long Term Development Plan 2008 highlights that there are no planned capital investment schemes for the strategic high pressure gas infrastructure within the East Midlands local distribution zone (LDZ) between 2009 and 2017. A strategic scheme is being developed for construction in 2012/2013 to support the local distribution network within east Retford which is located to the north of the District.

7.3.5 ELECTRICITY - EXISTING ASSETS

7.3.5.1 National Grid own and operate 400kV and 275kV transmission assets within the Newark and Sherwood District. There is one National Grid operated grid supply point (GSP) within the Newark and Sherwood District (Staythorpe 400kV), which transmits electricity to Central Networks electricity infrastructure via 132kV overhead cables to a series of 132kV>33kV bulk supply points (BSP); 33kV services typically transmit power to Primary Substations where it transforms down to 11kV for distribution purposes. The strategic 33kV to 400kV network is shown on the GIS database drawings contained within Appendix 8.

Figure 7.4: Extract Of National Grid Transmission System Taken From National Grid Web Site

7.3.5.2 A review of the Central Networks Long Term Development Statement (LTDS) 2009 has identified that there are several BSP's (132kV>33kV) within and surrounding the Newark and Sherwood District (Hawton, Staythorpe, Nottingham East, Clipstone, Mansfield and Annesley).

7.3.5.3 Figure 7.5 identifies the location of the Central Networks electricity infrastructure from the 132kV>33kV BSP's down to the 33kV>11kV Primary Substations within the District, while Table 7.1 identifies the Primary Substations that are located closest to the individual Settlement clusters and the associated upstream bulk supply point (BSP) and grid supply point (GSP).

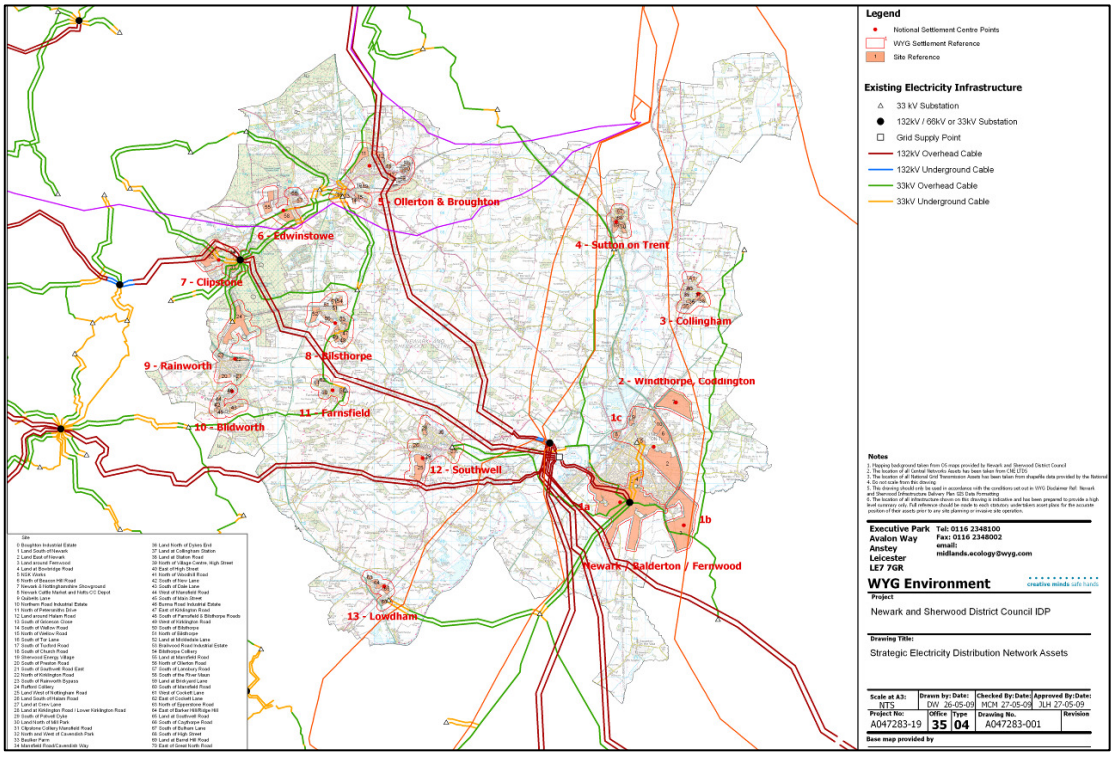


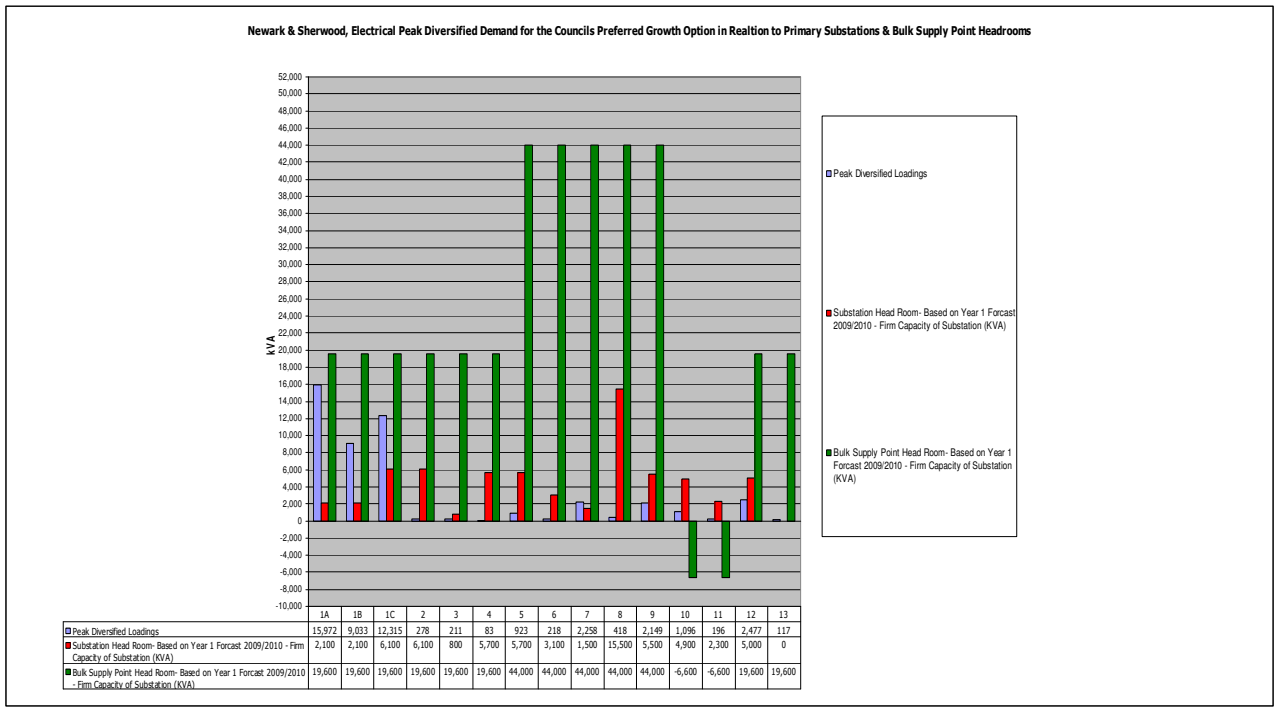
Figure 7.5: Extract From Central Networks LTDS 2009

Table 7.1: Information Derived From Central Long Term Development Statement 2009

WYG Settlement Ref	Nearest Primary Substation to WYG Settlement	Bulk Supply Point Serving Primary Substation	Grid Supply Point Serving Bulk Supply Point
1A – Newark, Balderton and Fernwood	Hawton	Hawton BSP	Staythorpe
1B – Newark, Balderton and Fernwood	Hawton	Hawton BSP	Staythorpe
1C– Newark, Balderton and Fernwood	Newark Junction	Hawton BSP	Staythorpe
2 – Winthorpe and Coddington	Newark Junction	Hawton BSP	Staythorpe
3 - Collingham	Swinderby	Hawton BSP	Staythorpe
4 – Sutton on Trent	Carlton On Trent	Hawton BSP	Staythorpe
5 – Ollerton and Boughton	Ollerton	Clipstone BSP	Chesterfield
6 - Edwinstowe	Thoresby	Clipstone BSP	Chesterfield
7 - Clipstone	Crown Farm	Clipstone BSP	Chesterfield
8 - Bilsthorpe	Bilsthorpe	Clipstone BSP	Chesterfield
9 - Rainworth	Rufford	Clipstone BSP	Chesterfield
10 - Blidworth	Blidworth	Annesley 1&2 BSP	Chesterfield
11 - Farnsfield	Farnsfield	Annesley 1&2 BSP	Chesterfield
12 - Southwell	Southwell	Hawton BSP	Chesterfield
13 - Lowdham	Caythorpe	Hawton BSP	Ratcliffe

7.3.6 ELECTRICITY - EXISTING NETWORK CONSTRAINTS AND DEFICIENCIES

7.3.6.1 An analysis of the Central Network LTDS 2009 has identified the estimated available capacity at each Primary Substation, BSP and GSP within proximity to each Settlement area. These estimated capacities have been reviewed in conjunction with the estimated diversified electricity demand required to develop each Settlement, and these preliminary findings have been presented in Figure 7.6. It is noted that the estimated diversified electricity demand has been calculated on the basis of the land uses identified in Appendix 4 for each settlement, and the residential development scenario in Appendix 3.



	1A	1B	1C	2	3	4	5	6	7	8	9	10	11	12	13
Peak Diversified Loadings	15,972	9,033	12,315	278	211	83	923	218	2,258	418	2,149	1,096	196	2,477	117
Substation Head Room- Based on Year 1 Forcast 2009/2010 - Firm Capacity of Substation (KVA)	2,100	2,100	6,100	6,100	800	5,700	5,700	3,100	1,500	15,500	5,500	4,900	2,300	5,000	0
Bulk Supply Point Head Room- Based on Year 1 Forcast 2009/2010 - Firm Capacity of Substation (KVA)	19,600	19,600	19,600	19,600	19,600	19,600	44,000	44,000	44,000	44,000	44,000	-6,600	-6,600	19,600	19,600

Figure 7.6: Peak Diversified Electricity Demand for Each Development Scenario and the Estimated Available Capacity at the Nearest Primary Substation and Bulk Supply Point (BSP) To the Settlement.

7.3.6.2 It can be seen from the information presented in Figure 7.6, the existing Primary Substations in proximity to Settlements 1A & 1B (Hawton Primary Substation) and 1C (Newark Primary Substation) have insufficient capacity to accommodate the peak diversified demand generated each individual settlement proposed within the emerging LDF.

7.3.6.3 The Crown Farm Primary Substation upstream of Settlement 7 (Clipstone) is shown to be operating close to its firm capacity, and the Councils Preferred Growth Option will push this Primary Substation above its firm capacity by approximately 0.75MVA. This constraint appears to be a result of a change to the firm capacity of the Primary Substation which has changed from 25MVA (as stated within the Central Networks 2008 LTDS) to 14.6MVA as stated within the 2009 LTDS. This may be due to a reduction in available capacity on the 33kV circuit upstream of the Primary Substation; however clarification has been requested from Central Networks.

7.3.6.4 The Primary Substations upstream of Settlements 2, 3, 4, 6, 8, 10, 11, 12 and 13 appear to have sufficient capacity to accommodate the electricity demand required by these settlements without triggering reinforcement of the Primary Substations.

7.3.6.5 In order to consider the capacity of the BSP's upstream of each Primary Substation, WYG have carried out a review of the Central Networks LTDS, and compared the estimated available capacity against the compound electricity demands for all Settlements that would potentially be served from that BSP. A summary of this data is included shown within Figure 7.7 below.

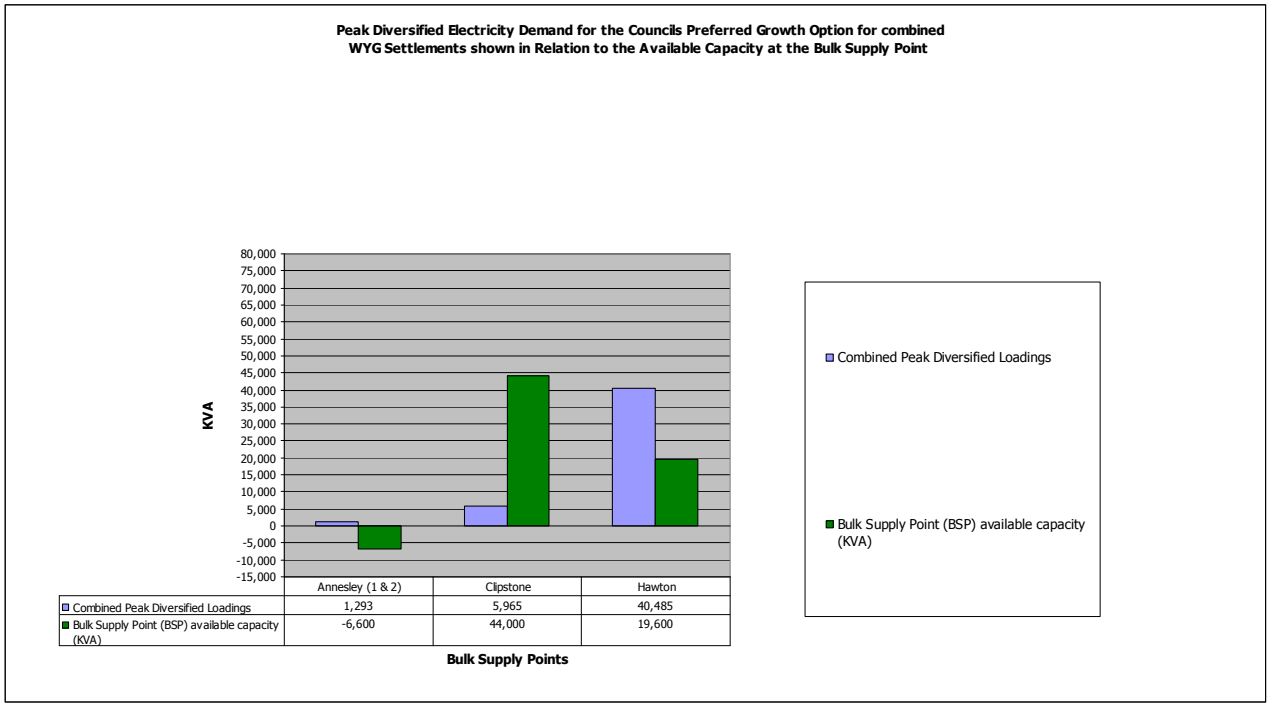


Figure 7.7: Peak Diversified Electricity Demand for Combined Settlements In Relation To the Available Capacity at the Upstream Bulk Supply Point (BSP)[3]

7.3.6.6 When considering the capacity of the BSP's upstream of each Primary Substation, it becomes apparent that there is potentially insufficient capacity at Hawton BSP to accommodate all development settlement areas served by Hawton BSP due to the electricity demand required by Settlements 1A, 1B and 1C (Newark, Balderton and Fernwood). The demand for Settlements 1A, 1B and 1C either as single or compound loads is greater than the available capacity at Hawton BSP.

7.3.6.7 It should be noted however that if Settlements 1A, 1B and 1C are excluded from the Councils Preferred Growth Option, then Settlements 3, 4, 12 and 13 (Collingham, Sutton on Trent, Southwell and Lowdham) could be accommodated both individually and as compound loads from Hawton BSP.

[3] Source: the available capacity of bulk supply points taken from the Central Networks Long Term Development Statement 2009.

7.3.6.8 Additionally growth within Settlement 7 (Clipstone) may be constrained by the limited available capacity at Crown Farm Primary Substation, however if the settlement comprises a number of discrete development parcels each making individual applications for electricity supply (<0.5MVA), then it is possible that Central Networks would take into account a greater degree of electricity diversity and network reinforcement may not be triggered, however a single application for the 2MVA demand required by the Clipstone Settlement may trigger upgrading of the Primary Substation or upstream 33kV network.

7.3.6.9 The LTDS identifies that there is currently a capacity deficit of 6.6MVA at Annesley BSP (this has increased from the 1.2MVA deficit identified within the 2008 LTDS), which means that the additional demand required by Settlement areas 10 and 11 (although they can be accommodated from Southwell and Caythorpe Primary Substations), cannot be accommodated from the upstream Annesley BSP ether as individual or compound loads. The BSP at Annesley may be considered to be a constraint to the development of Settlements 10 and 11 (Blidworth and Farnsfield), however the relatively small loads required by each settlement (1.096MVA and 0.196MVA) mean that developer funded network reinforcement is unlikely.

7.3.6.10 The LTDS identifies that Clipstone Bulk Supply Point has sufficient capacity to accommodate the Councils Preferred Growth Option for settlements 5,6,7,8 and 9 (Ollerton and Boughton, Edwinstowe, Clipstone, Bilsthorpe, and Rainworth).

7.3.6.11 The LTDS identifies that sufficient capacity exists at the grid supply points (Staythorpe, Chesterfield and Ratcliffe) upstream of each BSP to accommodate the individual and compound loads generated by each Settlement within the Councils Preferred Growth Option, and Grid Supply Point Capacity is unlikely to present a development constraint.

7.3.6.12 In summary new Primary Substations (or extension to existing Primary Substations) will be required to accommodate the projected growth within Newark, Balderton and Fernwood, which may include new 33kV circuits from the supporting BSP. This would be wholly developer funded. Further reinforcement of the BSP at Hawton will also be required (together with the potential reinforcement of supporting 132kV circuits from Staythorpe GSP); this would likely be undertaker funded but would certainly have programming risks in regard to population and employment growth.

7.3.7 TELECOMMUNICATIONS - EXISTING ASSETS

7.3.7.1 BT Openreach is the regulated 'Open Access' telecommunication network provider within Newark and Sherwood District. The strategic BT Openreach network comprises a series of Telephone Exchanges, with a downstream network of fibre and copper cables providing services to residential and commercial properties.

7.3.7.2 A list of BT telephone exchanges in proximity to the each Settlement area has been identified below, together with details of whether the exchange is SDSL enabled (Symmetric Digital Subscriber Line), ADSL enabled (Asymmetric Digital Subscriber Line) or under the BT Openreach 21st century network (21CN) capital improvement programme (which is typically an ADSL2+ investment programme – improving ADSL so that it provides a common voice/data/video/internet interface which is typically much better than SDSL). BT are also currently delivering a VDSL (Very-fast Digital Subscriber Line) "Superfast Broadband" capital investment programme between 2009 and 2013 at a number of Telephone Exchanges, which will improve average Broadband speeds considerably.

7.3.7.3 There are other 'open access' and 'closed access' operators in the District but these are not regulated in terms of a duty to provide physical connections to meet growth aspirations. A Cable TV operator (Virgin Media) has assets close to many of the proposed development sites. All of these operators will undertake capital investment under their own commercial models.

7.3.8 TELECOMMUNICATIONS - EXISTING NETWORK CONSTRAINTS AND DEFICIENCIES

7.3.8.1 21CN is based on internet protocol (IP) technology, alongside similar technologies. IP is more flexible than traditional circuit switched networks and can handle communications previously carried by multiple, bespoke networks. In simplistic terms, 21CN will replace BT's currently complex tradition system made up of various methods of communication, and replace these with a more streamlined number of operating facilities, with the added improvement of increasing the reliability for those services provided across the BT network. The 21CN programme is typically based on an enhanced ADSL platform (ADSL2+).

7.3.8.2 BT is currently investing £1.5 billion across the UK on VDSL (Very High Speed Digital Subscriber Line >20Mbps) in order to provide "superfast broadband". This investment includes a programme of Fibre Network installation from telephone exchanges to above ground cabinets (typically green cabinets found on street corners) and predictions estimate that 40% of the country will have Fibre To The Cabinet (FTTC) by 2012.

7.3.8.3 This VDSL/Superfast Broadband/Fibre to the Cabinet programme (also known as Next Generation Access) is being implemented by BT in 5 phases, with phase 3 being implemented during spring 2010, however at the present time there are no plans to enable telephone exchanged within the Newark and Sherwood IDP area.

7.3.8.4 Broadband is a high speed connection to the internet that can be provided for a fixed fee monthly charge. Broadband has a greater capacity to send and receive information than an ordinary dial up connection, and this can provide a range of benefits to the business and domestic users

7.3.8.5 The quality of the available broadband service at a particular Settlement will be dependant on a number of factors, such as whether the telephone exchange is broadband enabled with ADSL, SDSL, ADSL2+, VDSL and whether the cabling between the telephone exchange and site is copper or fibre optic cable (or a combination of both), and the distance from the telephone exchange. Table 7.2 provides details of local Telephone Exchanges.

Table 7.2: Telephone Exchange in Proximity to Each Settlement

WYG Settlement Reference	Nearest British Telecom Exchange	Currently Serving - Residential	Currently Serving - Non Residential	SDSL	British Telecoms 21st Century Capital Investment Programme	FTTC Enabled
1A– Newark, Balderton and Fernwood	Newark	20,866	759	Yes	Enabled	Not Enabled
1B– Newark, Balderton and Fernwood						
2 - Winthorpe and Coddington						
3 - Collingham	Collingham	1,460	60	No	Not Enabled	Not Enabled
4 – Sutton on Trent	Sutton on Trent	1,127	106	No	Not Enabled	Not Enabled
5 – Ollerton and Boughton	New Ollerton	4,924	248	No	Not Enabled	Not Enabled
6 - Edwinstowe	Edwinstowe	2,993	153	No	Not Enabled	Not Enabled
7 - Clipstone	Edwinstowe	2,993	153	No	Not Enabled	Not Enabled
8 - Bilsthorpe	Bilsthorpe	1,717	69	No	Not Enabled	Not Enabled
9 - Rainworth	Blidworth	7,719	190	Yes	Not Enabled	Not Enabled
10 - Blidworth						
11 - Farnsfield	Farnsfield	1,307	83	No	Not Enabled	Not Enabled
12 - Southwell	Southwell	3,721	191	No	Not Enabled	Not Enabled
13- Lowdham						

7.3.8.6 ADSL (asymmetric digital subscriber line) typically downloads data from the internet to the user at a much higher speed than it uploads data from the user back to the internet (asymmetric). ADSL is typically delivered over telephone lines, along with the existing voice

and fax services, by dividing the line into two different signals. It should be highlighted that all telephone exchanges in proximity to the Newark and Sherwood Settlements are ADSL enabled.

7.3.8.7 SDSL (symmetric digital subscriber line) is similar to ADSL, but with equally high speeds for both uploading and downloading data (symmetric). SDSL was typically delivered over a dedicated line, but later developments have allowed for the service to be delivered over existing telephone lines in the same way as ADSL.

7.3.8.8 It can be seen from Table 7.2 that Settlements 3, 4, 5, 6, 7, 8, 11, 12, and 13 (Collingham, Sutton on Trent, Ollerton & Boughton, Edwinstowe, Clipstone, Bilsthorpe, Farnsfield, Southwell and Lowdham) are served by telephone exchanges that are not currently SDSL enabled. Therefore the upload broadband speed for these Settlements is not likely to be as responsive as those which are SDSL enabled.

7.3.8.9 Additionally Figure 7.8 identifies the proximity of each Settlement in proximity to the nearest telephone exchange, while Table 7.3 identifies the likely broadband response that can be expected, based on the distance from the telephone exchange to each Settlement. It can be seen that Settlements 1A, 1B, 2, 7, 9 and 10 (Newark, Balderton, Winthorpe, Clipstone, Rainworth and Blidworth) are located more than 3km from the nearest telephone exchange, and therefore broadband response is likely to be less responsive that for Settlements 1C, 3, 4, 5, 6, 8, 11, 12 and 13 (Fernwood, Collingham, Sutton on Trent, Ollerton & Boughton, Edwinstowe, Bilsthorpe, Farnsfield, Southwell, and Lowdham) which are located closer to the telephone exchange.

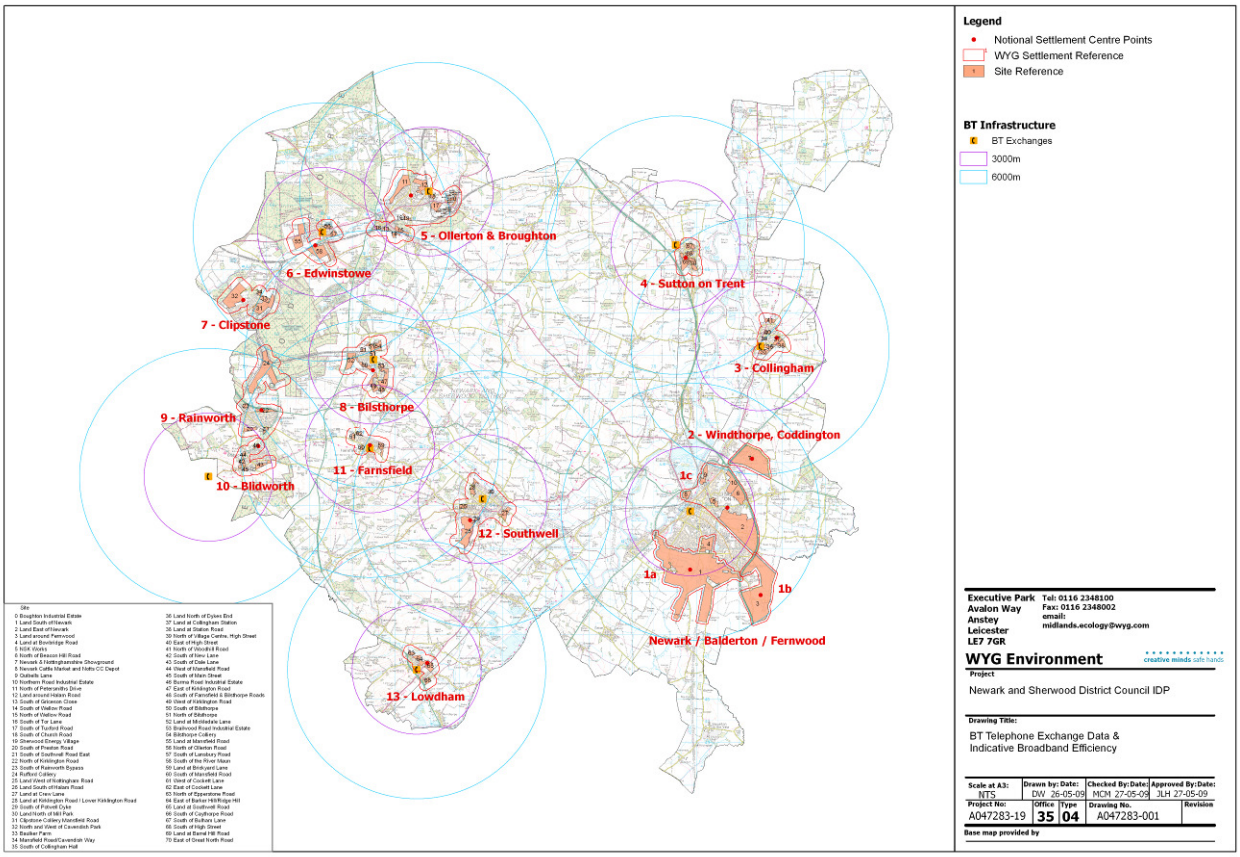


Figure 7.8: Settlement Locations in Proximity to Telephone Exchange

WYG Settlement Reference	Broadband Response Comments
1A & 1B - Newark, Balderton and Fernwood	The majority of this settlement is located more than 3km from the Exchange, therefore broadband service is likely to be less responsive than those settlements located closer to the telephone exchange
1C - Newark, Balderton and Fernwood	The majority of this settlement is located within 1.5km of the Exchange, therefore broadband service is likely to be good, however outlying areas of the settlement may have a less responsive broadband service where they are located more than 2km from the Exchange
2 - Winthorpe and Coddington	The majority of this settlement is located more than 3km from the Exchange, therefore broadband service is likely to be less responsive than those settlements located closer to the telephone exchange
3- Collingham	The majority of this settlement is located within 1.5km of the Exchange, therefore broadband service is likely to be good
4 – Sutton on Trent	The majority of this settlement is located within 1.5km of the Exchange, therefore broadband service is likely to be good
5 – Ollerton and Boughton	The majority of this settlement is located within 1.5km of the Exchange, therefore broadband service is likely to be good, however outlying areas of the settlement may have a less responsive broadband service where they are located more than 2km from the Exchange
6 - Edwinstowe	The majority of this settlement is located within 1.5km of the Exchange, therefore broadband service is likely to be good

7 - Clipstone	The majority of this settlement is located more than 3km from the Exchange, therefore broadband service is likely to be less responsive than those settlements located closer to the telephone exchange
8 - Bilsthorpe	The majority of this settlement is located within 1.5km of the Exchange, therefore broadband service is likely to be good
9 - Rainworth	The majority of this settlement is located more than 3km from the Exchange, therefore broadband service is likely to be less responsive than those settlements located closer to the telephone exchange
10 - Blidworth	The majority of this settlement is located between 2km and 3km from the Exchange, therefore broadband service is likely to be less responsive than those settlements located closer to the telephone exchange
11 - Farnsfield	The majority of this settlement is located within 1.0km of the Exchange, therefore broadband service is likely to be good
12 - Southwell	The majority of this settlement is located within 1.5km of the Exchange, therefore broadband service is likely to be good, however outlying areas of the settlement may have a less responsive broadband response where they are located more than 2km from the Exchange
13- Lowdham	The majority of this settlement is located within 1.0km of the Exchange, therefore broadband service is likely to be good

Table 7.3: Assessment of Likely Broadband Response Based On Settlement Distance from Telephone Exchange

7.3.9 WASTEWATER - EXISTING ASSETS

7.3.9.1 Severn Trent Water has twenty three sewage treatment works (STW's) in the District and these are located at Alverton, Amen Corner (Caunton), Balderton, Bilsthorpe, Boughton, Clifton, Collingham, Crankley (Newark), Cromwell, Eakring, Edwinstowe, Elston, Farndon, Farnsfield, Halam, Harby, Kirklington, Kneesall, Laxton, Perlethorpe, Rainworth and Southwell. Additionally Settlements are served by Mansfield Bath Lane, Stoke Bardolph and Sutton on Trent sewage treatment works.

7.3.9.2 Anglian Water has one STW within the District, which is located at Barnby in the Willows. There is also a major STW to the west of the District at Stoke Bardolph and Settlements at Lowdham currently drain to this sewage treatment works together with a large portion of the Nottingham catchment.

7.3.10 WASTEWATER - EXISTING NETWORK CONSTRAINTS AND DEFICIENCIES

7.3.10.1 It is understood from a review of the JMP Water Cycle Strategy – Detailed Strategy that there are currently no known problems with the capacity of the existing sewage treatment works and upstream sewerage network to accommodate existing flows, with the exception of Newark where parts of the sewerage network becomes overloaded during storm conditions. It has also been identified by Severn Trent Water that there are current sewer flooding problems within Ollerton & Boughton, Rainworth, Farnsfield and Southwell (Settlements 5, 9, 11, and 12),

however Severn Trent Water expect to have these issues resolved by undertaking planned capital investment within the next 2 to 3 years.

7.3.10.2 The increased wastewater load generated by population and employment growth within the District (as generated by the Councils Preferred Growth Option) will place an increased demand on the sewage treatment facilities and upstream sewerage networks. The need for upgrading works to accommodate this Preferred Growth Option will need to be investigated further by both Anglian Water and Severn Trent Water, however it should be highlighted that Severn Trent Water are currently developing a scheme to address the sewer flooding issues within Newark, and these works are likely to cater for some of the population and employment growth surrounding Newark.

7.3.10.3 The following comments are based on the information contained within the JMP Water Cycle Strategy – Detailed Strategy and consultation undertaken with Severn Trent Water on 15 May 2009 however the waste water loading figures generated by the Councils Preferred Growth Option should be assessed by Severn Trent Water and Anglian Water in order that a robust assessment of constraints can be identified.

7.3.10.4 At Newark, improvements to the existing sewerage system are required within the town centre to resolve known capacity issues; however Crankley Point STW has reasonable capacity to accommodate growth within the areas of the town served by the works.

7.3.10.5 Severn Trent Water has identified that there is potentially insufficient capacity at Balderton, STW and in order to accommodate the foul flows from the extension of the south and south east of Newark, comprehensive expansion of this STW will be required. There is currently no plans within AMP 5 (2010 – 2015) for this upgrading to be undertaken by Severn Trent Water. Detailed modelling will be required to determine the requirement and timescale for any improvements once details of development build-out rates are available. At that stage early discussions with Severn Trent Water are recommended to identify how any required improvements will be delivered. It may be possible for Severn Trent Water to fund and deliver improvements as part of their AMP6 (2015-2020) improvement programme however; if improvements are required earlier then developer funding (via Section 106 Agreements) may be required to help bring the works forward.

7.3.10.6 The growth within Ollerton and Boughton may necessitate upgrading of the STW at Boughton; however the Council's Preferred Growth Option considers only 513 new residential properties,

whereas the Water Cycle Study considered a development magnitude of up to 1500 new residential properties. The adequacy of the STW to accommodate 513 residential units will need to be considered by Severn Trent Water.

7.3.10.7 Consultation undertaken with each of the sewerage undertakers in regard to more optimistic growth scenarios suggested insufficient capacity at Southwell, Bilsthorpe, Collingham, Farnsfield and Sutton on Trent Sewage Treatment Works. The reduced growth aspirations being pursued in the Preferred Growth Option may not trigger works at each of these Treatment Works however this needs to be considered further by Severn Trent Water.

7.3.10.8 It has been identified that Clipstone, Rainworth and Edwinstowe STW's are likely to have sufficient capacity to accommodate growth.

7.3.10.9 Growth at Lowdham is unlikely to be constrained by treatment capacity at Stoke Bardolph STW, however will likely be constrained by the capacity of the village pumping station and rising main to Stoke Bardolph STW.

7.4 ADDRESSING SHORTFALLS TO MEET FUTURE GROWTH

7.4.1 WATER - INFRASTRUCTURE REQUIREMENTS, FUNDING AND PROGRAMME

7.4.1.1 The infrastructure requirements to accommodate the Council's Preferred Growth Option have been based on the consultations undertaken with STW during May 2009 and the information contained within the JMP Water Cycle Study: Detailed Strategy Report. These consultations should be updated to reflect the Council's Preferred Growth Option however this will require detailed modelling by Severn Trent Water hence it is likely to take several months to complete.

7.4.1.2 JMP has identified that Severn Trent Water are currently developing two schemes to directly provide security of supply to the District. The first scheme is a new river abstraction and water treatment works at Newark which would be capable of delivering 30Ml/day. The second strategic scheme is a new river intake and water treatment works at West Stockwith located to the north of Gainsborough which would be capable of delivering 100Ml/day. This would primarily serve an area north of the District but could also extend to the north west of the District around Ollerton and Boughton.

7.4.1.3 In addition to the above proposal by Severn Trent Water, Anglian Water is considering improvements at the Newton on Trent Water Treatment Works within the Lincoln water supply

zone which would deliver up to 30Ml/day. Although this is being considered as part of forward planning for growth within the Anglian Water supply zone, it is likely that this scheme could support the network within the north eastern part of the District.

7.4.1.4 Strategic network reinforcement is required to accommodate the growth identified within the emerging LDF for Newark, Balderton and Fernwood (Settlements 1A, 1B and 1C). Severn Trent Water has advised that approximately 13km of 500mm/600mm strategic water main had been identified as a possible reinforcement solution.

7.4.1.5 The new strategic water main would likely extend from the existing Carr Colston strategic water main located 13km to the south of Newark (near the A46 – Bingham roundabout), and the cost of this scheme is estimated at c.£6m. The scheme will likely to be triggered by a developer application however the scheme would also take into account future growth. Although the majority of the costs will be developer funded, Severn Trent Water may forward fund elements of any infrastructure upsizing included to incorporate further growth, and claw this back from subsequent developer applications; the fine detail of the 'clawback' is yet to be defined.

7.4.1.6 Severn Trent Water advised that a developer has proposed to commence onsite development at Land South of Newark (1A) in 2011; however this is subject to market conditions and a successful planning application being made. Severn Trent Water advised that completion of any strategic scheme would likely be 3-4 years away due to design and environmental impact considerations. An interim solution was likely to be implemented by Severn Trent Water (possibly reinforcement of the local distribution network) to allow a first phase of development to progress while the strategic scheme was being procured.

7.4.1.7 The Water Cycle Study: Detailed Strategy report states that Severn Trent Water has planned within its PR09 submission development expansion at Newark and Balderton, Southwell, Collingham, Farnsfield, Lowdham, and Sutton on Trent.

7.4.1.8 It is therefore likely that minor downstream network improvements to the distribution water infrastructure would also be required to accommodate the growth identified within the emerging LDF for Collingham, Sutton on Trent, Ollerton and Boughton, Farnsfield, Southwell, Lowdham, (Settlements 3, 4, 5, 11, 12, and 13), however Severn Trent Water will need to review this based on the Councils Preferred Growth Option.

7.4.1.9 Additionally for the outer lying settlements at Edwinstowe, Clipstone, Bilsthorpe, Rainworth and Blidworth (Settlements 6, 7, 8, 9, and 10) it is believed that network reinforcement will only be required at local distribution level and not be required at a strategic level.

7.4.1.10 The main population growth areas have been identified around Newark in the east, and the north west part of the District. The north west part of the District is closest to the Severn Trent Water strategic network and treatment sources, and therefore development in this location might be considered easier to supply with water.

7.4.1.11 The current supply capacity at Newark is understood to be constrained by the transmission network's capability to convey water from remote water resources, and significant capital investment is needed to resolve this issue. Severn Trent Water has proposed a scheme within the AMP5 (the 2010 to 2015 planned capital investment programme) to address this issue.

7.4.1.12 It is recommended that this report is reviewed once preliminary network modelling has been carried out by Severn Trent Water (based on the residential and employment figures for the Councils Preferred Growth Option) at which point the capacity of the existing water resources and strategic water network will be more clearly understood. Until this has been completed it is not possible to robustly identify the likely infrastructure required to provide an adequate water supply to each Settlement.

Table 7.4: Summary of Likely Offsite Water Infrastructure to Accommodate the Demand Generated By Each Settlement

WYG Cluster Ref	Likely Point of Connection with Sufficient Capacity	Likely Scope of Network Reinforcement	Indicative Capital Cost of Offsite Reinforcement	Developer or Statutory Undertaker Funded	Likely Programme
1A, 1B, 1C - Newark, Balderton and Fernwood, and 2- Winthorpe and Coddington	Carr Colston strategic water main located 13km to the south of Newark (Near the A46 – Bingham Roundabout)	13km of offsite 500mm diameter water main.	Circa £6,000,000	The works will be triggered by a developer application and will therefore be largely be developer funded	3 to 4 years from point of developer application
3- Collingham	TBC as part of formal developer application, however likely to be local distribution network	Minor reinforcement to the local distribution network may be required.	A budget figure of £500 per property should be included for budgeting purposes	The works will be triggered by a developer application and will therefore be largely be developer funded	12-18 months from point of developer application
4 – Sutton on Trent	TBC as part of formal developer application, however likely to be local distribution network	Minor reinforcement to the local distribution network may be required.	A budget figure of £500 per property should be included for budgeting purposes	As Above	As Above
5– Ollerton and Boughton	TBC as part of formal developer application, however likely to be local distribution network	Minor reinforcement to the local distribution network may be required.	A budget figure of £500 per property should be included for budgeting purposes	As Above	As Above
6 - Edwinstowe	TBC as part of formal developer application,	Minor reinforcement to the local distribution	A budget figure of £500 per property	As Above	As Above

	however likely to be local distribution network	network may be required.	should be included for budgeting purposes		
7 - Clipstone	TBC as part of formal developer application, however likely to be local distribution network	Minor reinforcement to the local distribution network may be required.	A budget figure of £500 per property should be included for budgeting purposes	As Above	As Above
8 - Bilsthorpe	TBC as part of formal developer application, however likely to be local distribution network	Minor reinforcement to the local distribution network may be required.	A budget figure of £500 per property should be included for budgeting purposes	As Above	As Above
9 &10 – Rainworth and Blidworth	TBC as part of formal developer application, however likely to be local distribution network	Minor reinforcement to the local distribution network may be required.	A budget figure of £500 per property should be included for budgeting purposes	As Above	As Above
11, 12 &13 – Farnsfield, Southwell and Lowdham	TBC as part of formal developer application, however likely to be local distribution network	Minor reinforcement to the local distribution network may be required.	A budget figure of £500 per property should be included for budgeting purposes	As Above	As Above

7.4.2 GAS - INFRASTRUCTURE REQUIREMENTS, FUNDING AND PROGRAMME

7.4.2.1 As highlighted within Section 7.3.4, there is a robust gas network within proximity to the all development settlements, with the exception of development Settlement 4 (Sutton on Trent) where the nearest strategic medium pressure gas main is located approximately 5km from the settlement boundary.

7.4.2.2 It is likely that the capacity of gas infrastructure in proximity to Settlements 1A, 1B, 1C, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, and 13 (Newark, Balderton, Fernwood, Winthorpe, Collingham, Ollerton & Boughton, Edwinstowe, Clipstone, Bilsthorpe, Rainworth, Blidworth, Farnsfield, Southwell and Lowdham) will not present a barrier to population or employment growth. It is however likely that significant offsite works would be required to bring a gas supply to the Settlement 4 (Sutton on Trent) boundary, and this might cost in the region of £925,000 (based on 5km of offsite main).

7.4.2.3 The gas mains and services for each settlement can either be procured from the incumbent gas transporter (National Grid Gas via their agent Fulcrum) or via an independent gas transporter (IGT) such GTC Utility Networks (there are many others).

7.4.2.4 Independent gas transporters will offer a contribution towards the capital cost of the gas infrastructure for residential development based on the revenue stream generated by the development, and this may offset the capital cost of any offsite and onsite infrastructure. The extent of any capital contribution cannot be determined until a formal application has been made for each development at detail design stage.

7.4.2.5 The programme for procurement of the gas infrastructure is likely to be developer driven for all settlements with the exception of Settlement 4 (Sutton on Trent), where significant offsite works is required. In this instance a lead in period of 12 to 18 months might be expected for procurement.

7.4.2.6 The table below identifies the likely offsite gas infrastructure requirements for each Settlement. These requirements should however be treated with care, pending an assessment by National Grid Gas based on the residential and employment figures for the Councils Preferred Growth Option. It should be noted however that the gas loading figures generated by the Councils Preferred Growth Option are less than those previously assessed by National Grid Gas in relation to the original development scenario option 1 to 4, and therefore the findings within this study are likely to be a worst case scenario.

Table 7.5: summary of likely offsite gas infrastructure to accommodate the demand generated by each Settlement

WYG Cluster Ref	Likely Point of Connection with Sufficient Capacity	Likely Scope of Network Reinforcement	Indicative Capital Cost of Offsite Reinforcement	Developer or Statutory Undertaker Funded	Likely Programme
1A - Newark, Balderton and Fernwood	The local 250mm PE medium pressure gas network within Newark (Beech Avenue or Hawton Lane) is likely to be sufficient.	N/A	N/A	Offsite works unlikely, although onsite gas mains and services procured by the developer.	Developer led programme
1B- Newark, Balderton and Fernwood	The local 180mm Medium Pressure Gas Main is likely to be sufficient.	N/A	N/A	Offsite works unlikely, although onsite gas mains and services procured by the developer.	Developer led programme
1C- Newark, Balderton and Fernwood	The local 150mm Medium Pressure Gas Main is likely to be sufficient.	N/A	N/A	Offsite works unlikely, although onsite gas mains and services procured by the developer.	Developer led programme
2– Winthorpe and Coddington	The local 125mm Medium Pressure Gas Main is likely to be sufficient.	N/A	N/A	Offsite works unlikely, although onsite gas mains and services procured by the developer.	Developer led programme
3 - Collingham	The local 180mm Medium Pressure Gas Main is likely to be sufficient.	N/A	N/A	Offsite works unlikely, although onsite gas mains and services procured by the developer.	Developer led programme
4 – Sutton on Trent	No gas mains in the vicinity of the settlement. A connection from the existing medium pressure main located 5km from the site is the closest connection point.	5km of offsite main	£925,000 for 5km of offsite main	The offsite works are likely to be developer funded, although some of this capital cost may be offset if onsite mains and services are procured via an iGT.	12 – 18 Months for construction of offsite mains
5 – Ollerton and Boughton	The local 250mm Medium Pressure Gas Main is likely to be sufficient.	N/A	N/A	Offsite works unlikely, although onsite gas mains and services procured by the developer.	Developer led programme
6 - Edwinstowe	The local 180mm Medium Pressure Gas Main is likely to be sufficient.	N/A	N/A	Offsite works unlikely, although onsite gas mains and services procured by the developer.	Developer led programme
7 - Clipstone	The local 180mm Medium Pressure Gas Main is	N/A	N/A	Offsite works unlikely, although onsite gas mains and	Developer led programme

	likely to be sufficient.			services procured by the developer.	
8 - Bilsthorpe	The local 180mm Medium Pressure Gas Main is likely to be sufficient.	N/A	N/A	Offsite works unlikely, although onsite gas mains and services procured by the developer.	Developer led programme
9 - Rainworth	The local 180mm Medium Pressure Gas Main is likely to be sufficient.	N/A	N/A	Offsite works unlikely, although onsite gas mains and services procured by the developer.	Developer led programme
10 - Blidworth	The local 125mm Medium Pressure Gas Main is likely to be sufficient.	N/A	N/A	Offsite works unlikely, although onsite gas mains and services procured by the developer.	Developer led programme
11 - Farnsfield,	The local 180mm Medium Pressure Gas Main is likely to be sufficient.	N/A	N/A	Offsite works unlikely, although onsite gas mains and services procured by the developer.	Developer led programme
12 –Southwell,	The local 6 inch Medium Pressure Gas Main is likely to be sufficient.	N/A	N/A	Offsite works unlikely, although onsite gas mains and services procured by the developer.	Developer led programme
13 – Lowdham	The local 180mm Medium Pressure Gas Main is likely to be sufficient.	N/A	N/A	Offsite works unlikely, although onsite gas mains and services procured by the developer.	Developer led programme

7.4.3 ELECTRICITY

7.4.3.1 There is potentially insufficient capacity at Hawton Primary Substation or Hawton BSP to accommodate Settlements 1A, 1B or 1C (Newark, Balderton and Fernwood) either as individual or combined Settlements. It is therefore likely that one or more new Primary Substations (c.3000m²) plus reinforcement of Hawton BSP would be required to accommodate these Settlements; this may also include new 132kV or 33kV circuits or reinforcement of existing 132kV or 33kV circuits upstream and downstream of Hawton BSP.

7.4.3.2 It would appear that there is sufficient capacity at the local Primary Substations to accommodate the preferred development scenario for Settlements 2, 3, 4, 5, 6, 8, 9, 10, 11, 12 and 13 (Winthorpe, Collingham, Sutton on Trent, Ollerton and Boughton, Edwinstowe, Bilsthorpe, Rainworth, Blidworth, Farnsfield, Southwell, Lowdham). However it might be considered necessary to install new 11kV circuits from each of these sites to the Primary Substation (with new 11kV circuit breakers at the Primary Substation).

7.4.3.3 The loads generated by Settlements 4, 6, 11 and 13 (Sutton on Trent, Edwinstowe, Farnsfield and Lowdham) would appear to be sufficiently low (<1MVA), and may be able to be accommodated from the local 11kV network in proximity to each Settlement.

7.4.3.4 The development within settlement 7 (Clipstone) will push the Crown Farm Primary Substation 0.75MVA above its firm capacity. The need for developer funded reinforcement is unlikely if

the Clipstone settlement is made up of a number of dispersed sites who each make separate small applications (<0.5MVA) for new electricity infrastructure. However there is a risk of upgrading of the Primary Substation or upstream circuits to accommodate the demand from the Clipstone settlement. As a worst case scenario, a new developer funded Primary Substation could be required (circa£3.5M).

Table 7.6 identifies the likely offsite electricity infrastructure requirements for each Settlement area together with an indicative capital cost, mechanism for funding and programme for implementation.

WYG Cluster Ref	Point of Connection with Sufficient Capacity	Likely Scope of Network Reinforcement	Indicative Capital Cost of Off-site Reinforcement	Developer or Statutory Undertaker Funded	Likely Programme
1A - Newark, Balderton and Fernwood	Insufficient Capacity at Hawton Primary Substation and BSP.	Upgrade of Hawton BSP plus 0.5km of twin 33kV circuits from Hawton BSP to a new 3000m² Primary Substation within or in proximity to the new settlement. It is possible that new 132kV circuits may be required upstream of Hawton BSP.	£TBC for BSP upgrades, however likely to be funded by Central Networks. £3,500,000 + £500,000 = £4,000,000 for Primary Substation and 33kV circuits	Reinforcement of the BSP and any upstream 132kV circuits is likely to be funded by Central Networks, however the downstream network (33kV cables and Primary Substation) would be developer funded (c.£4.5M).	18-24 Months for Reinforcement of BSP. 12-18 Months for Primary Substation and 33kV works.
1B - Newark, Balderton and Fernwood	Insufficient Capacity at Hawton Primary Substation and BSP.	Upgrade of Hawton BSP and any upstream 132kV circuit reinforcement, plus 3km of twin 33kV circuits from Hawton BSP to a new 3000m² Primary Substation within or in proximity to the settlement. Should be considered in conjunction with settlement 1A and 1C	£TBC for BSP upgrades, however likely to be funded by Central Networks. £3,500,000 + £1,000,000= £4, 500,000 for Primary Substation and 33kV circuits	Reinforcement of the BSP and any upstream 132kV circuits is likely to be funded by Central Networks, however the downstream network (33kV cables and Primary Substation) would be developer funded. (C.£4.5M).	18-24 Months for Reinforcement of BSP. 12-18 Months for Primary Substation and 33kV works.
1C - Newark, Balderton and Fernwood	Insufficient Capacity at Newark Junction Primary Substation and BSP.	Upgrade of Hawton BSP and any upstream 132kV circuit reinforcement, plus 3km of twin 33kV circuits from Hawton BSP to a new Primary Substation within or in proximity to the settlement. Should be considered in conjunction with settlement 1A and 1B	£TBC for BSP upgrades, however likely to be funded by Central Networks. £3,500,000 + £1,000,000= £4, 500,000 for Primary Substation and 33kV circuits	Reinforcement of the BSP and any upstream 132kV circuits is likely to be funded by Central Networks, however the downstream network (33kV cables and Primary Substation) would be developer funded. (C.£4.5M).	18-24 Months for Reinforcement of BSP. 12-18 Months for Primary Substation and 33kV works.
2 - Winthorpe a Coddington	Newark Junction	2.9km of twin 11kV circuits from settlement to existing Primary Substation plus new 11kV circuit breakers	£586,500	Developer	Developer led programme
3 - Collingham	Swinderby	3.3km of twin 11kV circuits from settlement to existing Primary Substation plus new 11kV circuit breakers	£660,500	Developer	Developer led programme
4 – Sutton on Trent	Carlton On Trent	1.3km of twin 11kV circuits from settlement to existing Primary Substation	£290,500	Developer	Developer led programme

		plus new 11kV circuit breakers			
5 – Ollerton and Boughton	Ollerton	2.1km of twin 11kV circuits from settlement to Primary Substation (inc 11kV circuit breakers).	£438,500	Developer	Developer led programme
6 - Edwinstowe	Thoresby	2.1km of twin 11kV circuits from settlement to existing Primary Substation plus new 11kV circuit breakers	£438,500	Developer	Developer led programme
7 - Clipstone	Crown Farm	3.25km of twin 11kV circuits from settlement to existing Primary Substation plus new 11kV circuit breakers	£651,250 (Note: Development within the Clipstone Catchment will push the Primary Substation 0.75MV above its firm capacity and there is a risk of additional reinforcement being triggered.	Developer	Developer led programme
8 - Bilsthorpe	Bilsthorpe	2km of twin 11kV circuits from settlement to existing Primary Substation plus new 11kV circuit breakers	£420,000	Developer	Developer led programme
9 - Rainworth	Rufford	Twin 11kV circuits from settlement to existing Primary Substation plus new 11kV circuit breakers	£450,000	Developer	Developer led programme
10 - Blidworth	Blidworth	Upgrade of Annesley BSP. 2.9km of twin 11kV circuits from settlement to existing Primary Substation plus new 11kV circuit breakers	£TBC for BSP £586,500 for offsite 11kV cables.	Reinforcement of the BSP is likely to be funded by Central Networks Developer. The 11kV circuits and cabling will be developer funded	18-24 Months for Reinforcement of BSP Developer led programme for 11kV cabling.
11 - Farnsfield	Farnsfield	0.7km of twin 11kV circuits from settlement to existing Primary Substation plus new 11kV circuit breakers	£TBC for BSP £179,500 for offsite 11kV cables.	Reinforcement of the BSP is likely to be funded by Central Networks Developer. The 11kV circuits and cabling will be developer funded	18-24 Months for Reinforcement of BSP Developer led programme for 11kV cabling.
12 – Southwell	Southwell	1.6km of twin 11kV circuits from settlement to existing Primary Substation plus new 11kV circuit breakers	£346,000	Developer	Developer led programme
13 - Lowdham	Caythorpe	0.5km of twin 11kV circuits from settlement to existing Primary Substation plus new 11kV circuit breakers	£142,500	Developer	Developer led programme

7.4.3.5 The electricity infrastructure as described above and in Table 7.6 can either be procured from the host distribution network operator (Central Networks) or in some instances through an independent operator (IDNO) such as Inexus, GTC or SSE (typically they are attracted to sites with more than 500 dwellings). An IDNO will operate in a similar way to an IGT (independent

gas transporter) in that they will design, build, own and operate a utility network as a licensed electricity distributor using exactly the same model as Central Networks – this form of competition is often referred to as an embedded network.

7.4.3.6 Due to the electricity demand required by Settlement 1A (c. 16MVA), it is likely that this Settlement would require its own Primary Substation, however it may be possible to construct a single Primary Substation for Settlements 1B and 1C (Balderton and Fernwood) which have a combined demand of c.21MVA. Furthermore reinforcement of the Hawton BSP will also be required to accommodate the electricity demands from Settlements 1A, 1B, 1C, 2, 3, 4, 12 and 13 (Newark, Balderton, Fernwood, Winthorpe, Collingham, Sutton on Trent, Southwell and Lowdham). Although reinforcement of the BSP is likely to be funded by Central Networks (as it is two voltage levels above that required for each development) any downstream 33kV cabling from the BSP and each new Primary Substation would be developer funded.

7.4.3.7 As a new Primary Substation and the upgrade of Hawton BSP and 132kV/33kV circuits is required to support a maximum of 9 discrete development Settlements, the procurement option should be carefully considered. Central Networks has a duty to operate a form of capital claw-back known as the 'apportionment rule'; any developer investing in wider network improvements should pay only an equitable proportion of the capital cost provided other developers benefit within 5 years of the initial investment.

7.4.3.8 A new Primary Substation requires 3000m² of land should be considered as part of the masterplan development for settlements 1A, 1B and 1C.

7.4.3.9 An alternative form of equitable capital investment within a multi stakeholder model might be the use of a bespoke collaboration \ partnership agreement.

7.4.4 TELECOMS - INFRASTRUCTURE REQUIREMENTS, FUNDING AND PROGRAMME

7.4.4.1 Historically BT Openreach did not generally charge for network reinforcement triggered by new development and would free-issue all onsite ducting and joint boxes for installation by the developer as part of the onsite groundwork package.

7.4.4.2 Since January 2008 BT Openreach has recharged network reinforcement costs should these costs exceed £3,400 per residential unit; which is typically very rare.

7.4.4.3 Due to the scale of development proposed within each development it is unlikely that network reinforcement charges would exceed the £3,400 per residential unit threshold, however Settlements that are located more remotely from trunk BT infrastructure, are likely to be more at risk of triggering chargeable network reinforcement. BT Openreach have advised that this will not be considered in detail until a detailed formal application has been submitted by a developer once planning approval has been granted and the development is due to commence on site.

7.4.5 WASTEWATER - INFRASTRUCTURE REQUIREMENTS, FUNDING AND PROGRAMME

7.4.5.1 The infrastructure requirements and costs to accommodate growth within the District cannot be fully understood until Severn Trent Water and Anglian Water have undertaken an assessment in relation to the wastewater demand generated by each settlement within the Council's Preferred Growth Option. The detailed consultation previously convened with Severn Trent Water and Anglian Water in 2009 was based on more optimistic growth scenarios and therefore provided very much worst case investment needs.

7.4.5.2 The information contained within this section of the report is therefore based on a meeting between WYG, JMP and Severn Trent Water on 15 May 2009 and the findings of the Water Cycle Study: Detailed Strategy report.

7.4.5.3 Information provided by Severn Trent Water on the likely capability of each STW to accommodate the additional growth identified within the emerging LDF together with further commentary by WYG is shown in Table 7.7, and can be summarised as follows:

7.4.5.4 Balderton STW has insufficient capacity to accommodate growth generated by the emerging LDF, and upgrading of the treatment works would be required. A £7m investment programme is anticipated by Severn Trent Water as part of their planned capital investment programme to accommodate Settlements 1A, 1B, & 1C at Newark, Balderton and Fernwood. This would be wholly funded by Severn Trent Water for sites contained within the adopted LDF or an existing local plan, however may be developer funded if triggered by any development sites that are outside of the adopted LDF/local plan.

7.4.5.5 It is understood from the Water Cycle Study: Detailed Strategy report that upgrading of Balderton STW is not included within the current AMP 5 programme (2010 – 2015) and there is a risk that these upgrading works would not be completed until the end of AMP 6, i.e. 2020.

7.4.5.6 The STW at Collingham, Sutton on Trent, Bilsthorpe, Farnsfield and Southwell (Settlements 3, 4, 8, 11 and 12) are likely to require upgrading to accommodate the growth identified within the emerging LDF. As identified above, this is likely to be funded by Severn Trent Water for any sites contained within the adopted LDF or local plan, however may be developer funded if triggered by any development sites that are outside of the adopted LDF/local plan. Again the timing of any upgrading works will be critical as Severn Trent Water have not planned for these works within AMP 5 (2010 – 2015), and therefore any upgrading may not be completed until the end of AMP 6, i.e. 2020.

7.4.5.7 It is possible that sufficient capacity exists at Edwinstowe and Clipstone (Settlements 6 and 7) to accommodate the growth identified within the Councils Preferred Growth Option, however this is subject to further assessment by Severn Trent Water.

7.4.5.8 There is sufficient capacity at Rainworth STW to accommodate the growth identified within the emerging LDF for Settlements at Rainworth and Blidworth (Settlements 9 and 10).

7.4.5.9 There is sufficient capacity at Stoke Bardolph STW to accommodate the growth identified within the emerging LDF for Lowdham (Settlement 13); however the local pumping station within Lowdham and the rising main between Lowdham and Stoke Bardolph STW may require upgrading (6.7km of rising main). This activity would likely be wholly developer funded.

7.4.5.10 The Water Cycle Study: Detailed Strategy report identifies that upgrading of the pumping station and rising main from the Sutton on Trent settlement to Cromwell STW may be required (3.2km of rising main), however it should be noted that this assessment was based on 201 residential units. The Councils Preferred Growth Option contains only 46 residential units, and therefore for the risk of triggering the need for this upgrading is reduced, although cannot be ruled out until an assessment has been made by Severn Trent Water.

7.4.5.11 The capability of the local sewer network between each site and the receiving STW to accommodate the additional foul flows generated by each settlement is not known. There may be a need for reinforcement of the local sewer network between each settlement, site and the STW to accommodate growth, however this cannot be confirmed until detailed network modelling has been undertaken by Severn Trent Water in response to detailed development applications. This should be considered when reviewing the Figures contained within Table 7.7.

7.4.5.12 It should be highlighted that any network reinforcement of the local sewage network would likely be developer funded, and a budget figure of £500 per property has been included at this preliminary stage.

Table 7.7: Summary of Likely Offsite Foul Water Infrastructure to Accommodate the Demand Generated By Each Settlement

WYG Settlement Ref	Likely Point of Connection with Sufficient Capacity	Likely Scope of Network Reinforcement	Indicative Capital Cost of Offsite Reinforcement	Developer or Statutory Undertaker Funded	Likely Programme
1A, 1B, 1C - New Balderton and Fernwood, and Winthorpe and Coddington	Connection point on existing sewer network to be confirmed by Severn Trent Water as part of developer application.	Upgrading of Balderton STW plus possible upgrading of the local sewer network.	A budget figure of £500 per property should be included for reinforcement of local sewer network + £7,000,000 for upgrades to STW.	The upgrading of the STW will be funded by Severn Trent Water where development sites are within approved LDF (developer funded if sites are not within approved LDF). Upgrading of the local sewer network would be developer funded if identified.	Severn Trent Water have not made provision within AMP5 (2010-2015), and therefore there is a risk that any upgrading would not be completed until AMP 6 (2015-2020)
3- Collingham	Connection point on existing sewer network to be confirmed by Severn Trent Water as part of developer application.	Possible upgrading of Collingham STW plus possible upgrading of the local sewer network.	A budget figure of £500 per property should be included for reinforcement of local sewer network + £TBC for upgrades to STW	As above	As above
4 – Sutton on Trent	Connection point on existing sewer network to be confirmed by Severn Trent Water as part of developer application.	Possible upgrading of Cromwell STW plus upgrading of the pumping station and rising main which conveys flows from Sutton on Trent to Cromwell STW.	£200,000 for pumping station and £960,000 for 3.2km of offsite rising main. =£1,160,000 might be considered to be a worst case scenario if direct pumping to the STW is required	The offsite infrastructure will likely be developer funded	Developer led programme
5– Ollerton and Boughton	Connection point on existing sewer network to be confirmed by Severn Trent Water as part of developer application.	Upgrading of Boughton STW may be required plus possible upgrading of the local sewer network for larger sites on the north side of Old Ollerton.	A budget figure of £500 per property should be included for reinforcement of local sewer network + £TBC for upgrades to STW	As Above	As above
6 - Edwinstowe	Connection point on existing sewer network to be confirmed by Severn Trent Water as part of developer application.	Severn Trent Water has advised that treatment capacity is unlikely to be an issue. Possible upgrading of the local sewer network may be required. Larger sites to the west of the village could require upgrading of trunk sewers into the village.	A budget figure of £500 per property should be included for reinforcement of local sewer network.	The offsite infrastructure will likely be developer funded	Developer led programme
7 - Clipstone	Severn Trent Water has advised that the settlement is likely to drain to either Edwinstowe or Mansfield Bath Lane STW's.	Severn Trent Water has advised that treatment capacity is unlikely to be an issue. A new pumping station and rising main may be required to convey	£200,000 for pumping station and £1,000,000 for 4km of offsite rising main. =£1,200,000 might be considered to be a worst case scenario if direct pumping to the	The offsite infrastructure will likely be developer funded	Developer led programme

	The capability of the local sewage network to accommodate additional growth is not known.	foul flows from the settlement to the STW.	STW is required		
8 – Bilsthorpe	Severn Trent Water has advised that there is unlikely to be sufficient capacity at Bilsthorpe STW to accommodate growth. The capability of the local sewage network to accommodate growth is also not known at this time.	Upgrading of Bilsthorpe STW will be required plus possible upgrading of the local sewer network.	A budget figure of £500 per property should be included for reinforcement of local sewer network + £TBC for upgrades to STW	The upgrading of the STW will be funded by Severn Trent Water where development sites are within approved LDF (developer funded if sites are not within approved LDF). Upgrading of the local sewer network would be developer funded	Severn Trent Water have not made provision within AMP5 (2010-2015), and therefore there is a risk that any upgrading would not be completed until AMP 6 (2015-2020)
9 – Rainworth	Severn Trent Water has advised that there is likely to be sufficient capacity at Rainworth STW to accommodate growth, however this available capacity may be reduced by any development taking place on the fringes of Mansfield. The capability of the local sewage network to accommodate growth is also not known at this time.	Possible upgrading of the local sewer network between each site and the treatment works to accommodate increased flows.	A budget figure of £500 per property should be included for reinforcement of local sewer network.	Upgrading of the local sewer network would be developer funded.	Developer led programme
10 Blidworth	Severn Trent Water has advised that this settlement is likely to drain to Rainworth STW which is believed to have sufficient capacity to accommodate growth. The capability of the local sewage network to accommodate growth is also not known at this time.	Possible upgrading of the local sewer network between each site and the treatment works to accommodate increased flows.	A budget figure of £500 per property should be included for reinforcement of local sewer network.	Upgrading of the local sewer network would be developer funded.	Developer led programme.
11 Farnsfield	Severn Trent Water has advised that there is unlikely to be sufficient capacity at Farnsfield STW to accommodate growth. The capability of the local sewage network to accommodate growth is also not known at this time.	Upgrading of Farnsfield STW will be required plus possible upgrading of the local sewer network.	A budget figure of £500 per property should be included for reinforcement of local sewer network + £TBC for upgrades to STW.	The upgrading of the STW will be funded by Severn Trent Water where development sites are within approved LDF (developer funded if sites are not within approved LDF). Upgrading of the local sewer network would be developer funded	Severn Trent Water have not made provision within AMP5 (2010-2015), and therefore there is a risk that any upgrading would not be completed until AMP 6 (2015-2020)
12 Southwell	Severn Trent Water has advised that there is unlikely to be sufficient capacity at Southwell STW to accommodate growth. The capability of the local sewage network	Upgrading of Southwell STW will be required plus possible upgrading of the local sewer network.	A budget figure of £500 per property should be included for reinforcement of local sewer network + £TBC for upgrades to STW.	The upgrading of the STW will be funded by Severn Trent Water where development sites are within approved LDF (developer funded if sites are not within approved LDF).	3 to 4 years from point of developer application.

	to accommodate growth is also not known at this time.			Upgrading of the local sewer network would be developer funded.	
13 Lowdham	Severn Trent Water has advised that there is sufficient treatment capacity at Stoke Bardolph STW. The pumping station within Lowdham and the rising main to and rising main Stoke Bardolph STW may not have sufficient capacity to accommodate growth.	Upgrading or replacement of the Lowdham pumping station and rising main over a length of approximately 6.7km.	£200,000 for pumping station and £1,675,000 for 6.7km of offsite rising main. =£1,875,000 might be considered to be a worst case scenario if direct pumping to the STW is required	The pumping station and rising main would be developer funded.	Developer led programme.

7.5 UTILITY INFRASTRUCTURE BUSINESS MODELS AND ALTERNATIVES

7.5.1 WATER - INFRASTRUCTURE BUSINESS MODELS AND ALTERNATIVES - THE MARKET

7.5.1.1 There are ten water and sewerage undertakers in England and Wales and sixteen water only undertakers. These undertakers are licensed to abstract, distribute and supply water under regulation. In recent times a number of new undertakers have been granted a water supply licence through the water supply licensing regime created within the Water Act 2003. To date there are seven new entrants who can purchase water wholesale for resale to new and large users (more than 50ml/year ~ circa 375 new residential dwellings) and in some instances introduce new supplies onto an existing incumbent operator's network (through abstraction boreholes or similar in order to remove/supply a similar quantity elsewhere). It is generally acknowledged that the water supply licensing regime is not delivering increased competition as few large users have actually switched water supplier to date.

7.5.2 WATER - CONTESTABLE AND NON-CONTESTABLE WORKS

7.5.2.1 Whether a new connection application is through the incumbent water undertaker, a non-incumbent water undertaker or a new entrant all new connections works can be broken into 'contestable' and 'non-contestable' operations; the same process is true of electricity and gas connections. Contestable operations are those activities that can be designed and built by any approved contractor or service provider through the WIRS Scheme (Water Industry Regulation Scheme managed by Lloyds). The contestable works are those that tend to be downstream of a point of connection to the existing network. The network connection itself is non-contestable as is all reinforcement upstream of the point of connection. Non-contestable works can only be undertaken by the incumbent water undertaker.

7.5.2.2 All connections into a live water main are non-contestable.

7.5.3 WATER - UNDERTAKER FUNDED CAPITAL INVESTMENT

7.5.3.1 All incumbent water undertakers have a duty to provide a new connection via Section 45 and 55 of the Water Industry Act 1991. Further, under Section 42 of the Water Industry Act 1991 a water undertaker must provide a financial contribution toward the capital cost of any requisitioned water main if the new requisitioned main has an inherent asset value (new domestic connections). The Water Act 2003 provides an additional model for cost sharing; the discounted aggregate deficit contribution. Under both the relevant deficit (S42 WIA91) and DADS models the sooner the maximum value of the asset is realised (the sooner the new development site becomes fully occupied) the greater the contribution from the water company. It is difficult to understand the new revenue stream from commercial development and therefore a DADS contribution might not be easily provided.

7.5.3.2 Water undertakers submit a five-year capital expenditure plan to Ofwat to determine the level of price raises that can be implemented to support population growth, network security, pressure improvement and leakage amongst other things. Once this plan is implemented water companies cannot easily derive additional capital funding for capitalised works other than through third party contributions. It might be argued that there is pressure for water companies to utilise developer funded activities to derive maximum benefit (however developer derived funding should not be utilised to support improvements to network operation except to maintain pressure and security of supply to existing customers at pre-development levels). Occasionally water companies align their capital investment programmes with major areas of new development (not necessarily that allocated in the local plan as this does not carry any development certainty), most often this capital investment will continue to be recovered from developers, but in the form of a 'claw-back' - often rechargeable as a 'roof tax' over and above the standard infrastructure charge for water and sewerage.

7.5.4 WATER - INSET LICENSES (AND COMMON CARRIAGE)

7.5.4.1 Effectively any water undertaker (non-incumbent or new entrant) can compete to supply water to a greenfield development or existing large user that requires more than 50ml/year (50,000,000 litres per year – equivalent to approximately 375 new residential dwellings at 146 litres per capita per day with an average population of 2.49 persons per dwelling). An undertaker may compete to supply water by obtaining an inset licence from Ofwat – a

mechanism which allows a non-incumbent operator to distribute and supply water with the same rights as the incumbent provider. Inset licenses are granted by Ofwat but the bureaucracy governing new licenses is onerous and to date only 11 inset licences have been granted since 1997.

7.5.5 GAS - TRANSPORTATION BUSINESS MODELS AND ALTERNATIVES - THE MARKET

7.5.5.1 The gas connections market is the most liberalised of all of the three key utility services; possibly because this industry was privatised before water and electricity and possibly because the regulator has been arguably stronger in regard to competition in connections generally.

7.5.5.2 Since the demise of Transco and National Grid Transco the national gas distribution network has been divided into its regional components (these regional distribution networks always existed behind the Transco brand). Scotia Gas Networks acquired the gas transportation (GT) networks in the south of England and Scotland (since renamed Southern Gas Networks and Scottish Gas Network – SGN). Wales and west utilities acquired the Welsh and west of England gas transportation network. Northern Gas Networks acquired the north of England. The four remaining gas transportation regions largely in the central parts of England were retained by National Grid.

7.5.5.3 National Grid Gas (NG) review local plans as they are released in order to influence longer term strategic planning of their network (5 year development price control review - DPCR), however specific development led strategic infrastructure will not be designed and constructed until triggered by the development itself. NG does not currently have any specific capital programmes in Newark and Sherwood District that will significantly affect the sites being considered in this study.

7.5.5.4 In each 5 year DPCR, an element of development growth is added, however unless a specific capital investment project or major development comes on-stream, the model is likely to remain fairly stable over the 5 year period.

7.5.5.5 NG review a revenue stream over a 10 year period, and the slow rate of occupation of business parks can often mean that developers are liable for 75% of the total capital cost of upstream reinforcement.

7.5.5.6 The contestable infrastructure works downstream of the point of connection (and including the point of connection itself), can be installed by an independent gas transporter (IGT) or

accredited (GIRS) contractor. An IGT if utilised might contribute to the cost of this asset based on the revenue stream generated by the proposed masterplan. Again this maximum new revenue stream that can be generated is based on the rate of occupation of the new premises.

7.5.5.7 The gas industry in Britain has evolved to a where many alternative connection services are now available on a competitive basis, while National Grid Gas continue to offer connection services in line with their obligations under the Gas Act.

7.5.5.8 Operating under the Gas Act 1986 (as amended 1995), National Grid Gas have an obligation to develop and maintain an efficient and economical pipeline system and, subject to that, to comply with any reasonable request to connect premises, provided that it is economic to do so.

7.5.5.9 In many instances, specific system reinforcement may be required to maintain system pressures for the winter period after connecting a new supply or demand. Depending on scale, reinforcement projects may have significant planning, resourcing and construction lead-times and that as much notice as possible should be given. In particular, National Grid Gas will typically require two to four years' notice of any project requiring the construction of high pressure pipelines or plant, although in certain circumstances, project lead-times may exceed this period. This is unlikely to affect proposed developments contained within this study.

7.5.6 GAS - DEVELOPER CONTRIBUTION VERSUS PLANNED CAPITAL INVESTMENT

7.5.6.1 In most instances, certainly where modest quantities of gas are required, gas networks will be extended into new development sites to provide new connections seemingly without the need for off-site reinforcement. In actual fact reinforcement is often required but will be funded directly by the incumbent GT with little noise.

7.5.6.2 Where larger quantities of gas is required, typically on larger new development sites, then upon application the incumbent GT may request (via an IGT or otherwise), a fee for undertaking a design study. This design study often takes six months and will identify a specific capital investment project that will enable the new connection activities to be undertaken (by a GT or IGT). Once the design study is completed an economic test will be completed to identify the proportion of the off-site network reinforcement project payable by the developer; again this is related to the new revenue stream generated by the development. The developer contribution is often a smaller proportion but the programme for off-site works might create a risk.

7.5.7 GAS - CONTESTABLE/NON-CONTESTABLE WORKS

7.5.7.1 The demarcation between contestable and non-contestable works is again the point of connection to the network however the actual connection to the network is now a contestable activity therefore there is significantly fewer risks using self-lay, multi-utility and embedded networks in the gas industry.

7.5.8 GAS - EMBEDDED NETWORKS

7.5.8.1 Embedded networks in the gas industry and construed as normal practise with few risks. Most residential, commercial and mixed-use development in England, Scotland and Wales utilise independent gas transporters (IGTs) to design, build and operate gas networks on new development sites. The market is currently led by GSC Utility Networks and Connect Utilities.

7.5.8.2 The reason that IGT led embedded networks have become popular in the gas sector is that all IGTs typically offer a large asset value contribution toward the contestable works (and the non-contestable works are mostly completed funded by the incumbent GT). In some instances developers pay no contribution for new gas mains and services when secured from an IGT.

7.5.9 GAS - SELF-LAY AND MULTI-UTILITY

7.5.9.1 As suggested above self-lay and multi-utility of gas mains and services carries fewer risks than water and electricity services; therefore gas mains and services installed by a water or electricity company acting as a multi-utility provider is often feasible whereas gas transporters undertaking multi-utility containing electricity and water services is a more risky operation.

7.5.10 ELECTRICITY - DISTRIBUTION BUSINESS MODELS AND ALTERNATIVES - THE MARKET

7.5.10.1 The electricity new connections market is largely facilitated through the fourteen licensed distribution network operators (DNOs). Each of these operators has an inherited network aligned to the former regional electricity companies. Recently the distribution market has been opened up to independent distribution network operators (IDNOs); Ofgem has granted licences to Connect, GSC, Energetics, and Laing Energy amongst others. Non-incumbent and independent DNOs can design, build, own and operate new distribution networks to support new connection activities within another operator's geographical area using a mechanism commonly referred to as an embedded network.

7.5.11 ELECTRICITY - LONG TERM DEVELOPMENT STATEMENTS AND CAPITAL INVESTMENT STRATEGY

7.5.11.1 Each DNO publishes a Long Term Development Statement; the current planning known as DPCR4 (development and planning control review) period matches AMP4 in the water industry, i.e. 2005 to 2010. This statement contains information on all strategic assets, capacity and forecast demands and is a good indicator whether works are planned that will benefit developers. Standard population growth funding attributed to each long term development plan is usually calculated from an extrapolation of actual demands on each of the primary networks over a number of preceding years and does not actively capture new development projects allocated in local plans or local development frameworks unless an 'availability charge' is being paid. Further, a DNO will not forward-fund network reinforcement attributable to new development until actually triggered by a formal new connection application. Therefore a large new development, if contained within a local plan or not, would probably require off-site network reinforcement before the new connections can be completed; this is certainly the case in the Newark and Sherwood District.

7.5.12 ELECTRICITY - AVAILABILITY CHARGES

7.5.12.1 If a developer wants to ensure that sufficient capacity is available on a network for a future date and 'availability charge' is paid, typically a monthly payment to the DNO (currently £0.45\kVA per annum) until the all new connections are completed. Again, this does not mean that off-site reinforcement will be forward-funded; any reinforcement of the network to secure the agreed new capacity will not be undertaken until a new connection application is received.

7.5.12.2 If an availability charge is not paid but a large lump-sum is paid to secure off-site reinforcement to support a multi-phase development and during this multi-phase development another developer requests a new connection on the same network there will be a risk that the second developer may utilise the spare capacity created such that the first developer may have to fund further network reinforcement. However, this practise should in part be mitigated by the 'apportionment rule' that has been operating since 2005, therefore the payment of availability charges should be considered carefully.

7.5.13 ELECTRICITY – RULE OF APPORTIONMENT

7.5.13.1 If a DNO is obliged to undertake network reinforcement to support a new connection project then the developer should contribute only to the proportion of the works that directly benefits

that developer. For example a new Primary Substation containing a 24MVA transformer may have to be established to support a new development requiring 8MVA; however the developer should fund only 33% of the capital cost. Subsequently the next developer utilising the benefit of this new substation would fund that part attributable the new demand. Effectively this is similar to the capital claw-back operated by the water industry whereby major developers will ultimately fund all network reinforcement over and above that which is defined as natural population growth in the Long Term Development Statements (or water AMP periods). In recent times a DNO is more likely to charge the developer 100% of the capital, of which part is refundable as other new developers apply for connections that benefit from this initial investment. There is a maximum 5-year window in which this 'claw-back' mechanism operates.

7.5.14 ELECTRICITY - CONTESTABLE/NON-CONTESTABLE WORKS

7.5.14.1 Contestable and non-contestable works in the electricity industry are the same as those within the water industry; demarcation between works that can be undertaken by any accredited contractor (Lloyds accredited) and those that can only be undertaken by the DNO is the point of connection to the existing DNO network. There is a concerted effort to change low-voltage live jointing operations to contestable works; this will greatly benefit local authority street lighting departments and multi-utility connection businesses.

7.5.15 ELECTRICITY - EMBEDDED NETWORKS

7.5.15.1 As suggested previously any non-incumbent or independent DNO can provide a developer with a new connection by building and adopting a network as an embedded network within another DNO's region. However it is very unlikely that a non-incumbent would offer to do this unless it is economically viable. A diversified peak demand of 5MVA might be utilised to determine viability; anything larger could be viable anything smaller would probably not be economic

7.5.15.2 When an independent or non-incumbent DNO is able to provide an embedded network such that genuine competition is available the non-incumbent network operator may wish to contribute to the installation of the new mains and services. This 'asset value' contribution is often viable because the embedded network will generate a new revenue stream based on the distribution of electricity to an end-user.

7.5.16 ELECTRICITY - SELF-LAY AND MULTI-UTILITY

7.5.16.1 Contestable connections activities (downstream of a point of connection) can be designed and installed by any competent service provider; a contractor or multi-utility service provider appointed by the developer. There are many advantages of this form of procurement but until live jointing is deliverable by the appointed contractor there are significant pitfalls.

7.5.17 TELECOMMUNICATIONS - BUSINESS MODELS AND ALTERNATIVES - PROVISION DUTIES

7.5.17.1 The main statutory instrument governing telecommunications is the Telecommunication Act 1984. This act was passed by the Government in 1984 to licence British Telecom when it was split off from the Post Office and privatised, and to provide a framework for promoting competition. Since that time other telecommunications network and service providers have been licensed, and now there are over 300 licensed companies. Their licenses are issued by the Department of Trade and Industry, but monitored and when necessary amended by Oftel (now Ofcom).

7.5.17.2 Oftel was set up under the Telecommunications Act 1984. Under this act Oftel had a number of functions. Briefly these were:

- To ensure that licensees comply with their licence conditions.
- The duties of Oftel were transferred to Ofcom when the Communications Act (2003) was introduced, and these duties were extended to include the following main responsibilities:
- It shall be the principal duty of Ofcom, in carrying out their functions:
- To further the interests of citizens in relation to communications matters; and
- To further the interests of consumers in relevant markets, where appropriate by promoting competition.

7.5.17.3 The things which Ofcom are required to secure in the carrying out of their functions include, in particular, each of the following:

- The optimal use for wireless telegraphy of the electro-magnetic spectrum;
- The availability throughout the United Kingdom of a wide range of electronic communications services;

- The availability throughout the United Kingdom of a wide range of television and radio services which (taken as a whole) are both of high quality and calculated to appeal to a variety of tastes and interests;
- The maintenance of a sufficient plurality of providers of different television and radio services;
- The application, in the case of all television and radio services, of standards that provide adequate protection to members of the public from the inclusion of offensive and harmful material in such services;
- The application, in the case of all television and radio services, of standards that provide adequate protection to members of the public and all other persons from both
- Unfair treatment in programmes included in such services; and
- Unwarranted infringements of privacy resulting from activities carried on for the purposes of such services.

7.5.17.4 Ofcom must also have regard, in performing those duties, to such of the following as appear to them to be relevant in the circumstances:

- the desirability of promoting the fulfilment of the purposes of public service television broadcasting in the United Kingdom;
- the desirability of promoting competition in relevant markets;
- the desirability of promoting and facilitating the development and use of effective forms of self-regulation;
- the desirability of encouraging investment and innovation in relevant markets;
- the desirability of encouraging the availability and use of high speed data transfer services throughout the United Kingdom;
- the different needs and interests, so far as the use of the electro-magnetic spectrum for wireless telegraphy is concerned, of all persons who may wish to make use of it;
- the need to secure that the application in the case of television and radio services of standards in the manner that best guarantees an appropriate level of freedom of expression;

- the vulnerability of children and of others whose circumstances appear to Ofcom to put them in need of special protection;
- the needs of persons with disabilities, of the elderly and of those on low incomes;
- the desirability of preventing crime and disorder;
- the opinions of consumers in relevant markets and of members of the public generally;
- the different interests of persons in the different parts of the United Kingdom, of the different ethnic communities within the United Kingdom and of persons living in rural and in urban areas;

7.5.17.5 In performing their duty under this section of furthering the interests of consumers, Ofcom must have regard, in particular, to the interests of those consumers in respect of choice, price, quality of service and value for money.

7.5.18 WASTEWATER - INFRASTRUCTURE BUSINESS MODELS AND ALTERNATIVES

7.5.18.1 Under section 94(1) (a) of the Water Industry Act 1991, it is the duty of every sewerage undertaker "to provide, improve and extend such a system of public sewers (whether inside its area or elsewhere)…as to ensure that the area is and continues to be effectively drained;"

7.5.18.2 The allocated sites within a local plan (or local development framework) should be captured within the undertakers capital investment programme (AMP5\6).

7.5.18.3 The duty under Section 94 is supplemented by Regulation 4 of the urban waste water treatment regulations 1994.

7.5.18.4 Under Section 98 of the Water Industry Act 1991, a sewerage undertaker is under a duty to provide a public sewer for the drainage of domestic purposes of premise in a locality in its area where it is required so to do by notice served upon it by one or more persons entitled to make such a demand. A notice may be served by:

- an owner of any premises in the locality concerned;
- an occupier of such premises;
- a local authority within whose area the locality is in whole or part located;

7.5.18.5 The commission for the new towns, the development board for rural Wales or the development corporation of a new town where the locality lies in whole or in part within an area of their

responsibility; and an urban development corporation where the locality is situated in whole or in part within an area designated as an urban development area under Part XVI of the local Government, Planning and Land Act 1980.

7.5.18.6 A requisition notice may only be served in respect of domestic drainage of premises upon which there are either buildings or will be when current proposals for construction are carried out. Drainage for "domestic purposes" in this context is carefully defined. Where there are buildings upon premises in the locality concerned, domestic drainage is taken to mean:

- The removal from the buildings and associated land of the contents of lavatories;
- The removal from such buildings and land of water which has been used for cooking or washing, other than in connection with a laundry business or the business of preparing food and drink for consumption otherwise than on the premises;
- The removal from such buildings and land of surface water.

7.5.18.7 Where a person is proposing to erect buildings upon the premises concerned, "domestic purposes" has the same meaning as in relation to existing buildings but must be specified in the requisition in relation to stated times after the erection of the buildings. Where a requisition notice is served upon a sewerage undertaker in due order under Section 98, the sewerage undertaker has, in effect, a period of six months from the day upon which any financial conditions which may be set are satisfied or that upon which private sewers and drains leading from the premises will connect with the public sewer are agreed, whichever shall be the later, in which to meet the requisition before it will be considered to be in default. The points of connection with the public sewer should be agreed between the parties, i.e. Those making the requisition and the sewerage undertaker, or in default be determined by a single arbitrator appointed by the agreement or, if this is not achieved, by the President of the Institution of Civil Engineers.

7.5.18.8 Where a sewer is requisitioned, the sewerage undertaker may impose financial conditions upon those making the requisition. The detail of such conditions is set out in Section 99 of the 1991 Act. The sewerage undertaker may require from the person or persons requisitioning a sewer undertakings from binding them to pay to it in each of the twelve years following the provision of the sewer and amount not exceeding the "relevant deficit" as defined for the year in question, if there should be one, in respect of the cost making the sewerage provision requisitioned.

7.5.18.9 Where a deposit is demanded under Section 99 by way of security by a sewerage undertaker, interest may be payable by the undertaker upon the sums so retained. Disputes upon financial undertakings under Section 99 are to be referred to a single arbitrator appointed by agreement between the parties or, in default thereof, by the president of the Institution of Civil Engineers.

7.5.19 WASTEWATER - THE ADOPTION OF SEWERS

7.5.19.1 Provided the appropriate procedure is followed the sewerage undertaker may at any time "adopt" any sewer, or any part thereof, or any sewage disposal works, situate within its area.

7.5.19.2 When a sewerage undertaker proposes to adopt a sewer by a declaration of vesting under the section, the following procedure must be observed:

7.5.19.3 Notice of the proposal must be given to the owners of the sewer or works in question, including the owners of easements in relation to the sewer.

7.5.19.4 In the rare case where the sewer, etc. In question is situate outside the area of the "adopting" sewerage undertaker it must give notice of its proposal to the undertaker whose area the sewer is situate, and may not proceed to make the vesting declaration until either the other undertaker has consented thereto, or the secretary of state has "dispensed with the necessity for such consent".

7.5.20 WASTEWATER - AGREEMENTS FOR THE ADOPTION OF SEWERS

7.5.20.1 Under Section 104 of the Water Industry Act 1991, a sewerage undertaker may agree with any person who is constructing or proposing to construct a sewer or sewage disposal works that, providing the sewer, etc. is constructed in the manner specified in the agreement, the undertaker will make a vesting declaration on completion of the work, or on some specified date or the happening of some future event. Any such agreement is enforceable against the sewerage undertaker by the owner or occupier for the time being of any premises served by the sewer, etc.

7.5.20.2 Where a person constructing or proposing to construct a drain, sewer or sewerage disposal works has applied to the sewerage undertaker for an adoption agreement under Section 104 and this has been refused, that person may appeal to the Director General of Water Services.

7.5.21 WASTEWATER - SECTION 104

7.5.21.1 The full cost of construction of the sewer to be adopted will normally be covered by the developer. Both AWS and STW will charge 2.5% of the value of the works for approval of the system and supervision (using CESMM3 as a basis for calculating the value of the works). Where a bond must be put in place this will be 10% of the value of the works to be adopted.

7.5.21.2 If pumping stations are required for adoption both AWS and STW will require 2.5% of the value of the works for approval and supervision and a 15% bond will be required.

7.5.22 WASTEWATER - CROSSING 3RD PARTY LAND

7.5.22.1 Where a sewer must cross third party land the undertaker would serve notice on the relevant landowner(s). The sewer would be laid at cost price (taken by the developer) and Anglian Water would require 4.5% of the capital value of the drain for approval and supervision. In this case there may be a need to pay compensation to the 3rd party affected and any on-costs generated.

7.5.23 WASTEWATER - SEWER DIVERSIONS (SECTION 185 OF WIA 1991)

7.5.23.1 The developer is expected to cover the full cost of moving the sewer. Anglian Water will request 4.5% (6% for STW) of the value of works for approval, supervision and adoption. There may be a need to pay compensation to 3rd parties depending on the works undertaken.

7.6 SUMMARY OF INFRASTRUCTURE REQUIREMENTS

7.6.1.1 An indicative scope of works together with budgeting costs has been prepared by WYG on the basis of unit costs derived from similar projects and may vary as information is received from each of the statutory undertakers in relation to the Councils Preferred Growth Option.

7.6.1.2 Indicative capital costs and delivery programmes for the procurement of off-site and remote water, wastewater and energy distribution network investment to support population and employment growth within the District of Newark and Sherwood is provided in Tables 7.5, 7.6, 7.7 and 7.8.

7.6.1.3 The capacity of the existing water network within the District and its suitability to accommodate population and employment growth from the emerging LDF sites is not fully understood at present but a good picture of likely investment need is starting to emerge

following the meeting with Severn Trent Water dated 15 May 2009 (minutes in Appendix 9), and the Water Cycle Strategy – Detailed Strategy.

7.6.1.4 It is known that the District falls within the Severn Trent Water East Midlands Water Supply Zone, and that the water resources, treatment works and strategic water mains are all remote from proposed new development areas. Therefore water is currently being transported over long distances, and the network is constrained due to this factor.

7.6.1.5 Anglian Water is currently developing schemes for implementation within the AMP5 (2010 – 2015) period at Newark and Gainsborough, which will include river abstraction and new water treatment works. These works are likely to benefit the proposed Newark settlement and the settlements to the north west of the District around Ollerton and Boughton

7.6.1.6 Anglian Water has plans for a strategic scheme in the Lincoln water supply zone which will include improvements to the Newton on Trent water treatment works, and would benefit development of the north eastern and eastern part of the District.

7.6.1.7 Severn Trent Water has advised that there is insufficient capacity within the existing strategic water supply network around Newark, Balderton and Fernwood (Settlements 1A, 1B and 1C) to accommodate to accommodate the growth identified within the emerging LDF. Severn Trent Water advised that approximately 13km of 500mm/600mm diameter strategic water main had been identified as a possible reinforcement solution (c. £6m of developer funded capital investment).

7.6.1.8 It is understood from the WCS Detailed Strategy that Severn Trent Water has made an allowance for growth at Collingham, Sutton on Trent, Ollerton and Boughton, Southwell, Farnsfield and Lowdham, (Settlements 3, 4, 5, 11, and 13) within its PR09 Bid, and therefore it is likely that only reinforcement of the local distribution network will be required.

7.6.1.9 It is understood that only localised network reinforcement will be required to accommodate growth within settlements at Edwinstowe, Clipstone, Bilsthorpe, Rainworth and Blidworth (Settlements 6, 7, 8, 9 and 10).

7.6.1.10 National Grid Gas is currently assessing the impact of the IDP Settlements on the existing gas network to identify a suitable point of connection that will accommodate each settlement and growth scenario. In advance of this assessment being completed, WYG have carried out a desk top assessment of the likely infrastructure requirements.

7.6.1.11 It is likely that Balderton, Fernwood, Winthorpe, Collingham, Ollerton & Boughton, Edwinstowe, Clipstone, Bilsthorpe, Rainworth, Blidworth, Farnsfield, Southwell, and Lowdham (Settlements 1A, 1B, 1C, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12 and 13) could be accommodated from the local medium pressure gas networks without triggering network reinforcement.

7.6.1.12 There is no gas infrastructure within proximity to Settlement 4 (Sutton on Trent), and therefore connection to the medium pressure gas main located 5km to the east of the settlement is considered the most likely scenario. This may trigger an investment of £925,000.

7.6.1.13 Although Sutton on Trent (Settlement 4) will require significant offsite infrastructure, the capacity of the gas network within the District is not believed to be a significant constraint to population and employment growth within the District.

7.6.1.14 From a review of the information published within the Central Networks Long Term Development Statement 2009 that there would appear to be sufficient capacity at the Primary Substations close to Winthorpe, Collingham, Sutton on Trent, Ollerton and Boughton, Edwinstowe, Bilsthorpe, Rainworth, Blidworth, Farnsfield, Southwell, and Lowdham (Settlements 2, 3, 4, 5, 6, 8, 9, 10, 11, 12 and 13) to accommodate demand required by each settlement.

7.6.1.15 The capability of the local 11kV network at each settlement is not known, however it is likely that twin offsite 11kV circuits from each of these settlements may be required back to the local Primary Substation; typically this need would not be greater than £750,000 per cluster. The electricity demand for Sutton on Trent, Edwinstowe, Farnsfield and Lowdham (Settlements 4, 6, 11 and 13) might be sufficiently low (<1MVA) to avoid the need for this offsite work, however this cannot be confirmed until a detailed formal application has been made to Central Networks.

7.6.1.16 Development of Clipstone (settlement 7) will push the Crown Farm Primary Substation above its firm capacity by approximately 0.75MVA. It should be noted that the stated firm capacity of the Primary Substation has reduced from 25MVA (as stated within the 2008 LTDS) to 14.6MVA (as stated within the 2009 LTDS). This may be due to a reduction in available capacity on the 33kV circuit upstream of the Primary Substation rather than transformer capacity; however clarification has been requested from Central Networks.

7.6.1.17 If the Clipstone settlement comprises a number of discrete development parcels each making individual applications for electricity supply (<0.5MVA), then it is possible that Central Networks would take into account a greater degree of electricity diversity and network reinforcement may not be triggered. However a single application for the 2MVA demand required by the Clipstone Settlement may trigger upgrading of the Primary Substation or upstream 33kV network which would be developer funded, however considered unlikely.

7.6.1.18 Although some sites within the IDP are constrained by limited capacity at local Primary Substations, it would appear that the largest constraint to growth within the District is capacity at Hawton BSP. This is primarily due to the demand required by settlements 1A, 1B and 1C (Newark, Balderton and Fernwood). Upgrading of the Hawton BSP, although likely to be funded by Central Networks would likely take 18-24 months to undertake. In addition to this a new Primary Substation would likely be required (c. 18 months); the Primary Substation and all 33kV network reinforcement will be chargeable to the developer supply chain (circa £3.5m to £5.5m) and require 3,000sqm of land.

7.6.1.19 The distance of each settlement from the existing BT telephone exchange will impact on the responsiveness of the broadband service available. The quality of the available broadband service at a particular settlement will be dependant on a number of factors, such as whether the telephone exchange is broadband enabled with ADSL and or SDSL capability, whether the cabling between the telephone exchange and site is copper or fibre optic cable (or a combination of both), and the distance from the telephone exchange.

7.6.1.20 It is likely that Collingham, Sutton on Trent, Ollerton and Boughton, Edwinstowe, Clipstone, Bilsthorpe, Farnsfield, Southwell and Lowdham (Settlements 3, 4, 5, 6, 7, 8, 11, 12 and 13) will have good broadband speed due to their close proximity to their local telephone exchange, however outlying areas of Settlements 5 and 12 might experience a less responsive broadband service.

7.6.1.21 Similarly Newark, Balderton, Winthorpe, Clipstone, Rainworth and Blidworth (Settlements 1A, 1B, 2, 7, 9 and 10) might typically have a less responsive broadband response due to the fact that they are located more than 3km away from the nearest telephone exchange.

7.6.1.22 It is unlikely that any of the settlements within the IDP will trigger chargeable network reinforcement, however BT Openreach has advised this will not be assessed until a detailed development application has been submitted for their consideration. Typically BT Openreach

only recharge off-site network reinforcement where the cost per unit between primary connection point and new premises is >£3,400; this is quite rare. Otherwise all investment is delivered within BT Openreach.

7.6.1.23 The IDP does not currently fall within the area being considered by BT for their Fibre to the Cabinet (FTTC) superfast broadband programme; however Newark and Sherwood District Council might lobby BT to consider inclusion of the IDP within this programme to enable the delivery of broadband speeds in excess of 20mbs.

7.6.1.24 Severn Trent Water have confirmed that £7m of capital investment is required at Balderton STW to accommodate growth generated by the emerging LDF for Settlements 1A, 1B &1C (Newark, Balderton and Fernwood). This would be funded by Severn Trent Water within their AMP programmes for any development within the existing local plan or an adopted LDF, however would potentially be developer funded if triggered by any development sites outside of the adopted LDF/local plan. Upgrading of the treatment works has not been included within the current AMP programme (AMP 5 – 2010 to 2015), and therefore there is a risk that any upgrading would not be undertaken until AMP 6 (2015-2020). If improvements are required earlier then developer funding (via Section 106 Agreements) may be required to help bring the works forward

7.6.1.25 The STW's at Southwell, Bilsthorpe, Collingham, Farnsfield and Sutton on Trent are likely to require upgrading to accommodate the growth identified within the emerging LDF. Again this is likely to be funded by Severn Trent Water within their amp programmes where the sites are contained within the existing local plan or an adopted LDF. If any sites are not contained within the LDF/local plan then it is possible that upgrading of the STW could be developer funded. Again upgrading of the treatment works has not been included within the current AMP programme (AMP 5 – 2010 to 2015), and therefore there is a risk that any upgrading would not be undertaken until AMP 6 (2015-2020).

7.6.1.26 There is sufficient capacity at Rainworth STW to accommodate the growth identified within the emerging LDF for settlements at Rainworth and Blidworth, while it is believed that sufficient capacity also exists at Edwinstowe STW to accommodate growth at Edwinstowe and Clipstone.

7.6.1.27 There is sufficient capacity at Stoke Bardolph STW to accommodate the growth identified within the emerging LDF for the Lowdham settlement; however the local pumping station

within Lowdham and the rising main between Lowdham and Stoke Bardolph STW may require upgrading (6.7km of rising main).

7.6.1.28 Sutton on Trent (Settlement 4) may trigger upgrades to the existing pumping station and rising main which currently conveys flows to Cromwell STW which is located 3.2km to the south of the settlement.

7.6.1.29 The capability of the local sewer network between each site and the STW to accommodate the additional foul flows generated by each settlement is not known. There may be a need for reinforcement of the local sewer network between each settlement, site and the STW to accommodate growth – the need or extent of local reinforcement this cannot be considered by Severn Trent Water until formal applications are made on a development by development basis.

7.6.1.30 There are a number of options for further procurement and-or value engineering activities that specific developers might utilise; this may affect the level of investment cited in this report.

8 GREEN INFRASTRUCTURE

8.1 BACKGROUND

8.1.1.1 Evidence currently available with regard to the distribution and type of green infrastructure across the District is provided in the Community Green Space Provision Improvement Plan (2010) by Knight Kavanagh and Page written for NSDC. The Community Green Space Provision Improvement Plan also details existing Green Infrastructure Deficits. The current report considers levels of population growth that can be served by existing capacity, where there are requirements for additional infrastructure provision, and the options for its provision.

8.1.1.2 Should the available existing data sets change (due to new information being compiled), or should the standards change (to reflect the differences between rural and urban needs) or if there are changes to the SHLAA options, the methodology outlined can still be applied and the report updated and revised for future use. In other words this should be viewed as a working document reflecting changes in available information and policy.

8.1.1.3 Green infrastructure is defined by The Green Infrastructure Planning Guide as the physical environment within and between our cities, towns and villages. It is a network of multi-functional open spaces, including formal parks, gardens, woodlands, green corridors, waterways, street trees and open countryside. It comprises all environmental resources, and thus a green infrastructure approach also contributes towards sustainable resource management.

8.1.1.4 Natural England defines Green Infrastructure slightly more succinctly as a network of multi-functional greenspace that contributes to the high quality natural and built environment required for existing and new sustainable communities in the future. Green Infrastructure as defined by Natural England is a strategically planned and delivered network of high quality green spaces and other environmental features. It should be designed and managed as a multi-functional resource capable of delivering a wide range of environmental and quality of life benefits for local communities. Green Infrastructure includes parks, open spaces, playing fields, woodlands, allotments and private gardens.

8.1.1.5 Green Infrastructure can provide many social, economic and environmental benefits close to where people live and work including:

- Places for outdoor relaxation and play

- Space and habitat for wildlife with access to nature for people
- Climate change adaptation - for example flood alleviation and cooling urban heat islands.
- Environmental education
- Local food production - in allotments, gardens and through agriculture
- Improved health and well-being – lowering stress levels and providing opportunities for exercise

8.1.1.6 The necessity to create, maintain and enhance well connected green infrastructure is of ever more importance to allow habitats and species to adapt and disperse in response to climate change.

8.1.1.7 Any future development within the District should aim for net social, environmental and economic gains, with no net loss to biodiversity, and enhancements to landscape, ecology and green infrastructure incorporated into spatial plans.

8.1.1.8 The East Midlands Region is widely cited as having the poorest biodiversity in the country; 'Wildlife habitats have been lost and those that remain are often small and fragmented' (EMRA Biodiversity Statement). Biodiversity is considered to be important to people's physical and mental health and to contribute to their quality of life (English Nature 2002). Communities in the East Midlands have been found to place value in visiting accessible, well managed wildlife sites (Natural England 2004). The East Midlands Biodiversity Partnership has noted that this region should be considered to be particularly important for the movement of wildlife across and through the region as a consequence of its central position in the country.

8.2 CLASSIFICATION OF GREEN INFRASTRUCTURE

8.2.1.1 Identification of green infrastructure types within the District and presentation in a hierarchical format has been undertaken as shown in Table 8.1 below.

Table 8.1 – Classification of GI Components

International Interest	**Local Interest / Other**
Special Areas of Conservation	BAP Habitats
National / Regional Interest	Presence of protected species
National Parks	Presence of notable species
Sites of Special Scientific Interest	Strategic importance
National Nature Reserves	Within an important wildlife / dispersal corridor
Major river corridors	Adjacent to an important wildlife / dispersal corridor
Major recreational and amenity sites (Regional park)	Allotments & community gardens
County Interest	Cemetries & churchyards
Long distance footpaths	Woodland
National Cycle Network	**Is there potential to address shortfall?**
Significant public parks (District Park)	Brownfield Sites with GI potential
Local Nature Reserves	Council owned land
Significant river corridors	Currently inaccessible green space
Significant recreational routes	**Potential biodiversity impacts (positive or negative)**
District Interest	Special Areas of Conservation
Public parks & gardens	National Nature Reserves
Other river corridors	Sites of Special Scientific Interest
Public Rights of Way & Greenways	Major river corridors
Local cycle routes	Local Nature Reserves
Playing fields	Significant river corridors
Informal green space	Other river corridors
Accessible woodland	Water bodies and wetlands
Water bodies and wetlands	Local Wildlife Sites
Local Wildlife Sites	BAP Habitats
Natural & semi-natural green space	Presence of protected species
Outdoor sports facilites	Presence of notable species
Play facilities	Strategic importance
Amenity green spaces	Important wildlife / dispersal corridor

8.3 STANDARDS, DATA SOURCES & POLICY

8.3.1.1 Various national and local standards have been applied to the existing infrastructure provision within the District, and to the potential IDP sites and these are summarised at the end of this chapter of the report together with details of data sources and relevant policies referred to in the preparation of this assessment.

8.4 EXISTING GREEN INFRASTRUCTURE

8.4.1 PUBLIC OPEN SPACE

8.4.1.1 The District currently supports three green flag parks at Vicar Water Country Park, Newark Castle Gardens and Sherwood Avenue Park, three Country Parks at Sherwood Forest, Sherwood Pines and Rufford.

8.4.1.2 Other green spaces have been categorised by the Green Spaces Strategy (NSDC 2007) as:

- Parks and gardens
- Natural and semi-natural green spaces, including woodland
- Outdoor sports facilities
- Amenity greenspace
- Provision for children and young people
- Allotments and community gardens
- Cemeteries and churchyards

8.4.1.3 For further details on this classification, please refer to the Green Spaces Strategy (NSDC 2007). This classification has been retained in the 2010 Newark & Sherwood documents – the Green Infrastructure Strategy and Community Green Space Provision Improvement Plans.

8.4.1.4 Sustainable Accessible Natural Green Space (SANG) are also mentioned in the GI strategy as an ideal way of reducing this impact and creating space for biodiversity to thrive in an accessible environment. Natural England recommends these features as a way of reducing visitor pressure on sensitive high value biodiversity sites such as SACs and SPAs.

8.4.2 LANDSCAPE

8.4.2.1 Newark and Sherwood District is split into 5 landscape character areas, as described on the Nottinghamshire County Council website (http://www.nottinghamshire.gov.uk/home/environment/countryside/nature_conservation/countrysideappraisal) and summarised in Table 8.2 on the following page.

Table 8.2 – Regional Landscape Character Areas

Landscape Character Area	Defining features
Sherwood Landscape Area	The remnants of Sherwood Forest cross the northwestern corner of the District, with dominant woodland and heathland habitats, between arable, urban and industrial areas. Evidence of coal mining is conspicuous, as are historical parks and estates.
Trent Washlands	Formed by the River Trent, the washlands run up the eastern side of the District, and are dominated by the large, slow flowing river, although it is often hidden from view behind flood banks. Between urban and industrial areas, flat arable land is split by lines of pollarded willows and poplars. Power station chimneys and pylons are obvious along the river corridor.
Mid-Nottinghamshire Farmlands	Running through the centre of the District, this agricultural rural area characterised by narrow country lanes, small red brick villages, ancient woodlands and wooded streams known as "dumbles".
East Nottinghamshire Sandlands	A remote agricultural area far to the east of the District, to the east of the River Trent. The Sandlands are low-lying with regular-shaped fields and roads. Villages are again largely red brick.
South Nottinghamshire Farmlands	To the south of the district, the rural farmlands support larger arable fields and broad alluvial levels.

8.4.2.2 Detailed landscape character assessments are currently being completed by NSDC for each of these areas.

8.4.3 ECOLOGY

8.4.3.1 Newark and Sherwood has an internationally important site, Birklands and Bilhaugh Special Area of Conservation. This part of Sherwood Forest also supports nationally important designations as a National Nature Reserve, Site of Special Scientific Interest, and a regionally important Country Park. There is currently a proposal to create a Sherwood Forest Regional Park.

8.4.3.2 There are 19 Sites of Special Scientific Interest (SSSIs) in the District. These are nationally important sites, legally protecting the rarest habitats and species. Nottinghamshire as a county is particularly poor in SSSIs, with only 1.6% of the area protected, compared to a national average of 7.5% (Nottinghamshire County Council website).

Table 8.3 – Designated sites

Site Name	Importance	Description
Birklands and Bilhaugh Special Area of Conservation	International	Special Areas of Conservation (SACs) are strictly protected sites designated under the EC Habitats Directive. Birklands and Bilhaugh are designated for their old acidophilous oak woods on sandy plains. The site has an exceptionally high density of veteran trees, including the Major Oak. Both native oak species are present, with a varying age structure, ensuring ongoing availability of dead wood, providing habitat for invertebrates and fungi. The dead wood invertebrate fauna is of international importance and has led to the site being designated as a SAC. It is also believed to be the only site in the county where redstarts breed. Other notable breeding birds include all three woodpeckers, tree pipit and marsh tit. The areas of relic heathland within this site support the only county population of bilberry. Common lizards are also present in these areas.
Sherwood Forest National Nature Reserve	National	Sherwood Forest National Nature Reserve includes Birklands and Bilhaugh SAC, and is managed by Nottinghamshire County Council. Formed from the remnants of the Royal Forest of Sherwood, the site contains some of the oldest oak trees in Europe. Other native tree species include birch, rowan, holly and hawthorn. Invertebrate and fungi populations are notable, and other species present include woodpeckers, nightjars and bats. Open areas of the site support species such as tree pipits and woodlank within dry sandy heathland, dominated by heather, gorse and bracken.
Besthorpe Warren SSI	National	A mosaic of dry acid grassland vegetation, and dune grassland, dominated by sand sedge
Besthorpe Meadows SSSI	National	Unimproved alluvial grasslands in the River Trent floodplain, reliant upon seasonal flooding and traditional management.
Birklands and Bilhaugh SSSI	National	Within the Birklands and Bilhaugh SAC
Clipstone Heath SSSI	National	Dry acid lowland heath, dominated by dwarf shrubs. A previously widespread habitat has declined with changing land uses.
Hoveringham Pastures SSSI	National	Grazed neutral grassland on the River Trent floodplain.
Kirton Wood SSSI	National	One of the best remaining ash-wych elm woodlands in the county.
Eakring and Maplebeck Meadows SSSI	National	One of the best remaining neutral grasslands in the county.
Laxton Sykes SSSI	National	Laxton supports the best neutral grasslands in the county (SK 7266 and SK 7366). Besides the archaeological and cultural significance of this area, the arable fields are a known haunt of quail during the summer. This is a legally protected Schedule 1 bird. Other notable farmland birds also occur including grey partridge, corn bunting and

		yellowhammer.
Mather Wood SSSI	National	Ash-oak-maple woodland.
Newhall Reservoir Meadow SSSI	National	Grassland species indicative of calcareous clay soils.
Rainworth Lakes SSSI	National	Marsh and open water communities of regional importance.
Rainworth Heath SSSI	National	One of the last remaining areas of heathland in the county, containing both wet and dry heath. Peat bogs support species such as sphagnum moss, purple moor-grass, cross-leaved heath, common sedge and cotton grass. The drier areas support heather, bell heather, bracken, wavy hair-grass sheep's sorrel and mat grass. Green woodpecker, tree pipit, turtle dove and several species of warbler have been recorded from the site, as have a number of rare moth species. The heath is currently threatened by illegal motorbike scrambling, and Nottinghamshire Wildlife Trust is aiming to establish heather on currently bare areas.
Redgate Wood and Mansey Common SSSI	National	Broad-leaved semi-natural woodland and natural grassland.
Roe Wood SSSI	National	Roe Wood (SK 700589). This is a private ancient wood to the north of Southwell and contains many indicator plant species such as giant bellflower and bluebells. It also supports a notable breeding bird assemblage including willow and marsh tits and turtle dove, all being of high conservation concern.
Sherwood Forest Golf Course SSSI	National	One of the largest blocks of lowland heath in the county.
Spalford Warren SSSI	National	Spalford Warren Notts Trust Reserve, the best remaining example of grass heath, dominated by wavy hair grass. This site comprises a conifer plantation of Scots pines, planted sometime between the 1950s and 60s on blown cover sand. The main ecological interest on this site is the relic heathland along the rides and in the clear-felled areas where the Trust have been actively encouraging heather regeneration. This site, together with the road verge below is the last remaining substantial areas of the Cover Sands in Nottinghamshire (most of this resource is in Lincolnshire). Characteristic plant species are sand sedge, field mouse-ear, heather and early forget-me-not amongst others. Spalford Warren also currently has a strong population of crossbills (at least 40 in January 2009) at least some of which are expected to breed on the site. The habitat is also suitable for woodlarks and nightjars – all three being legally protected under Schedule 1 of the Wildlife and Countryside Act.
Thoresby Lake SSSI	National	Mixed habitats present including dry acid grassland, acid loam grassland, open water, marsh and reedswamp.
Wellow Park	National	Ash-wych elm woodland.

SSSI		
Sherwood Forest Country Park	Regional	This 450 acre country park is part of the Sherwood Forest National Nature Reserve as discussed above.
Devon Park Pastures Local Nature Reserve	County	Located within Newark, the pastures are well used for recreation, but also support a number of habitats along the river, including pasture, woodland and riparian vegetation.
Sherwood Heath LNR	County	This site comprises heathland and mature deciduous (planted) woodland. It experiences high visitor pressure so typical heathland birds are largely absent although there is a high density of common lizards. Notable butterflies include brown argus, small heath and purple hairstreak. Ecologically linked to the Birklands and Bilhaugh SAC, the heathland here supports nationally important assemblage of beetles found within the decaying wood of the old trees. The LNR is also designated as a SSSI, and is one of the most important sites for this habitat in the East Midlands.
Cockglode and Rotary Woods LNR	County	Cockglode Wood is an ancient remnant of the Royal Hunting Forest, while Rotary Wood has been recently planted over the former Thoresby Colliery. Cockglode supports ancient woodland indicator species such as bluebells and dog's mercury, while open areas within the two sites contain heathland species, ecologically connected to the Sherwood Heath LNR.
Farndon Willow Holt LNR	County	One of the few remaining 'willow holts', traditionally found in Trentside villages. This site is associated with the Nottinghamshire botanist Lever Howitt who amassed an exceptional collection of willow species. This site is of significant cultural and historical importance.
Rainworth Water LNR	County	Rainworth Water was created through colliery spoil, planted with trees and enclosing a watercourse. The Water appears natural, and includes pools, shallows, meanders and marshy areas. Notable species include dragonflies, damselflies and the dingy skipper butterfly.
Rufford Country Park LNR	County	The Gallow Hole Dyke flows across the site, forming interconnected ponds and islands. The wetlands support a number of species including water vole and great crested newts. All three woodpeckers, marsh and willow tits and wintering hawfinches have been recorded in the woodland area.
Southwell Trail LNR	County	A former railway line managed for cyclists, walkers and horse riders, and providing a wildlife corridor of semi-natural habitats including scrub and acid grassland. Species present include common lizard, sparrow hawks and butterflies.
Tippings Wood LNR	County	Habitats created on this former colliery tip include mixed broadleaved woodland, wetland and grasslands. Species include dragonflies, damselflies and bee orchids.
River Trent Corridor	County	As a landscape feature, the River Trent dominates the east of the District. The focus of green infrastructure initiatives such as 'On Trent' and the Trent Vale Landscape Partnership.

8.4.3.3 Locally designated sites are known as Sites of Importance for Nature Conservation (SINCs). Within Newark and Sherwood, a number of these sites are road verges supporting rare and notable plant species. The Essex skipper is gradually spreading northwards along these linear habitat features. However, many of these sites are declining due to lack of disturbance, leading to swamping of herb flora by coarse grasses. Other issues include rabbit grazing and tyre track damage.

8.4.3.4 A selection of SINCs are described below to provide a background to the habitats of importance within the district.

8.4.3.5 Weecar Road Verge (A1133 Gainsborough Road) (SK 829667). This is a SINC road verge, immediately to the north of New Lane on the east side of the A1133. This verge covers approximately 50m but appears to be slowly declining in quality due to inappropriate mowing and leaving of cuttings. It would also benefit from periodic, small-scale disturbance as the patch of sand sedge has been getting smaller over the years. Other interesting flora species include field mouse-ear, bitter vetchling and wild onion. Apparently blue fescue was recorded here in the past.

8.4.3.6 Hallaughton Dumble (SK 674510). This is another private ancient wood, south west of Southwell alongside a small brook. Herb-paris is present along with other ancient woodland indicators. Badgers are almost certainly present.

8.4.3.7 Halam Reservoir Track SINC (SK 654547 to SK 661547). This track has an exceptionally diverse neutral grassland flora with at least 12 indicator species including cowslip and a very large population of adder's tongue fern. The service reservoir at the eastern end has a strong population of bee orchids and cowslips. The adjacent hedgerows are also species-rich and include guelder rose, wild privet and spindle.

8.4.3.8 Oxton Bogs (Blind Lane – SK 633515). This site comprises wet willow and alder dominated woodland and has one of the largest populations of breeding common toads in Nottinghamshire.

8.4.3.9 Brackenhurst College Grounds (SK 6952). This is an extensive area with many species-rich hedgerows both within the college grounds themselves and along Stubbins Lane to the west and Gipsy Lane to the south. Most of these rich hedgerows would be considered "important" under the Hedgerows Regulations (1997). Spurge-laurel is a notable county plant present to

the south west of the college buildings. The pond in the former rose garden has an exceptional population of great crested newts, which use the college grounds and stone walls as terrestrial and hibernation habitat. The section of Hallaughton Dumble to the south of Gipsy Lane and also the artificial lake immediately to the north has a population of water voles. Substantial numbers of badgers are also present.

8.4.3.10 Egmanton Wood (SK 740678). This is another ancient wood with several indicator species including bluebell, sanicle and wild service tree. The hedgerow to the west between SK 729677 and the western edge of the wood at SK 736679 has 23 woody species including wild service tree towards the eastern end and also bluebells and other ancient woodland indicators.

8.4.3.11 Besthorpe and Girton Gravel Pits (SK 8163 and SK 8167). Both these worked out gravel pits function as one ecological unit in terms of wintering wildfowl, some species being present in county important numbers. There is a mixed breeding colony of grey herons and cormorants at Besthorpe and other notable birds present during the breeding season around both water bodies include common tern, shelduck, little plover and grasshopper warbler.

8.4.3.12 Langford Lowfield RSPB Reserve (SK 815607). This reserve is not yet "official" although public access is available along a footpath. The site comprises former sand settling lagoons and a large former gravel pit that is now largely a reedbed. This site hosts county important numbers of overwintering teal and smaller numbers of other wildfowl including pintail. This site also regularly hosts little egrets at all times of year. Breeding birds include both ringed and little plovers, lapwing, willow tit and several notable farmland birds including grey partridge, yellowhammer, linnet and reed bunting. Little owls breed in old pollarded willows near Willow Farm.

8.4.3.13 Eakring Flash (SK 675629). A mining subsidence pond with surrounding marsh and willow scrub. Important breeding birds include turtle dove.

8.4.3.14 Brown's Covert (Sherwood Pines, SK 6161). This site comprises relic heathland amongst plantation coniferous woodland and is a historic location for breeding woodlark and nightjar although numbers fluctuate in response to forestry operations. This site also has common lizards and large numbers of common toads. The heathland and woodland rides are of value to foraging bats including both species of pipistrelle, brown long-eared and noctule and there may also be others. Whinchat bred up until at least 1993 and long-eared owls have also bred here in the past and possibly still do. Red and roe deer are frequent.

8.4.3.15 Blidworth Lodge (SK 5853 and 5953). As with the above, this site contains some relic heathland amongst mature coniferous plantation and is also a historic breeding site for nightjar although numbers have declined from a peak in the late 1980s as the trees have matured. Tree pipit and other, more common woodland birds breed and common lizards are still thought to be present.

8.4.3.16 Budby Common (SK 6072 and 6071). This is the most extensive intact heathland area in the county and is now managed by Nottinghamshire Wildlife Trust, grazed by their "flying flock". It is still used for military training. It has the highest density of breeding nightjars and woodlarks in the county in what are probably regionally important numbers. Other notable birds include buzzard, goshawk, tree pipit and all three woodpeckers. Crossbills are also usually present. Besides extensive heather cover, the flora includes western gorse, bitter vetchling, pill sedge and areas of sphagnum moss around a small fire tank. This tank has a notable dragonfly fauna, comprising at least 13 species in 2005/06, and this includes the county scarce common hawker. A small population of black darters were present up to at least 1998 although there have apparently been no recent records. The sandy tracks are of importance for aculeate hymenoptera with several notable solitary bee and digger wasp species. The moth population is exceptional in a county context and includes many species designated as Nationally Scarce. Common lizards are present and there are historical records of adders. The bat populations have been extensively studied and the majority of the species present in Nottinghamshire have been recorded recently including a particularly notable roost of Leisler's bats.

8.4.3.17 Swinecote Road Verge (B6034, SK 627688). This verge comprises a triangle of acidic grassland between the B-road, the A616 Sheffield Road and a rough track. This site has the only extant population of petty whin in the county.

8.4.3.18 Coddington Road North Verge (SK 840546). This verge supports the only Nottinghamshire population of soap-wort. Badger setts are also present on the verge amongst hawthorn scrub.

8.4.3.19 Hoveringham Gravel Pits - Sailing Pit (SK 7147) and Railway Pit (SK 6947). These gravel pits between them support county important numbers of wintering wildfowl including wigeon, goldeneye and goosander. It also occasionally hosts divers and the scarcer grebes.

8.4.3.20 River Devon south of Newark (SK 7852). There are historical records of otters from this section of the river and an artificial otter holt has been constructed.

8.4.3.21 Ploughman Wood Nature Reserve (SK 640467). This is a Nottinghamshire Wildlife Trust Reserve and is ancient woodland with a notable breeding bird assemblage.

8.4.3.22 Kilvington Old Railway Line (SK 799430 to SK 799455). This section of dismantled railway line has several small populations of the National BAP listed grizzled skipper. Dingy skipper also occurred until 2001 when a large area of habitat was lost to gypsum mining. Other notable butterflies present include brown argus and small heath. Grass snakes have also been recorded near the gypsum workings. Grizzled skippers have also been recorded in the Cotham section of this former railway line.

8.4.3.23 Dairy Farm Railway (Borrow Pits SK 789539). This is a SINC with water violet and water pepper in the open water sections.

8.4.3.24 Trent Banks – Newark Wharves (SK 798545). Another SINC with a diverse riparian flora including flowering-rush and river water-crowfoot along the banks of the River Trent.

8.4.3.25 Sconce Hills SINC, Newark (SK 790530). A civil war earthwork with drought-prone acidic grassland supporting county rare species such as subterranean clover, rest-harrow, crested hair-grass, prickly sedge (ssp lamprocarpa) and sand spurrey.

8.4.3.26 Devon Park SINC, Newark (SK 789529). This site comprises unimproved neutral grassland and marshy grassland on the south side of the River Devon and west of the Queen's Sconce (civil war earth work). The marshy grassland contains county rare brown sedge and sharp flowered rush.

8.4.3.27 Newark Grassland SINC (SK 793551). This site is located to the east of the A616, to the south east of Kelham Lane. It comprises unimproved neutral grassland containing many scarce species such as meadow saxifrage, subterranean clover, crested hair-grass and early forget-me-not. Small ponds and wet drains are also present.

8.4.3.28 Kelham Road Grassland SINC (SK 784548). This site is located between the Trent Valley Way footpath and the A617 and comprises unimproved neutral grassland surrounded by arable crops. Locally notable species include great burnet, lady's bedstraw and meadow barley.

8.4.3.29 Welbeck Lakes and Carburton Lodge Woodland (SK 5872, 5873 etc). Although this site is outside Newark and Sherwood, it is in close proximity (i.e. within 2km). The mature deciduous woodland is of planted origin but contains several veteran trees. The woodland and lakes are

of county importance for raptors (birds of prey) with summering honey buzzards since the 1980s, common buzzard, goshawk and hobby and ospreys have summered since the mid 1990's. There are recent records of ravens.

8.4.3.30 The River Maun within Newark and Sherwood has populations of water voles in the vicinity of Ollerton and beyond both upstream in Mansfield and downstream in Bassetlaw.

8.4.4 NOTABLE EXISTING GREEN INFRASTRUCTURE PARTNERSHIPS

8.4.4.1 The following GI projects, partnerships and initiatives are currently active in Newark & Sherwood.

8.4.4.2 The Greenwood Community Forest covers 161 square miles (19% of the county), on the northwestern border of the District and has a vision to '*Create a multi-purpose forest with a rich mix of woods, farmland, open spaces and Settlements in Nottinghamshire, contributing towards the sustainable development and providing a better environment for people to use, cherish and enjoy for now and for generations to come*'. The partnership has launched an education initiative, an events program and the Sherwood Forest Community Rangers Project.

8.4.4.3 Sherwood Forest. The Sherwood Forest Trust, Sherwood Initiative, Sherwood Vision, Sherwood Forest Habitat Restoration Project, Action for Sherwood and Sherwood Forest Regional Park Feasibility Study. The Sherwood Forest area includes the internationally important Birklands and Bilhaugh Special Area for Conservation (SAC), and nationally important nature reserves and SSSIs.

8.4.4.4 A feasibility study is currently underway to determine whether identifying the Sherwood Forest Area and surroundings as a Regional Park would add benefits and value to the initiatives already underway. Regional Parks are not designated sites, but may be used to enhance opportunities and tie together a number of features and assets. The proposal is seeking to improve biodiversity and provide multiple social benefits with the provision accessible green space (http://www.nottinghamshire.gov.uk/regionalpark.htm).

8.4.4.5 The key question being addressed in this Feasibility Study is whether identifying the Sherwood Forest Area and surroundings as a Regional Park would bring about transformation changes and add value to what is already being done.

8.4.4.6 The On Trent initiative, based mainly in Staffordshire has been endorsed by Newark & Sherwood District Council. The long-term vision for the partnership is for 'A Trent landscape, rich in wildlife habitats and historic features for the benefit of all, both now and in the future'. The River Trent is 'a strategically important feature for wildlife, landscape, culture and recreational potential', and the partnership aims to ensure that the decline in biodiversity is halted and reversed (East Midlands Green Infrastructure Scoping Study 2005).

8.4.4.7 The Trent Vale Landscape Partnership Scheme currently has an application with the Heritage Lottery Fund. The Partnership aims to increase awareness of the River Trent, and to improve access to the banks, reconnecting Trentside communities to this key landscape feature. The project area runs from Newark in the South to East/West Stockwith (north of Gainsborough) and covers 388 square kilometres. Key partners include British Waterways, BTCV, RSPB, English Heritage, Natural England, The Environment Agency, Wildlife Trusts, County and District Councils (http://www.ontrent.org.uk/youcando/trentvale.php).

8.4.4.8 The Trent River Corridor has also been identified by the 6 Counties Green Infrastructure Strategy, who's remit doesn't extend into Newark & Sherwood as such, but GI initiatives and features such as the Sherwood Initiative and Greenwood cross between these areas. The 6Cs incorporates previous regional GI studies such as EMRA's multiple public benefits mapping, EMDA's Green Infrastructure Programme, the East Midlands Green Infrastructure Network, local expression of the Regional Biodiversity Strategy through biodiversity opportunity mapping and the Regional Forestry Framework. A workshop was held in January 2009, and GIS work is due to be released shortly.

8.4.4.9 The Trent Holmes Project aims to provide demonstrable benefits for flood alleviation and water resources and to restore the biodiversity of the Trent Valley.

8.4.4.10 The Public Benefit Mapping Project (EMRA) has identified areas where GI delivery would provide most benefit across the East Midlands.

8.4.4.11 The Rainworth Area Project. Scoping and data review is currently being undertaken to protect, conserve, and expand populations of characteristic Sherwood heath land and woodland species such as the nightjar, woodlark, bats and reptiles.

8.4.4.12 There are many other GI initiatives across the District, and in the surrounding area such as the Trent Floodplain Initiative, The Maun Valley Action Plan, The Nottinghamshire Heathland Strategy and the Mansfield Trials Strategy.

8.4.4.13 The Lincolnshire Coversands project also has some relevance to the District as they have a small road verge SINC on the Gainsborough Road at Weecar which is just inside Nottinghamshire, with the adjacent hedge forming the county boundary. This site has declined in quality over the years due to the lack of disturbance.

8.5 ASSESSMENT METHODOLOGY

8.5.1 ASSESSMENT OF STANDARDS RELATING TO POPULATION AT A PARISH LEVEL

8.5.1.1 Approximately half of the standards used can be summarised as x hectares of a particular GI feature per 1,000 people. These population-based standards have been applied at a parish level in accordance with the existing Newark & Sherwood Green Infrastructure documents. Existing Parish populations have been taken from the 2001 census, obtained from Newark & Sherwood District Council. Potential increases in population under the preferred growth option have been calculated using the predicted housing numbers provided by the District Council.

8.5.1.2 It is not necessary to extrapolate compliance with population standards to the individual IDP sites, as the measurement against the standard occurs at a parish level. Potential population increases under the preferred growth option could take place at any of the IDP sites within the parish. Where IDP sites cross parish boundaries the increase in population was allocated in proportion with the area of the IDP site in each parish.

8.5.2 ASSESSMENT OF STANDARDS RELATING TO DISTANCE AT AN INDIVIDUAL SITE LEVEL

8.5.2.1 Individual IDP sites and clusters have been assessed for compliance against distance standards through the creation of appropriately sized buffers surrounding the IDP sites, for example a 2km buffer for woodland, or a 30km buffer for a Regional Park. Figure 8.1 below illustrates this process with indicative IDP sites.

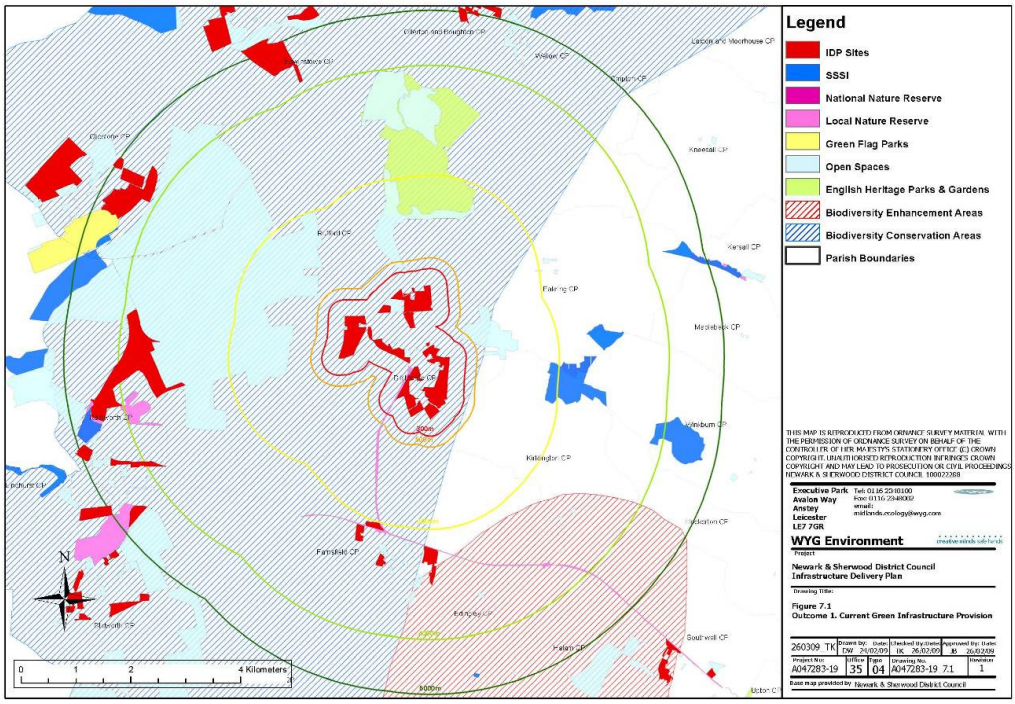


Figure 8.1 – Application of buffers to SHLAA sites to determine current GI provision

8.5.3 EXCEPTIONS

8.1

8.5.3.1 Although the compliance with standards at a Parish (i.e. population-related level), should be elementary, with GI provision either being adequate, or inadequate for the size of the current or future population, a certain amount of manual assessment been included: For example, the IDP sites within the parish of Southwell are on the border of the Parish, while the neighbouring parish of Upton contains a Green Flag Park, bordering onto Southwell; in this instance the Green Flag result in the matrix is considered to be positive, as this park will be easily accessible to any potential new residents of the IDP site.

8.5.3.2 Where there is an obvious shortfall in data supplied from the District Council, efforts have been made to fill these data gaps through analysis of Ordnance Survey maps and aerial

photography. Features searched for include churchyards and playing fields that do not appear to be associated with schools.

8.5.4 LIMITATIONS

8.5.4.1 Buffers for determining compliance with distance-related standards are calculated for each IDP site as whole, therefore certain parts of the IDP site may be within the required distance, while other parts are not. Compliance is determined by the result for the site as whole, so if some part of site X falls within 2km of a woodland, the standard is considered to be met. Within the outlying areas of the District, this would appear to be appropriate, as most of the development sites are relatively small; however, application of these standards to the larger IDP sites south of Newark is more troublesome. Although it may be more appropriate to break these sites down to yield more useful results, this is not possible at the current time as specific locations for employment / residential / open space have not yet been identified at this stage.

8.5.4.2 Compliance with distance related standards is elementary to some degree as the distances are 'as the crow flies' rather than following footpaths, roads or other infrastructure, the buffers have not been screened to include severance factors such as canals, motorways, railways and rivers. It is hoped that this level of detail will be incorporated into design proposals and concept statements for individual sites, and into detailed green infrastructure studies.

8.5.4.3 There are some limitations to the application of GI standards to the whole of the Newark & Sherwood District. Rural areas, with dispersed settlements are less likely to have access to formal open spaces and green infrastructure; however they are more likely to benefit from rural views, fields, woods and footpaths. Hence, the matrices need to be considered carefully regarding the degree to which each Parish is classified to be rural or urban. The Green Spaces Strategy has determined a rural / urban methodology for the District, and for a detailed assessment, reference to this document is recommended.

8.5.4.4 The open space data sets provided by the District Council as used to inform the green space strategy contain a large number of sites lacking sufficient information to classify as a particular type of open space. Therefore, the matrix columns may show a lack of certain types of green space, and yet the 'miscellaneous' column may show a large area of unidentified open space within the parish (highlighted in purple).

8.5.4.5 A number of assumptions have also had to be made regarding the accessibility of green space, where data behind the GIS data sets has been lacking. It is recommended that prior to any

planning decisions being made, or detailed site designs created, a detailed assessment of accessible green space is made to ensure that the true level of compliance is known, and future predictions are adequately informed. Further and more detailed information can be found in the Community Green Space Provision Improvement Plans (2010).

8.5.4.6 A similar approach is recommended regarding ecological features within and surrounding potential development sites. This IDP study has summarised existing data sets, but ground-truthing was beyond the scope of this IDP. We would recommend that any potential development sites are surveyed ecologically for their potential to support protected species and habitats, and an assessment made of their relative value prior to any planning decisions, or production of detailed designs.

8.5.5 ASSESSMENT CRITERIA

8.5.5.1 Existing green infrastructure provision has been determined as shortfall, adequate or surplus for each Settlement area.

8.5.5.2 Parishes with potential to support strategic housing allocations in the future have been assessed and rated within the Green Infrastructure matrix using a green, red or amber allocation to display existing provision, and compliance with the standards under the preferred growth option:

- Green – Green infrastructure provision meets the standard required for that GI feature
- Amber – There is some GI provision within the parish, but existing GI (to currently available information) falls below the levels required by the standards. Areas without sufficient provision for additional development and appropriate levels of GI, where investment / creation / enhancement would be required, should the development go ahead.
- Red – There is currently no provision for this type of GI within the parish. Additional provision may be difficult to achieve due to a lack of suitable sites within the area, or prohibitive costs.

8.5.5.3 The main change of interest to the matrices under the preferred growth option will be where existing GI provision is adequate, but development of the IDP sites causes this green to become amber of red. Such values are bordered in red in the matrices, and can be narrowed to a few parishes and types of GI.

8.5.5.4 All standards applicable to individual IDP sites are measured by distance, so that an IDP is either within 500m of a 2ha or woodland (a green result), or it is not (a red result). More detailed investigation is now required to identify those amber sites; whereby there is potential to deliver a 2ha woodland within 500m of an IDP site that currently lacks provision.

8.5.5.5 It is not considered necessary at this stage to create a single overview table with appropriate weightings and flexibility to determine a single grading for each parish and IDP site. However, should this be required in the future, the data amassed in the current project can be fed into such a summary table.

8.5.5.6 It is necessary to interpret the tables with caution, as although the provision for a certain type of GI may be lacking (e.g. Local Areas for Play within 100km), there may be other suitable GI within this distance (e.g. a Neighbourhood Equipped Area for Play), providing a far larger area of GI, and therefore negating the requirement for the smaller LAP.

8.6 SUMMARY OF GREEN INFRASTRUCTURE PROVISION AND REQUIREMENTS

8.6.1 ASSESSMENT RESULTS

8.6.1.1 Data matrices for existing green infrastructure provision have been produced for each potential IDP site together with predicted population increases under the preferred growth option:

Appendix 8.1 – Baseline compliance with population and distance standards

Appendix 8.2 – Table showing compliance with green infrastructure standards following preferred growth option

Appendix 8.3 – Map illustrating those parishes that have changes in green infrastructure provision under the preferred growth option.

8.6.2 SHORTFALLS IN GREEN INFRASTRUCTURE

8.6.2.1 Changes in infrastructure provision under the preferred growth option can be summarised as changes from adequate provision to inadequate provision for the following features:

Table 8.4 – Changes in GI compliance with standards

Parish	Green Infrastructure type
Farnsfield	Outdoor Sports Facilities
Newark	Playing Fields & Amenity Green Spaces, Open Spaces
Bilsthorpe	Amenity Green Space

8.6.2.2 Compliance with distance standards for individual IDP sites to various GI features is unaffected by the proposed development, as the measure is for the individual site and its geographical location rather then numbers of houses or population.

8.6.2.3 It should be considered that many of the funding sources available for GI provision will not be applicable to existing shortfalls in provision, but can only be used towards additional GI for new developments, for example developer contributions via S106 Agreements as part of the planning application process.

8.6.2.4 Shortfalls in playing fields, amenity green spaces and open spaces are likely to be difficult to address within the urban areas of Newark.

8.6.2.5 PPG17 highlights the need to retain the ability to respond to changing requirements, for example provision of football pitches may not remain as important to communities in the future, while access to allotments may become increasingly valued.

8.6.3 POTENTIAL NEGATIVE IMPACTS

8.6.3.1 IDP sites at Edwinstowe, and Ollerton and Boughton are in close proximity to the nationally and internationally designated sites around Birkland and Bilhaugh SAC, and Sherwood Forest National Nature Reserve. Although this ensures that large areas of green infrastructure are within easy reach of these IDP sites, the potential for negative impacts upon the designated sites should also be considered. Additional housing is likely to increase visitor pressure, and may potentially have other indirect impacts on air and water quality as well as changing the landscape of this protected area.

8.6.3.2 The same IDP sites also have potential to negatively impact upon nationally important SSSIs, as do sites at Sutton-on-Trent and Blidworth.

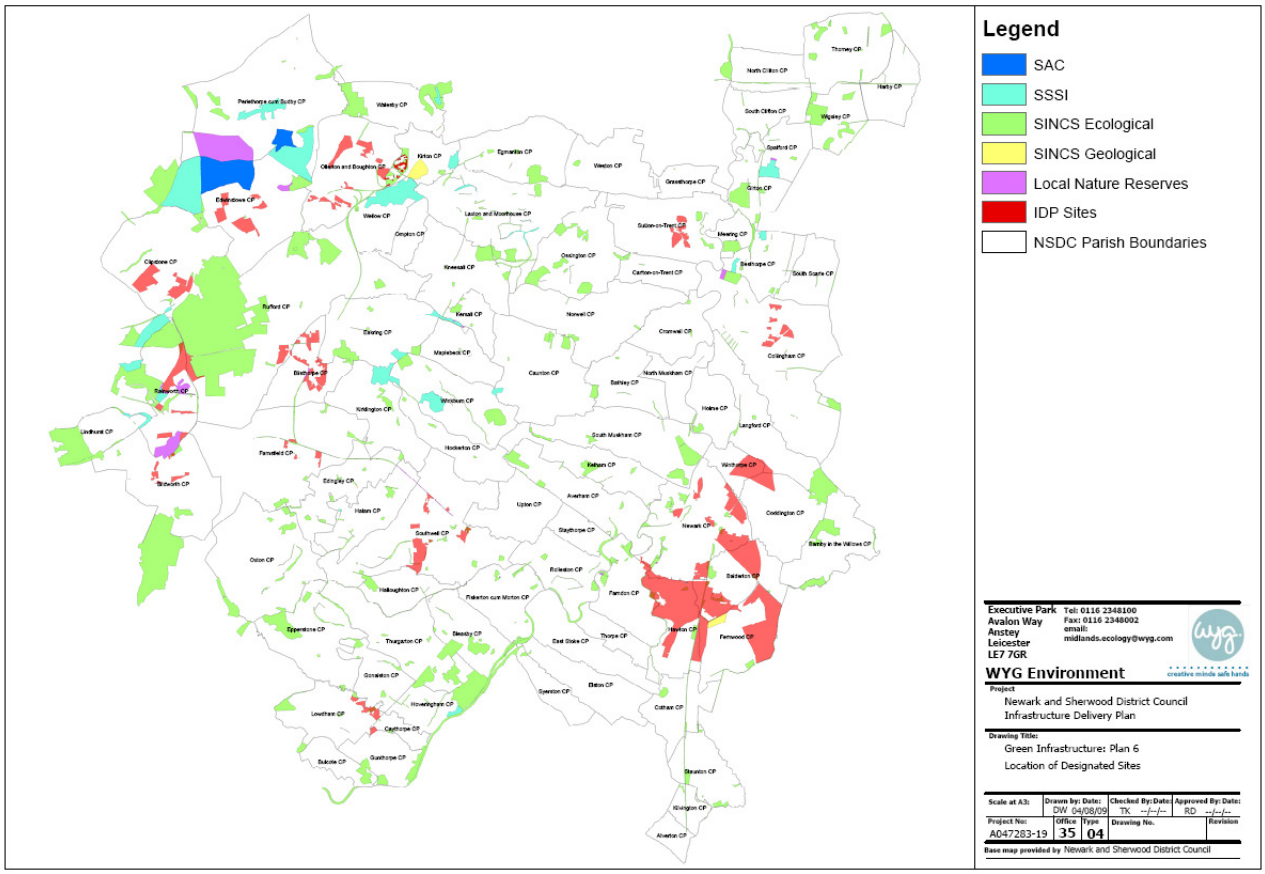


Figure 8.2 Locations of Designated Sites.

8.6.3.3 Any additional development within the Sherwood Forest Area should be carefully considered as this part of the district is particularly rich in terms of landscape and biodiversity value. The East Midlands Biodiversity Forum describes the west of the District as a Biodiversity Conservation Area. This incorporates IDP sites at:

- Farnsfield, Bilsthorpe, Blidworth, Rainworth, Clipstone, Edwinstowe, Ollerton and Boughton.

8.6.3.4 The aim of highlighting these areas is not to create constraints to development, but to act as a focal point for regional, and sub-regional, biodiversity funding and partnership working.

8.6.3.5 IDP sites within Lowdham and Southwell are within areas highlighted as Biodiversity Enhancement Areas, where opportunities to enhance biodiversity are particularly valuable. Development of the IDP sites, assuming adequate provision for multi-functional green space, could be particularly beneficial to biodiversity within these parishes.

Figure 8.6

8.7 POTENTIAL LOCATIONS FOR THE CREATION AND ENHANCEMENT OF GI

8.7.1.1 Detailed suggestions for the provision of green infrastructure in Newark and Sherwood are provided in the Community Green Space Provision Improvement Plans (2010)

8.7.1.2 The provision of the additional infrastructure where required to meet the standards for GI can be achieved by a number of routes. In terms of GI, suitable sites will be more difficult to find in urban areas where there is more pressure on land for development. Brownfield sites could potentially provide part of the solution in these areas, however even these can be developed with extensive remedial work for housing, business or mixed use developments.

8.7.1.3 Existing landfill sites at Bilsthorpe and Staple Quarry will require remediation in the future. However, the detailed proposals for remediation at these sites are not currently known.

8.7.1.4 In suburban and rural areas the availability of land suitable for GI purposes is possibly easier to find, with pressures on green field sites becoming less, with increasing distance from the main urban areas. Land in areas prone to flooding, for instance could be cheaper to develop for GI if it is unsuitable for building development. Land previously used for mining or other mineral extraction will be subject to planning conditions which require the satisfactory restoration of the land and could help create a ready made park/ woodland/ nature reserve. Negotiations at an early stage with minerals developers and the County Council who determine mineral planning permissions could provide a tailor made park ready to be developed further to cater for the people who will be using the site. Such sites can provide a wide range of wildlife habitats coupled with amenity open space for the public, consisting of areas for potential water sports, fishing (which can also raise revenue for maintenance and management), horse riding, walking, bird watching, play areas, sports pitches etc. These sites are usually large and therefore could go a long way to providing a significant multi-functional green space in an area deficient in GI.

8.7.1.5 The importance of creating, maintaining and enhancing a well connected green infrastructure is of ever more importance to allow habitats and species to adapt and disperse in response to climate change.

- The East Midlands Biodiversity Forum published 'Putting wildlife back on the map' in 2006. This document is a biodiversity strategy for the East Midlands. It identifies areas for biodiversity conservation, and areas for biodiversity enhancement. The aim of highlighting

these areas is not to create constraints to development, but to act as focal points for regional, and sub-regional, biodiversity funding and partnership working.

- The Newark & Sherwood Core Strategy Objective 11 is to protect and enhance the District's natural environment and biodiversity.

8.8 FUNDING

8.8.1 DEVELOPER CONTRIBUTIONS – SECTION 106 AGREEMENTS

8.8.1.1 Funds may be obtained from private developers with an interest in providing new homes with associated infrastructure. This would have to be handled carefully in the planning approval process to ensure that infrastructure provision is accommodated, at the same time ensuring that the cost of providing all elements of infrastructure are not prohibitive to the success and quality of the overall development. With much of the land purchased up to 2007 – 2008 at high cost, developing during the current recession may not be profitable for many developers, so it may be some time before money from private developers can be utilised in the form of Section 106 Agreements.

8.8.1.2 Section 106 agreements are derived from the Town and Country Planning Act 1990 (OPSI, 1990), and allow a Local Planning Authority (LPA) to enter into a legally-binding agreement or planning obligation with a land developer over a related issue. Developer contributions can include planting trees, retaining areas of land for amenity use, or ownership of habitats such as woodlands transferred to the LPA together with fees for future maintenance. Contributions may be in the form of lump sum or an endowment, or as phased payments over a period of time.

8.8.1.3 National guidance (ODPM Circular 05/2005) "That planning obligations are only sought where they meet all the following tests:

"A planning obligation must be:

1. Relevant to planning;
2. Necessary to make the proposed development acceptable in planning terms;
3. Directly related to the proposed development;
4. Fairly and reasonably related in scale and kind to the proposed development; and
5. Reasonable in all other respects."

8.8.1.4 Developer contributions may take the form of maintenance contributions, but normally the costs of subsequent maintenance are borne by the authority who is given ownership of the site. Pooled contributions may also be of value, where a number of developers will pool resources to allow joint infrastructure to be implemented.

8.8.2 GROWTH POINT FUNDING

8.8.2.1 Newark's Growth Point status should provide access to funds accompanying the designation. This will be addressed further in the planning section of the document.

8.8.3 LANDFILL COMMUNITIES FUND

8.8.3.1 Tax on landfill waste may be contributed through partnership to enrolled Environmental Bodies (EBs) to work towards environmental objects as detailed in the Landfill Tax Regulations. Projects should create significant environmental benefits or jobs and improve the lives of communities near landfill sites. Funding is usually received through a Distributive Environmental Body, such as Waste Recycling Environmental Limited (WREN) who ensure that the proposed expenditure complies with the Landfill Tax Regulations and guidelines.

8.8.3.2 However, landfill tax is less likely to be available in the future as domestic waste will no longer be landfilled after 2011, and only Staples Quarry will continue to operate for industrial and commercial waste (http://www.newark-sherwooddc.gov.uk).

8.8.4 WILDLIFE AND HERITAGE ORGANISATIONS AND CHARITIES

8.8.4.1 Wildlife and Heritage organisations and charities such as the Wildlife Trusts, RSPB and National Trust are interested in buying and maintaining sites important for wildlife, heritage and landscape, when they have sufficient funds. Liaison with organisations such as this could reveal potential for securing sites which would contribute to GI provision.

8.8.4.2 Organisations such as the Groundwork Trusts who's mission is to: "Work alongside communities, public bodies, private companies and voluntary sector organisations to deliver projects and programmes that benefit: people – creating opportunities for people to learn new skills and become more active citizens; places – delivering environmental improvements that create cleaner, safer, greener neighbourhoods; and prosperity – helping businesses and individuals fulfill their potential."

8.8.4.3 Money is secured from a variety of sources including the UK Government and devolved assemblies, Local Authorities, the private sector, charitable trusts, the European Union, the National Lottery and from individual legacies and donations. Each year Groundwork generates and invests more than £100 million in practical activities to support regeneration in the country's most deprived neighbourhoods. For every £1 they receive they are able to generate on average a further £3 from other sources.

8.8.4.4 Example voluntary sector organisations and partnerships that may be approached for funding or grants

- Black Environment Network
- British Horse Society
- British Trust for Conservation Volunteers
- Confederation of Forest Industries
- The Deer Initiative
- Local Wildlife Trusts
- East Midlands Arts
- East Midlands Local Trees Initiative
- Forest Education Initiative
- Globe
- Groundwork
- MENCAP
- National Memorial Arboretum
- NFU Countryside
- People Express Arts
- Ramblers Association
- Royal Forestry Society
- RSPB
- Sustrans
- The Tree Council
- Woodland Trust

8.8.4.5 Community Forest Partnerships, such as the Greenwood Community Forest in Nottinghamshire, including sections of Eastern Newark & Sherwood and the National Forest crossing between Leicestershire and Derbyshire, can help to generate GI over a wide area involving different organisations and landowners. The National Forest Company works through

partnerships with landowners, businesses, public, private and voluntary organisations and local communities.

8.8.5 GRANTS

8.8.5.1 There are various sources of funding for community environmental and conservation schemes. Many of the smaller grants are for established communities wishing to improve their local environment; however the larger grants are open to more organisations and can pay for the creation and/ or maintenance of larger projects. The table below summarises some potential funding sources, with information obtained from Regen.net, the Forestry Commission and Natural England.

8.8.5.2 Example Government agencies and bodies that may be approached for funding or grants

- Advantage West Midlands
- British Waterways
- Department for Environment, Food and Rural Affairs (Defra)
- Department of Communities and Local Government
- East Midlands Development Agency
- East Midlands Regional Assembly
- English Heritage
- Environment Agency
- Forestry Commission
- Government Office for the East Midlands
- Government Office for the West Midlands
- Highways Agency
- Natural England

8.8.6 HERITAGE LOTTERY FUND

8.8.6.1 A number of community and green space projects within Newark & Sherwood District have benefited from funding associated with the lottery. A recent example of this is the successful Sconce Hills Lottery Bid. A grant from the Heritage Lottery Fund in 2005 was used to complete a historic landscape survey and to prepare a conservation and restoration management plan for the site. A "Parks for People" bid was then put together and resulted in a grant of £1.13 million from the Heritage Lottery Fund and Big Lottery Fund. Additional funding was secured from Nottinghamshire County Council, Alliance SSP, Waste Recycling Environmental Limited (WREN) and Veolia Environment Trusts, the Friends of Sconce & Devon Park and the District

Council. A total of £1.7 million is now being used to create a new visitor centre, footpaths, toilets and interpretation signs.

8.8.6.2 A summary of potential Heritage Lottery Fund grants and examples of recent grants obtained for GI work are provided in the table below.

Table 8.5 HLF Grants and Funding Sources

GRANTS ABOVE £1 MILLION
PARKS FOR PEOPLE **Funding:** Grant sizes range between £250,000 and £5 million. Grants of up to £50,000 are available for project planning. In England, this is a three-year joint initiative between the Heritage Lottery Fund and the Big Lottery Fund. **Aim:** To help with the restoration and regeneration of public parks and gardens, including squares, walks and promenades, valued by communities as part of their heritage. **Who Can Apply?** Most applications are led by Local Authorities, or other not-for-profit organisations that own public park (in this case considered to be an existing designed urban or rural green space, the main purpose of which is for informal recreation and enjoyment). **Deadline:** Two per year, on 31 March and 30 September **Contact:** **T** 020 7591 6042/43/44 **E** enquire@hlf.org.uk **W** http://www.hlf.org.uk/English/HowToApply/OurGrantGivingProgrammes/Parks+for+People/ LANDSCAPE PARTNERSHIPS Landscape Partnerships (LP) grants are available to support schemes of between £250,000 and £2million led by partnerships of local, regional and national interests which aim to conserve areas of distinctive landscape character throughout the United Kingdom. The aim is to deliver the following outcomes: ▪ Conserving or restoring the built and natural features that create the historic landscape character. ▪ Increasing community participation in local heritage. ▪ Increasing access to and learning about the landscape area and its heritage.

- Increasing training opportunities in local heritage skills.

Completed first-round application should reach your regional or country office no later than 30 November of each year, for a decision in a single annual batch by our Trustees in the following April.

Contact:
T 020 7591 6000
E enquire@hlf.org.uk
W http://www.hlf.org.uk/English/HowToApply/OurGrantGivingProgrammes/LandscapePartnerships/

TOWNSCAPE HERITAGE INITIATIVE

Again funded by the Heritage Lottery Fund, grants of between £500,000 and £2,000,000 are made available to not-for-profit organisations to support the renewal of the historic environment in towns and cities. Projects should "preserve and enhance the character and appearance of conservation areas that are affected by high levels of deprivation and are in need of regeneration; bring historic buildings back into appropriate and sustainable use; and safeguard the character of conservation areas".

Deadline: 30 November each year.

Contact: T 020 7591 6042/43/44
E enquire@hlf.org.uk
W http://www.hlf.org.uk/English/HowToApply/OurGrantGivingProgrammes/TownscapeHeritageInitiative/

GRANTS UP TO £1 MILLION

ACCESS TO NATURE PROGRAMME

Funding: The total allocation for the Access to Nature programme is £25 million. Grants range from £50,000 to £500,000.

Funder: Big Lottery Fund, administered by Natural England.

Aim: To encourage people who currently have limited contact with the natural environment to enjoy the outdoors. The programme will fund projects that expect to result in:

- a greater number and diversity of people with improved opportunities to experience the natural environment;
- more people having opportunities to learn about the natural environment and gain new skills;
- more people being able to enjoy the natural environment through investment in access to natural places;
- and an increase in communities' sense of ownership of local natural places, by establishing

strong partnerships between communities, councils, voluntary organisations and others.

Who Can Apply? The programme will only award grants to: community groups governed by a written constitution; registered charities; statutory bodies, including schools, colleges, councils and health organisations; companies that are not registered charities but have a charitable purpose and a community focus; mutual societies; charitable or not-for-profit companies; and church-based and other faith groups.

Deadline: Brought forward to February 2010.

Contact:
W http://www.naturalengland.org.uk/ourwork/enjoying/outdoorsforall/accesstonature/default.aspx

FAIR SHARE TRUST

Funding: The total funding for the lifespan of the funding programme is £50 million. The minimum grant available is £5,000 and the maximum is £250,000, although there is some room for flexibility on both accounts.

Funder: The Big Lottery Fund.

Aim: The Fair Share Trust was set up to provide sustained funding in fair share areas - areas that have missed out on Big Lottery Fund investment in the past. The Fair Share Trust programme aims to: build capacity by involving local communities in decision-making about lottery funding; build social capital by building links within and between communities to promote trust and participation; and improve the living environment for communities.

Deadline: The final closing date for the fund, which has been running since 2003, is 31 December 2013.

Contact:
W http://www.communityfoundations.org.uk/fair_share_public.php

THE COALFIELDS REGENERATION TRUST

Funding: Over £60 million between 2008 and 2011. Two grants schemes award between £500 and £300,000 in England, and £500 and £100,000 in Scotland and Wales.

Funder: Former Office of the Deputy Prime Minister in England, Communities Scotland and the Welsh Assembly Government.

Aim: To promote and achieve social and economic regeneration in the coalfield communities of England,

Scotland and Wales.

Who Can Apply? Groups, organisations and agencies in England, Scotland and Wales which can show that their project or activity benefits a coalfield community. The trust will not normally support an established business.

Deadline: Not fixed; rolling programme.

Contact:
T 01709 760272
E info@coalfields-regen.org.uk
W www.coalfields-regen.org.uk

UNLTD

Funding: Drawn from a legacy of £100 million left by the Millennium Commission. Level 1 grants available from £500 to £5,000. Level 2 grants range from £5,000 to £20,000.

Funder: National Lottery funding through the Millennium Commission.

Aim: To provide funding and complete packages of support for social enterprises designed to benefit the local community.

Who Can Apply? Level 1 is aimed at individuals or informal groups who want to start a project in their spare time. Level 2 is for up and running projects.

Deadline: Not fixed; rolling programme.

Contact:
T 020 7391 9220;
W http://www.unltd.org.uk/template.php?ID=1

AGGREGATES LEVY SUSTAINABILITY FUND

Funding: £5000 - £350 000

Who can apply: Any individual company or organisation. An expression of interest form must be completed to see if project is eligible. Limited availability as only operational where effects of aggregate extraction can be demonstrated.

Deadline: Ongoing

Contact: ALSF Partnership Grants Team, Natural England www.naturalEngland.org.uk/conservation/grants-funding alsfgrants@naturalEngland.org.uk Tel 01476 584821

GREENER LIVING FUND

Funding: The fund totals just over £6 million, with a minimum grant of £200,000 on offer. Funding is over two years, from April 2009 to March 2011, and is expected to be available to up to ten organisations.

Funder: Defra.

Aim: Part of Defra's new Third Sector Strategy, the fund is designed to enable charities and voluntary sector organisations to promote sustainable living in England by encouraging local participation. Programmes should aim to help individuals and communities to reduce their carbon footprints, to make greener lifestyle choices and to rely less on natural resources. Applicants must: be able to implement programmes at a national level; have a clear understanding of the target audience; and demonstrate appropriate methods of engaging people and encouraging more sustainable living at the grass roots. Ideally, grants will enable organisations to obtain funding from additional sources in order to encourage further environmental change. Programmes can be also be implemented through partnerships with other third sector organisations, businesses or the public sector.

Who Can Apply? The fund is restricted to charities and voluntary organisations that are capable of implementing programmes and projects nationally.

Deadline: Applicants must make a submission of concept and application for a £30,000 programme preparation grant by 16 December. The second stage began in January 2009.

Contact: For more information, visit www.defra.gov.uk

LLOYDS TSB FOUNDATION FOR ENGLAND

Funding: Grants range between £500 and £20,000.

Funder: Lloyds TSB Foundation for England and Wales.

Aim: To support under-funded charitable organisations in England and Wales, particularly those that help disadvantaged or disabled people. Funding priorities are activities that assist refugees and asylum-seekers, and work to tackle exclusion among ethnic minority groups.

Who Can Apply? Registered charities in England and Wales **Deadline:** Not fixed; rolling programme **Contact:** **T** 0870 411 1223 **W** www.lloydstsbfoundations.org.uk

8.8.6.3 Many agricultural landowners and managers in the area benefit from Environmental Stewardship agri-environment schemes. Entry Level Stewardship and Higher Level Stewardship schemes are administered by Natural England, for the purposes of conserving and enhancing habitats, species, landscapes, resources and access.

8.8.6.4 Locally, Nottinghamshire Biodiversity Action Group (Notts BAG) has created a bank of projects to contribute to Local Biodiversity Action Plan targets, and is seeking funding to enable the implementation of these projects. These targets and projects could provide direction for the provision of locally appropriate GI to enhance biodiversity. The Notts BAG group has obtained funding from a variety of sources including an Aggregates Levy Sustainability Fund grant from Natural England.

8.9 COSTS

8.9.1.1 The provision of cost estimates for various forms of green infrastructure are difficult to quantify at this stage, until it is known which IDP sites will be taken forward, and in which combinations. There is some existing guidance regarding costs available in the good practice examples from the companion guide to PPG 17 (ODPM May 2006), and in the Milton Keynes and East Midlands Green Infrastructure Guide (2005). Developer contributions of approximately £3,000 per house may be worth considering.

8.10 DELIVERY PROGRAMME

8.10.1.1 The programme for delivery of additional green infrastructure will be related to the number of houses being completed and the date at which they will be completed and whether the particular sites require further green infrastructure or if the current provision is adequate. Although we are keen to emphasise that it is very unlikely that any particular parish or area will have too much green infrastructure. Any potential opportunities for gains for biodiversity,

landscape and enhancement should always be taken, and will provide social, economic and environmental benefits.

8.10.1.2 Given the current recession which has hit the housing market, from a cost perspective regarding the creation of new green infrastructure, it would be preferable to develop in those areas that currently have a surplus of GI, or where the smallest amount of new infrastructure is required, reducing the reliance on other organisations to provide funding in a time when funding may be more difficult to find. Therefore the sites which would require considerable amounts of new green infrastructure would be developed at a later date.

8.10.1.3 Smaller GI sites such as pocket parks, LEAPs, NEAPs and accessible green space should be easily integrated into residential and commercial developments of any size.

8.10.1.4 Developing the sites in this order will reduce the amount of funding required initially until such time as the economy recovers and developers, voluntary organisations and public bodies are in a stronger financial position to deliver the necessary infrastructure required for those sites which will require a large input into the GI provision.

8.11 SUMMARY

8.11.1.1 The northwestern corner of the District is currently well provided with regards to nationally and internationally designated sites and access to Country Parks.

8.11.1.2 This report does not seek to redress existing green infrastructure deficits, which are discussed in detail in the Community Green Space Provision Improvement Plans (2010). We have highlighted the changes in shortfall under the preferred growth option.

8.11.1.3 Under existing GI standards, development within Newark CP is likely to require additional GI provision in the form of playing fields and amenity green spaces and open space.

8.11.1.4 Additional Amenity Green Space will be required in Bilsthorpe under the preferred growth option.

8.11.1.5 There will be a shortfall in outdoor sports facilities in Farnsfield area.

8.11.1.6 Any additional development within the Sherwood Forest Area should be carefully considered as this part of the district is particularly rich in terms of landscape and biodiversity value. IDP sites at Edwinstowe, and Ollerton and Boughton are in close proximity to the nationally and

internationally designated sites around Birkland and Bilhaugh SAC, and Sherwood Forest National Nature Reserve. Additional housing has the potential to increase visitor pressure, and may have other indirect impacts on air and water quality as well as changing the landscape of this protected area, considered to be a 'Biodiversity Conservation Area' by the East Midlands Biodiversity Forum.

8.11.1.7 Development of the IDP sites, assuming adequate provision is included for multi-functional green space, has the potential to contribute positively to GI provision, and enhancement of biodiversity and landscapes.

8.12 STANDARDS

Table 8.6 – Accepted GI Standards

Natural England Accessible Natural Greenspace Standards:

- No person should live more than 300 metres from their nearest area of natural green space of at least 2 hectares in size.
- At least 1 hectare of Local Nature Reserve should be provided per 1,000 population.
- There should be at least one accessible 20 hectare green space site within 2 kilometres from home.
- There should be one accessible 100 hectare green space site within 5 kilometres.
- There should be one accessible 500 hectare green space site within 10kilometres

The Woodland Trust Woodland Access Standards:

- No person should live more than 500 metres from at least one area of accessible woodland of no less than 2 hectares in size.
- There should also be at least one area of accessible woodland of no less than 20 hectares within 4 kilometres (8 kilometre round-trip) of people's homes.

National Playing Fields Association:

- Planning and Design for Outdoor Sport and Play (PAD) continues to uphold the original FIT recommendation that 6 acres of recreational space is required for every 1000 people – a benchmark which has become the accepted industry-wide standard since its inception in the 1930s.
- The national playing field associations 'Six Acre Standard' document recommends that all children live within walking distance of appropriate play facilities. The recommendations are: Local Area for Play (LAP) within 1 minute walking distance, Local Equipped Area for

Play (LEAP) within 5 minute walking distance, Neighbourhood Equipped Area for Play (NEAPS), within 15 mins walking distance

(i) For communities of 1000 or more people full LAP, LEAP and NEAP provision

(ii) For communities of 250 – 1000, with LAPs and priority LEAP

(iii) 100- 250 people, a LEAP plus casual playing space of at least 100 sqm and LAPs in new housing developments.

(iv) Less than 100 people, 100 sqm play space and LAPs on new housing developments

8.12.1.1 In defining 'Access to Natural Greenspace Standards' (ANGSt) locally, other standards need to be considered, e.g.

a. Six Acre Standard.
b. Towards a Level Playing Field.
c. Woodland Access Standards.

A brief resume of these is given below:

Six Acre Standard

A long-standing national standard, with which ANGSt can work, includes the former National Playing Fields Association's (now Fields in Trust) Six Acre Standard. This was originally developed in the 1930s as part of the garden city movement. In 2008, Fields in Trust (FIT) published Planning and Design for Outdoor Sport and Play (PAD), the document which updates and supersedes the Six Acre Standard. PAD continues to uphold the original FIT recommendation that 6 acres (2.4 ha) of recreational space is required for every 1000 people, and also provides a detailed framework relating to quantity, quality and accessibility of outdoor facilities for sport and play and the importance of local assessments and standards.

Towards a Level Playing Field

Sport England has produced a detailed toolkit for calculating the number of playing fields needed in a given area. The toolkit enables demand to be calculated for football, rugby, cricket and hockey pitches. It uses actual population figures and numbers of sports teams from ward data.

The tool can forecast future demand for pitches through an assessment of the number of teams generated per 1000 population in the local area. No distance thresholds are included, but it is possible to see which areas have sufficient pitches to meet local demand, and where there are shortfalls. Overall a high proportion of urban greenspace is dedicated to natural turf pitches, which are generally poor in bringing people close to nature. Making provision for sport through artificial turf pitches can assist in releasing these areas for more effective use. It needs to be remembered that the Sport England calculations of the number of pitches needed using this model do also impact on access to nature.

The Woodland Trust Woodland Access Standards

This is based on a similar principle of accessibility to the Natural England ANGSt:

- No person should live more than 500 metres from at least one area of accessible woodland of no less than 2 hectares in size.
- There should also be at least one area of accessible woodland of no less than 20 hectares within 4 kilometres (8 kilometres round-trip) of people's homes.

8.12.1.2 The National Society of Allotment and Leisure Gardeners (NSALG) has also produced a national allotment standard for a minimum provision of 20 standard plots of 250 square metres per 1,000 households.

8.12.1.3 Individual Councils have developed their own standards which they feel relate to their area as some may not be appropriate for more rural areas. There are types of infrastructure which do not have well-recognised standards applicable to them in terms of GI e.g. landfill sites, current and former mineral workings, however they will be considered where there is an infrastructure shortfall in some areas and will be assessed in terms of the shortfall type e.g. playing fields, play areas. These areas may provide a multi functional use by providing infrastructure for a number of types of GI.

8.12.2 EXISTING OPEN SPACE STANDARDS USED BY NEWARK & SHERWOOD DISTRICT COUNCIL

8.12.2.1 These are based on the above standards and were used in the Green Space Strategy document and deemed appropriate for the District.

Table 8.7 – Open Space Distance Standards as used in the Green Space Strategy

Open Space categorisation	Size guideline (ha)	Distance from homes
Regional park	Over 60	Up to 30km
District park	10 -60	Up to 15km
Town park/ Playing field	4-10	Up to 3km
Neighbourhood park/ Playing field	2-4	Up to 1km
Local Playing field	0.5- 2	Up to 500m
Pocket playing field	0.2- 0.5	Up to 300m

Table 8.8 – Open Space Population Standards as used in the Green Space Strategy and Green Space Provision Improvement Plans

Open Space categorisation	Standard
Parks and Gardens	0.6 ha per 1,000 population
Natural and semi-natural green spaces	10 ha per 1,000 population
Outdoor sports facilities	2.2 ha per 1,000 population
Amenity green space	0.6 ha per 1,000 population
Provision for children and young people	0.75 ha per 1,000 population
Allotments and community gardens	0.5 ha per 1,000 population
Cemeteries and churchyards	0.5 ha per 1,000 population

8.12.2.2 The Newark & Sherwood Green Space Provision Improvement Plans (2010) also use the distance standard that all residents should be within 300m of natural and semi-natural green spaces.

8.12.3 POTENTIAL ECOLOGICAL & LANDSCAPE IMPACTS

8.12.3.1 Potential impacts (positive or negative) upon sites of ecological value and landscape designations will also be considered where appropriate with regard to maintaining / enhancing & creating wildlife corridors and landscape character. Relevance to Natural England's Biodiversity Enhancement Areas and Biodiversity Conservation Areas can be used as guidance where appropriate.

8.13 DATA SOURCES

8.13.1 LDF EVIDENCE BASE – IDP CONSULTATION

8.13.1.1 The extracts below from the Consultation responses to Newark & Sherwood District Council (2008-2009) are those considered to be directly relevant to current and future provision of GI across the District.

8.13.1.2 Nottinghamshire County Council – replied on the 23rd September 2008

The County Council stated that *'there needs to be an increase in green / environmental infrastructure. However, there are no specific targets as such for the provision of green / environmental infrastructure, although targets such as those in the Nottinghamshire Local Biodiversity Action Plan and Natural England's Accessible Natural Greenspace Standards are relevant.'*

8.13.1.3 Nottinghamshire County Council – a detailed response was obtained from the Spatial Planning Team on the 9th February 2009 in relation to consultation on the SHLAA sites.

In response to the consultation from NSDC, NCC carried out a broad scale assessment of the potential SHLAA locations in relation to designated sites; coincidence with or proximity to UKBAP or LBAP priority habitats was not examined, and nor was coincidence with or proximity to known sites for protected or UKBAP/LBAP species.

Assessment was made of any SHLAA sites that coincided with, or were in proximity to designated sites such as Birklands and Bilhaugh Special Area of Conservation (SAC), the only internationally designated important ecological site within the District, or nationally important Sites of Special Scientific Interest (SSSIs) and locally important Sites of Importance to Nature Conservation (SINCs), also known as Local Wildlife Sites (LWSs).

However, it is understood that Nottinghamshire Biological and Geological records Centre (NBGRC) have been asked to undertake a similar assessment exercise. As such, NCC consider that they will be identifying where sites might affect UK Biodiversity Action Plan (BAP) priority habitats (and possibly Local BAP priority habitats as well) or known sites for protected species.

NCC also identified SHLAA sites that are either wholly or partially located within the Nottingham Derby Green Belt. A review of the boundary of the Green Belt will need to be undertaken in relation to the release of any of these sites, as residential development is not a

type of development considered to be appropriate in the Green Belt (in accordance with PPG2 and Nottinghamshire and Nottingham Joint Structure Plan Policy 1/2). Nottinghamshire County Council is keen to be involved in any such review.

8.13.1.4 Natural England – the Nottinghamshire Team replied on the 10th October 2008

'Natural England acknowledges that high levels of growth are forecast across the region and recognise that this will put increased pressure on the natural environment. However we also realise the potential opportunity the growth provides to invest in the environment and deliver substantial benefits for people, places and nature. Natural England believe if new development is carefully planned, designed, developed and managed it will be possible to meet the environmental, social and economic needs of our present and future communities.

It is vital that the right kind of development is delivered in the right place. Options should be pursued that primarily protect but also seek to enhance and improve the current environmental assets as a cultural and recreational amenity and as a resource for biodiversity. We support the government's commitment to creating sustainable communities in Planning Policy Statement 1 which encompasses integrating social economic and environmental objectives from the outset. It promotes development that is:

- Sustainable in both built form and function
- Respects the ability of the environment to accommodate change, including climate change
- Avoids damage to and increases or enhances the environmental resource
- Reduces risks to, and potentially arising from, the environment
- Respects local distinctiveness and sense of place and is of high quality design, so that it is valued by communities
- Reflects local needs and provides local benefits.

We believe green infrastructure is central to sustainable development and the achievement of sustainable communities. The provision of multi-functional green space as an integral part of development can create high quality, locally distinctive, resource efficient places that are attractive to live and work, support a wide range of biodiversity and enhance the quality of life for present and future residents and visitors.

Green Infrastructure Strategic Considerations:

Green Infrastructure is defined as a network of multi-functional greenspace that contributes to the high quality natural and built environment required for existing and new sustainable communities in the future. Natural England believe in order to accommodate the necessary growth with minimum impacts and deliver maximum benefits for the natural environment the most environmentally sustainable locations should be found for new housing development.

GI must be planned strategically and delivered in an integrated way across the sub region. An assessment of environmental capacity should underpin strategic development decisions. GI strategies should be shaped by landscape character and informed by the local Biodiversity Action Plan (lBAP) and reference should also be made to Nottinghamshire's Rights of Way Improvement Plan – Nottinghamshire County Council. A holistic approach to GI is required to ensure the most sustainable use and management of available green space resources is established, maintained and properly resourced to guarantee its long term development as an essential component of the urban environment.

GI is essential for quality of life and therefore it is important that we protect the existing greenspace and incorporate new GI provision as part of development establishing links between areas to create a network of multifunctional greenspace that can be used by residents and act as habitats and green corridors for wildlife, this approach is promoted in Policy 6 of Three Cities SRS.

GI spans urban and rural areas, providing an essential link between town and countryside that allows a continuum of publicly accessible green spaces, Rights of Way and wildlife corridors. The ultimate goal is to achieve an easily accessible greenspace network. Therefore urban extensions must avoid existing green wedges and seek to extend them and establish links with existing green corridors across the wider landscape to provide an adequate recreational resource for the communities they serve and the wildlife they support, supported in Policy 3 of the Three Cities SRS.

A crucial initial step will be to gather a robust evidence base. We therefore recommend a GI mapping exercise is carried out to identify all existing green spaces and corridors. The GI mapping exercise should identify all public and private assets, with and without public access in both urban and rural location, a full list of GI elements are given in Annex 1.

Other useful information that should be referred to as part of this exercise is the Public benefits Mapping work to show areas that would give greatest benefit with GI, carried out by The Regional Assembly. Can be accessed via http://www.emra.gov.uk/publications/regional-communities-policy/environment

8.13.1.5 Additional comments on SHLAA layer forwarded from NSDC (dated 10th Feb 09)

Kirton Parish – the proposed green space 'gives the impression of almost a village green which would be lost'. '…the loss would change the village characteristics'. 'Existing recreational use would be affected' & 'any development would not safeguard the mature trees within the site'.

Newark Parish - comments on a number of SHLAA sites in Hawtonville as being some of the 'few remaining green spaces within Hawtonville'. One of which (08-0249) is 'currently used for football and play area both maintained by NSDC. As such if Hawtonville were to be built today, this land would be considered under a S106 agreement as land held for the community benefit.'

8.13.1.6 General comments on Newark, by Newark Town Council – Certain sites represent 'remaining open space within the Hortonville estate. The estate is acknowledged as suffering major depravation and the development of the remaining green space will serve only exacerbate the social problems found within the estate. On planning grounds alone the concentration of existing development would mean that further development of the site would have adverse impacts on its surroundings'.

8.13.2 FURTHER SOURCES OF INFORMATION

8.13.2.1 Additional information of use to the Infrastructure Delivery Plan has been obtained from the following sources:

- Newark & Sherwood District Council (2010). Community Green Space Provision Improvement Plans. Knight, Kavanagh and Page.
- Newark & Sherwood District Council (2010). A Green Infrastructure Strategy for Newark & Sherwood.
- Although information from Nottinghamshire County Council Minerals and Waste information on existing and former sites has not been located, NSDC have provided a layer showing existing mineral excavations.

- Nottinghamshire Biological & Geological Records Centre (NBGRC) & the National Biodiversity Network (NBN) Gateway hold records regarding species distribution, however, limited data information has been provided relating to the responses to the SHLAA consultation.
- The Multi-Agency Information Centre (MAGIC) contains information regarding the distribution of features such as ancient woodland and agri-environment schemes. The latter are considered to be beyond the scope of the current document, but are of value to GI and biodiversity at a local level.
- Natural England's (NE) website contains some broad scale information regarding the current distribution of BAP habitats within the District, Landscape Character Areas and Natural Areas.
- GIS data from the Newark and Sherwood Green Space Strategy document has been incorporated into the IDP; however there is currently a lack of background information behind the data to determine details.
- The Countryside appraisal – Nottinghamshire landscape guidelines – Notts County Council
- Town and Country Planning Association – www.tcpa.org.uk
- National Playing Fields Association – www.npfa.co.uk
- National Land Use Database – www.nlud.org.uk
- Communities and Local Government – www.communities.gov.uk
- The Landscape Character Network – www.landscapecharacter.org.uk. Locally, landscape character assessments have been completed for the Mid-Nottinghamshire Farm Lands, the Sherwood Forest area and the Trent Vale.
- Green infrastructure Planning Guide - www.greeninfrastructure.eu/index.php

8.13.3 INFORMATION GAPS

8.13.3.1 Further information that would help to inform and deliver infrastructure provision within the Newark & Sherwood area:

- Up to date information regarding brownfield, minerals and waste sites that may be available for restoration and redevelopment either now, or in the future. These sites may not be suitable for remediation to building development, but could potentially be used to create new multifunctional green space.

- Nottinghamshire Biological & Geological Records Centre (NBGRC) & the National Biodiversity Network (NBN) Gateway hold records regarding species distribution. It is recommended that any sizeable developments or green infrastructure provision projects should consult with these organisations, and where necessary have baseline ecological studies undertaken to determine those species and habitats already present, and that any developments undertaken enhance biodiversity.
- Allotments and Community gardens – information of this type tends to be kept at parish level, and has been addressed in detail in the Community Green Space Provision Improvement Plans (Newark & Sherwood 2010).
- There is an acknowledged lack of up to date, qualitative data regarding UK BAP priority habitats and species data (Towards a Regional Biodiversity Audit for the East Midlands, 2004), although the unverified locations of some BAP habitats have been downloaded from the Natural England website.

8.14 POLICY SUMMARY

8.14.1 EUROPEAN LEGISLATION & GUIDANCE

- The European Landscape Convention, an instrument of the Council of Europe ratified by UK Government in November 2006.
- The EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC): The Conservation (Natural Habitats, &c.) Regulations 1994 (amended 2007) represents the UK implementation to the Habitats & Species Directive (1992) issued by the European Community (EC).

8.14.2 NATIONAL LEGISLATION & GUIDANCE

- The Wildlife and Countryside Act 1981 (WCA 1981) (as amended); the primary legislation covering endangered or threatened species in England which sets out the framework for the designation and protection of Sites of Special Scientific Interest (SSSIs).
- The Countryside and Rights of Way (CRoW) Act 2000 affords a greater level of protection to Sites of Special Scientific Interest (SSSIs), provides better management arrangements for Areas of Outstanding Natural Beauty (AONBs) and strengthens wildlife enforcement legislation. Section 74(2) of the Act requires the Secretary of State to list those habitats and species of principal importance for the conservation of biodiversity in England, in accordance within the United Nations Convention of Biological Diversity 1992.

- The Natural Environment and Rural Communities (NERC) Act 2006 is designed to help achieve a rich and diverse natural environment and thriving rural communities through modernised and simplified arrangements for delivering Government Policy. Public authorities should have regard for the conservation of biodiversity, particularly the habitats and species within the revised UK Biodiversity Action Plan (BAP) and future revisions of the Nottinghamshire local BAP.
- Green Infrastructure is referred to in Planning Policy Guidance 12 (PPS12), which states that 'the core strategy should be supported by evidence of what physical, social and green infrastructure is needed to enable the amount of development proposed for the area, taking account of its type and distribution. This evidence should cover who will provide the infrastructure and when it will be provided'.
- National planning policy of relevance to nature conservation is embodied in Planning Policy Statement 9 (PPS9) – Biodiversity and Geological Conservation and the accompanying Government circulars (ODPM Circular 06/2005, Defra Circular 01/2005) and Good Practice Guide. This includes requirements for development to deliver biodiversity enhancement/gain as well as avoidance, reduction and compensation for adverse effects, and moves towards sustainable development.
- Natural England's policy position is contained in The Countryside in and Around Towns, published by the Countryside Agency with Groundwork in 2005. This sets out a vision for connecting town and country in the pursuit of sustainable development and identifies 10 key functions for open land around urban areas.
- The UK Biodiversity Action Plan (BAP) was first published in 1994, with the list of priority species and habitats revised in 2007

8.14.3 LOCAL POLICY

- The East Midlands Regional Plan includes specific policy to deliver, protect and enhance GI: Policy 27 – Protecting and enhancing the region's natural and cultural assets; Policy 28 – Priorities for enhancing the region's biodiversity; Policy 29 – A regional target for increasing woodland cover; Policy 30 – Priorities for the management and enhancement of the region's landscape; Policy 31 – Regional priorities for the historic environment; Policy 32 – Regional priorities for sports and recreational facilities; Policy 33 – A regional approach to the Water Environment; Policy 34 – Regional priorities for strategic river corridors

- The East Midlands Biodiversity Forum published 'Putting wildlife back on the map' in 2006. This document is a biodiversity strategy for the East Midlands. It identifies areas for biodiversity conservation, and areas for biodiversity enhancement. The aim of highlighting these areas is not to create constraints to development, but to act as focal points for regional, and sub-regional, biodiversity funding and partnership working.
- The Regional Environment Strategy (EMRA) has an overall key challenge 'to integrate considerations of the environment in all decision making as part of the move towards a sustainable region'.
- The Regional Economic Strategy (RES) has a strategic priority to protect and enhance green infrastructure through environmental stewardship.
- The Nottinghamshire Local Biodiversity Action Plan (1998) provides a framework for the District Council to take forward its own District-wide Biodiversity Implementation Plan, which was adopted in July 2003. Both of documents are used to raise the profile of wildlife conservation and provide clear targets and actions to promote biodiversity and safeguard areas of nature conservation importance.
- The Newark and Sherwood Community Plan (2006-2012) by Newark and Sherwood Local Strategic Partnership has the 'Preservation and enhancement of wildlife, landscape and ecology of the District' as a priority.
- A number of SPDs have been prepared for, or by Newark & Sherwood District Council. These include a Green Space Strategy, a Playing Field Strategy and a Children's Play Strategy, and a Green Infrastructure Strategy for Newark and Sherwood.

8.15 GLOSSARY

ANGSt	Access to Natural Greenspace Standards
BAP	Biodiversity Action Plan
EMBP	East Midlands Biodiversity Partnership
EMDA	East Midlands Development Agency
EMRA	East Midlands Regional Assembly
GI	Green Infrastructure
HLF	Heritage Lottery Fund
IDP	Infrastructure Delivery Plan
LAP	Local Area for Play
LBAP	Local Biodiversity Action Plan
LDF	Local Development Framework
LEAP	Local Equipped Area for Play
LWS	Local Wildlife Site, also known as a SINC (Site of Interest to Nature Conservation)
NBGRC	Nottinghamshire Biological and Geological Records Centre
NCC	Nottinghamshire County Council
NE	Natural England
NEAP	Neighbourhood Equipped Areas for Play
NSDC	Newark & Sherwood District Council
NWT	Nottinghamshire Wildlife Trust
RSS	Regional Spatial Strategy
SAC	Special of Area of Conservation (an International Designation)
SANG	Sustainable Accessible Natural Green Space
SHLAA	Strategic Housing Land Availability Assessment
SINC	Site of Interest to Nature Conservation
SSSI	Site of Special Scientific Interest
UK BAP	UK Biodiversity Action Plan
WREN	Waste Recycling Environmental Limited

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9 DELIVERY PLAN

9.1 INTRODUCTION

9.1.1.1 Each of the previous chapters has identified the infrastructure required to overcome the existing shortfall as a result of the forecast growth across the District.

9.1.1.2 The infrastructure requirements across the District have been collated for the preferred development scenario in Appendix 11. The table has been formatted to show the location of the infrastructure, the likely delivery programme, and possible sources of funding.

9.1.1.3 The delivery programme is shown as either an approximate period of time within the plan period, or as a trigger point based on a number of residential units completed within the plan period before the infrastructure is required.

9.1.1.4 Any costs of infrastructure referred to in this chapter have been identified in preliminary form and are intended to give an approximate 'order of cost' only. All scheme proposals and costs presented in this report exclude; land ownership/acquisition issues, environmental impacts, statutory procedure issues and detailed design, and are presented for information purposes only.

9.2 TRANSPORT

9.2.1.1 Chapter 5 of this study has identified likely infrastructure improvements that will be required in order to address the cumulative impacts of proposed development across the District. An approximate estimate of scheme delivery priority has been made based on a combination of estimated 'spare' traffic capacity on highway corridors, the need to address existing safety and/or capacity issues, the requirement to address the cumulative traffic impacts of development traffic and the relative difficulty of delivering the improvements required. Delivery priority has then been grouped into the following categories:

- 2009 – 2015 or 'Short Term' - improvements required in the near future to address existing capacity/safety issues, or to permit future growth to proceed.
- 2015 – 2020 or 'Medium Term' – improvements required to meet future traffic demands associated with residential/employment growth.

- 2020 – 2026 or 'Long Term' – improvements required to meet future traffic demands associated with residential/employment growth.

9.2.1.2 This assessment methodology is very approximate and is only used to give a rough indication of priorities for the delivery of highway improvements.

9.2.1.3 It is also highlighted that this is a link-based assessment only and does not take into account junction capacity. In practice, it is likely that the junctions along these links will exceed their capacity before the links do, and these junctions should therefore be improved in advance of consideration of link widening/dualling.

9.2.1.4 Details of impacts at specific junctions will need to be determined as part of the Transport Assessments submitted in support of development proposals and appropriate improvements secured through the planning process.

Improvement Location	Indicative Construction Costs (£m)	No Growth	With Growth	Timescale for Delivery	Likely Funding Sources	Comments
Newark on Trent Southern Link Road	20.00	X	✓	2009 - 2015	Developer	New link road
A46/B6166 Farndon Roundabout, Newark-on-Trent Bypass	0.00	✓	✓	2009 - 2015	HA/Devel'	Assumed to be improved as part of the SLR
A1/B6326 London Road Roundabout, Balderton	0.00	✓	✓	2009 - 2015	LTP/Devel'	Assumed to be improved as part of the SLR
A614/A6075/A616 Ollerton Roundabout junction	4.00	✓	✓	2009 - 2015	Developer	As per previously proposed NCC scheme
A46/A617 Cattle Market Roundabout, Newark-on-Trent Bypass	3.00	✓	✓	2009 - 2015	HA/Devel'	Introduction of signal control (safety/capacity improvement)
A1/A17 Winthorpe Roundabout, Newark-on-Trent Bypass	2.00	✓	✓	2009 - 2015	HA/Devel'	Introduction of signal control (safety/capacity improvement)
A1/A46 Brownhills Roundabout, Newark-on-Trent Bypass	2.00	✓	✓	2009 - 2015	HA/Devel'	Introduction of signal control (safety/capacity improvement)
A46 Link Capacity, Newark-on-Trent Bypass	0.50	✓	✓	2015 - 2020	HA/Devel'	Road space reallocation to make best use of available carriageway
A6097/Trentside, Gunthorpe	0.25	✓	✓	2015 - 2020	LTP/Devel'	Scheme to ban right turns
A6097/A612 junction, Lowdham	1.25	✓	✓	2015 - 2020	LTP/Devel'	Possible introduction of signal control and associated geometry revisions
A6097/B6386 junction at Oxton	0.50	✓	✓	2015 - 2020	LTP/Devel'	Possible widening of southern arm entry/exist and circulatory to allow 2-lane ahead movements north-south

A6097 Link capacity (A46 to A612), Gunthorpe to Lowdham	2.00	✓	✓	2015 - 2020	LTP/Devel'	Possible on-line carriageway widening and/or alternative capacity improvements, such as provision of 'Ghost-Islands'
A6097 Link capacity (A612 to B6386), Lowdham to Oxton	7.00	✓	✓	2015 - 2020	LTP/Devel'	Possible on-line carriageway widening and/or alternative capacity improvements
A617 Link capacity (A46 to C17), Kelham	5.00	✓	✓	2020 - 2026	LTP/Devel'	Possible on-line carriageway widening and/or alternative capacity improvements
Possible new bridge over River Trent	10.00	✓	✓	2020 - 2026	LTP/Devel'	Possible provision of a new road bridge over the River Trent
A614/C1 junction - 'White Post' roundabout	0.50	X	✓	2020 - 2026	Developer	Possible re-allocation of road space to provide 2 approach lanes from the south
A614/A617 junction (Lockwell Hill)	1.00	X	✓	2020 - 2026	Developer	Possible widening of entry/exists and circulatory to allow 2-lane movements
A614/Mickledale Lane junction	0.25	X	✓	2020 - 2026	Developer	Rationalise junction layout with possible closure of adjacent accesses
A614/C13 Eakring Road junction	0.10	X	✓	2020 - 2026	Developer	Provide standard acceleration/deceleration tapers
A614/B6030 junction (south of Ollerton)	0.30	X	✓	2020 - 2026	Developer	Possible introduction of signal control and associated geometry revisions
Church Gate/Westgate/King Street junction, Southwell	0.50	X	✓	2020 - 2026	Developer	Possible introduction of signal control and associated geometry revisions
A614 Link capacity (A6097 to C1 'White Post' roundabout)	2.00	X	✓	2020 - 2026	Developer	Possible on-line carriageway widening and/or alternative capacity improvements
A614 Link capacity (A617 to C13 Eakring Road)	3.60	X	✓	2020 - 2026	Developer	Possible on-line carriageway widening and/or alternative capacity improvements
A614 Link capacity (B6030 to A6075/A616 Ollerton Roundabout)	1.70	X	✓	2020 - 2026	Developer	Possible on-line carriageway widening and/or alternative capacity improvements
A612 Westgate link capacity, Southwell	0.40	X	✓	2020 - 2026	Developer	Possible traffic management scheme
Total Cost (£m)	67.85					

Notes:
1. Scheme costs are indicative only and are provided as an approximate 'order of cost'.
2. Timescales for delivery are **indicative only**.
3. It is likely that the junctions on the links identified above will exceed their capacity before the links do and these junctions should therefore be improved in advance of consideration of link widening/dualling.
4. Details of impacts at specific locations should be determined as part of Transport Assessments submitted in support of development proposals and appropriate improvements secured through the planning process.

9.2.1.5 Chapter 5 and Appendix 11 of this study identifies the potential sources of funding for each project. The funding streams are discussed in Chapter 5 but can be summarised here as:

- Developer – funding provided in full by developers to address transport impacts as a result of development proposals.
- LTP – funding provided in full by the Local Transport Plan (LTP) budget to address existing transport issues on the County highway network.
- LTP/Developer – funding split between the Local Transport Plan (LTP) budget and developer(s) to address existing transport issues on the County highway network that will be exacerbated by development proposals.
- LTP/Central Gov' - funding split between the Local Transport Plan (LTP) budget and Central Government to investigate potential rail connection opportunities.
- HA/Developer - funding split between the Highways Agency (HA) and developer(s) to address existing transport issues on the Trunk Road network that will be exacerbated by development proposals.

9.2.1.6 It is recommended that further detailed assessment of the costs of each project is undertaken, prior to establishing funding attributable to each of the above mechanisms.

9.3 EDUCATION

9.3.1.1 As discussed in Section 5.3.7 of this study, the Education Authority determines future pupil numbers generated by new development on the basis of:

- 21 primary places per 100 dwellings
- 16 secondary places per 100 dwellings

Thus 1,000 new dwellings would generate a need for a one form entry (210 pupil) primary school, and 8,000 new dwellings would generate the need for a 1,280 pupil secondary school.

9.3.1.2 The only settlement with forecast growth exceeding 1,000 residential units is Newark. The education infrastructure requirements across the District are summarised in Table 9.3 below. The table calculates the number of primary and secondary school places required for the preferred growth option in each settlement location.

9.3.1.3 The preferred growth option provides sufficient development numbers to justify new primary school infrastructure in Newark on Trent and a shared facility for Ollerton & Boughton and Clipstone (see paragraph 4.3.8.6).

9.3.1.4 Development at Newark on Trent requires a provision of 1,242 new secondary school places. Consideration must be given to whether these numbers alone justify a new secondary school, and should be reviewed alongside the impacts of recent consolidation of secondary school infrastructure and the forthcoming Building Schools for the Future programme in Newark. This study assumes that there will be a requirement to position a new secondary school that will serve the potential sites for development to the south and east of the town.

Preferred Growth Option			
Settlement	No. of Primary School Places	No. of Single Form Entry Primary Schools	No. of Secondary School Places
Sub-Regional Centre			
Newark, Balderton & Fernwood	1,629	8	1,242
Service Centres			
Ollerton & Boughton	108	1	82
Clipstone	134	0	102
Rainworth	88	0	67
Southwell	62	0	47
Principal Villages			
Bilsthorpe	49	0	37
Blidworth	63	0	48
Collingham	25	0	19
Edwinstowe	25	0	13
Farnsfield	22	0	17
Lowdham	14	0	10
Sutton on Trent	10	0	7
Totals	2,229	9	1,691

Table 9.3 Education Infrastructure Requirements

9.3.1.5 In all other settlement locations there are not sufficient pupil numbers to justify entire new primary and secondary schools for the identified development alone. Decisions will need to be made of where to place new school infrastructure to best capture the planned growth in pupil numbers, as well as alleviate the pressure on existing education infrastructure. This may be by extensions to existing infrastructure at each settlement, or positioning new schools in the centre of clusters of settlements, or a combination of both.

9.3.1.6 The following assumptions of costs for new school infrastructure have been made:

- Single Form Entry (210 pupil) Primary School; £5m
- Two Form Entry (420 pupil) Primary School; £7m
- 1,500 pupil Secondary School; £25m

These costs are for comparison purposes only[4] and are subject to further detailed assessment. Where forecast growth in a settlement provides pupil numbers less than that required for a new primary school or secondary school, costs have been pro-rated based on the pupil numbers generated at each settlement.

9.3.1.7 A two form entry primary school has been allocated to settlements where development numbers provide sufficient growth for two or more single form entry primary schools.

9.3.1.8 Current sources of funding for new education infrastructure are:

- Central Government Funding via the Local Education Authority;
- Primary Capital Programme
- Voluntary Aided Schools
- New Pupil Places
- Private Finance Initiative / Public Private Partnerships
- Building Schools for the Future (BSF)
- Section 106 contributions

[4] Based on an approximate cost of £17,000 per pupil place and then rounded. This is roughly based on the costs provided in the Newark & Sherwood 'Developer Contributions Supplementary Planning Document' dated October 2008, and is provided for comparison purposes only.

9.3.1.9 However, it should be noted that a new secondary school for Newark on Trent will be funded from Community Infrastructure Levy (CIL) contributions.

9.3.1.10 It is noted that the BSF programme (2010 to 2013) makes allowance for current committed development only, and currently excludes detailed consideration of the preferred growth option being considered across the District.

9.4 UTILITIES

9.4.1.1 Chapter 7 of this report identifies infrastructure investment needed to meet the potential growth requirements of different development clusters of settlements across the District.

9.4.1.2 Key utility infrastructure projects assumed to be required for the preferred development scenario are:

- Central Networks; Newark on Trent - Upgrade to Bulk Supply Point – est. £6m (funded by Central Networks)
- Central Networks; Newark on Trent - minimum one no. additional 18mVA primary substation – est. £4m
- Severn Trent Water; Newark on Trent - Upgrade to Balderton Sewage Treatment Works – est. up to £7m (funded by Severn Trent Water if development included in LDF)
- Severn Trent Water; Newark on Trent – Offsite reinforcement of water main from Carr Colston to Newark – est. £6m
- National Grid Gas; Newark on Trent - Offsite reinforcement to gas main to development land south of Newark – est. £640,000

9.4.1.3 Outside of Newark on Trent, the following key utility infrastructure projects will be potentially required:

- Severn Trent Water; Clipstone; new pumping station and 4km offsite rising main – est £1.2m
- Severn Trent Water; Lowdham; new pumping station and 6.7km of off-site rising main – est. £1.9m
- National Grid Gas; Sutton on Trent; 5km of new offsite gas main – est £925,000

9.5 OTHER INFRASTRUCTURE REQUIREMENTS

9.5.1.1 Apart from the key infrastructure projects identified for Utilities, Education and Transport, there are several other key projects noted:

- Newark - new sports hub to replace the Grove Leisure Centre, completion by end of 2011 – est. cost £10m.
- Newark – a new Health Centre – est. cost £3.5m.
- Newark – an extension to the library.
- A new Community Centre at Clipstone.
- A new Community Centre at Bilsthorpe.

9.6 INFRASTRUCTURE DELIVERY PROGRAMME

9.6.1.1 The tables enclosed in Appendix 11 identify the approximate programme for delivery of transport projects, and the forecast trigger points in terms of residential units completed for other key infrastructure projects.

9.6.1.2 A more detailed consideration has been given to the programme for development of the three strategic sites identified in Newark on Trent; Land South of Newark, Fernwood and Land East of Newark. A forecast delivery programme has been included in Appendix 12.

9.6.1.3 The following forecast milestones are identified from the study outputs to date:

- Land South of Newark; a new medium pressure gas main is required to serve the site prior to 500 residential units being completed.
- Land South of Newark and Fernwood; 500 residential units can be completed at each site before the Southern Link Road is completed.
- Land South of Newark and Fernwood; a total of 1,000 residential units across both sites can be completed prior to reinforcement of Central Network's Bulk Supply Point and a new primary substation being required, and prior to the offsite water main reinforcement being completed.
- All three strategic sites; 2,000 residential units can be completed before the upgrade to Balderton Sewage Treatment Works is required.

9.6.1.4 It should be noted that these conclusions are drawn from the assessment work undertaken to date and will need to be verified through more detailed examination and consultation with the respective utilities companies.

Appendix 1

Schedule of Data Received from Newark and Sherwood District Council

Appendix 2

Administrative Boundary of Newark and Sherwood District Council

Appendix 3

Newark and Sherwood Preferred Development Scenario

Appendix 4

Infrastructure Delivery Plan Sites

Appendix 5

Transport Stress Plans

Appendix 6

Flood Infrastructure Analysis

Appendix 7

IDP Sites Clustered for Utilities Study

Appendix 8

Existing Statutory Undertakers Assets

Appendix 9

Severn Trent Water Minutes of Meeting dated 15 May 2009

Appendix 10

Green Infrastructure Analysis

Appendix 11

Infrastructure Delivery Plan

Appendix 12

Strategic Sites Delivery Programme