Worcestershire County Council

Infrastructure requirements within Worcestershire to 2026 arising from Phase Two Review of West Midlands RSS Preferred Option

Final Report

March 2009

Contents

1. Executive Summary

2. Introduction

3. Methodology

4. Development Options

5. Identifying Infrastructure Requirements and Generic Costs

6 Spatial Infrastructure Requirements, Existing Capacity and Costs

7. Funding, Development Viability and Developer Contributions

8. Infrastructure and Phasing Frameworks

9. Recommendations

Appendix 1: Development Options Maps

Appendix 2: Transport Infrastructure Figures

Appendix 3: Infrastructure Stakeholders

1 Executive Summary

1.1 Baker Associates and Transport Planning International (TPI) have been commissioned to undertake an infrastructure requirements study by Worcestershire County Council.

1.2 The objective is to examine emerging development options to accommodate Regional Spatial Strategy (RSS), residential and employment growth. Specifically, the infrastructure requirements study has sought to:

- highlight infrastructure capacity issues and existing capacity where possible, through the review of existing information and consultation with stakeholders;
- identify the infrastructure impacts of additional development in generic and locationally specific terms for main settlements and on a County and District basis;
- illustrate the net infrastructure impact of new development and highlight significant issues;
- provide information on the indicative cost of infrastructure;
- identify funding mechanisms and responsibility for delivery;
- produce County and settlement infrastructure delivery plans/schedules. This output is considered to be the crucial element of the study, as it draws together evidence and identifies infrastructure tipping points in the proposed RSS delivery rates and the subsequent funding.

1.3 The study represents a snap shot in time and uses information available at the time of writing, the strength of the study has been the engagement with infrastructure and community service providers to obtain first hand views on requirements. The study examines likely levels of developer contributions and we have taken a cautious view given the current economic climate and uncertainty surrounding the housing market and wider economy at this time. The study provides a basis to enable the County Council to proactively respond in the RSS Phase 2 review process and provides a baseline for the County Council and individual District Councils to form an infrastructure evidence base to support the development of their Local Development Framework Core Strategy and the development of a consistent approach to collect S106 monies via a planning tariff approach across the County.

1.4 The infrastructure requirement has examined the following infrastructure types:

- Education
- Health
- Community - including libraries and faith
- Emergency - including police, fire and ambulance
- Recreation and green infrastructure
- Transport and access
- Energy generation supply and distribution
- Water infrastructure
- Household waste and recycling collection
- Telecommunications

1.5 The study has identified what is meant by infrastructure for each type, examined approaches to the identification of infrastructure requirements, provided context and support evidence where available and established costs, potential funding sources and delivery issues.

Conclusions

1.6 Overall the study has identified a total cost of Infrastructure of approximately £802.38 million

1.7 It is important to note at present only £25.75 m of funding has currently been secured. The remaining shortfall of £776.63 could be reduced through successful funding bids, currently (£172.86 m) is requested through funding bids which have not been agreed and future developer contributions (£451.93 m) will need appropriate mechanisms to secure and should not be banked on due to the level of economic uncertainty at present. Table 1.1 illustrates the overall results:

Table 1.1: Overall Funding Trajectory

Infrastructure Funding Trajectory 2006 – 2026 £ (millions)					
	2006-2011	2011-2016	2016-2021	2021-2026	2006-2026
Transport Infrastructure	£82.48	£176.48	£208.48	£55.81	£523.14
Social Infrastructure	£28.63	£56.50	£130.39	£63.72	£279.24
Total Infrastructure Cost	£111.11	£232.98	£338.37	£118.93	£802.38
Secured Funding	£11.09	£7.21	£4.71	£2.71	£25.73
Funding Bids	£28.89	£77.83	£49.83	£16.33	£172.86
Developer Contributions	£5.07	£51.31	£191.03	£204.52	£451.94
Trajectory Shortfall	-£66.06	-£96.63	-£93.30	£104.03	-£151.85

1.8 Table 1.1 shows that there are potential funding shortfalls for the first three time periods 2006-2011, 2011-2016 and 2016-2021. Balancing this is a funding surplus of £104.03 million in the 2021-2026 period. Overall there is a potential funding shortfall of £151.85 million, **if** all funding bids are successful and **if** developer contributions can be maximised.

1.9 All individual Districts have a funding shortfall and trajectory issues. Table 1.2 below sets out the results:

Table 1.2: District Summary Tables

Infrastructure Funding Trajectory 2006 – 2026 £ (millions)					
	2006-2011	2011-2016	2016-2021	2021-2026	2006-2026
Worcester	-£5.39	-£23.93	-£43.23	£39.40	-£43.14
Wychavon	-£36.98	-£6.31	-£7.88	£42.62	-£8.57
Malvern	-£8.78	-£5.04	£0.63	£12.43	-£1.21
Redditch	-£5.49	-£26.79	-£13.85	£5.69	-£40.74
Bromsgrove	-£2.07	-£30.32	-£21.49	£9.49	-£44.40
Wyre Forest	-£7.49	-£4.23	£2.98	£6.64	-£2.11

1.10 Table 1.2 shows that funding deficits vary from £1.21 m to £44.40 m. The Districts with the largest deficiencies include Worcester, Redditch and Bromsgrove. All Districts have a funding trajectory problem which will be difficult to overcome with out additional resources to forward fund infrastructure in the early time periods.

2. Introduction

2.1 Baker Associates and Transport Planning International (TPI) have been commissioned to undertake an Infrastructure Requirements Study by Worcestershire County Council.

2.2 In recognition of the continuing need for housing arising from changes in household size, from economic growth and migration, and with a view to shifting the spatial distribution towards major urban areas, the Government is pushing up the level of housing provision through the mechanism of the Regional Spatial Strategy (RSS) and now the West Midlands RSS Phase 2 Review.

2.3 Concurrently, Communities and Local Government (CLG) is emphasising that Local Development Frameworks (LDFs) have to demonstrate the means of their implementation, with the policy position that they cannot be considered sound unless this is the case. Many well-intentioned planning authorities are finding themselves in a strategy gap between the top-down imposition of targets from RSS and the bottom-up product of investigations into how the necessary and desirable infrastructure that will make working places is to be provided at the right time.

2.4 The need for the Infrastructure Requirements Study arises in particular from the Phase 2 Revision of the West Midlands RSS and the Preferred Option that has been presented in December 2007. The matters addressed in the Revision include the role of different named settlements and categories of settlements, and the level of housing and employment directed to those places as part of bringing about their intended role. The infrastructure issues raised by the Preferred Options therefore are more involved than simply scaling up the previously proposed provision. Rather, they go to the heart of what is required from a good spatial strategy.

2.5 Baker Associates and TPi have worked with the County and District Councils and with the appropriate stakeholders and service providers, see appendix 3

Objectives

2.6 The infrastructure requirements study has two main objectives:

- to support the County Council's response to the EIP for the Phase 2 Review of the West Midlands Regional Spatial Strategy;
- to provide additional infrastructure evidence to support individual District Core Strategy submission documents.

2.7 Specifically, the infrastructure requirement study has sought to:

- highlight infrastructure capacity issues and existing capacity where possible, through the review of existing information and consultation with stakeholders;
- identify the infrastructure impacts of additional development in generic and locationally specific terms for main settlements and on a County and District basis;
- illustrate the net infrastructure impact of new development and highlight significant issues;
- provide information on the indicative cost of infrastructure;
- identify funding mechanisms and responsibility for delivery;
- produce county and settlement infrastructure delivery plans/schedules. This output is considered to be the crucial element of the study, as it draws together evidence and identifies infrastructure tipping points in the proposed RSS delivery rates and the subsequent funding

implications.

Study Limitations

2.9 It must be noted that this study has been undertaken at a time of significant economic uncertainty and represents a snapshot in time. It is important to note that several assumptions have been made on future development viability, potential developer contributions and the future phasing of development that all require an element of crystal ball-gazing. The study represents a snapshot in time and presents views on infrastructure capacity and future requirements and costs based on information available when published. Costs will invariably increase, capacity can fluctuate due to changing migration trends and new national objectives can increase requirements for provision.

Structure of the Report

2.10 Section 3 sets out the methodology followed and Section 4 the Development Options. A series of assumptions has been made to allow for the examination of the development options. The aim of Section 4 is to highlight the development options and the implications of these assumptions and establish an indicative development phasing.

2.11 Section 5 takes each infrastructure type in turn, providing context and establishing how infrastructure requirements and costs have been identified and discusses funding and delivery issues. Section 5 provides valuable baseline information but does not provide detailed infrastructure requirements for Worcestershire.

2.12 Section 6 presents infrastructure schedules for each of the main settlements, the remaining rural areas and additional NLP options. This information is the result of the analysis conducted as part of this study following the approaches defined in Section 5. The results are presented as a table showing identified infrastructure requirements and costs for each location.

2.13 Section 7 provides analysis of potential funding sources. This focuses on developer contributions, development viability, housing market analysis and residual valuations to identify the likely level of funding from S106 agreements and recommends mechanisms to secure it. Section 6, also provides information on secured funding and current funding bids.

2.14 Section 8 establishes an Infrastructure Framework based on information identified in Section 6 and 7. It presents this for both transport and social infrastructure to illustrate the infrastructure phasing and funding trajectory for Worcestershire. A further summary table in section 8 provides infrastructure frameworks for each District and Worcestershire as a whole. This section illustrates the overall funding deficiency and funding trajectory problems in the delivery of future development.

2.15 Section 9 provides recommendations of how to address the funding shortfall, and smooth the infrastructure phasing, by establishing infrastructure priorities. Section 9 also discusses other influencing factors in the delivery of infrastructure, including affordable housing and the Code for Sustainable Homes.

3 Methodology

3.1 The methodology followed for the study is set out in this section and is described according to the two stages identified in the County Council's brief, each with specific steps.

Stage 1 Infrastructure requirements

Step 1 - Inception meeting

3.2 Step 1 involved early discussion with the Council's Project Manager to provide greater clarity on the objectives of the study and information available. The inception meeting was used to:

- confirm the objectives of the study in relation to the ongoing RSS work;
- review the scope of infrastructure for consideration in the study;
- agree the scope and best means of stakeholder engagement to be undertaken, including consideration of the proposed workshop and of one-to-one working (with the identification of contacts);
- specifically to consider the best way to establish a Local Infrastructure Group;
- explore the form of presentation of the material from the study that would be most helpful to the client, mindful of other audiences;
- agree the detailed programme with dates for the delivery of outputs and for meetings.

3.3 The most important element of the inception meeting was the agreement of the scope of the Infrastructure Requirements Study. The following list reflects the project brief:

- education;
- health;
- community - including libraries and religion;
- emergency - including police, fire and ambulance;
- recreation and green infrastructure;
- transport and access;
- energy generation, supply and distribution;
- water infrastructure;
- household waste and recycling collection;
- telecommunications.

Step 2 - Review of development proposals

3.4 There is already a great deal of material directly and indirectly relevant to this study, and this has been assimilated. The review included the examination of material on the infrastructure needs of development and the means of its procurement, but in accordance with the Council's brief and the identified stages. We describe this work under Stage 2, Step 6 – appreciating that the timing of the work may be undertaken earlier than this implies.

3.5 Step 2 reviewed the current Preferred Option proposals from the RPB, and accessible material that has informed these proposals. We examined the 4/4 authority submissions and background studies undertaken for their preparation, together with material presented by the planning authorities and others at earlier stages in the preparation of the RSS. Material presented for the current examination

of the RSS by the promoters of any schemes that could match the emerging requirements has been reviewed where available.

3.6 We have increased our understanding of the implications of the proposals by discussion with the District Councils. We undertook an initial stage of information gathering and assessment, essentially looking at emerging LDFs.

3.7 From evidence assembled for the LDFs such as SHLAAs, landscape character work and employment land studies, we sought knowledge on:

- the amount of development already committed relative to the new totals for Districts and where identified, settlements and categories of settlements;
- the potential for development within the settlements in the District in aggregate, and for specified settlements;
- the identification of suitable land on the periphery of the main settlements, according to policy and delivery criteria such as those used in good SHLAAs;
- the employment land supply on sites with characteristics reasonably well matched to the identified growth potential in specified sectors;
- possible ways of meeting the development requirement arising from the Preferred Option.

3.8 This meant that future infrastructure requirements could be as closely related as possible to the likely scale, location and form of development that would arise if the Preferred Option were implemented. This stage produced development options set out in Section 3.

Step 3 - Initial assessment of infrastructure requirements

3.9 Arriving at an initial assessment of community infrastructure requirements arising from new development can be fairly straightforward. From the many studies of this subject, given the renewed emphasis on implementation, and particularly from a great deal of our own work, we have been able to draw upon well established starting point standards on most of the types of provision needed to make places work as places to live. The standards covered include open space (ha) per dwelling, GPs or acute bed spaces per dwelling, and the number of form entries required amongst primary and secondary schools.

3.10 The output of this stage is reflected in Section 4. An initial schedule of community infrastructure will be put together related to the development proposed. It will be arranged according to strategic locations, settlements and districts as appropriate.

3.11 This review will identify the issues arising from the performance of the existing network, and the priorities established for investment in supplementing and managing the network as part of the current strategy with the justification for these. This will enable members of the team to work with the transport authority and transport operators on what the changes to infrastructure would be required to support the new development now proposed, along with behavioural change.

Step 4 - Stakeholder engagement

3.12 A strength of the study has been engagement with stakeholders to provide qualitative views on infrastructure requirements. The specific purposes of engaging with service providers and

stakeholders for this study has been to:

- corroborate the assumptions already used in developing an initial list of infrastructure requirements;
- relate those assumptions to the particular circumstances of places and communities, so that, for instance, understanding the implications of existing infrastructure capacity such as in schools on future requirements can be built into the assessment;
- learn about the very specific requirements determined by local circumstances, in dealing with drainage and transport for instance;
- obtain information on costs from the relevant suppliers and agencies to place alongside information obtained from more generalised sources;
- hear views on what the needs of the place will be under different levels of development, and what the priorities should be;
- identify sources of funding, and the extent of these sources;
- learn about what might already be in existing or foreseeable programmes.

3.13 We have directly engaged with representatives of the sectors that are responsible for services that come under the heading of 'community infrastructure'. This may have taken the form of a written request for information, email or telephone conversation to each service provider to ensure all appropriate evidence and information is made available. In some cases, direct contact with stakeholders was undertaken.

3.14 Throughout the consultation process we were interested in exploring such matters as:

- views on existing levels of provision in both Districts, on the spatial variation, and on the reasons for the patterns that exist;
- the objectives of service providers in relation to their interests, and the role of both the provision they are responsible for and the work of other partners in meeting these objectives;
- what constitutes a satisfactory level of provision (on what evidence);
- the costs associated with provision and how provision can be financed with what reliance on indirect sources;
- what changes are already programmed, together with investment programmes and lead times.

3.15 In addition we organised a workshop with Council officers, members of the Local Strategic Partnership and infrastructure service providers. This gave us the opportunity for a creative exchange of ideas and allowed ideas on the prioritisation of resources and contributions to be explored together. The theme of the event was what kind of places we are trying to achieve, what constitutes 'sustainable communities,' how stakeholders can contribute to the study process and ultimately influence the outcome through positive and participatory spatial planning.

Step 5 - Significance assessment of infrastructure requirements

3.16 The purpose of the study is to provide a basis for representations and negotiations over the level and location of development to be directed to Worcestershire and the ability for infrastructure associated with that development to be provided. In what is essentially a negotiation, the Council will need flexibility and this will be helped by taking a view on priorities. The same thinking has been applied in exploring the means of funding provision and in the use of developer contributions alongside other ways of making things happen.

3.17 The relative importance of different types of infrastructure is a matter on which we have previously contributed views to an RSS EIP. On that occasion, we offered a distinction between strategic infrastructure and community infrastructure. The former was seen as something that is integral to the regional and sub regional spatial strategies, with its provision necessarily integrated with the implementation of strategic development, and where there was a significant funding requirement from public funds. The latter – community infrastructure – essentially was seen as something which is delivered with new development, including as part of the general uplift in activity as well as identifiable components of strategic development, and where there would be a significant contribution towards its provision from development itself in the form of negotiated obligations and standardised tariffs.

3.18 A similar approach has been applied at the sub regional level. We have placed identified infrastructure requirements into bands of significance according to factors such as the degree of dependence on their provision to enable development to take place, the level of development they are associated with, and their cost. This banding is reflected in the Infrastructure Frameworks.

Stage 2 Infrastructure costs and funding sources

Step 6 - Review of infrastructure costs

3.19 At this stage in the study we already had extensive information on the costs of community provision and the number of different types of facility required. We had established a basis on which to cost types of utility and transport infrastructure together with the need for such provision. From these pieces of information, derived from standard sources, specific studies and work with stakeholders, we have been able to assemble a costed schedule of infrastructure requirements.

Step 7 - Possible funding packages

3.20 Essentially, infrastructure will have to be funded from some combination of:

- the funds available to service providers from commercial investment decisions and from public funds such as through the operation of LTPs and major scheme bids;
- developer contributions.

3.21 We have also considered the possible significance of types of forward funding that could allow for more effective use of funds available from development, through discussion with RDA, for instance, and use of the Regional Infrastructure Fund (RIF).

3.22 For each aspect of infrastructure we identified possible sources of funding that could be available from service providers and public funds. This has allowed the likely demand on developer contributions to be estimated based on a development viability assessment.

3.23 The first step was to relate packages of infrastructure to the development they facilitate and support. For some elements of strategic infrastructure this will require an apportionment which will inevitably call for some judgment at this level of work as no modeling will be available.

3.24 It was then possible to identify what sources of funding there were, what the amounts would be and when this could be available. Essentially, development and infrastructure trajectories were built and, through iterative steps, conclusions reached on whether these can be made to 'fit'. Clearly, there will be some movement according to which schemes are prioritised for public funds and so how developer contributions are used.

Step 8 Infrastructure funding formulae

3.25 The brief required the development of approaches to setting tariffs on development. In order to test the feasibility of providing infrastructure, to develop tariff models and to demonstrate the use of these to the planning authorities that will have to implement the approach, we have carried out work on development viability in the area.

3.26 A critical aspect of any assessment of deliverability of a development scheme is its financial viability. Quite simply, if it doesn't break even, or make a profit, the development will not happen. All developers in considering the acquisition of land will carry out a detailed economic viability and financial appraisal. This is usually in the form of a residual valuation, setting out all the income, or turnover, of a scheme, set against all the development costs, fees, and allowing for developer's profit. The bottom line is the land value, and if the developer secures the land at a certain price, the financial appraisal is the evidence required to demonstrate profit to investors based that the land purchase price.

3.27 We have undertaken a market appraisal and developed some examples to provide information on viability and to establish some demonstration material for users. These take the form of step-by-step residual land value calculations and have been conducted for a number of examples representing the types of development likely to be required. These types include allocations within the larger urban areas and strategic greenfield sites of varying sizes attached to larger and medium sized settlements. The steps in this method are:

- likely number and mix of open market dwellings;
- establishment of sales values - effect of location;
- saleable floorspace - open market;
- sales turnover open market;
- affordable housing proportion and tenure mix;
- affordable housing revenue;
- total gross turnover;
- marketing costs;
- build costs;
- developer's profit;
- overheads - architect / consultant / legal / planning fees, insurance, financing, survey, Stamp Duty, contingencies;
- estimated land values from other land uses;
- residual land value - expressed as £ per unit area (acre or hectare).

3.28 Having established a base RLV per unit area as a model spreadsheet, subsequent modeling through the framework can factor in costs infrastructure and implications about the likely level of affordable

housing. Affordable housing has been built into the model spreadsheet, using the assumptions set out in draft RSS. This has dealt with:

- affordable housing proportion and tenure mix;
- affordable housing revenue;
- major infrastructure costs, other abnormal development costs: highway/access improvements, drainage improvements, contamination, demolition, abnormal foundations etc;
- planning contributions.

3.29 This valuation work will determine the level of overall planning gain package that can be achieved, which will be influenced by both the individual RLV, and the extent of each individual package of infrastructure.

3.30 This work has assisted in coming to conclusions on the feasibility of delivering the required infrastructure, providing specific evidence on what level of funding might be available, and assisting in the development of the funding packages and trajectories associated with identified infrastructure and development phasing. The step has also fed into the design and application of a suggested tariff system. This will contain guidance on the evidence that identified infrastructure needs and costs, the means of prioritising how developer contributions are collected and used, and the level of contribution related to different types of development.

Step 9 Reporting

3.31 An overall report has been prepared and presented in draft to the Steering Group. This describes the approach taken and presents the evidence. The report has recommendations for the County Council based on the evidence and the tools set out in the study.

4. Development Options

4.1 This section sets out the development options that have been examined. These include spatial options for the location and level of residential, employment and retail development within Worcestershire by 2026.

4.2 To develop the options, a series of steps have been followed making several assumptions. The steps include:

- identifying RSS requirements;
- identification of named settlements within emerging LDF Core Strategies and other rural areas;
- identification of existing completions and commitments since 2006;
- highlighting spatial distribution of development and potential urban extension locations;
- seeking agreement on the location of development to address potential NLP dwelling requirements.

4.3 The first step below identifies the development requirements for housing and employment as set out in RSS and individual Core Strategy documents.

Phase 2 Review Regional Spatial Strategy Requirements

4.4 The West Midlands Regional Assembly is currently reviewing the Regional Spatial Strategy (RSS). At present, the Regional Assembly's preferred option for the RSS proposes that Worcestershire makes provision for 36,600 additional dwellings and 264 ha of employment land between 2006 and 2026. Table 4.1 illustrates the development requirements for each District:

Table 4.1: RSS Development Requirements

District	Residential Requirement	Employment Requirement
Worcester City	10,500 dwellings	81 ha
Wychavon	9,100 dwellings	33 ha
Malvern Hills	4,900 dwellings	69 ha
Redditch	6,600 dwellings	27 ha
Bromsgrove	2,100 dwellings	21 ha
Wyre Forest	3,400 dwellings	33 ha
Worcestershire County	36,600 dwellings	264 ha

4.5 The delivery rates set out in RSS will be used to formulate the phasing and infrastructure framework in section 7.

Main Settlements

4.6 A review of emerging Core Strategies for each of the Districts was undertaken to identify the main settlements across the County which will be the location of the vast majority of new development. From this review we have identified the following settlements to be included in the study:

- Worcester;
- Great Malvern;
- Droitwich Spa;
- Evesham;

- Pershore;
- Redditch;
- Bromsgrove;
- Kidderminster;
- Stourport on Severn.

4.7 The testing of Core Strategy options will focus on the main settlements and identify the location of development in a broad sense. The location of development will include development within the urban area and development located within urban extensions.

4.8 The overall impact of future development levels in each District and across the County has been considered, including the remaining settlements and rural areas. However it must be noted that for these areas where development locations have not been specifically identified. It has not been possible to compare the existing capacity with identified infrastructure requirements for locationally specific issues such as transport and utilities.

4.9 The study has endeavoured to identify the likely gross requirements for infrastructure where possible, such as social and leisure infrastructure including education, health, community facilities, open space and built leisure for these remaining rural areas. These rural areas include:

- Malvern Hills: Category 1 and 2 villages;
- Wychavon: Category 1 and 2 villages;
- Bromsgrove: Other settlements and rural areas;
- Wyre Forest: Bewdley and rural areas.

Existing Completions and Commitments

4.10 Existing housing and employment completions and commitments since 2006 have been identified and separated from the RSS requirement. These dwellings or employment premises will have an infrastructure impact or are already having an impact, but the opportunity to revisit infrastructure impacts and contributions secured through S106 mechanisms has passed and therefore funding opportunities are reduced.

4.11 As part of the study, we have used the most up-to-date information on completions, sites under construction and those with full permission available from individual districts. These completions and commitments have been tested alongside remaining development requirements within the existing urban area and urban extensions. However, it is important to make the distinction because of the constrained funding sources available to address infrastructure impacts. It must be noted that allocations or sites with outline permission have not been included in commitments, only sites with full planning permission.

District Council Core Strategy Development Options

4.12 The main development options represent the development levels within the urban areas and within urban extensions identified within individual District Core Strategies, We examined material out for consultation or due to emerge for consultation and agreed development options for testing with planning officers. Table 4.2 overleaf sets out the development options.

Table 4.2: Core Strategy Development Options

Settlements	District Core Strategy Spatial Distribution
Worcester (Worcester City)	**Within the settlement:** Completions/Urban Potential/Commitments/Windfall - 3200 dwellings Retail Floorspace - 85,500 sq m Employment Floorspace - 55,000 sq m **Urban extensions at:** Worcester West - 3500 dwellings and 15 ha employment Worcester South - 3,000 dwellings and 25 ha employment Fernhill Heath - 500 dwellings Kilbury Drive - 300 dwellings Junction 6 Regional Site - 25 ha employment **Total = 10,500 dwellings, 65 ha and 55,000 sq m of employment and 85,500 sq m of retail**
Great Malvern (Malvern Hills)	**Within the settlement:** Urban Potential/Commitments/Windfall - 1,700 dwellings, QinetiQ site development 4.5 ha employment 10,000 sq m of Retail **Urban Extensions at:** North East (Newland) 1,100 dwellings, 10 ha employment East (Townsend Way) 500 dwellings, 7 ha employment **Total = 3,380 dwellings, 21.5 ha employment and 10,000 sq m of retail**
Malvern Hill: Category 1 and 2 villages and rural area	Rural Capacity/Commitments/windfall - 1600 **Total = 1600 dwellings**
Evesham (Wychavon)	**Within the settlement:** Urban Potential/Commitments/Windfall - 1,180 dwellings, 7,400 sq m of Retail **Urban Extensions at :** Offenham Road - 1,500 dwellings Hampton - 800 dwellings Vale Business Park - 10 ha employment **Total = 3,480 dwellings, 10 ha employment and 7,400 sq m of retail**
Droitwich Spa (Wychavon)	**Within the settlement:** Urban Potential/Commitments/Windfall - 395 dwellings, 2,900 sq m of Retail **Urban Extensions at :** South Droitwich (Copcut) - 1,800 dwellings, 10 ha of employment North of Pulley Lane - 250 dwellings **Total = 2,430 dwellings, 10 ha employment and 2,905 sq m of retail**

Pershore (Wychavon)	**Within the settlement:** Urban Potential/Commitments/Windfall - 285 dwellings, 2,000 sq m of Retail **Urban Extensions at :** Three Springs - 150 dwellings Station Road - 400 dwellings Wyre Road - 450 dwellings Keytec 7 - 5 ha employment land **Total = 1,285 dwellings, 5 ha employment and 2,000 sq m of retail**
Wychavon: Category 1 and 2 Villages, and rural area	Rural Capacity/Commitments/windfall - 1,900 dwellings **Total = 1,900 dwellings**
Redditch (Redditch)	**Within the settlement:** Urban Potential/Commitments/Windfall - 2,243 dwellings 50,000 sq m of retail **Urban Extensions at** North, North West of Redditch - 4,357 dwellings and 24 ha employment **Total = 6,600 dwellings, 24 ha employment and 50,000 sq m of retail**
Bromsgrove (Bromsgrove)	**Within the settlement:** Urban Potential/Commitments/Windfall - 500 dwellings **Urban Extensions at:** North West Bromsgrove - 1,000 dwellings and 12 ha of employment **Total = 1,500 dwellings and 12 ha employment**
Rural Areas (Bromsgrove)	Rural Potential/Commitments/windfall - 600 dwellings 6 ha of employment **Total = 600 dwellings and 6 ha of employment**
Kidderminster (Wyre Forest)	**Within the settlement:** Urban Potential/Commitments/Windfall - 1,870 dwellings, 33 ha of employment **Total = 1,870 dwellings and 33ha of employment**
Stourport on Severn (Wyre Forest)	**Within the settlement:** Urban Potential/Commitments/Windfall - 1,105 dwellings **Total = 1,105 dwellings**
Wyre Forest : Bewdley and rural areas	Rural Potential/Commitments/Windfall - 425 dwellings **Total = 425 dwellings**

4.13 Overall, the development options for the main settlements represent 36,600 new dwellings, 186.5 ha of identified employment land. It must be noted that employment sq m is also concentrated within existing centres to meet RSS requirements. The split between development within the urban area and urban extensions is still unconfirmed, but based on figures to date, urban extensions represents 66% of residential development and 97% of future employment development located at the main

settlements. This illustrates the importance of assessing the impact of these development locations.

NLP Development Options for Testing

4.14 The Nathaniel Lichfield and Partners Report "Development of Options for the West Midlands RSS in Response to the NHPAU" sets out a series of potential development options to accommodate higher growth. As part of the infrastructure requirement study, the scale and location of the options needs to be identified to enable their testing. The NLP report provides the following recommendations:

- 2,500 dwelling extension/s of Worcester in South Worcestershire;
- 3000-5,000 dwelling extension of Birmingham in Bromsgrove;
- 2,500 dwelling urban extension of Redditch in Bromsgrove/Stratford Upon Avon;
- 1,500 dwelling as part of the Middle Quinton Eco Town;
- 1,500 dwelling within the rural areas of South Worcestershire;
- 400 dwellings within the rural area of Wyre Forest.

4.15 At this early stage in the consideration of a potential increase in residential development levels it is difficult to get a definitive view on the scale and location of the NLP options. For the process of testing in the infrastructure requirements study, we have contacted the individual district councils to agree what assumptions should be made to enable testing. The following assumptions have been made:

- 2,500 dwellings in extensions of Worcester in South Worcestershire; 500 additional dwellings located at Worcester West increasing its total to 4,000 dwellings, 500 dwellings located on the north edge of Worcester adjacent to the built up area, south of the A449 outside the greenbelt and 2,500 South East of Worcester, in the vicinity of Worcester Parkway/Norton. It must be noted that this level of development is 1,000 dwelling higher than NLP requirements.

- 3000-5,000 dwelling extension of Birmingham in Bromsgrove; two locations are identified in the Birmingham Core Strategy Issues and Options, at south of Maypole and south east of Longbridge. However there is no clear rational to test these locations over others. Therefore, it has been agreed to examine the infrastructure requirements on a generic basis where possible.

- 2,500 dwelling urban extension of Redditch in Bromsgrove or Stratford upon Avon: An extension of North, North West Urban Extension has been identified in the Redditch Growth Strategy Stage 2 Report.

- 1,500 dwelling as part of the Middle Quinton Eco Town; within Worcestershire and Warwickshire. There has already been extensive work undertaken on the infrastructure requirements for Middle Quinton and therefore this study will not duplicate this work. It must be noted therefore that the infrastructure cost of this NLP option does not include the Eco town proposal.

- 1,500 dwellings in rural area within South Worcestershire; it has been assumed that this will be accommodated in category 1 and 2 villages and the wider rural areas in South Worcestershire. For testing, the requirement has been apportioned by the overall housing target in RSS option 2. This would mean a split of 525 to Malvern Hills and 975 to Wychavon.

- 400 dwellings within the rural area of Wyre Forest; it has been assumed that this will be accommodated within Bewdley and the rural areas category.

4.16 Following discussions with planning officers from individual Districts the study has examined some addition development options, these include:

- Land at West of Redditch for 6,837 dwellings;
- North West of Bromsgrove for an additional 2,500 dwellings;
- 1,000 dwellings at Throckmorton Airfield, North of Pershore.

4.17 These locations are not specifically identified by NLP but given the uncertainly regarding how additional development might be accommodated above RSS levels we have examined these additional options to provide additional information for District authorities.

Phasing

4.18 It has been essential to establish a phasing trajectory for new development to assist in the formulation of views on infrastructure requirements, tipping points and potential funding availability from developer contributions over the time period. Table 3.3 overleaf sets out an indicative phasing trajectory for Worcestershire. It must be noted that this trajectory is not based on existing Local Authority Housing Trajectories, but represents a simplified trajectory based on emerging LDF strategy and the continued promotion of brownfield development opportunities before Greenfield housing releases.

4.19 Whilst more simplistic, it was concluded that due to the continual monitoring and adjustment of housing trajectories as part of the plan, monitor, and manage approach, local authorities will be annually reviewing their supply to ensure the appropriate level of supply. Therefore the phasing in Table 4.3 represented a reasonable assumption on development rates to enable testing.

Table 4.3: Worcestershire County Development Phasing 2006 - 2026

	Districts						
Phasing	**Worcester City**	**Wychavon**	**Malvern Hills**	**Redditch**	**Bromsgrove**	**Wyre Forest**	**Worcestershire County**
2006 - 2011	**Worcester:** 1,600 within the urban area	**Evesham:** 590 within urban area **Droitwich Spa**: 197 within urban area **Pershore:** 143 within urban area 225 within urban extensions **Rural:** 475	**Malvern Hills:** 850 within Malvern Rural: 400	**Redditch:** 1,122 within the urban area	**Bromsgrove:** 250 within the urban area Rural: 150	**Kidderminster:** 468 within the urban area **Stourport on Severn:** 276 within urban area **Rural:** 106	**Urban Areas:** 5,496 **Urban Extensions**: 225 **Rural:** 1,131 **Total 2006 - 2011**: 6,852
2011 - 2016	**Worcester:** 1,600 within the urban area and 800 at urban extensions	**Evesham:** 590 within urban area **Droitwich Spa:** 198 within urban area **Pershore:** 142 within urban area 225 within urban extensions **Rural:** 475	**Malvern Hills**: 850 within Malvern **Rural**: 400	**Redditch:** 1,121 within the urban area	**Bromsgrove:** 250 within the urban area Rural: 150	**Kidderminster:** 468 within the urban area **Stourport on Severn**: 276 within urban area **Rural:** 106	**Urban Areas:** 5,494 **Urban Extensions**: 1,025 **Rural:** 1,131 **Total 2011 - 2016**: 7,650

	Districts						
Phasing	**Worcester City**	**Wychavon**	**Malvern Hills**	**Redditch**	**Bromsgrove**	**Wyre Forest**	**Worcestershire County**
2016 - 2021	**Worcester:** 3,250 at urban extensions	**Evesham:** 1,150 within urban extensions **Droitwich Spa:** 1,025 within urban extensions **Pershore:** 275 within urban extensions **Rural:** 475	**Malvern Hills**: 800 at urban extensions **Rural:** 400	**Redditch:** 2,179 at North, North West Redditch	**Bromsgrove:** 500 within urban extensions **Rural:** 150	**Kidderminster:** 468 within the urban area **Stourport on Severn:** 276 within urban area **Rural:** 106	**Urban Areas:** 744 **Urban Extensions**: 9,178 **Rural:** 1,131 **Total 2016 - 2021** 11,053
2021 - 2026	**Worcester:** 3,250 at urban extensions	**Evesham:** 1,150 within urban extensions **Droitwich Spa:** 1,025 within urban extensions **Pershore:** 275 within urban extensions **Rural:** 475	**Malvern Hills:** 800 at urban extensions **Rural:** 400	**Redditch:** 2,178 at North, North West Redditch	**Bromsgrove:** 500 within urban extensions **Rural:** 150	**Kidderminster:** 468 within the urban area **Stourport on Severn:** 276 within urban area **Rural:** 106	**Urban Areas:** 744 **Urban Extensions**: 9,178 **Rural:** 1,131 **Total 2021 - 2026**: 11,053
District Totals	**10,500**	**9,100**	**4,900**	**6600**	**2100**	**3400**	**36,600**

5. Identifying Infrastructure Requirements and Generic Costs

5.1 The study has sought to identify, and where possible, quantify the infrastructure requirements for new development. The first aspect of this analysis has been the identification of relevant information applicable on a County basis. This has been followed by analysis of existing capacity information, where available, to identify a net infrastructure requirement. The following infrastructure areas have been covered:

- Education
- Health
- Community - including libraries and faith
- Emergency - including police, fire and ambulance
- Recreation and green infrastructure
- Transport and access
- Energy generation supply and distribution
- Water infrastructure
- Household waste and recycling collection
- Telecommunications

5.2 Each infrastructure area has been taken in turn, examining the infrastructure items within each area, e.g. primary, secondary and special school. The section examines the following areas:

- context, existing strategies and existing capacity to accommodate growth;
- approaches to calculate or identify infrastructure requirements and generic costs;
- view on funding and delivery arrangements.

5.3 It is important that existing infrastructure capacity is considered. In general, physical infrastructure capacity is affected by an increase in population facilitated by development. The Worcestershire Infrastructure Study has identified that several infrastructure types have no additional capacity to support additional development and subsequent population, whilst other infrastructure types have capacity that could potentially be used to meet future needs. Table 4.1 summaries the general view on infrastructure capacity to accommodate additional infrastructure requirements:

Table 4.1: Existing Infrastructure Requirements

Infrastructure Type	Capacity Available
Education	Existing available school places across the County
Health	Existing GP capacity for additional patients
Community	Library, community and religious facilities are considered sufficient for existing population, therefore no capacity is available
Emergency	Existing capacity for increased incidents/population in existing facilities
Recreation and Green infrastructure	Existing provision assumed sufficient for current population, therefore no capacity is available
Transport and Access	Existing road and public transport capacity
Household Waste and Recycling collection	Existing capacity within household waste recycling centres and within refuse and recycling collection rounds.
Energy Generation and Distribution	Existing gas, electricity network capacity
Water Infrastructure	Existing water infrastructure capacity
Telecommunications	Existing telecommunications capacity

5.4 Table 4.1 identifies which infrastructure types have no capacity and what other information has been used to determine the availability of capacity.

5.5 The following paragraphs take each infrastructure type in turn, providing some context and examining and presenting approaches to the calculation of infrastructure requirements. It then goes on to discuss potential funding where available and other phasing and delivery issues. The outcome of this section is not to identify what infrastructure is required across Worcestershire but to establish the approaches used to identify infrastructure requirements and costs in section 6 onwards. The section provides a useful resource of information to the continued identification of infrastructure requirements.

Education

5.6 Worcestershire County Council has statutory responsibility for the provision of children's services. It has a duty to ensure that there are sufficient school places in terms of quantity and quality to meet the needs of the population of the County. Future housing developments across the County will lead to an increase in educational age population. This will result in a demand for additional school places for early years 0-5, primary schools and secondary schools, special schools and post 16.

Context

5.7 Strategic planning for school places is contained within the Worcestershire School Organisation Plan: 2003-2008. Each year, the local authority forecasts pupil numbers and matches the demand to the current supply of school places. This can lead to a school being asked to increase its published admission number (PAN) or to reduce its PAN. An increase can only be implemented if there is sufficient capacity at the school to take extra pupils. Capacity in this sense refers to the size of classrooms, available soft and hard play space and other facilities.

Calculating Infrastructure Requirements

5.8 Pupil numbers are increasing in some parts of the County, such as East Kidderminster, East Worcester and North West Redditch. Conversely pupil numbers are falling in other areas, in particular South East Redditch, Tenbury and Pershore. The effect of this is that although pupil numbers are decreasing across the County, the available school places are not always at the schools where they are needed. At present, early years, primary and secondary school provision has some capacity. This is locationally specific and could help facilitate development in certain parts of Worcestershire.

5.9 The Surplus School Places 2008 provides the latest school population forecasts, school net capacities and surplus places for all Worcestershire County schools as at January 2008. This information shows school capacity for the next five years for primary and secondary schools and has been taken into consideration when identifying specific requirements for each settlement/rural area in section 6.

5.10 The infrastructure impact on Education and Children's Services is generally applicable for all residential developments that result in a net increase in dwellings. The impact from specific types of housing such as one bed flats, sheltered and student accommodation is considered to be negligible. For this study the following infrastructure types have been calculated:

- Primary Schools
- Secondary Schools

- Special Schools.

5.11 The County Council has identified a pupil product ratio for each new residential unit containing two or more bedrooms for primary, secondary and special schools. The following pupil product ratios have been used to calculate indicative school place requirements:

- 21 pupils per 100 dwellings of primary education age
- 15 pupils per 100 dwellings of secondary education age
- 1 pupil per 100 dwellings with special education needs.

5.12 The next stage to the approach is to translate the school places requirement for primary and secondary schools into school provision. It is considered that special school requirements are insufficient to generate new facilities and will be accommodated within existing special schools, therefore a financial contribution will be required.

5.13 The size of primary and secondary schools varies by form entry. A form entry is the number of classes in each year group. This generally varies between 1 to 3 forms for primary school and 4 to 8 forms for a secondary school. The indicative form entry (FE) capacity of a primary is 210 pupils, whilst a secondary school is 181.8 pupils; these figures reflect the number of pupils within each form across all year groups. The capacity of different school sizes is set out below:

Primary School

- 1 FE - 210 pupils;
- 2 FE - 420 pupils;
- 3 FE - 630 pupils.

Secondary School

- 4 FE - 727.1 pupils;
- 6 FE - 1090.8 pupils;
- 8 FE - 1454.4 pupils.

Identifying the Cost

5.14 Worcestershire County Council set out a table of charge 2008-2009 as part of the Education Supplementary Planning Document. This provides information on existing capacity and the cost per dwelling type towards providing pupil places. Costs are dependant on location and development size. Developments of more than 100 homes are evaluated on an individual basis. One bedroom dwellings and social housing incur no charge. The following costs represent the maximum cost per school place required:

- First School - £2,407;
- Middle School - £1,711;
- Primary School - £2,389;
- High School - £3,128.

5.15 Cost multipliers provided by Department of Further Educations and Skills (DfES) identify the indicative cost per pupil for the construction of accommodation to provide for additional pupil places. It has been assumed that the costs of special school places are similar to that of post 16 provision. The 2006-7 multipliers, including Worcestershire's location factor, which represent the regional variation in construction costs are set out below:

- Primary - £11,521 per place;
- Secondary - £17,361 per place;
- Special School - £19,894 per place.

5.16 Following research into the cost of school provision, it is considered that DfES cost multipliers and existing Worcestershire SPD costs provide a conservative cost of primary and secondary school provision and reflect the cost to extend existing schools rather than allow the construction of new schools. Dependant on size and facilities, our research with other authorities across the South West and West Midlands has identified that two FE primary schools cost approximately £6.5 to £8 million and eight FE Secondary Schools cost in the region of £35 million. It is considered that the approach to costing education provision is based on the type of provision which could be an extension to an existing school or a new facility.

5.17 Table E1 below sets out the indicative approach to calculating the education infrastructure requirement.

Table E1: Calculating Education Infrastructure Requirements

	Pupil Places	New Schools	Cost of provision (New build	Cost of provision (Extension)
Primary places	21 pupils per 100 dwellings	One 2 FE primary per 2000 dwellings*	£6.5 million or £3,250 per dwelling	£1,700 - £2,400 per dwelling, dependant on tier system
Secondary places	15 pupils per 100 dwellings	One 8 FE secondary School per 9,696 dwellings*	£35 Million or £3,610 per dwelling	£3,128 per dwelling
Special School	1 pupil per 100 dwellings	NA	NA	£198.94 per dwelling

*reflects pupil generating development, e.g. excludes one bed dwellings

Funding and Delivery

5.18 A three year programme of capital works funded through the Capital Programme is in place for the academic years 2008 – 2011 and all monies are allocated to specific projects. The next three year plan will be compiled for academic years 2011 – 2014. In addition, central government releases funding for projects that meet specific criteria. To access this funding, the local authority has to make a successful bid.

5.19 Currently, the County Council has successfully bid for Building Schools for the Future funding and the Primary Capital for Change funding. Both programmes involve rebuilding or refurbishing existing schools but neither programme is for additional new schools. These programmes cover the next ten years and additional housing developments can be factored into the size of the new schools.

5.20 There is a statutory process for establishing a new school. Current legislation requires the local authority to run a competition for providers to bid to run the school, including bodies such as church trusts, foundations or parent groups. The local authority may also bid in if it wishes. The process also requires local consultation and can take up to eighteen months to complete. After this, the design and build of the new school can take place. The local authority is responsible for the statutory process and subsequent delivery.

5.21 The local authority has a legal duty to educate all pupils living in the County. In real terms, this means that as soon as the first child moves into a house on a development the local authority must have a school place available. It would, however, not be economically viable to have a new school built and staffed before any children had moved onto the new development. To be economically viable, the school needs to be near its capacity. The critical phasing point would come at the point where approximately half of the houses were occupied with the new school opening, preferably, at the start of an academic year, i.e. September. The local authority would have to put interim arrangements in place for the children to attend other schools until the new school had opened and then it would be parental choice as to whether or not the children moved to the new school. Overall, the lead-in time to establish, design and build a new school is approximately three years.

Health

5.22 Health infrastructure includes a variety of primary and secondary care facilities, ranging from community hospitals to health centres with general practitioners (GPs), dentists and opticians.

5.23 The Worcestershire National Health Service Trust provides hospital-based services from three main sites - the Alexandra at Redditch, Kidderminster and Worcestershire Royal at Worcester. These together currently cater for over 95,000 planned and emergency operations, more than 130,000 A&E attendances and around 500,000 outpatient appointments, including appointments with consultants or specialist nurses, diagnostic tests such as X-rays and minor surgical procedures.

5.24 Worcestershire Primary Care Trust (PCT) commissions and provides health services for the 553,000 residents of Worcestershire. They have an annual budget of £700 million and manage healthcare services including five community hospitals, 67 GP practices, 92 pharmacies, 64 dental practices and 174 optometrists across the County. Their main responsibilities are:

- improving and protecting the health of the local population and reducing health inequalities;
- commissioning the full range of health services;
- directly providing community services.

Context

5.25 The Worcestershire Primary Care Trust produces a Local Delivery Plan 2005 to 2008 that sets out the PCT's priority areas. These include:

- staying healthy – reduction in smoking prevalence, reduction in alcohol related hospital admissions
- maternity services – reduction in caesareans, increase in breastfeeding
- falls prevention – reduction in fractured neck or femur
- stroke care – increase in number of stroke patients given a prompt physio assessment
- end of life care – increase the proportion of deaths at home.

5.26 Worcestershire Primary Care Trust (PCT) is responsible for addressing the health needs of people who live in the County of Worcestershire. They provide this service by employing teams of nurses and allied health professionals, treating patients in their own homes and in community hospitals. The PCT also buys in NHS services from other primary health care professionals such as GPs, dentists, pharmacists and opticians.

5.27 The National Health Service Primary and Social Care Premises Planning Design Guidance has been used to provide examples of health care provision, alongside standard approaches to assessing the impact for primary care facilities.

5.28 Following discussions, it has been identified that there is some capacity in Worcestershire within existing GP practices based on GP patient registers. The availability of capacity is locationally specific, so at this stage has not been considered due to the uncertain ability of capacity to address future infrastructure requirements.

Calculating Infrastructure Requirements

5.29 The Worcestershire NHS Trust provides a range of secondary care service, including accident and emergency services. Nationally, secondary care services are centrally managed and provided across

large geographical areas because of the freedom of choice the NHS allows patients. The Worcestershire NHS Trust, like other trusts, is modernising service provision away from traditional forms of 'capacity' planning of wards or beds and towards increased primary care and more efficient ways of working. The increased population, specifically the increase in the elderly population by 2026, will have an impact on the demand for secondary care services but the Worcestershire NHS Trust will ensure that supply is kept up with demand for secondary care. There have been suggestions that there is a potential requirement for a new hospital in Worcestershire, but this has not been confirmed and should be keep under review by the County Council.

5.30 Primary care comprises the provision of community hospitals, GPs, dentistry and optician services. A standard of 1 GP per 1500 to 1800 people and 1 Dentist per 2000 people can be used to calculate the number of GPs and dentists that future development is likely to require. Population projections provided by the Worcestershire County Council Research and Intelligence Unit identifies a population growth of 25,900 people by 2026. Table H1 below sets out an indicative quantum of provision required for this level of population growth in Worcestershire:

Table H1: Health Provision:

	Standard	Provision
General Practitioners	1 per 1,500 people	17.26 GPs
Dentists	1 per 2,000 people	12.95 Dentists

5.31 Table H1 identifies an overall requirement for 17-18 additional GPs and 13 additional dentists. The complex issue with the identification of health facilities is the variety of health provision. The critical issue is the requirement to provide additional health facilities in addition to generic consulting and treatment rooms. This could include:

- public spaces, e.g. reception area, pharmacy, toilets;
- clinical activity spaces, e.g. consulting room and specialist treatment room;
- non-clinical activity spaces, e.g. group activity meeting space;
- support spaces, e.g. utility and storage spaces;
- administration spaces, e.g. office and record/archive space;
- staff spaces, e.g. staff room, changing facilities and training room.

5.32 The size of facility is dependant on specific PCT preferences and requirements to provide particular provision within the facility.

Identifying the Cost

5.33 The cost of health facilities to meet future needs is dependant on the size of facility and contents. Health centres and clinics vary in size from 600 sq m to 6,000 sq m and some individual GP practices are as small as 95 sq m. The Worcestershire PCT prefers to provide health centres that can cater for 10,000 or 15,000 patients. Costs can be based on two approaches, of which the first uses a standard cost multiplier. Kier Group as cost advisors to PCTs has benchmarked the construction costs for recent health centres and concluded that typical healthcare buildings are in the order of £2,105 per sq m to £2,359 per sq m.

5.34 The second approach has been to benchmark real facilities identified in the NHS, Primary and Social Care Premises Planning Design Guidance. Table H2 overleaf sets out the benchmarked costs of several facilities:

Table H2: Benchmarked national cost of Health Centres:

Facility	Patients	Floorspace	Overall Cost	Cost per sq m
Horfield, Bristol	13,500	1,460 sq m	£2,300,000	£1575.34
Ashby, Scunthorpe	6,000	1,590 sq m	£2,750,000	£1,729.55
Prospect, Newcastle	14,000	1,100 sq m	£2,000,000	£1818.18
Manor Park, London	14,000	2,500 sq m	£5,000,000	£2,000

5.35 Table H2 highlights that the cost of health centres varies significantly depending on the composition of facilities, and the size of facility does not directly correlate with the level of patients that can be serviced. The average cost per sq m for the three real examples that support between 13,500 and 14,000 patients is £1797.84.

Funding and Delivery

5.36 The cost of health facilities is further complicated by the funding mechanisms for delivery. Costs above relate to the physical cost of construction. There are different approaches to funding and these have an impact on overall facility cost. The main sources of funding for new and expanded health facilities are:

- private finance initiative for major projects;
- trusts/PCTs' borrowing facilities;
- third party development (rental reimbursement).

5.37 Currently, the PCT has been funding new GP premises developments through rental reimbursement. A third party developer such a Haven Health or Matrix constructs and maintains the facility in return for a rental reimbursement for a typical period of 25 years. The capital cost is borne by the developer. Typically, a new GP premises development costs between £32 and £42 per patient per annum (based on actual/predicted list size). In terms of rent and rates reimbursement, this could result in an overall cost of between £8 to £10 m for a 10,000 patient health centre and £12 to £15 m for a 15,000 patient health centre.

5.38 The PCT scrutinises proposals from third party developers to construct health centres and seeks advice from the County Valuer before proceeding with any scheme. Ultimately the PCT must consider that any rental reimbursement is good value for the use of public money. This presents a problem for funding in the sense that meeting the infrastructure requirements for health needs cannot always be met through rental reimbursement. If a scheme is not considered good value for money then it will not be provided, and if it is taken forward it represents a significant increase in the cost of provision.

5.39 Given the variation in cost for new health provision, it appears prudent to identify an indicative infrastructure cost of £2.5 million for capital costs or £13 m for rental reimbursement to support a 15,000 patient health centre. It is considered that facilities need to be front-loaded in the phasing process to ensure that they are available when the new resident population needs them. In reality, new facilities need a critical mass of people to support them and hence be economical. Given the lead time of 2 years to deign and build a community facility, they could be provided midway through the delivery of future developments.

Community

5.40 Libraries, museums, community and cultural facilities play a key role in underpinning education and quality of life in its broadest sense. The information and stimulation they supply promotes a wider understanding of the past, offers individuals the opportunity to acquire new skills and knowledge and gives everyone the opportunity to enjoy a rich and varied cultural life.

5.41 New developments impose extra costs on the service providers at a time when resources are stretched. Central Government states in PPS1 that *"Development plans should promote development that creates socially inclusive communities, including suitable mixes of housing. Plan policies should address accessibility (both in terms of location and physical access) for all members of the community to jobs, health, housing, education, shops, leisure and community facilities".* The community at large should not suffer as a result of new development proposals and it is therefore reasonable to expect new development to contribute towards the costs of community infrastructure where the need for those facilities arises directly from the development.

Context

5.42 The Worcestershire Sustainable Community Strategy (2008) presents a vision for Worcestershire. This vision is based on what Worcestershire residents said was important to them in making the County a great place in which to visit, work or live. The Worcestershire Partnership vision is for "a County with safe, cohesive, healthy and inclusive communities, a strong and diverse economy and a valued and cherished environment".

5.43 The Infrastructure Study focuses on physical infrastructure such as libraries, community centres and places of religious worship.

Calculating Infrastructure Requirements

5.44 Library authorities have a statutory duty to provide a public library service and to ensure that it is "comprehensive and efficient". In addition to its statutory duties, the library service has to meet a number of National Library Standards which together constitute a nationally recognised acceptable level of service. Additional development will have a direct effect on a number of these standards[1].

5.45 Community centres and religious buildings provide valuable facilities to promote community cohesion. It is important that with significant levels of residential development in the future that community meeting space is provided to address the increased requirements for such facilities. Strategic studies into infrastructure impacts have been used to provide standard assumptions on the provision of community centres, religions meeting space and libraries.

Libraries and Archives

5.46 Oxford Brookes Research for the South East Museum and Library Archive Council uses a standard of 28 sq m per 1000 people to generate the requirement per dwelling. Other local authorities, such

[1] These standards will be affected:

- 88% of the population to live within 1 mile of a static library;
- 100% of the population to live within 2 miles of a static library. (Whilst the Department for Culture, Media and Sport (DCMS) will take into account mobile library provision, the above standards are a requirement towards which the Council is expected to work).
- the provision of 6 electronic workstations per 10,000 population
- the provision of 216 new items of stock added per year per 1,000 population

as Bristol City Council and Plymouth City Council use higher standards of 35 sq m per 1000 and 30 sq m per 100 respectively. Assuming an average household size of 2.28, an indicative requirement per dwelling can be determined.

5.47 Based on a standard of 35 sq m, there will be a future requirement for almost 3,000 sq m of new library space across Worcestershire. Dependant on facility size and locations required to meet national library standards on accessibility and local authority preferences, this could result in new libraries or extensions to existing premises. The minimum size for a viable standalone library is 200 sq m, but in general, community libraries consist of between 300 to 400 sq m, with central facilities being larger.

Religion

5.48 'Facilities for Faith Communities in New Developments in the Cambridge Sub-Region' (Three Dragons 2008) has identified that 6% of the population actively participate in religion. Therefore a population increase of 25,900 people could generate potentially 1,554 new active religious participants.

5.49 The Three Dragons report suggests an indicative standard of 0.5 ha per 3,000 dwellings based on case studies, but states that provision should be based on an assessment of local religious need. Using the standard 36,600 dwellings would generate a potential requirement of 6.1 ha. The report recommends that 0.5 ha is considered the smallest size site. Depending on local needs and the built form of the development, this contribution could be taken in the form of:

- all land (requiring the faith group to fund its own premises);
- smaller amount of land plus a building;
- a financial contribution based on the value of land required which was to used to refurbish an existing building which would meet the faith needs of local people.

Community Centres

5.50 Supplementary Planning Guidance for Aldershot Urban Extension produced for Rushmoor Borough Council suggests that one 750 sq m community centre is required per 3000 dwellings or 7200 people. Roger Tym in 'The Costs and Funding of Infrastructure in the West of England' increases this standard to one community centre per 1500 dwellings. This standard is considered particularly high but if consideration is given to religious facilities within this requirement then it could be more realistic. An average standard of 2250 dwellings has been used to calculate the community centre requirement. For Worcestershire, this could result in a requirement for 16 new community centres of 1,500 sq m each.

Identifying the Cost

5.51 Library building costs are derived from the 'Building Costs Information Service' of the Royal Institution of Chartered Surveyors. The figures below are based on the updated costs of accepted tenders for 98 public library schemes across England over recent years and are published quarterly:

- mean building cost for public library building (BCIS) £1,265 per sq m;
- regional adjustor (x 0.98) (-£26) £1,239;
- external works, car parking, hard standing, landscaping, security fencing, signage (assume 15%) (+£186) £1,425;
- design costs (assume 15%) (+£213) £1,638;

- fitting out costs, including initial book stock and IT (88% of capital costs of £1,425) £1,254;
- total £2,892 per sq m.

5.52 The cost of a community centre as outlined in the Roger Tym study, 'Costing the Infrastructure Needs of the South East Counties' is £1,309,500 per community centre. This is further supplemented in work for the West of England which indicates a cost of £1,746 per sq m and an overall cost of £1,310,000 per community centre.

5.53 The cost of religious facilities is dependant on the price of land and will vary depending on location.

Funding and Delivery

5.54 Like many other social infrastructure matters such as education and health, funding for community facilities comes predominantly from the public or voluntary sector funded through general taxation. The additional capital costs associated with new community infrastructure presents an increased funding problem for local authorities. As a consequence, there is an adverse impact on existing facilities which cater for new developments and increased population levels. Funding sources could include:

- reaching communities programme;
- big lottery funding;
- DCSF new youth facilities funding.

5.55 Community facilities are an important aspect of creating sustainable and successful communities. It is considered that facilities need to be front-loaded in the phasing process to ensure that they are available when new resident population needs them. In reality, new facilities need a critical mass of people to support them in order to run in an economical way. Given the lead time of 2 years to deign and build a community facility, they could be provided midway through the delivery of future developments.

Emergency

5.56 Emergency infrastructure includes the requirements of the police, fire brigade and ambulance service. Increased development levels create new areas that will require emergency service coverage and new people who increase emergency incidents.

Police

5.57 The West Mercia Police Authority has the responsibility for ensuring that an efficient and effective police service is provided to the people of West Mercia. The following lists the strategic priorities that guide the approach of the authority in the West Mercia Constabulary 3 Year Strategic Plan and Joint Policing Plan. They are underpinned by the authority's work programme:

- maintaining effective police authority monitoring of force activity and its progress towards policing plan priorities, including the development of enhanced protective services;
- developing and monitoring community engagement and partnership working both by the force and the authority, including the development of local (neighbourhood) policing;
- monitoring and promoting force performance and in particular public reassurance and satisfaction;
- maintaining police officer and staffing levels at a minimum of shire force average;
- adopting a long-term capital programme, making sufficient provision for the infrastructure needs of the force;
- monitoring budget expenditure, efficiency and effectiveness.

Fire

5.58 The Hereford & Worcester Fire and Rescue Service has four whole time stations in Worcestershire based in the city of Worcester and the three towns of Kidderminster, Bromsgrove and Redditch. It also operates three day-crewed stations in the Worcestershire towns of Malvern, Droitwich and Evesham. In addition there are 7 stations which all operate the retained duty system. These are located in Pershore, Bewdley, Stourport, Upton, Tenbury, Broadway and Pebworth.

5.59 The service attends approximately 9,000 emergency incidents each year. The majority of calls for assistance are to fires, road traffic collisions and alerts from automatic alarm systems. In the area in particular, there are also calls for rope rescues, for grass fires in open areas, and to assist when floods strike. The service has highly trained specialist teams to deal with these specific types of emergencies. Its long-term vision is 'making Herefordshire and Worcestershire safer from fire and other hazards and to improve community well-being'.

Ambulance

5.60 The Hereford and Worcestershire Ambulance Trust provides a 24-hour, 7 day per week Emergency and Urgent Ambulance Service for the people living in or travelling through the 1500 sq miles of the two Counties of Herefordshire and Worcestershire. This service covers:

- 999 emergency calls
- urgent hospital admissions requested by a doctor
- maternity admissions
- mental health admissions for patients sectioned under the Mental Health Act
- transfers between acute hospitals which require paramedic care or a fully equipped ambulance

for clinical escort
- major incident response.

Calculating the Infrastructure Impact and Identifying the Cost

5.61 With all emergency services the impact of development relates to two main areas. Firstly, increased development and population leads to increased incidents which require an emergency response. The second area is response times. New development such as major urban extensions will provide new destinations to be serviced and therefore require infrastructure if response times can't be met.

5.62 Requirements have been identified, based on three factors:

- existing ratios of staff to residents;
- spatial implications of new development on service provision and response time;
- existing facility capacity.

5.63 For example, the West Mercia Constabulary has a ratio of 1 Police officer per 436 population and will require additional officers to maintain the ratio and therefore level of service. All the emergency services are currently establishing approaches to determining infrastructure impacts.

5.64 The following infrastructure items have been identified and costed by stakeholders:

- new section station - £4 million
- neighbourhood policing post - 250 k
- improvements to South Worcestershire custody suite £13 million
- new fire station - £750 k excluding land
- pumping appliance - £220 k
- new ambulance - TBC by ambulance service
- new ambulance station -TBC by ambulance service
- medical equipment - TBC by ambulance service

Funding and Delivery

5.65 At the present time, the funding formula used by government only funds revenue costs for emergency services. This means that the emergency service may struggle to find the capital costs to fund infrastructure requirements related to future development.

5.66 Further liaison is required with the emergency services to confirm infrastructure requirements and costs as development proposals become more certain.

Recreation and Green Infrastructure

5.67 The consideration of recreation and green infrastructure has included open space, children's play space, playing pitches, built leisure facilities, green infrastructure, including environmental assets, and public rights of way.

5.68 The local authorities say they are committed to improving recreation, sport, open space, children's play provision and green infrastructure across the County. New residential development will place increased pressure on existing provision or have a potential impact on valuable environmental assets and require new or enhanced provision in Worcestershire. It is important that future provision of new recreation and green infrastructure ensures that provision is located in the right places, in sufficient size and quality, offers opportunities for biodiversity and is well maintained to meet the needs of the community.

Context

5.69 There has been a national recognition in recent years of the continuing importance of parks and green spaces. Various policies and strategies have shown a commitment to renewal of this vital part of our heritage including government Planning Policy Guidance Note 17: 'Planning for open space, sport and recreation' and the CABE Green Space Report: 'A guide to producing parks and green space management plans'. The role that green spaces can have in meeting policy objectives linked to other agendas, such as education, diversity, health, safety, environment and regeneration is also recognised. The Green Spaces, Better Places Report (DTLR Task Force May 2002)[2] highlighted that parks and open spaces:

- contribute significantly to social inclusion because they are free and accessible to all;
- can become a centre of community spirit;
- contribute to child development through scope for outdoor, energetic and imaginative play;
- offer numerous educational opportunities;
- provide a range of health, environmental and economic benefits.

5.70 The other areas of green infrastructure include the protection and potential enhancement of existing green infrastructure, environmental assets and public rights of way. It is considered that the infrastructure impact in these areas is about the specific impact of development on surrounding assets and the detailed design and layout of schemes to ensure that they enhance existing green infrastructure assets and public rights of way rather than adversely affect them.

Calculating Infrastructure Requirements

5.71 Individual district open space assessments have been completed and have been used to inform quantity and access standards for all types of open space and recreational facilities. The quantity standards for each district are set out in Table R1 below. This demonstrates the considerable variety that exists across the County in terms of the types and definition of open space and recreational provision, and also in terms of the actual standards that are being applied.

5.72 There is a significant range in the total amount of land required from between approximately 3 to 12 hectares. The most variable figures are seen in the standards for town/local parks and gardens,

[2] DTLR, 2002: Green Spaces, Better Places (Urban Green Spaces Task Force 2002)

natural and semi-natural green space and amenity green space. It should be noted that there are two categories for Malvern to reflect the fact that their open space assessments and standards have been prepared for four different parts of the district together with a district-wide standard. Table L1 below sets out current standards:

Table R1: Existing Open Space Standards

Typology	Quantity Standard per 1000 population (ha)						
	Bromsgrove	Malvern Town	Malvern District	Wyre Forest	Worcester	Wychavon	Redditch
Town/Local Parks and Gardens	0.26	0.29	0.14	0.57	0.61	0.76	7.43 Informal unrestricted open space
Natural and Semi Natural Green Space	0.44	2.98	7.72	2.3	2	0.75	
Amenity Green Space	0.42	2.13	1.86	0.29	0.5 includes cemeteries	0.61	
Provision for Children (equipped)	0.027	0.05	0.04	0.05	0.2	0.07	0.8
Provision for Young People (equipped)	0.03			0.03	0.4	0.02	
Outdoor Sport Facilities	1.67	2.01	1.83	1.91	0.8	1.9	1.21
Allotments	0.19	0.2	0.14	0.191	0.4	0.39	
Cemeteries		0.24	0.13				
Civic		0.01	0.01				
Total	3.037	7.91	11.87	5.341	4.91	4.5	9.44

5.73 The Sport England Facilities Calculator has been used to determine the built leisure facilities requirement for 36,600 homes. This model uses fourth quarter 2007 costs and building variation for the Worcestershire area. Sport England standards per 1000 population for swimming pools, sports halls and indoor bowls rinks are:

- Swimming pools - 11.2 sq m per 1000 people or 1 pool every 20300 people;
- Sports halls - 0.32 courts per 1000 people or 1 sports hall per 12,500 people;
- Indoor bowls centre 0.07 rinks per 1000 people or 1 bowls centre per 112,000 people.

5.74 Only three districts have included any standards for built leisure facilities. Even across these districts there is considerable variety in the standards that have been set and for that reason the Sport England National standards have been used to identify infrastructure requirements for built leisure.

5.75 This study has assumed that there is no existing capacity within existing provision of facilities and therefore all new residential development will have an impact of open space and built leisure provision.

5.76 By virtue of the nature of environmental assets, environmental mitigation needs to be dealt with at a local site/development area level and cannot be costed for individual sites at this stage. An initial strategic approach to infrastructure assessment has been undertaken in order to provide a broad

assessment of the impact on natural resources. Table R2 identifies the hectares of habitat that is likely to be affected by future development.

Table R2: Habitat Impact

Habitat	Activity	quantity (ha)
Acid Grassland	Restore	100
Neutral grassland	Restore	300
Calcareous Grassland	Restore	50
Woodland	Expand	430
Lowland heathland	Expand	10
Reedbed	Expand	100
Traditional Orchard	Expand	120
Scrub	Restore	50
Wet woodland	Restore	5

5.77 Overall the indicative assessment has highlighted a requirement in the County for 1,165 ha of restored or expanded habitat. Environmental mitigation measures can take a wide range of forms and complexity, depending upon the environmental asset to be protected or enhanced, ranging from landscape and visual impacts to impacts affecting habitats or species. In areas near to, or where there are, environmental designations, mitigation measures may be greater, or the designation may preclude development altogether. Development sites should be the subject of environmental assessments

Identifying the Costs

5.78 Wide variation in the cost of open space provision identified in individual Open Space SPDs reflects the differing experience across the authorities and varying cost of provision and maintenance of different typologies. This includes £181 sq m for children's play space, to £15 for playing pitch provision or informal open space. For the Worcestershire Infrastructure Study, an average cost of provision of £50 per sq m meter has been adopted to reflect these variations.

5.79 It is highlighted by stakeholders that maintenance for open space is an important issue. It has been assumed that maintenance costs for 5 years would be acceptable at an average rate of £15 per sq m.

5.80 It is assumed that all new dwellings within urban extensions will provide sufficient open space to meet existing standards. New residential development within urban areas, however, is unlikely to provide open space with every development. Therefore the infrastructure requirements within settlements will be a combination of on-site provision and financial contributions to off-site provision or improvements to existing space. For the purposes of identifying the costs of future requirements, it is assumed that 60% of sites will make a financial contribution.

5.81 Examples of recent built leisure facilities also illustrate the wide variation in costs depending on the content and scale of facilities:

- Wednesbury Leisure Centre. This £12 m, 5,000 sq m facility features a six-lane, 25m swimming pool; a leisure pool with flume and wave machines as well as a 140-station gym; a group training studio; café and children's play area;
- Cotswold Leisure Centre, Cirencester. The £7m, 5,000 sq m new building will house a 25-metre

by six-lane pool, a small pool, three squash courts, a six-court sports hall, sauna, steam and relaxation area, fitness/dance studio and a coffee shop;

- Longwell Green Swimming Pool and Gym consisting of a 25m swimming pool, learner pool and gym equipped with more than 60 pieces of equipment. The facility cost £6m and opened in 2006;
- Leeds Armley Leisure Centre and Morley Leisure Centre will cost £30 m total. The Armley scheme will feature a 25m swimming pool, 10m learner pool, hydrotherapy pool, a 100-station Bodyline gym, a four-court sports hall, a two-court sports hall, a dance studio and a bar/café. The Morley centre will host a 25m swimming pool and 10m learner pool, 150-station Bodyline gym, six-court and four-court sports halls, a multi-activity hall, a dance studio and a bar/café;
- John Warner Sports Centre, Hoddesdon. The £7m facilities at the site include a 25m stainless steel pool, the largest in the country, a learner pool, a gym, exercise studio, squash courts and multi-purpose sport hall.
- St Johns Leisure Centre, Worcester. This £4m centre opened in 2008 and includes a 4 court sports hall with under floor heating, air conditioned 56 station fitness suite, air conditioned dance studio with sprung wooden floor, multi purpose room with under floor heating and two floodlit outdoor 5-a-side 3G all weather pitches;

5.82 The Sport England Facilities calculator generates the following built leisure costs requirements. However, based on the real costs of schemes identified, higher costs have been assumed for Worcestershire

Table R3: Built Leisure Infrastructure Costs Requirements

	Sport England Costs	Assumed Costs
Swimming Pool	£2,000,000	£2,500,000
Sports Halls	£2,500,000	£3,000,000
Indoor Bowls	£1,500,000	£2,000,000

5.83 Table R4 below sets out the indicative costs of restoring and expanding habitat across Worcestershire:

Table R4: Indicative Habitat Costs

Habitat	quantity (ha)	Capital cost per ha*	Total cost capital
Acid Grassland	100	830	£83,000
Neutral grassland	300	435	£130,500
Calcareous Grassland	50	2,063	£103,150
Woodland	430	1,500	£645,000
Lowland heathland	10	350	£3,500
Reedbed	100	1,361	£136,100
Total	**990**		**£1,101,250**

*source of costings is UK Biodiversity Action Plan: preparing costings for species and habitat action plans, April 2006.

5.84 Table R4 identifies the indicative cost of green infrastructure as £1.1 m. The costs have been identified in the UK Biodiversity Action Plan 'Preparing Costs for Species and Habitat Action Plans' by GHK Consulting. Until specifically affected habitats have been identified, the cost of mitigation or replacement is still indicative. It must be noted that at this stage all costs have not been identified. Table R5 overleaf sets out the maintenance costs:

Table R4: Indicative Habitat Costs

Habitat	quantity (ha)	Maintenance cost annual*	Annual costs for 10 yr period
Acid Grassland	100	200	£2,000
Neutral grassland	300	200	£2,000
Calcareous Grassland	50	200	£2,000
Woodland	430	200	£2,000
Lowland heathland	10	450	£4,500
Reedbed	100	380	£3,800
Total	**990**		**£16,300**

5.85 Table R4 highlights that the indicative maintenance cost for 990 ha of habitat is £16,300 per annum. If a 10 year maintenance period was considered appropriate then this would generate an requirement for £1.117,550 of additional funding. It must be noted that this costs has not been added to the overall infrastructure requirement costs at this stage.

5.86 Within Worcestershire, there are some areas which are more sensitive to environmental impact and will therefore require greater environmental mitigation measures if these are even acceptable at all. The work, and costs, required to mitigate the effects of development are clearly specific to those sites. A broad assessment of impacts has been undertaken but this is considered an initial assessment and should be the subject of more detailed work in the future.

Funding and Delivery

5.87 Local authority funding is required to provide additional facilities unless contributions to the capital cost of open space provision and its maintenance. Funding for sport and leisure is available through the Sport England Lottery Fund or from the Football Foundation and therefore these could be an available source of funding for recreation infrastructure.

Transport and Access

5.88 This section of the report gives a strategic view as to the identification of infrastructure requirements for Worcestershire to support the proposed West Midlands Regional Spatial Strategy (RSS) housing allocation. A challenge for the RSS is to allocate housing land in a way which minimises the negative impacts on the transport system. The growth must be delivered in a way that is sustainable in terms of transport, including ongoing operating costs and levels of subsidy. This requires a close co-ordination of land use and transport planning.

Context

5.89 The aim of investment in transport must be to help deliver the growth associated with the RSS in a sustainable way, consistent with national, regional and local policies and guidance. The emerging transport strategies and associated investment in infrastructure and services must have the following foci:

- encouraging people to use the most appropriate mode of transport for their particular journey;
- improving the quality of service offered by sustainable modes of transport (through investment in infrastructure and services),
- making them a viable alternative to the car;
- increasing the number of residents and visitors that use sustainable modes of transport, specifically, walk, cycle and passenger transport.

5.90 These aims will build upon existing policies and objectives laid out for Worcestershire. Worcestershire's Local Transport Plan 2006/2011 (LTP2) contains the following objectives for achieving sustainable communities:

- to improve passenger transport and walk/cycle networks to ensure people can make essential journeys by bus, rail, on foot and by bike as easily and cheaply as possible;
- to make passenger transport the mode of choice for all or part of a journey through improvements to the overall package offered to the public.

These aims are further supported by Worcestershire's Integrated Passenger Transport Strategy (ITPS) for the period 2007/2011, which states that:-

- "An effective transport network is essential in order to give people, in both the urban and rural areas of Worcestershire, access to the opportunities and benefits that contribute to the enjoyment of a better quality of life."

5.91 The overarching vision for the ITPS is to provide for Worcestershire: "An affordable, accessible, safe, convenient, environmentally sustainable and integrated passenger transport network, that is accessible to all and capable of attracting an increasing market share for passenger transport thereby contributing to the achievement of the objectives in Worcestershire's LTP2."

5.92 This will be achieved by "Instead of a reactive approach to plugging the gaps left by discontinued non-profitable commercial services, and the inefficient use of resources in dedicated social car transport, this strategy will work on the basis of one core network."

5.93 In order to deliver the proposed housing growth in line with these existing policies and guidance for Worcestershire, an emphasis on changing travel behaviour, coupled with an enhancement of infrastructure and services and effective land use planning, will be an important means to achieving

RSS implementation.

Identifying Infrastructure Requirements

5.94 The transport infrastructure requirements for Worcestershire have been identified through a range of methods. Key documents highlighting the existing transport constraints and proposed schemes for Worcestershire, including the West Midlands Regional Transport Strategy (RTS), LTP2, IPTS and the Worcester Transport Strategy (WTS), have been reviewed, along with emerging regional reports discussing proposed locations for housing and employment growth.

5.95 Following this extensive literature review, consultation has been undertaken with key stakeholders and transport operators to further highlight any current capacity issues on the transport networks, both in terms of main settlements and on a County and District basis, as well as plans or proposals for improving services and facilities, their costs and funding mechanisms. This was followed by an all-day workshop with service providers and stakeholders to discuss the findings of the report to date, along with identifying and prioritising infrastructure requirements.

5.96 Worcestershire has external administrative boundaries with Warwickshire, Herefordshire, Shropshire, Gloucestershire and the West Midlands. Due to the predominantly rural nature of the County, large areas of the County rely on services provided by the neighbouring authorities[3]. Travel within Worcestershire is influenced by a range of factors, including the proximity of the County to the West Midlands conurbation, the rural nature of much of the County, and the medium-sized towns and cities that house the majority of the County's population. A range of strategic transport routes cross the County, including the M5 and M42 motorways and the main railway lines linking Birmingham with Bromsgrove, Droitwich, Worcester, Malvern, Bristol and the south west and Hereford with Worcester, Oxford and London. The River Severn forms a significant barrier to east-west movement across the County, whilst its tributaries, the Rivers Avon and Teme, also have limited crossing points, concentrating traffic movements onto small sections of the network.

5.97 As illustrated in Figure 5.1 in Appendix 2, journey to work (JTW) movements from Worcestershire generally demonstrate a north/south divide in the County[4]. JTW movements originating from settlements in the north of the County generally travel towards Birmingham and the Black Country for access to jobs and services, with some movement to/from Worcester and between Kidderminster, Bromsgrove and Redditch. In South Worcestershire, JTW movements are largely self-contained between settlements, in particular towards Worcester, with some movement north towards Birmingham and east towards Stratford-upon-Avon and further out to London. Travel demands are also placed along the Central Technology Belt, between the employment nodes of Malvern, Worcester, Droitwich, Bromsgrove and Birmingham.

5.98 As identified in the LTP2, the key movement corridors are outlined below:

- **Bromsgrove - Birmingham**
  - 15,000 two-way journeys in total by all modes (2001 Census data)
  - nearly a third of these journeys from Birmingham into Bromsgrove
  - places pressure on M42 Junction 1 and A38

[3] Local Transport Plan 2006/11 Accessibility Strategy

[4] Journey-to-Work Assessment; City of Worcester Passenger Transport Area Review (DRAFT) November 2008

  - largest number of rail commuters on this corridor (870 per day in 2001 with significant growth since).

- **Malvern - Worcester**
  - over 9,000 journeys in each direction "all mode" (2001 Census data)
  - bus routes provide direct links to employment sites in eastern Worcester
  - parallel rail route, but constrained by poor rail service reliability and lack of car parking at the Malvern stations

- **Wychavon – Worcester**
  - includes Droitwich, Evesham, Pershore and a large number of villages
  - demand is dispersed over wide number of routes
  - difficult to provide attractive alternative to the car by improving single public transport route

- **Redditch - Birmingham / Warwickshire**
  - pressure on M42 Junctions 2 and 3
  - forms southern terminus of the Cross-City railway line
  - travel demand on this corridor will potentially grow with the re-development of the Longbridge Works, and the development of Central Technology Belt sites in Birmingham

- **Bromsgrove - Redditch**
  - approximately 5,500 two-way journeys per day "all mode"[5]
  - close proximity, good road links and short travel time, high levels of employment opportunities in each town

- **Wyre Forest - Black Country, Birmingham and Wychavon**
  - reflects proximity of the District to the conurbation
  - pressure on A456 through Hagley and parallel rail route to Birmingham
  - strong travel to work corridor to Wychavon due to employment sites that serve Kidderminster and Stourport

- **Bromsgrove - M42 corridor**
  - easy access to the motorway and hence employment sites around south and east of Birmingham
  - pressure on M42 Junction 1.

5.99 Within the County, the City of Worcester is the key journey-to-work destination, with three quarters of all journey-to-work trips into the city having origins in the surrounding districts[6] . The majority of these trips originate from Malvern Hills and Wychavon (75%). The City itself generates approximately 14,900 single employment journeys daily travelling outwards, with 6,100 (40%) of these to non-Worcestershire locations, namely Birmingham, Herefordshire and the Black Country. The principle gateways to/from Worcester are M5 Junction 6, currently accommodating approximately 24% of Worcester's inbound and outbound journeys, and M5 Junction 7.

[5] Worcestershire's Local Transport Plan 2006/11

[6] Journey-to-Work Assessment; City of Worcester Passenger Transport Area Review (DRAFT) November 2008

Constraints and Existing Infrastructure Proposals

Highways

5.100 Within Worcestershire, congestion is a major constraint on growth. In terms of highways, the River Severn creates a barrier to east-west movement across the County, with limited crossings creating congestion at those locations. The M5 operates at, or near capacity, for most of the day as it approaches Birmingham[7], and significant sections of the M5 and M42 were amongst the most unreliable motorways in England in 2005[8]. As highlighted in the LTP2, specific congestion problems have been identified by the Highways Agency (HA) on the M5 motorway at Junctions 4, 5, 6 and 7 and on the M42 at Junctions 1, 2 and 3, where excessive demand for car travel results in severe congestion at peak times. However, the most recent modelling work undertaken by the HA suggests that Junction 7 on the M5 is currently operating within its capacity during peak periods[9].

5.101 To improve some of the existing capacity issues at junctions on the M5 and M42 motorways, the Highways Agency has several current and planned improvement projects underway:

- M42/M5/M6 (Birmingham Box) Route Management Strategy (RMS)
  - Status: **current**
  - Includes M5 Junction 5 and M42 Junctions 1, 2 and 3
  - Formulating a strategic plan for the next 15 years

- M5 Junction 4 Improvement Scheme
  - Status: **current**
  - Improvements to ease congestion and queuing
  - Work due to have started early 2009

- M5 Junction 5 Improvement Scheme
  - Status: **current**
  - Various measures to improve capacity through the junction
  - Works started in January 2009

5.102 In terms of the local highway network, Worcestershire's LTP2 identifies the sections of the local road network within Worcestershire where traffic congestion is at its worst. Three levels of congestion are identified:

- red routes – prone to congestion at any time of day, weekends and weekdays;
- amber routes – generally congested at peak periods, and prone to congestion at off-peak periods on weekdays; and
- yellow routes – generally congested during weekday peak periods.

5.103 Some of the most heavily congested highways within the County include Worcester's A4440 Southern Link Road (SLR), which is congested for most of the day and at times operates at levels near 100% over capacity; Evesham High Street (A4184); and the A38 between Bromsgrove and M42

[7] Worcestershire County Council, 'Worcester Transport Strategy: Major Scheme, Technical Report', 2008

[8] West Midlands RSS Preferred Option – Regional Transport Strategy / Draft Implementation Plan (2007)

[9] The South Worcestershire Joint Core Strategy Preferred Options; Response by the Highways Agency (December 2008)

Junction 1, all of which are designated 'Red Routes'. Other congested highways include Evesham Bypass; radial routes into Evesham town centre; sections of the A449 in Malvern Link; sections of the A441 in southern Redditch; and the A38 between Bromsgrove and M5 Junction 5, all of which are designated as 'Amber' and 'Yellow' Routes.

5.104 The majority of the large settlements in Worcestershire suffer from congestion. In Worcester, heavy congestion is experienced between the M5 and the regional and local highway network around the city, particularly M5 Junction 6 which is currently operating close to capacity. Traffic congestion in the city centre is exacerbated by limited river crossings and inappropriate use of the car for short distance local trips. These issues are intended to be addressed by the Worcester Transport Strategy (WTS), a package of measures including new and enhanced Park & Ride sites, associated Bus Rapid Transit (BRT) routes, dualling of the Southern Link Road, city centre urban realm enhancements and enhanced pedestrian and cycle routes. The proposed Worcester Parkway located at Norton would make up one of the Park & Ride multimodal interchanges, although the business case for this scheme is separate to the overall WTS package.

5.105 In Evesham, the A4184 Abbey Bridge and Viaduct are significantly below strength and are suffering under the weight of heavy traffic, with the serious possibility of the bridge closing within the next five years[10]. The bridge and viaduct are due to be fully replaced, and the scheme has been submitted for consideration as part of the Regional Funding Allocation for the West Midlands. The High Street is also due to undergo enhancements to improve the pedestrian environment and bus interchange facilities, with the scheme intended to commence early in the 2009/10 financial year.

Rail

5.106 Various sections of rail line intersecting the County are hindered by inadequate signalling and lengths of single track, which, along with limited parking at heavily used key stations, combine to constrain commuting by rail. Such constrained lines include sections of the Worcester – Malvern – Hereford Line (part of the Cotswold Line), with limited parking at Great Malvern and Malvern Link. There is poor track layout between the heavily used Worcester Foregate Street and Shrub Hill stations, both of which sit on the Worcester – Malvern – Hereford line as well as the Worcester - Oxford – London line (also part of the Cotswold Line); Worcester - Birmingham Snow Hill line; Worcester - Birmingham New Street line; and the Worcester – Cheltenham line. Limited parking at these stations adds a further constraint.

5.107 The Worcester - Oxford – London line (Cotswold Line) is currently single track from Norton Junction and through Wychavon, which adversely affects rail service reliability. Evesham and Pershore Stations, located on this line, are constrained by lack of sufficient parking.

5.108 Due to the strong journey to work movements towards the Birmingham conurbation, the Cross-City South line from both Redditch and Bromsgrove to Birmingham (the Redditch – Birmingham New Street and Worcester – Birmingham New Street lines, respectively) is overcrowded on both corridors. The section of line between Redditch and Barnt Green is currently single track, providing further restriction on the efficient operation of the line, with demand in Bromsgrove being suppressed "principally by an inadequate station, car parking facilities and relatively infrequent service levels"[11] , as identified by Network Rail.

[10] A4184 Abbey Bridge and Viaduct – A Bid for Capital Maintenance Funding, Halcrow (2009)

[11] Network Rail SBP Route Plans, Route 17 West Midlands (April 2008)

5.109 The section of the Worcester – Birmingham Snow Hill line between Stourbridge Junction and Cradley Heath to Birmingham currently experiences congestion, with Kidderminster Station, the second most heavily used station in the County after Worcester Foregate Street[12], suffering from a poor location and limited integration with bus operators.

5.110 The County also suffers from lack of direct access to the Birmingham – Bristol Line, which bypasses Worcester to the east.

5.111 Various proposals exist for improvements to rail infrastructure in Worcestershire. For the County as a whole, a package of rail improvement measures is currently being considered up to the year 2028; as part of the Worcestershire Rail Package. The package includes improvements to Worcester Foregate Street and Malvern Link stations with aspirations for track doubling between Droitwich Spa and Stoke Works; and a potential station at Redditch North. The flagship project in the Rail Package is Worcestershire Parkway, proposed to be located on the intersection of the Worcester – London and Birmingham – Bristol railway lines. The Park & Ride interchange will offer direct access to national rail services, as well as providing additional car parking for travel to Birmingham and London and will help relieve congestion on the M5 motorway. The Business Case for this project is currently being updated by Worcestershire County Council.

5.112 Other proposals being actively considered to improve rail infrastructure include upgrading the Cotswold Line to double track from Evesham to Charlbury (Oxfordshire), resulting in increased reliability, capacity and services, and allowing an hourly service to London from Worcester. The scheme is anticipated to be delivered commercially by September 2010. Furthermore, there is an aspiration for double tracking of the Cotswold Line from Norton Junction to Pershore, as identified in the LTP2 and West Midlands RSS Infrastructure Review Report[13]. Network Rail are also intending to improve the Cross City Line South to Redditch with an extension of the line to Bromsgrove, increasing the service frequency to stations to three trains per hour, resulting in increased passenger and operational capacity.

5.113 As part of these Network Rail proposals to improve Cross City Line South services, there are strong aspirations to relocate and upgrade Bromsgrove station to a multimodal interchange and to build an additional platform at Redditch. Similarly, an upgrade is also proposed for Kidderminster Station. The Bromsgrove station package already has £11 million of the required £17 million committed from third parties and the Network Rail Discretionary Fund, with the final funding anticipated to come from the Regional Funding Allocation. The Kidderminster station package scheme is estimated to cost between approximately £5.5 – 6 million and is about to procure Network Rail's GRIP (Guide to Railway Investment Projects) Stage 4 (Single Option Development), which means its scope is fixed.

Bus

5.114 Generally, bus services throughout Worcestershire are limited by infrequent services, with poor service reliability and delays in many settlement centres due to traffic congestion and lack of bus priority measures. In particular, non-concessionary fare bus patronage in Worcester has experienced "a year-on-year decline of approximately 10% ... since April 2006"[14]. Many railway stations are currently limited by poor integration with local bus services, with the clear need for improved accessibility and integration with other modes of travel.

[12] Office of Rail Regulation, 2006/07 station usage figures

[13] West Midlands Regional Spatial Strategy - Infrastructure Review Report (November 2007)

[14] Worcestershire County Council, 'Worcester Transport Strategy: Major Scheme, Technical Report', 2008

Cycling and Walking

5.115 In terms of cycling infrastructure, although relatively few journeys within Worcestershire are made by cycle, significant additional links are required across with County. There are also gaps in footway and footpath networks in urban areas. Walking and cycling routes will need to be integrated with other transport modes, bus and rail routes, to achieve the IPTS's vision of providing a public transport network that can "offer a realistic and sustainable alternative to the private car, whilst supporting economic prosperity and an improved environment for residents and visitors alike." There are a number of schemes being developed currently in Worcester, including the 'Connect2 Worcester' in conjunction with Sustrans.

Funding and Delivery

Transport Funding Packages

5.116 To support the delivery of transport infrastructure to ensure the sustainability of housing growth, various funding sources are available, including the Regional Funding Allocation (RFA), Community Infrastructure Fund (CIF), New Growth Points Fund (NGP), Maintenance Block, Integrated Transport Block (IT Block), Advantage West Midlands (AWM), and Transport Innovation Fund (TIF). Some of these organisations most likely to fund the transport infrastructure proposals detailed previously are summarised below.

Regional Funding Allocation (RFA)

5.117 The RFA process was launched by the government in July 2005. In transport terms, regions were invited to give advice to the government on priorities for public spending decisions for transport schemes costing over £5 million (Major Schemes), for the period up to 2015/16. The RFA process does not include motorways, other national roads and railway schemes other than those promoted by local authorities. Details of the second RFA round were announced in July 2008, giving regions until the end of February 2009 to submit their guidance to the government. Worcestershire falls under the West Midlands RFA Programme.

Integrated Transport Block (IT Block)

5.118 Schemes that are identified in Local Transport Plans and cost less than £5m are normally funded through the Department for Transport integrated transport (IT) Block. The distribution of the IT Block funding is phased in over the LTP2 period of five years (2006/07 to 2010/11), with the distribution up to 2009/10 also reflecting the distribution of funding made during the first local transport plan period. Adjustments are made to reflect departmental assessments of plan quality and delivery, with 'excellent' final second LTPs and excellently delivered first LTPs each receiving an uplift of 12.5% per year.

Community Infrastructure Fund (CIF)

5.119 The Housing Green Paper (July 2007) announced a joint Communities and Local Government and DfT 'Community Infrastructure Fund' (CIF) that would be available for transport schemes to support housing growth in Growth Areas, Growth Points and Eco-towns. Worcester has been identified as a New Growth Point in the West Midlands. In order to ensure that there was not a concentration of schemes in just a few areas; no location has had more than two schemes supported. The CIF process is currently at stage two of the appraisal process (CIF2).

Growth Fund

5.120 The Growth Fund is providing funding to support the delivery of infrastructure in the three newer Growth Areas and the Growth Points for 2008/09 - 2010/11. This is part of the larger contributions that Communities and Local Government will be investing across the Growth Areas, the Thames Gateway, Growth Points and Eco-towns during this period. Instead of funding individual projects, the Growth Fund has provided unringfenced block funding to local authorities and partnerships, with no grant conditions about how or when it is spent.

Advantage West Midlands (AWM)

5.121 Advantage West Midlands is the Regional Development Agency (RDA) for the West Midlands. The responsibility of AWM is to work to create conditions for growth by focusing on securing the delivery of the Regional Transport Strategy and the region's transport priorities.

5.122 The West Midlands Regional Transport Priorities Action Plan, jointly published by the West Midlands Regional Assembly and Advantage West Midlands, identifies nine transport priorities to be progressed, including Regional Rail Capacity, a package of 13 potential projects including improved rail services to Bromsgrove and Redditch, and New Growth Points/Settlements of Significant Development, a variety of public transport and highway schemes to support sustainable growth in NGPs/SSD. The Action Plan includes a 'Funding Challenge' to ensure the region unlocks the appropriate levels of funding for transport projects, at the right time. This involves bringing together a number of funding partners, including DfT (via the Highways Agency, Network Rail and RFA) and the Community Infrastructure Levy.

Transport Innovation Fund (TIF)

5.123 The Transport Innovation Fund (TIF) is a central government fund that supports "innovative solutions to congestion problems, involving demand management measures". The fund has two strands for supporting different types of project: Congestion TIF where local authorities bid for funds for their own schemes; and Productivity TIF where the DfT will identify schemes of national importance. Money from the TIF became available in 2008/09, and is forecast to grow significantly by 2014/15.

Other Funding Bodies

5.124 Other potential sources of funding for specific schemes include Train Operating Companies (TOC), bus operating companies and Network Rail (NR), as well as private developers, who, where appropriate, may make a contribution to a scheme's costs.

5.125 The tables in section 6 and 8 illustrate that several of the proposed transport infrastructure requirements are to be put forward as Major Schemes to bid for funding, and are anticipated to receive funding from central government through either the RFA or IT Block. If these bids are won, the shortfall in costs is anticipated to be made up from a variety of potential sources, including those described above, as well as developer contributions. For rail specific schemes, such as the Kidderminster and Bromsgrove multimodal interchanges, a proportion of the funding is anticipated to come from Network Rail and the relevant train operating companies, such as London Midland.

Energy Generation, Supply and Distribution

5.126 This section covers the provision of electricity and gas supplies. The general principle involved here is that these services are provided by the utility companies as required at their own cost with capital raised through private debt or equity capital as they see fit, and in return for the income generated from sales to domestic and commercial customers.

5.127 Some additional infrastructure required is paid for by developers. Our view is that the issues with regard to the utilities are not ones of funding per se, but of whether the regulatory structure for the industries concerned is adequate to ensure that investment takes place at the appropriate time to facilitate growth. We consider this in relation to the energy utilities below.

Context

5.128 The electricity and gas industry in the UK has three key levels of responsibility. The top two levels are responsible for ensuring appropriate infrastructure is in place to meet demand. They are:

Table U1: Utility Structure

Electricity	Gas
National Electricity Network - Generated electricity flows into the National High Voltage Electricity Transmission network. This is owned and maintained by National Grid. Electricity is then passed through to the regional Distribution networks.	**National Gas Network** - National Grid owns and operates the National Gas Transmission System throughout Great Britain. Gas is then passed through the strategic network to Distribution Network Operators (DNO).
Distribution Network Operators DNO - are the owners and operators of the network of towers and cables that bring electricity from the National Transmission Network to homes and businesses.	**Distributors** - are the owners and operators of the local gas distribution network. In Worcestershire, Central Networks is responsible for Gas distribution.
Gas and electricity suppliers - are the companies who supply and sell gas and electricity to the consumer, e.g. EON, N-Power, Scottish Power, British Gas etc. The suppliers are the first point of contact for consumers when arranging a gas or electricity supply to domestic, commercial and smaller industrial premises. They are not responsible for infrastructure.	

Electricity Supply

5.129 National Grid owns and maintains the high-voltage electricity transmission system in England and Wales, together with operating the system across Great Britain, balancing supply with demand on a minute by minute basis. National Grid is responsible for the bulk transmission of electricity in the United Kingdom. The estimation of load growth associated with housing and general light industrial developments for the West Midlands Region is undertaken by the local Distribution Network Operator (DNO), which is EON Central Networks. It advises National Grid of the predicted increase in demand at the 132kV bulk supply points.

5.130 National Grid then determines whether additional reinforcement at the 400kV or 275kV to 132kV substation would be required. However, reinforcement on the 132kV distribution system remains the

responsibility of the DNO. Reinforcements at National Grid substations can usually be accommodated within 3 years, subject to planning approval. In recent years there have been improvements to Redditch South Primary Substation to improve security of supply in 2007 and further work is planned at Gaydon Primary Substation to meet load growth in the area by 2011.

5.131 EON Central Networks is the Distribution Network Operator (DNO) for the East and West Midlands, including Worcestershire. It is primarily responsible for the 11kva and 33Kva electricity networks and are regulated by OFGEM.

5.132 A key issue when it comes to the identification, funding and delivery of electricity is the statutory and regulatory requirement on distribution companies to provide a supply where it is economic to do so. Conversely this implies that they have no obligation to provide a supply where this would be uneconomic. There is an active debate between the regulator and distributors about what is considered 'economic' in these circumstances. This lack of clear direction could act as a disincentive to distributors to provide a supply in any instance in which there is no proven end-user demand, such as an allocation of land for development in advance of a developer commitment. Given that forward planning of 36,600 dwellings across Worcestershire illustrates proven demand, this is considered unlikely to impact on the infrastructure improvements required to ensure delivery.

5.133 Broadly speaking, over the twenty year period of planned growth, there should not be a problem in delivering electricity capacity to support development in Worcestershire. However, as development takes place, hotspots can occur in specific locations where a lack of capacity at substations arises. This could be addressed at the time but is likely to be addressed systematically over time. The Central Network is fairly heavily loaded and some infrastructure is 40-50 years old. EON Central Networks is planning to replace substations because of age. As they are replaced, additional capacity for growth will be built in where it is known that there will be demand to pay for that investment.

Gas Supply

5.134 In 2005, the UK became a net importer of gas for the first time as UK Continental Shelf supplies continue to dwindle. Import dependency could be around 46% by 2010 and as much as 80% by 2014-2015. In response, the UK has sought to diversify its supply options in order to increase its security of supply. Although there are inevitable uncertainties with demand/supply projections, DTI studies suggest that market participants are identifying and responding to the need to invest in new gas infrastructure. Long-term infrastructure developments include:

- additional direct import connections from Norway;
- liquefied natural gas (LNG) terminals to import gas from worldwide sources;
- more interconnection with continental Europe to import gas from the Netherlands and beyond;
- pipeline upgrades to existing inter-connectors to increase import capacity;
- additional investment in UKCS exploration and production;
- gas storage, both onshore and offshore, to provide additional seasonal and daily swing capacity.

5.135 If all projected developments materialise, the total UK import / supply capability is forecast to be well in excess of demand. National Grid has investment plans in place to ensure that these demands will continue to be met. Any trends in power generation away from natural gas towards coal, renewable sources and nuclear technologies would only serve to increase gas availability towards the residential sector. While bio-fuels and liquid petroleum gas (LPG) may have a significant role to play in the transport sector, they are unlikely to impact on the availability of gas for residential consumers.

During consultation National Grid tested the development options on the West Midlands Medium Pressure year 5 planning model. This identified that growth in the following locations will require network reinforcement to meet future development growth:

- Worcester West
- Worcester South
- Reddtich
- North, North West Redditch
- West Redditch
- North West Bromsgrove

5.136 At present it is unclear how much these improvements might cost but it is assumed that National Grid will undertake the improvements and there will be no abnormal costs that will require external funding. In summary, there are no foreseen problems with gas supply for the duration of the RSS study period, however further consultation with National Grid is required to confirm this assumption.

Water Infrastructure

5.137 Water infrastructure includes water supply, sewerage, water drainage and flood risk.

Water Supply and Sewerage

5.138 Severn Trent Water Draft Water Resources Management Plan 2009 provides a 25 year strategy on water supply. The plan considers the future pressures on Severn Trent's capability to balance the supply and demand for water in the region and presents the potential shortfall in the strategic water supply capability if no action is taken. The plan also sets out the proposed long term investment strategy for ensuring that the future demand for water can be met.

5.139 The plan takes increases in housing into account. The rates of housing growth proposed through the RSS process represent a significant increase in the amount of new housing provision. The number of new properties connecting to the network has averaged around 25,000 properties per annum over the past 10 years. The RSS based projections imply future new household provision of around 33,000 properties per annum, which would be an increase in the rate of new connections of over 30%. There remains significant uncertainty over how and when these increases in new housing provision will be delivered, and the headroom assessment reflects this.

5.140 Worcestershire is a sub-area within the plan's Severn Zone (WRZ3). The Severn Zone faces a supply / demand risk that worsens over the forecast period to 2034. The Worcestershire, Warwickshire, Gloucestershire and South Shropshire sub area has a predicted supply-demand balance deficit under both annual average and peak demand periods. Aquifers are under pressure in many areas including Kidderminster and Bromsgrove. The River Severn is a major source of water with five key water supply abstractions having the potential to impact on the Severn Estuary. In addition, there are low flow watercourses identified around Kidderminster and Bromsgrove.

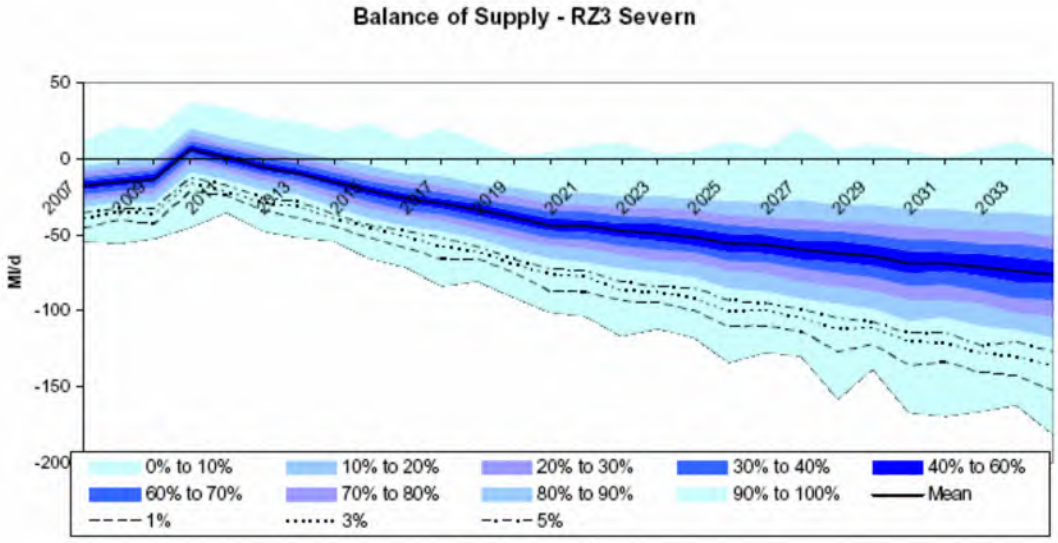
5.141 The plan sets out a baseline scenario which illustrates the projected demand for water that would arise due to changes in the customer base and behaviours but assuming that current polices are maintained regarding leakage, meterage, and demand management. It depicts the hypothetical situation in which a dry year is assumed to occur in each and every year to 2035, with demand being unrestricted, with reliable resources. This scenario is used to test whether future investment is likely to be required to maintain the balance of supply and demand and to ensure that the target level of service can be maintained.

5.142 For the Severn Zone, under the baseline scenario, unmeasured household consumption reduces by 34 Ml/d from the base year to the end of AMP 5 and measured household consumption increases by 42 Ml/d over the same period. Over the entire forecasting period 2006 to 2035, the plan forecasts a 109 Ml/d consumption reduction in unmeasured households and a 142 Ml/d consumption increase in measured households. Total household underground supply pipe losses decreases by under 1.5 Ml/d to 2034/35. The net impacts of these forecast changes on total household water delivered are an increase of approximately 7 Ml/d from the base year to the end of AMP 5; and an increase just over 31 Ml/d over the whole forecasting period.

5.143 The analysis shows that there is a continued supply / demand risk in the Severn Zone, and that risk worsens over the forecast period to 2036. The reasons for the worsening supply / demand projection are due mainly to climate change driven uncertainty, long term uncertainties in water quality trends and the projected growth in demand for water across this zone.

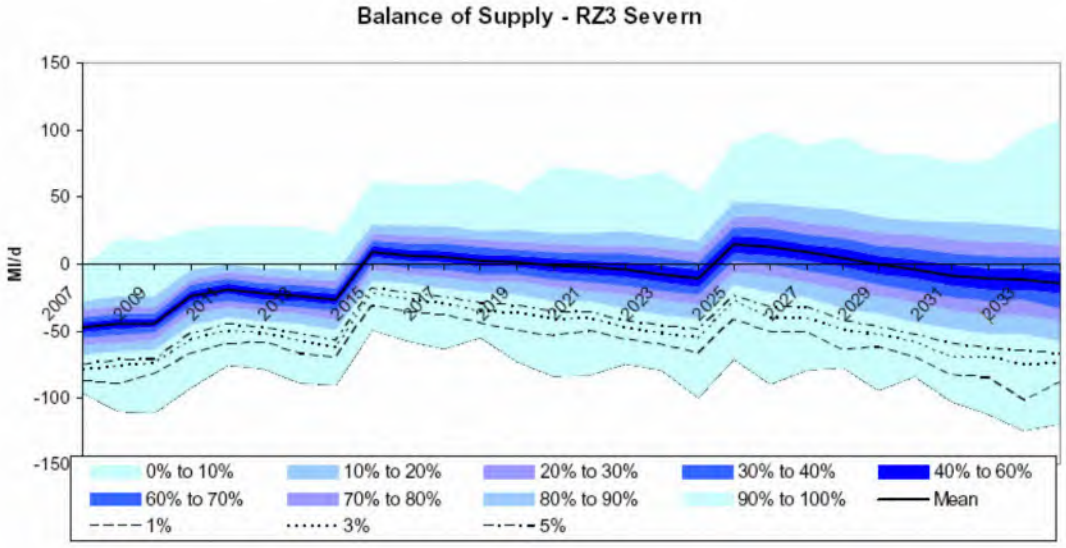
5.144 The supply-demand balance for the Severn Zone became negative in 2006/07, and remains negative thereafter. At the end of AMP6 (2019/20) the supply shortfall is around 70 Ml/d. By the end

of the planning period (2034/35) the supply shortfall is about 100 Ml/d. The following table sets out the supply- demand balance with different levels of certainty /uncertainty.



Source: Severn Trent Water Draft Water Resources Management Plan 2009

5.145 The plan sets out the strategy for the Severn area and the balance of supply. .



Source: Severn Trent Water Draft Water Resources Management Plan 2009

Calculating Infrastructure Requirements

5.146 The following table sets out the proposed supply / demand balance strategy for the Severn Zone over the next 25 years, including infrastructure requirements:

Table W.1: Proposed supply / demand balance strategy for WRZ3 – Severn

Period	Proposed intervention
2010 - 2015	• Promotion of household retrofit and other appropriate water efficiency options • Leakage control through combination of active leakage control, mains replacement and pressure control • Derwent Valley Aqueduct duplication – Kings Corner to Hallgates. Additional support to the east / west link
2015-2020	• Promotion of household retrofit and other appropriate water efficiency options • Leakage control through combination of active leakage control, mains replacement and pressure control
2020-2025	• Promotion of household retrofit and other appropriate water efficiency options • Leakage control through combination of active leakage control, mains replacement and pressure control • Ombersley water treatment works
2025-2030	• Promotion of household retrofit and other appropriate water efficiency options • Leakage control through combination of active leakage control, mains replacement and pressure control • Mill End Granular Activated Carbon (GAC)
2030-2035	• Promotion of household retrofit and other appropriate water efficiency options • Leakage control through combination of active leakage control, mains replacement and pressure control

5.147 This Severn Trent strategy proposes three main schemes for increasing the deployable output of the Severn Zone:

- Increasing the capacity of the Derwent Valley Aqueduct
- GAC Treatment, Frankley, Birmingham
- New river intake and water treatment works, Ombersley, near Worcester

5.148 Derwent Valley Aqueduct Scheme for 2010-15 aims to increase the capacity of the Derwent Valley Aqueduct in order to give the capability to deploy more water from treatment works along the River Derwent to the south of the East Midlands zone, and to provide further support to the east / west link and therefore Worcestershire. The strategy for the Severn Zone assumes that with the existing network and resource base, there is up to 20 Ml/d of supply available from the East Midlands zone

via the existing east/west strategic link. Assessment shows that the enhancement to the Derwent Valley Aqueduct would not only provide an increase in deployable output to both the East Midlands and Severn zones, but would also provide supply resilience benefits too.

5.149 The Granular Activated Carbon (GAC) Treatment Scheme, Frankley, Birmingham proposes to transfer raw River Severn water from the Trimpley water treatment works to Frankley for treatment, which allows the company to maintain storage in the Elan Valley reservoir system for longer. The scheme also provides additional supply resilience benefits through a more integrated strategic grid. The scheme is due for completion in 2009-10, and once complete, assessment shows that it will benefit the deployable output in both the Birmingham and Severn zones. The additional deployable output at Frankley will allow around 20 Ml/d of treated water to be available for transfer to the Severn zone via the strategic link main to Meriden. This increase in water available for use in the Severn zone is included in the supply / demand projections.

5.150 New river intake and water treatment works, Ombersley, near Worcester will provide an additional 30 Ml/d of supply capacity to support the Severn zone through the strategic water grid. The issues around gaining the appropriate planning permissions, and the need to justify the additional abstraction licence that would be required, have meant that Severn Trent has been unable to deliver this project before the original 2010 target.

5.151 In the preparation of Water Resources Management Plan 2009 (WRMP09), the Ombersley scheme has been treated in the same way as all other available options, and re-tested for its attractiveness as a supply-demand balance solution using cost / benefit analysis – albeit in light of the more difficult deliverability position.

5.152 The scheme still forms part of the proposed supply / demand balance strategy for the zone, but the need for the scheme has been deferred until later in the planning period. This deferral reflects the fact that the WRMP09 strategy has identified options to make more use of the existing water resource base through enhancing the strategic grid capability. The additional time allows Severn Trent to address the now identified issues surrounding promotion and approval of the scheme. Further analysis on the sub zonal issues is planned, for both the average and peak week demand scenarios, between the draft and final versions of WRMP09.

Identifying the costs

5.153 The regulator for the water industry is OFWAT, and the principle underlying the regulation of the sector is that the various companies such as Seven Trent submit consumer pricing proposals for a five year period. The price structure subsequently agreed with the regulator rewards them with a predetermined return on:

- The asset base which effectively forms their inheritance from the old nationalised system.
- The cost of the additional investment that is required and which has been agreed between OFWAT and Severn Trent.

5.154 The regulator aims to balance the need to allow the water companies enough financial leeway to invest while protecting consumers from predatory pricing. In December 2004 OFWAT issued their Determination on Future Water and Sewage Charges for 2005-2010 and this effectively determines how much will be invested during this period. Within this additional investment, money will be spent on responding to:

- New regulations and standards such as the Urban Waste Water Treatment Directive, the Groundwater & Habitats Directives, the Water Framework Directive, the Integrated Prevention of

Pollution and Control Directive and the Landfill Directive.

- Increases in the water consumption of existing households.
- Increases in the number of households such as the 36,600 new dwelling in Worcestershire.

5.155 For new development, Severn Trent can recover contributions from developers for a range of works, as set out in the Water Industry Act 1991. In some cases companies have allocated asset improvements attributable to new development, which is recoverable from developers. Developers bear the costs of utilities as part of construction costs rather than alongside other community infrastructure secured through S106 agreements. Severn Trent are planning for future population growth and at this strategic stage it is considered that suitable infrastructure will be provided. Severn Trent does not anticipate any major barriers in terms of funding to providing the necessary infrastructure/supply for water or sewerage.

Flood Risk and Water Drainage

5.156 Planning Policy Statement 25 and the Water Framework Directive set the context in which flood risk and water drainage must be considered. The sustainable management of water is an essential issue to be addressed in Worcestershire. A particular problem is managing the disposal of waste from buildings. The RSS states that a 'significant investment in waste water infrastructure, such as sewers and sewage treatment works is likely to be needed to ensure the water environment is protected. Reducing the volume of waste water from both new and existing buildings by water efficiency measures will help to reduce demand on existing infrastructure'.

5.157 New housing can increase the risk of diffuse pollution getting into surface water sewers. The pollution can come from a range of sources, such as waste water from houses or industry that should go to the foul drain, or oil and sediment collected on hard surfaces that is washed into these drains during rain. Sustainable Drainage Systems (SUDS) should be used wherever possible to mitigate the impact of this type of diffuse pollution. Surface Water Management Plans (SWMP) are encouraged by the practice guide companion to PPS 25. These plans should focus on managing flood risk, making efficient use of SUDS and safeguarding existing features of the water environment. There is the opportunity to turn these plans into SPDs to support the delivery of effective spatial plans.

5.158 The Technical Paper 'Planning for Water in Worcestershire' (March 2008) states that "approximately 10% of the land area of Worcestershire is at risk of flooding (about 167km2). There are over 9,146 properties at risk of flooding, approximately 4% of the total number of properties. 38% of the 9,146 properties are at significant risk; 30% are at moderate risk; 32% are at low risk. The types of flooding that arise in Worcestershire include rainfall, rivers, rising groundwater, overwhelmed sewers, drainage systems, and from canals. Parts of Worcestershire are particularly prone to river flooding.

5.159 An assessment of each District by Faber Maunsell 2007 provides the following information which illustrates where flood risk can be a significant constraint on the location of new development.

5.160 It is perceived by Wychavon LPA that flood risk is a significant factor for strategic planning in the district, with no developments anticipated in Flood Zone 3 in the next 20 years. Wychavon LPA considers that the following areas are not defended to a satisfactory standard: Badsey, Beckford, Cleeve Prior, Evesham (Hazel Ave), Harvington, Honeybourne, Little Comberton, North Littleton, Pinvin, Rous Lench, Stock and Bradley.

5.161 In Redditch, flood risk is not seen as a significant factor for strategic planning in the District. No development is anticipated in Flood Zone 3 in the next 20 years. It is considered that the following

areas are not defended to a satisfactory standard: Beech Tree Close/Salters Lane, Batchley, Windsor Works, Enfield, Loxley Close & Brooklands Lane, Church Hill, Furze Lane and Wingates Green.

5.162 In Bromsgrove, flood risk is seen as a significant factor for strategic planning in the district. There is the possibility of some development on some small sites in Flood Zone 3 in the next 20 years.

5.163 Wyre Forest LPA sees flood risk as a significant factor in strategic planning for the district. It considers that neither Kidderminster nor Bewdley are defended against flooding to a satisfactory standard. It is anticipated that there will be some development in Flood Zone 3 in the next 20 years, but this is less than 1% of the total Zone 3 land in the district.

5.164 Flood risk is considered to be a significant factor in strategic planning in Worcester City. No significant development is anticipated in Flood Zone 3 in the next 20 years, although there could be some limited development. The LPA considers that the following locations are not defended against flooding to a satisfactory standard: along the River Severn and Teme, along Duck Brook, Laugherne Brook, Barbourne Brook, Astwood Brook and flash flooding from rainstorms at other locations.

5.165 In Malvern Hills, flood risk is seen as a significant factor for strategic planning in the district. It is anticipated that there will be no development in Flood Zone 3 in the next 20 years. The LPA considers that the following locations are not defended against flooding to a satisfactory standard: Upton Upon Severn and the area west of Worcester.

Calculating Infrastructure Requirements

5.166 Strategic Flood Risk Assessments (SFRA) present flood risk maps that show the extent of land with a high chance of flooding (Zone 3) and land with a medium chance of flooding (Zone 2). Land outside of these areas is considered to have a low chance of flooding (Zone 1). The current SFRA Flood Zones are defined below.

- Flood Zone 1 – All areas that are not considered to be at risk of fluvial flooding. Whilst fluvial flooding is not a concern in these areas, the risk of flooding from other sources, such as surface water, groundwater, sewers and artificial sources (reservoirs) may still be an issue.

- Flood Zone 2 – Shows areas at risk of flooding in an extreme fluvial flood event. This zone shows those areas with a risk of flooding between a 0.1% and 1% Annual Exceedence Probability (AEP).

- Flood Zone 3a – This represents the area that is part of Flood Zone 3, but outside Flood Zone 3b (Functional Floodplain). This zone identifies the areas at risk from a 1% AEP fluvial flood event or a 0.5% AEP flood event caused by flooding from the sea.

- Flood Zone 3b (Functional Floodplain) – The functional floodplain shows areas of land which are frequently flooded. For all areas, it has been necessary to make conservative assumptions about the extent of the functional floodplain in the absence of historical flood outlines and detailed models.

5.167 Currently the local authorities are in the process of conducting or have recently conducted Strategic Flood Risk Assessments. These include:

- SFRA Level 1 - Bromsgrove and Redditch

- SFRA Level 1 - South Worcestershire
- SFRA Level 1 - Wyre Forest

5.168 These documents are currently examining the implications for future development in terms of flood risk. A good approach to planning is to avoid developing within flood zones unless absolutely necessary. However, in Worcestershire, many existing settlements are already affected by flood issues. Flood defences should not be used as an option to make urban extensions within higher flood risk areas permissible. This is because of the risk of flood defence failure. If this approach is followed, the infrastructure cost of future development for flood defences should be minimal for urban extensions in the County. Where flood defences are required to protect existing settlements and future intensification, dwellings within urban areas could be expected to contribute proportionally to that scheme.

5.169 The Bromsgrove and Redditch Water Cycle Study (September 2008) provides a detailed evaluation of all the development sites and their vulnerability to flood risk. It identifies that sewer and surface water flooding is a more common source of direct flood risk to potential developments, especially within the towns of Bromsgrove and Redditch. It demonstrates that the greatest risk of flooding within Bromsgrove District and Redditch Borough is from rapid rainfall runoff resulting in high flows on poorly maintained ordinary watercourses which are constrained by development and subsequently overtop. The study believes that '"it is therefore imperative that any new development takes this into account and minimises the volume of runoff produced through the implementation of SUDS, especially where located on greenfield sites". Over the whole of Redditch Borough and most of Bromsgrove District, the underlying geology is silt or clay which is impermeable and will therefore render infiltration techniques impractical.

5.170 The study concludes that "at present, within Bromsgrove District and Redditch Borough, water is overabstracted and demand outweighs supply, the sewage treatment works are generally at or approaching capacity and in many places flooding from lack of sewer capacity is seen". While work is being done to invest and resolve many of these issues, it is likely that they will have an effect on the timing of growth, and the appropriate flood risk mitigation measures. Close liaison with the stakeholders concerned is essential if development targets are to be met.

5.171 Sustainable Drainage Systems (SUDS) are encouraged and will require installation and ongoing maintenance costs. Their adoption by a suitable body is also essential to ensure their maintenance and retain their effectiveness. These types of measures would also be necessary to achieve level 6 of the Code for Sustainable Homes Standard. This standard would mean that about 30% of the water requirement of the home is provided from non-potable sources such as rainwater harvesting systems or grey water recycling systems. Other minimum requirements are required for surface water management – this may mean the provision of soakaways and areas of porous paving.

5.172 In future, where development is being considered at an early stage as part of a wider plan, the Community Infrastructure Levy may be an appropriate funding tool to pay for wider flood risk infrastructure, strategic surface water management opportunities, such as water storage or large-scale sustainable drainage systems needs. This would only be appropriate where it would fund infrastructure needs across a wider area and benefit more than one development.

5.173 However, localised flood issues and urban areas already affected by flood risk zones could potentially require mitigation. The number of these dwellings cannot be identified at a strategic level.

5.174 Table W2 overleaf provides indicative costs to construct and maintain flood defences. The costs are based on the flood risk management estimating guide published by the Environment Agency (Unit Cost Database, 2007).

Flood defences – Walls				
Wall height	<1.2m	1.2 to 2.1m	2.1 to 5.3m	Basis for cost rates: - average 185m plan length - minimum 25m length
Masonry wall (£/m run)	406	1500	1057	
Retaining wall* (£/m)	1565	1751	2286	
Wall* with cutoff (£/m)	916	2652	3031	
Wall* with piling (£/m)	-	3059	2671	
Flood defences - Embankment				
Volume	500-5,000	5,000-15,000	>15,000	- average 12m3 per metre run - average 700m length - average 12,000m3 volume
Fill material (£/m3)	31-116	29-53	17-31	

*wall type - steel reinforced concrete

5.175 The cost rates quoted include:

- contractors' direct construction costs;
- direct overheads - preliminaries and site costs (site establishment, insurance, profit, etc.);
- minor works such as fencing, drainage, minor repairs to road surfacing, etc;
- temporary works such as access tracks, pumping, cofferdams, river diversions, etc.

5.176 The cost rates exclude external costs such as client/consultants' charges, land compensation, contingency, etc. In addition, no flood defence works should be undertaken without appropriate mitigation such as compensatory flood storage. Otherwise, ground level raising could increase the flood risk to the surrounding area.

5.177 By way of an example, the following cost build-up is presented for a flood defence wall:

- wall cost rate at £1500 per metre run over 100m £150,000
- compensatory storage to offset 'lost' floodplain £25,000
- client/consultant charges £20,000
- land compensation £25,000
- contingency, 30% £66,000
- total capital scheme cost £286,000

5.178 Maintenance cost of £1,430 every year (based on 0.5% of capital cost) and major refurbishment works cost of £143,000 every 25 years (based on 50% of capital cost), therefore the whole-of-life scheme could cost over 50 years £500,000 (capital, maintenance, refurbishment). It must be noted that this illustration is to allow a strategic level of assessment to be possible.

5.179 In conclusion, if new development is located outside flood zones and thereby does not rely on flood defenses to render it appropriate, the costs associated with flood alleviation will be negligible. However, water cycle strategies are essential in understanding the detailed implications on development sites. All new development is likely to require the inclusion of SUDS and most will require the collected surface runoff to be disposed of on site, together with an infiltration assessment. It will therefore be necessary to use sustainable demand management techniques to recycle the collected water into the existing developments. There will also be costs associated with achieving appropriate drainage solutions to attain the higher standards required from the Code for Sustainable Homes.

5.180 Further consultation with the Environment Agency is required to identify the water infrastructure costs associated with new development. There are likely to be proposed flood relief schemes to protect specific settlements and it could be considered that new development should contribute a proportional share of this cost. Until development proposals become clearer in locational terms, the schemes to protect them cannot be identified or costed at this time

Climate Change

5.182 It is important that consideration is given to climate change when making decisions about infrastructure requirements. Climate change will affect the location of development and infrastructure requirements to mitigate the increased risk of flooding in the future. This includes existing facilities such as Bengeworth school in Evesham as well as new facilities.

5.183 As stated this report represents a snapshot in time, but it will be important that as infrastructure requirements are reviewed through LDF processes, that the increased impact of climate change is considered to ensure that spatial strategies are future proof to climate change. In 2007 the clear up costs of flooding Cost Worcestershire County Council £9 m. In reality the infrastructure impacts of climate change will increase over time and this issue should be monitored in the future.

Household Waste and Recycling Collection

5.184 Household waste and recycling infrastructure has addressed household waste impacts and recycling issues such as refuse and recycling collections and the provision of household waste recycling centres (HWRC). Worcestershire County Council has recently complete consultation on approaches to deal with waste going to landfill in the Joint Municipal Waste Strategy.

5.185 The population increase will generate additional demand for facilities and services such as recycling and waste management. New development will require new infrastructure to ensure that Worcestershire County Council meets recycling targets introduced in 2007 in the government's Waste Strategy and set out in the Joint Municipal Waste Management Strategy for Herefordshire & Worcestershire, 2004-2034 and the current Waste Core Strategy Issues and Options Consultation (2008). Worcestershire produced about:

- 318,543 tonnes of municipal waste in 2006-07 (WCC Waste Management Authority);
- 628,000 tonnes of commercial and industrial waste in 2006-07 (Environment Agency);
- an unknown amount, estimated to be 818,000 tonnes of construction and demolition waste in 2006-07 (West Midlands Regional Planning Body).

Context

5.186 The Waste Core Strategy Issues and Options Consultation (2008) has estimated National Waste Reduction Targets for Worcestershire. These will require the reduction of the total of household residual waste (waste not re-used, recycled or composted):

- 7642kg/household (29% of 2000 levels by 31st March 2010);
- 699kg/household (35% of 2000 levels by 31st March 2015);
- 592kg/household (45% of 2000 levels by 31st March 2020).

5.187 In practice, this means the County Council will have to try to limit the amount of non-recyclable waste collected, promote reuse, home composting and maximise the amount recycled and composted, (Note these figures are estimated and subject to clarification by DEFRA) to achieve the requirements of the Housing Waste Recycling Act 2003 by 31st December 2010. The target is to provide a kerbside collection of at least two recyclable materials from all households by 31st December 2010 unless the cost of doing so would be unreasonably high or comparable alternative arrangements are available, and to reduce CO2 emissions per household arising from waste collections by 5% by 31st December 2015. In practice, this means using the government's NI 185 LA Carbon Tool CO2 component attributable to transport of waste collections divided by the number of households served.

Regional Planning Policy Targets

5.188 The West Midlands Regional Spatial Strategy (RSS) sets the following regional targets for Worcestershire:

Municipal Waste Management	2005/06		2010/11		2015/16		2020/21		2025/26	
	Min. Diversion from Landfill	Max. Landfill	Min. Diversion from Landfill	Max. Landfill	Min. Diversion from Landfill	Max. Landfill	Min. Diversion from Landfill	Max. Landfill	Min. Diversion from Landfill	Max. Landfill
Worcestershire	78,000	234,000	160,000	181,000	212,000	143,000	242,000	127,000	254,000	130,000
Herefordshire's figures may need to be taken into account when calculating landfill space requirements. The figures are:										
Herefordshire	24,000	68,000	43,000	59,000	60,000	48,000	69,000	45,000	74,000	46,000

(WMRSS Phase 2 Revision Preferred Options Paper, Table 5)

5.189 The regional targets indicate that progressively less waste can be landfilled and more must be recycled, composted or treated over the period up to 2026. These figures are provisional and subject to revision when the final housing figures for the Phase 2 Revision of the RSS are set by the Secretary of State. Her decision is likely to be made after 2009, and the figures for regional waste targets will be revised subsequently.

County Council Targets

5.190 Worcestershire County Council has also adopted the following local targets. One of the Council's Local Area Indicators is to maximise the diversion of waste away from landfill through prevention, reuse, recycling/composting and recovery (Indicator NI 193, Municipal waste landfilled).

- The baseline is 57% (2006/07 figures)
- 2008/09 53%
- 2009/10 51%
- 2010/11 48%

Calculating the infrastructure Requirement

5.191 New residential development will have an infrastructure impact on waste and recycling services and facilities. It is projected that growth in waste production per household will remain static across Worcestershire to 2011. New residential development will affect the following waste and recycling services:

- refuse collection
- recycling collection
- household waste recycling centres.

5.192 Refuse collection vehicles (RCV) conduct area-based collections of refuse from all residential areas at a pass rate of 1000 households a day, with potential for 1200-1300 in a very dense urban setting. At present, there is some capacity within collection services but this is specific to locations.

5.193 Recycling collection vehicles have a typical pass rate of around 700-800 households a day. In

addition, there is a requirement for dwellings on both collection services to be supplied with appropriate bins, timetables and to be incorporated into new or existing routes. At present, recycling collection services vary across individual Districts, but can include paper, cardboard, metal, glass, plastic and food.

5.194 The third area of infrastructure impact will be the demand on household waste recycling centres (HWRC). At present, the number of households in Worcestershire is approximately 233,049 (Census 2001) and the number of HWRC is eleven. This provides a ratio of one HWRC per 20,227 households. The West Midlands regional average for HWRC provision is 1 per 34,736 people but this varies heavily between very urban metropolitan areas and more rural counties of the region and appears dependant on the accessibility of specific facilities and range of other waste and recycling facilities such as bottle banks/recycling bring sites.

Table W1: HWRC Ratios across the West Midlands:

County and Unitary	HWRC	Households	Ratio
Worcestershire	11	223,049	1 per 20,277
Warwickshire	9	210,898	1 per 23,434
Staffordshire	14	328,234	1 per 23,445
Shropshire	5	117,301	1 per 23,460
Herefordshire	4	74,282	1 per 18,571
Rural County Sub Total	**43**	**953,764**	**1 per 22,180**
Birmingham	5	390,792	1 per 78,158
Coventry	1	122,523	1 per 122,353
Dudley	1	124,988	1 per 124,988
Sandwell	1	115,426	1 per 115,426
Solihull	1	80,930	1 per 80,930
Stoke-on-Trent	2	103,196	1 per 50,667
Telford and Wrekin	4	63,768	1 per 15,942
Walsall	2	101,333	1 per 50,667
Wolverhampton	2	97,122	1 per 48,561
Metropolitan and Unitary Sub Total	**19**	**1,200,078**	**1 per 63,162**
West Midlands Region	**62**	**2,153,672**	**1 per 34,736**

Source: Census 2001 household accommodation

Identifying the Cost

5.195 The capital cost of a refuse collection vehicle is £130,000, whilst annual running costs (crew salary, fuel, depreciation, maintenance etc) is around £150,000 pa. Capital costs of recycling collection vehicles are lower at £80,000, but annual running costs would be similar at £150,000.

5.196 To facilitate both refuse and kerbside collection services, new dwellings will require bins/sacks and promotion information, including timetables. The cost of including a new residential dwelling on a refuse and recycling collection scheme is approximately £50 per dwelling dependant on the scheme. This comprises of the following elements:

- wheelie bin and/or recycling box/sacks;
- kitchen waste bin and caddy;
- publicity material including instructions about the scheme and timetables;
- the re-configuration and incorporation of new dwellings into existing collections.

5.197 Household waste recycling centres can take several forms. Examples range in scale from:

- Islington's new waste transfer station, which is being developed as part of the new Arsenal

Stadium project and which will include seven compactors in a recycling and transfer facility which will reportedly cost Arsenal £60m; to

- The new £3.5m Aylesbury Recycling and Reuse Centre, which is primarily aimed at providing a community-based recycling facility.

5.198 It appears prudent to assume a minimum cost would be £3.5m to acquire land, develop and equip the site. Running costs are approximately £100,000 pa, but this excludes the cost of haulage and disposal of material deposited.

5.199 Table W2 below sets out the indicative infrastructure requirements from new dwellings in Worcestershire. It has assumed that refuse collection services will run five days a week every fortnight and recycling collection services 5 days a week, weekly:

Table W2: Calculating Waste Infrastructure Requirements

	Standard	Cost	Cost per dwelling
Refuse Collection Vehicles	1 per 10,000 dwellings	£130,000	£13
Recycling Collection Vehicles	1 per 7,500 dwellings	£80,000	£10.60
Kerb site Collection equipment	1 per dwelling	£50	£50
Household Waste Recycling Centres	1 per 20,000 people or 9,000 dwellings*	£3.5m	£389

Note: * based on average household size of 2.2 people

Funding and Delivery

5.200 Waste collections are funded through council tax receipts. Once new housing developments are occupied, residents begin to contribute to the revenue costs of providing waste collection services. District Councils are responsible for refuse and recycling collections and the County Council is responsible for the provision of new household waste and recycling centres. However, the capital costs of new equipment place an extra burden on authorities. It is anticipated that funding towards the capital costs of new refuse and recycling equipment will be met through developer contributions.

5.201 The provision of refuse collection and recycling equipment and incorporation on collections rounds should be undertaken on the occupation of the first residents. HWRC require a lead time of 2 years to design and implement, and should be provided before existing HWRC facilities reach capacity.

Telecommunications

5.202 The general principle with telecommunication as with other utilities is that telecommunication services are provided as required at their own cost with capital raised through private debt or equity capital as they see fit, and in return for the income generated from sales to domestic and commercial customers.

5.203 The issues with regard to the utilities are not ones of funding per se, but of whether the regulatory structure for the industries concerned is adequate to ensure that investment takes place at the appropriate time to facilitate growth. This is considered in relation to the telecommunications below.

Context

5.204 British Telecom (BT) has a statutory obligation to supply capacity as and when required. When a new housing or employment development is built, infrastructure requirements will also be met by BT.

Calculating Infrastructure Requirements

5.205 Historically, there used to be instances of a lack of capacity in a BT exchanges. This problem has virtually disappeared with modernisation and now the main service issue relate to availability of broadband. At the end of the 2005 BT reached over 99% of homes with broadband. In the future broadband itself is likely to play an increasing role in telephone services.

5.206 The main issue at present relates to broadband speeds required for uploading and downloading information. Currently BT offers up to 8meg speeds within Worcestershire, but increasing customer demand is requiring better performance. It must be noted that Broadband speed availability is very specific and determined primarily by the distance from the exchange and quality of cabling.

5.207 BT monitors planning applications and produces forecasts when developments are likely to come on stream, determining infrastructure on actual developments proposals. BT forecasts three years ahead because of the cut-off point for planning application implementation. Sites with detailed approval are dealt with within one year. Following this, developers contact BT who supply cabling and ducting to developers, to enable the ducting to be completed and enable BT to put through cables and terminal boxes to houses themselves. With businesses, BT finishes the work once occupiers are in. There is no specific lead time. It depends on the nature and size of developments.

5.208 For new infrastructure, the worst case scenario is a whole new exchange. BT usually looks at termination points from local exchanges to see whether they have capacity. BT has stated that there are no major problems in Worcestershire.

Funding and Delivery

5.209 Like other utilities, BT puts forward cases internally to ensure revenue is available to fulfill future needs. Ultimately the provision of telecommunication is generally self-financing. However some additional infrastructure may be required through developer contributions from developers. At present no additional infrastructure requirements have been identified, but this areas should be kept under review.

6 Spatial Infrastructure Requirements, Existing Capacity and Costs

6.1 This section seeks to identify the specific infrastructure requirements of specific settlements and rural areas identified in the development options. The following settlements/areas have been examined:

- Worcester;
- Great Malvern;
- Droitwich Spa;
- Evesham;
- Pershore;
- Redditch;
- Bromsgrove;
- Kidderminster;
- Stourport on Severn;
- Rural Areas;
- NLP Development Options and other options

6.2. The following paragraphs and tables provide a commentary on existing capacity and reflect the subsequent infrastructure requirements and costs based on infrastructure stakeholders views:

6.3 In terms of transport, the majority of the costs allocated to the required infrastructure proposals have been based on current data available from various transport agencies and stakeholders. In some cases, contributions rather than estimated full costs of the scheme have been given due to the RSS housing allocation.

6.4 There are a number of areas where comprehensive data has not been available; these include proposed improvements to motorway junctions, where, although some modelling work has been undertaken in places, design or feasibility works have not been carried out and as such generic costs have been allocated. This is also the case for social infrastructure, such as ambulance provision where costs have not yet been identified.

6.5 In terms of rail improvements, several of these infrastructure proposals will be undertaken by Network Rail and so are assumed to be funded separately, and hence costs have not been stated. Costs have been given, where known, for proposals that are considered essential to support the RSS and NLP housing growth, whereas other proposals are considered to be merely beneficial rather than essential and have therefore not been allocated a cost.

Worcester Infrastructure Requirements

6.6 Based on future development of 10,500 dwellings, 65 ha and 55,000 sq m of employment and 85,500 sq m of retail within the city centre, Worcester will require new infrastructure to support development within the existing urban area and at five potential urban extension locations:

- Worcester West – 3,500 dwellings and 15 ha employment
- Worcester South - 3,000 dwellings and 25 ha employment
- Fernhill Heath - 500 dwellings
- Kilbury Drive - 300 dwellings
- Junction 6 Regional Site - 25 ha employment.

6.7 NLP development options for Worcester include:

- Worcester West - 500 additional dwellings
- Worcester North/Fernhill Heath - 500 additional dwellings
- Norton Parkway - 2,500 dwellings.

6.8 The paragraphs below discuss infrastructure requirements and Table 6.1a sets out the infrastructure schedule and cost. Table 6.1b sets out the additional implications of the NLP options.

Social Infrastructure

6.9 At present pupil numbers in both primary and secondary phases are expected to decline in the short term. However, post 2011 housing development in Worcestershire is likely to have taken up available capacity and therefore development concentrated in and around Worcester will require additional facilities. It is considered that two new primary schools will be required to support the development of the Worcester West and Worcester South. The relocation of the existing primary school to support development at Fernhill will also be required.

6.10 A new secondary school will be required to support Worcester West and will need to be provided mid way through the development. Given the lead time for procurement, design and construction of new education facilities, it is recommended that they are commenced 3 years before they are required.

6.11 Currently, the Primary Care Trust is in the process of improving the quality of existing premises across Worcestershire. Existing premises capacity is sufficient to meet the majority of future patient needs in terms of increased GP, NHS dentistry and optician requirements. There is, however, a requirement to provide a new health centre or expand the existing health centre at St Johns to meet the needs of Worcester West.

6.12 Based on standards of provision, there is a requirement for 830 sq m of new library provision and 2,650 sq m of community centre space. This level of provision could equate to two new community libraries and four new community centres if this was the desired size and spatial distribution of provision. Worcestershire County Council's existing strategy is to expand and improve existing facilities in Worcester rather than provide all new facilities.

6.13 There is no capacity within existing recreation and leisure provision. Based on the Worcester open space standard of 4.9 ha per 1000, Worcester could require the provision of 116.5 ha of new open space of a variety of typology. Urban extensions will be able to provide their requirement on site, however development within the urban area will not always be able to meet this objective. It has been assumed that 60% of all open space will be provided on site with the rest as a financial contributions.

6.14 A new sports hall and swimming pool will also be required. Like other leisure requirements across the County. This requirement is tied to the overall level of development rather than any one specific development or urban extension. It is likely that one of the urban extensions would be a suitable location for new leisure provision.

6.15 For Worcester, the planned increase in housing may require additional emergency resources such as an additional part time fire appliance and a new fire station. This is especially the case for the west of the city. In addition, there is a requirement for 2 new neighbourhood police posts and a new section station as part of the Worcester West urban extension. The ambulance service will also require an additional ambulance station in Worcester with a new ambulance and rapid response vehicle.

Transport Infrastructure

6.16 Worcester was identified as a Settlement of Significant Development in the West Midlands Regional Spatial Strategy (RSS) and was successful in a bidding process to be selected as a New Growth Point by the Government in October 2006, meaning that a significant proportion of the housing and employment growth allocated to Worcestershire County will be focused in the Worcester area. The city is currently constrained by accessibility problems which have led to congestion, and as a result there is concern that, as indicated in the RSS , there is "insufficient capacity in the transportation system to accommodate the projected growth levels" of housing and employment. To mitigate this, an integrated strategy is required to help deliver the growth associated with the New Growth Point (NGP) and the RSS in a sustainable way.

6.17 The Sustainable Travel Towns (STT) initiative, established in Worcester between 2005 and 2008, has demonstrated how a significant investment in a package of 'Smarter Choice' measures can influence travel patterns when coupled with infrastructure improvements. Within the first three years of the demonstration project, targeted areas of the city showed a 12% reduction in car use. Building on the success of this scheme, the emerging Worcester Transport Strategy (WTS) proposes a package of measures comprising improvements to the public transport network and the highway network to "accommodate growth, as allocated within the Regional Spatial Strategy, whilst seeking to resolve existing problems of accessibility" within Worcester itself.

6.18 The implementation of WTS is central to the proposed integrated strategy to help deliver the proposed growth areas to accommodate the RSS and NLP housing for Worcester sustainably, along with further measures to improve accessibility between other settlements within Worcestershire. The proposed strategy involves enhancements to the public transport network, including walking and cycling, as well as the highway network, so ensuring improved accessibility across all modes. Proposals are also included for rail infrastructure and service improvements, including enhancements to key stations on the Malvern – Worcester City rail corridor, which supports the HA's view that "rail improvements are... the most important method of reducing pressure on the SRN in the longer term"[15].

6.19 The 3,200 dwellings and 16 ha of employment development to be accommodated within the city boundary will require the priority implementation of the WTS measures to help deliver the growth sustainably. This includes the proposed network of Park & Ride interchanges, which are referred to as Lower Broadheath, M5 South Parkway, St. Peter's and Claines, as well as the enhancement of the two existing Park & Ride site in Worcester; Worcester North and Sixways. These interchanges will help transfer trips to the outside of the city centre, along with the associated Bus Rapid Transit (BRT) network linking the new land use developments to key services and facilities.

6.20 The proposed Park & Ride and BRT network will be complemented by the implementation of Intelligent Transport Systems (ITS) to "better inform travellers and to maximise confidence and capacity for the sustainable transport network", as stated in WTS. The heavily used Worcester Foregate Street station would benefit from infrastructure enhancements to allow the station to form the gateway to the city's new University campus and Library complex, as well as to the city centre as a whole.

6.21 In terms of highways, this urban intensification within the city boundary will add pressure to the city's already congested road network, including the Southern Link Road (SLR), as well as to the main 'gateways' into the city; M5 Junctions 6 and 7. Recent modelling work undertaken by the HA suggests that a mitigation scheme for Junction 6 will be required to accommodate the levels of growth proposed in the Preferred Option, although Junction 7 is anticipated to still be operating just within capacity to 2026. It would seem likely that with the addition of proposed NLP housing in

Worcester, this would lead to improvements to Junction 7 being required. Mitigation works to Junctions 6 and 7 and improvements to significantly increase the capacity of the SLR and its junctions, the latter proposed as part of the emerging WTS, will be highly important to help accommodate this RSS and NLP growth.

6.22 A further highways proposal to support the additional housing, envisaged as part of the WTS scheme, is for a new river crossing bridge to divert traffic to the north of the city centre; this will lead to the downgrading of the existing bridge to a 'green bridge' dedicated to public transport, pedestrians and cyclists. A comprehensive package of pedestrian and cycle priority measures would also help support the housing growth, and builds upon the work of the STT initiative. The 3,500 dwellings and 16 ha employment to be located north/northwest of the city will rely upon fulfilment of WTS to provide sustainable transport links to and from the city centre, particularly the proposed Park & Ride site to the west (Lower Broadheath Interchange) and the associated bus rapid transit corridor, which will help ease congestion on the highly congested A44 Bromyard Road that will serve the development site[15]. Quality walking and cycling routes will also be required to support the housing.

6.23 As proposed in the South Worcestershire Joint Core Strategy (SWJCS)[16], this housing north/northwest of the city would also require a new rail halt in the Rushwick area to provide links to employment areas, the University and the city centre, along with associated significant improvements to rail infrastructure. Again, significant capacity improvements to the SLR would also be essential to provide access to the national network. These requirements will also be necessary to support the potential additional NLP housing as an extension to this location. It has been suggested that the construction of a northwest bypass or a new northern bridge crossing could be required to support the allocated housing in this location, although modelling undertaken as part of WTS indicated that the construction of a North West Link Road (NWLR) would result in a modal shift away from public transport and would not provide good value for money. Assessments are currently underway to ascertain whether the NWLR would be required to support the proposed additional NLP growth.

6.24 The 3,000 dwellings and 25 ha urban extension south of the city would similarly require the dualling of the SLR as well as the development, in particular, of the Park & Ride site off the A38 (St. Peter's Interchange) proposed as part of WTS, along with enhanced bus routes and walking and cycling links. The 300 houses proposed southeast of Worcester would add pressure to the necessity of these infrastructure requirements, and would benefit particularly from the development of the nearby M5 South Parkway Park & Ride site proposed as part of WTS. The 3,000 houses to the south would also benefit from the addition of a pedestrian/cycle bridge over the SLR to link to the existing urban area.

6.25 The proposed 500 dwellings in Fernhill Heath, along with the additional 500 dwellings proposed as part of the NLP growth options, would again add pressure to the M5 Junction 6, and would require enhanced bus, walking and cycling links to Worcester City Centre.

6.26 The potential housing development proposed at Norton to accommodate the additional 2,500 NLP dwellings could be made more sustainable by Worcestershire Parkway, and as such would be linked to housing in this area.

6.27 To support the 25 ha of employment land at the Regional Investment Site (RIS) proposed in the

[15] West of Worcester Bus Rapid Transit Corridor, CIF 2 Round 2 - Full Business Case, Worcestershire County Council (2008)

[16] South Worcestershire Joint Core Strategy Preferred Options Paper (September 2008)

vicinity of M5 Junction 6, significant improvements will be required to this already congested junction. The extension of bus services to serve this site would also be required.

6.28 To assist in delivering the proposed RSS and NLP housing in a sustainable manner for Worcester as a whole, double tracking of the Cotswold Line between Norton Junction to Pershore would complement the existing proposal to double track the line from Evesham to Charlbury (Oxfordshire), due to be delivered commercially by 2010. This aspiration, as identified in the LTP2 and West Midlands RSS Infrastructure Review Report, would improve rail accessibility between Worcester and Pershore, Evesham and further southeast to London, and would help achieve the LTP2's view "that signaling improvements and track improvements should be progressed as a priority to increase capacity on this line". However, although beneficial, this proposal is not considered essential to support Worcester's proposed housing growth. A cost for the scheme has therefore not been included in Table 6.1a.

6.29 Table 6.1a and b summarise the infrastructure requirements for Worcester to support the RSS and NLP housing, respectively, as illustrated in Figure 6.1 in appendix 2.

Utilities and Waste

6.30 Based on future household growth, Worcester could require a new or relocated household waste recycling centre, plus additional refuse and recycling vehicles to enable new dwellings to be incorporated into existing collection rounds. In addition, the cost of including dwellings on refuse and recycling rounds in terms of equipment will generate a substantial infrastructure cost. There are no specific utility infrastructure requirements for Worcester.

6.31 Table 6.1a below sets out the specific infrastructure requirements from 10,500 dwellings and 65 ha and 55,000 sq m of employment and 85,500 sq m of retail within the City centre

Table 6.1a: Worcester Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	1 new secondary tied to the delivery of the Worcester West urban extension	£35 m
Education	1 new primary tied to the delivery of the Worcester West urban extension	£6.5 m
Education	1 new primary tied to the delivery of the Worcester South urban extension	£6.5 m
Education	1 new site for relocation of existing first school in Fernhill Heath tied to development of around 500 dwellings there	£4.5 m
Education	Special School Financial Contribution	£1.85
Health	New or extended health centre at Worcester West	£3 m
Community	2,650 sq m of new community centre space, comprising three or four new centres	£4.55 m
Community	830 sq m of new library provision, comprising extensions to existing facilities	£2.4 m
Community	466 religious participants @ 6%. Indicative requirement for 1.8 ha subject to local assessment of demand	Land Cost
Recreation	102.3 ha open space (on site)	Land Cost
Recreation	Contribution towards 14.2 ha (off site)	£7.1 m
Recreation	Open space maintenance for 5 years	£17.5 m
Recreation	1 x 25m 5 lane swimming pool	£2.5 m
Recreation	1 x four court sports hall	£3 m

Emergency	Police section station at Worcester West	£4 m
Emergency	2 x neighbourhood Police post	£500 k
Emergency	Fire Station tied to the west Worcester Urban Extension	£1 m
Emergency	Ambulance Station and equipment	£TBC
Highways	Highway improvements, including increasing capacity of the Southern Link Road	£66 m
Highways	Improvements to M5 Junction 6	£30 m*
Highways	New city centre river crossing	£31 m
Highways	Intelligent Transport Systems (ITS)	£9 m
Rail	Enhanced infrastructure at Worcester Foregate Street station	£1.5 m
Rail	Rail halt at Rushwick	£2 m*
Rail	Double track Norton Junction (Worcester) to Pershore section of line (aspiration)	Considered beneficial but not essential so no cost included
Bus	Network of Park & Ride interchange hubs	£70 m
Bus	BRT network & associated infrastructure, across key routes throughout the city	
Walk/cycle	Cycle/pedestrian routes	£14 m
Walk/cycle	Pedestrian/cycle bridge over the Southern Link Road	£2 m*
Waste and Recycling	1 new refuse collection vehicle	£300 k
Waste and Recycling	1 new recycling collection vehicle	£180 k
Waste and Recycling	10,500 kerbside recycling equipment sets	£525 k
Waste and Recycling	1 new or relocated household waste recycling centre	£3 m
Total		**£329.4 million**

* Generic cost

6.32. Table 6.1b sets out the additional infrastructure requirements to accommodate the NLP options for Worcester:

Table 6.1b: Additional NLP Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	1 new primary school tied to the delivery of the Norton Parkway	£6.5 m
Education	Special School Financial Contributions	£497 k
Community	625 sq m of new community centre space, comprising one new centre or extensions to existing facilities	£1.1 m
Community	198 sq m of new library provision, comprising extensions to existing facilities	£570 k
Community	1066 religious participants @ 6%. Indicative requirement for 0.4 ha subject to local assessment of demand	Land Cost
Recreation	27.7 ha open space (on site)	Land Cost
Recreation	Open space maintenance for 5 years	£4.1 m
Highways	Improvements to M5 Junction 7	£30 m*
Rail	Worcester Parkway Park & Ride	£17 m
Walk/cycle	Cycle/pedestrian routes	Covered under Worcester RSS requirements ‡

Waste and Recycling	2,500 kerbside recycling equipment sets	£125 k
Total		**£59.9 million**

* Generic cost
ǂ Infrastructure would be required although costs covered under Worcester RSS proposals.

Great Malvern Infrastructure Requirements

6.33 Based on future development of 3,380 dwellings, 21.5 ha and 10,000 sq m of retail within the town centre, Malvern will require new infrastructure to support development within the existing urban area and at two potential urban extension locations:

- North East (Newland) - 1,100 dwellings and 10 ha employment
- East (Townsend Way) - 500 dwellings and 7 ha employment

6.34 There are no additional NLP implications for Malvern. The paragraphs below discuss infrastructure requirements and Table 6.2 sets out the infrastructure schedule and cost:

Social Infrastructure

6.35 In Malvern, school numbers in the primary sector are expected to decline, whilst secondary school numbers should be stable in the short term. Significant building development is expected in north Malvern where there is more pressure on primary schools and a site has been identified for a new one form entry primary school. There is an infrastructure requirement for a new primary school if a north east site of 1100 dwellings is developed. There is an existing option on land at Persimmon Homes' site "Malvern Vale" for new 1FE primary school and this may also be required.

6.36 Currently, the Primary Care Trust is in the process of improving the quality of existing premises across Worcestershire. Existing premises capacity is sufficient to meet future patient needs in terms of increased GPs, NHS dentistry and optician requirements in Malvern.

6.37 Based on standards of provision, there is a requirement for 262 sq m of new library provision and 845 sq m of community centre space. This level of provision could equate to an extension to an existing library and a new community centre, if this was the desired size and spatial distribution of provision. Worcestershire County Council's existing strategy is to expand and improve existing facilities in Malvern rather than provide all new facilities.

6.38 There is no capacity within existing recreation and leisure provision. Based on the Malvern open space standard of 7.91 ha per 1000, Malvern could require the provision of 59.4 ha of new open space of a variety of typology. Urban extensions will be able to provide their requirement on site. However, development within the urban area will not always be able to meet this objective. It has been assumed that 60% of all open space will be provided on site with the rest as a financial contribution.

6.39 There is no overall built leisure requirement at Malvern. Whilst there is increased demand, it is not sufficient to support a new facility. Strategic leisure for Malvern should be considered alongside other settlements and rural areas that will not receive sufficient development to warrant new facilities

6.40 For Malvern, the planned increase in housing may require additional emergency resources, such as an additional fire appliance. In addition, there is a requirement for 2 new neighbourhood police posts and an additional ambulance station in Malvern with a new ambulance.

Transport

6.41 As stated within the SWJCS, Malvern is a centre of employment forms a Key Node on the Central Technology Belt, with high technology businesses focussed at QinetiQ and the new Malvern Science Park. Malvern holds strong links with Worcester via regular bus services along the A449; a frequent rail service, although this is hindered by poor rail service reliability and lack of car parking at the Malvern stations; and road links to the M5 via Junctions 7 and 8.

6.42 Traffic congestion on the A4440 Southern Link Road is currently exacerbated by significant journey to work movements between Malvern and the employment sites on the eastern side of Worcester; a strong journey to work corridor. The Malvern – Worcester corridor is likely to see increased demand placed by employment nodes on the Central Technology Belt (Longbridge, Bromsgrove, Droitwich, Worcester and Malvern) and the further development of Malvern Science and Technology Park programmed for the LTP2 period. The sustainable delivery of additional housing growth in Malvern will therefore be strongly influenced by the delivery of the multi-modal measures proposed as part of the emerging Worcester Transport Strategy including:

- dualling of the Southern Link Road; and
- improved car parking at Great Malvern and Malvern Link stations.

6.43 Further to the emerging WTS, additional measures will also be required to provide enhanced multi-modal accessibility for Malvern by public transport, as identified in the ITPS, alongside some highway improvements.

6.44 An initial transport assessment undertaken for Malvern[17] concluded that the housing and employment allocated within the vicinity of Newland and south of Townsend Way would require a new bus service linking the sites with the rail station and main employment sites in Malvern, as well as providing an interchange with existing bus Route 44 to provide a connection to Worcester. This would be complemented by further enhancements to the bus network to provide services within the town and to surrounding villages.

6.45 In addition, enhanced cycling and walking routes will be required to link the developments to central Malvern, as well as the extension of Townsend Way, subject to conclusions of the Malvern Transport Study. Figure 6.2 in Appendix 2 illustrates the transport infrastructure requirements for Malvern to support the RSS and NLP housing.

Utilities and Waste

6.46 Based on future household growth, Malvern will require refuse and recycling equipment to ensure all new dwellings are included on refuse and kerb side collection rounds. There are no specific utility infrastructure requirements for Malvern that will require additional funding.

6.47 Table 6.2 below sets out the specific infrastructure requirements for Malvern:

Table 6.2: Malvern Infrastructure Requirements

Type	Infrastructure	Estimated cost
Education	1 new primary tied to the delivery of the northern urban extension	£6.5 m
Education	1 new primary tied at Malvern Vale	£6.5 m

[17] DRAFT Malvern Housing Association Transport Study, Transport Infrastructure Requirements, 2008. Halcrow.

Education	Special School Financial Contribution	£617 k
Community	845 sq m of new community centre space, comprising one new centre or extensions to existing centres	£1.3 m
Community	262 sq m of new Library provision, comprising extensions to existing facilities	£760 k
Community	144 Religious participants @ 6%. Indicative requirement for 0.6 ha subject to local assessment of demand	Land Cost
Recreation	49.9 ha open space (on site)	Land Cost
Recreation	Contribution towards 12.5 ha (off site)	£6.25 m
Recreation	Open space maintenance for 5 years	£5.35 m
Emergency	Fire appliance	£220 k
Emergency	2 x neighbourhood Police posts	£500 k
Emergency	Ambulance station and equipment	£TBC
Highways	Dualling of Southern Link Road	Covered under Worcester requirements[ǂ]
Highways	Extensions to Townsend Way (subject to Malvern Transport Study)	£1 m contribution towards overall cost of £5 m
Rail	Malvern stations improvement packages (part of WTS)	£4m
Bus	Enhanced bus network, , including ongoing revenue costs of infrastructure and services	£10 m
Walk/cycle	Improvements to walking/cycling network	£0.25 m*
Waste and Recycling	3,380 kerbside recycling equipment sets	£169 k
Total		**£43.41 Million**

[ǂ] Infrastructure would be required although costs covered under Worcester proposals.

Evesham Infrastructure Requirements

6.48 Based on future development of 3,480 dwellings, 10 ha and 7,400 sq m of retail within the town centre, Evesham will require new infrastructure to support development within the existing urban area and at three potential urban extension locations:

- Offenham Road - 1,500 dwellings
- Hampton - 800 dwellings
- Vale Business Park - 10 ha employment

6.49 There are no additional NLP implications for Evesham. The paragraphs below discuss infrastructure requirements and Table 6.3 sets out the infrastructure schedule and cost:

Social Infrastructure

6.50 In Evesham there is a three tier system of education. Within Evesham itself, significant housing growth will counteract the effect of declining rolls in recent years, thus maintaining numbers in schools in the town. To support future development, a new site for relocation of Bengeworth First School is required. Some funds have already been secured from money made available for infrastructure impacted by recent severe flooding. The balance of funding remains to be secured. In addition, the expansion for St Andrew's CE First School is required and a new first school on old Bengeworth site assuming acceptable flood defences can be put in place, This cost is not been identified.

6.51 Currently, the Primary Care Trust is in the process of improving the quality of existing premises across Worcestershire. Following the recent completion of the new Hampton health centre, existing premises capacity is sufficient to meet the majority of future patient needs in terms of increased GP, NHS dentistry and optician requirements in Evesham. Future growth will require either a new health centre of the extension to two existing centres at Riverside and De Montfort.

6.46. Based on standards of provision, there is a requirement for 277 sq m of new library provision and 870 sq m of community centre space. This level of provision could equate to an extension to an existing library and a new community centre, if this was the desired size and spatial distribution of provision. Worcestershire County Council's existing strategy is to expand and improve existing facilities in Evesham rather than provide all new facilities.

6.52 There is no capacity within existing recreation and leisure provision. Based on the Wychavon open space standard of 4.5 ha per 1000, Evesham could require the provision of 35.7 ha of new open space of a variety of typologies. Baker Associates considers that urban extensions will be able to provide their requirement on site. However, development within the urban area will not always be able to meet this objective. It has been assumed that 60% of all open space will be provided on site with the rest as a financial contribution.

6.53 There is no overall built leisure requirement at Evesham. Whilst there is increased demand, it is not sufficient to support a new facility. Strategic leisure for Evesham should be considered alongside other settlements within the District and rural areas that will not receive sufficient development to warrant new facilities but could collectively require a strategic facility.

6.54 For Evesham, the planned increase in housing may require additional emergency resources such as an additional fire appliance and changes to Evesham fire station. In addition, there is a requirement

for 2 new neighbourhood police posts and additional ambulance equipment including a new ambulance and rapid response vehicle.

Transport

6.55 As stated in the SWJCS, Evesham is a relatively self contained settlement, with 54% of residents working within the town and 30% working outside of the District in Stratford-upon-Avon, the Cotswolds, Tewkesbury and Worcester. Frequent bus services run from Cheltenham and Worcester, and being located on the Hereford – London line, Evesham offers work opportunities to London and the South East.

6.56 To support any additional housing to Evesham, the planned replacement of the A4184 Abbey Bridge and Viaduct will be critical to maintain accessibility over the river. The closure of the bridge, which is considered to be a serious possibility within the next five years unless mitigation works are undertaken[18], would effectively sever the town. To ensure the improvement of air quality with the management area in Evesham (AQMA), special care will be required to provide sufficient sustainable transport measures.

6.57 In light of the existing journey to work patterns, the additional housing growth in Evesham is likely to place pressure on the A46 for travel to Stratford-upon-Avon and Tewkesbury, and some localised junction improvements may be necessary. Improvements to public transport may, however, mitigate this stress[19]. Additional journey to work trips travelling to Worcester by car will add pressure to the already congested M5 junctions into the city, particularly Junction 6, thus requiring junction improvements to help accommodate demand.

6.58 As stated in the IPTS Accessibility Strategy Best Practice Report, "Addressing the issue of travel demand solely through large-scale road construction is neither a viable nor a sustainable option… we must, therefore, find other solutions that can meet peoples' desire to travel, by creating an attractive alternative that will encourage greater use of passenger transport, cycling and walking and reduce the reliance on the car."

6.59 Sustainable modes of transport in the network will therefore need to be enhanced in order to improve accessibility and to make Evesham's growth sustainable. In order to encourage travel by sustainable modes, the public transport network will need to provide improved accessibility by, amongst other factors, shorter travel times and a lower perceived cost of travel, in terms of both fares and time costs.

6.60 In support of this, increased parking will be required at Evesham railway station to encourage commuting by rail to Worcester and the South East. Improved service frequencies along the Cotswold Line, which are likely to occur with the proposed double tracking along sections of the line, would also be beneficial although not essential to support the housing growth. Improvements to the bus network would also be required to support additional trips on the existing route to Worcester, which passes through Pershore. A new pedestrian/cycle bridge will be required to link the residential development at Hampton to the town centre. Figure 6.3 in Appendix 2 illustrates the transport infrastructure requirements for Evesham to support the RSS housing.

[18] A4184 Abbey Bridge and Viaduct – A Bid for Capital Maintenance Funding, Halcrow (2009)

[19] The South Worcestershire Joint Core Strategy Preferred Options; Response by the Highways Agency (December 2008)

Utilities and Waste

6.61 New residential dwellings at Evesham will require refuse and recycling equipment to ensure all new dwellings are included on refuse and kerb side collection rounds. There are no specific utility infrastructure requirements for the town.

6.62 Table 6.3 below sets out the specific infrastructure requirements for Evesham:

Table 6.3: Evesham Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	Relocation of Bengeworth first school	£3 m
Education	Extension of St Andrews CE first school	£3 m
Education	New first school at Bengeworth	£6.5 m
Education	Special School Financial Contribution	£635 k
Community	870 sq m of new community centre space, comprising one new centre or extensions to existing centres	£1.3 m
Community	262 sq m of new library provision, comprising extensions to existing facilities	£800 k
Community	148 religious participants @ 6%. Indicative requirement for 0.6 ha subject to local assessment of demand	Land Cost
Recreation	30.9 ha open space (on site)	Land Cost
Recreation	Contribution towards 4.8 ha (off site)	£2.42 m
Recreation	Open space maintenance for 5 years	£5.35 m
Emergency	Fire appliance and station improvements	£350 k
Emergency	2 x neighbourhood police posts	£500 k
Emergency	Ambulance equipment	£TBC
Highways	Evesham Bridge & Viaduct Replacement	£9.5 m
Highways	Improvements to M5 Junction 6 (and 7, combined with Worcester NLP allocation)	£30 m each* (covered under Worcester requirements)Ŧ
Highways	Improvements to localised junctions on the A46	£1 m*
Rail	Improved parking provision at Evesham Railway Station	£0.5 m*
Bus	Enhanced bus network, including ongoing revenue costs of infrastructure and services	£10 m
Walk / cycle	Improvements to walking and cycling networks	£0.25 m*
Walk / cycle	New pedestrian/cycle bridge to Hampton	£2 m*
Waste and Recycling	3,480 kerbside recycling equipment sets	£174 k
Total		**£47.27 Million**

* Generic cost
Ŧ Infrastructure would be required although costs covered under Worcester RSS / NLP proposals.

Droitwich Spa Infrastructure Requirements

6.63 Based on future development of 2,430 dwellings, 10 ha and 2,905 sq m of retail within the town centre, Droitwich Spa will require new infrastructure to support development within the existing urban area and at two potential urban extension locations:

- South Droitwich - 1,800 dwellings - 10 ha of employment
- North of Pulley Lane - 250 dwellings.

6.64 There are no additional NLP implications for Droitwich Spa. The paragraphs below discuss infrastructure requirements and Table 6.4 sets out the infrastructure schedule and cost.

Social Infrastructure

6.65 Education follows the three tier system. First and middle school numbers are expected to increase slightly overall, taking up some of the surplus places. The High School is expected to continue to operate at capacity. Overall there is likely to be no new infrastructure required for education only a contribution towards the provision of additional special school places.

6.66 Currently, the Primary Care Trust is in the process of improving the quality of existing premises across Worcestershire. Existing premises capacity is sufficient to meet future patient needs in terms of increased GP, NHS dentistry and optician requirements in Droitwich Spa.

6.67 Based on standards of provision, there is a requirement for 193 sq m of new library provision and 608 sq m of community centre space. This level of provision could equate to an extension to an existing library and an extension to an existing community centre. Worcestershire County Council's existing strategy is to expand and improve existing facilities in Droitwich Spa and this requirement would support this objective.

6.68 There is no capacity within existing recreation and leisure provision. Based on the Wychavon open space standard of 4.5 ha per 1000, Droitwich Spa could require the provision of 24.9 ha of new open space of a variety of typologies. Urban extensions will be able to provide their requirement on site. However, development within the urban area will not always be able to meet this objective. It has been assumed that 60% of all open space will be provided on site with the rest as a financial contribution.

6.69 There is no overall built leisure requirement at Droitwich Spa. Whilst there is increased demand, it is not sufficient to support a new facility. Strategic leisure for Droitwich Spa should be considered alongside other settlements within Wychavon that will not receive sufficient development to warrant new facilities but could collectively require a strategic facility.

6.70 For Droitwich Spa, the main emergency infrastructure requirement is a new police section station. Additional requirements include a new fire appliance and an ambulance station in Droitwich Spa with a new ambulance and rapid response vehicle.

Transport

6.71 Droitwich Spa is a node on the Central Technology Belt and as such is anticipated to accommodate a significant proportion of the housing allocation for Worcestershire. The town has strong links with Worcester and Bromsgrove for journey to work movements, as well as Wyre Forest District and Birmingham.

6.72 To assist with the delivery Droitwich Spa's proposed housing growth in a sustainable manner, enhancements to the passenger transport network and highway network will be required to help meet the residents' accessibility needs and to enhance their quality of life. This will include the provision of high quality walking and cycling routes.

6.73 The preferred locations for RSS growth will place additional pressure on the M5 Junction 5 for travel to work towards Bromsgrove and Birmingham and Worcester, which will require improvements. Although a scheme of works is due to be implemented at this junction in early 2009, further improvements are likely to be required to address future capacity issues.

6.74 In order to improve accessibility levels by public transport, upgrading the section of single track between Droitwich Spa and Stoke Works to the north (an aspiration identified in the Worcestershire Rail Package) will improve rail services towards Bromsgrove and Birmingham, with increased parking at Droitwich Spa station encouraging commuting by rail. Enhancements will also be required to the local bus, cycling and walking networks linking the developments and the town centre and railway station, with improved inter-urban bus services to Birmingham and Worcester. Figure 6.4 illustrates the transport infrastructure requirements for Droitwich Spa to support the RSS housing.

Utilities and Waste

6.75 New residential dwellings at Droitwich Spa will require refuse and recycling equipment to ensure all new dwellings are included on kerb side collection rounds. There are no specific utility infrastructure requirements for the town. Table 6.4 below sets out the specific infrastructure requirements for Droitwich Spa.

Table 6.4: Droitwich Spa Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	Special School Financial Contribution	£443 k
Community	608 sq m of new community centre space, comprising one new centre or extensions to existing centres	£1 m
Community	193 sq m of new library provision, comprising extensions to existing facilities	£561 k
Community	103 religious participants @ 6%. Indicative requirement for 0.4 ha subject to local assessment of demand	Land Cost
Recreation	23.4 open space (on site)	Land Cost
Recreation	Contribution towards 1.6 ha (off site)	£780 k
Recreation	Open space maintenance for 5 years	£3.74 m
Emergency	Fire appliance	£220 k
Emergency	New police section station	£4 m
Emergency	Ambulance station and equipment	£TBC
Highways	Improvements to M5 J5	£30 m*
Rail	Droitwich Spa – Stoke Works track doubling (aspiration)	£25 m
Rail	Increased parking at Droitwich Spa railway station	£0.5 m*
Bus	Improved bus services, including ongoing revenue costs of infrastructure	£2 m
Walk/cycle	Improvements to walking/cycling network	£0.25 m*
Waste and Recycling	2,480 kerbside recycling equipment sets	£121 k
Total		**£68.6 Million**

* Generic cost

Pershore Infrastructure Requirements

6.76 Based on future development of 1,285 dwellings, 5 ha and 2,000 sq m of retail within the town centre, Pershore will require new infrastructure to support development within the existing urban area and at four potential urban extension locations.

- Three Springs - 150 dwellings
- Station Road - 400 dwellings
- Wyre Road - 450 dwellings
- Keytec 7 - 5 ha employment land.

6.77 There are no additional NLP implications for Pershore. The paragraphs below discuss infrastructure requirements and Table 6.5 sets out the infrastructure schedule and cost:

Social Infrastructure

6.78 Pershore has a three-tier system of education. Some of the first schools have significant levels of surplus places, a problem which will be exacerbated by continued falling rolls. Declines in pupil numbers will start to affect the middle schools but the high school is expected to continue operating at or near capacity over the next twenty years. Given the available capacity, there is likely to be no new infrastructure required for education in Pershore.

6.79 Currently, the Primary Care Trust is in the process of improving the quality of existing premises across Worcestershire. Existing premises capacity is sufficient to meet future patient needs in terms of increased GP, NHS dentistry and optician requirements in Pershore.

6.80 Based on standards of provision, there is a requirement for 102 sq m of new library provision and 321 sq m of community centre space. This level of provision could equate to an extension to an existing library and an extension to an existing community centre. Worcestershire County Council's existing strategy is to expand and improve existing facilities in Pershore and this requirement would support this objective.

6.81 There is no capacity within existing recreation and leisure provision. Based on the Wychavon open space standard of 4.5 ha per 1000, Pershore could require the provision of 13.2 ha of new open space of a variety of typologies. Urban extensions will be able to provide their requirement on site. However, development within the urban area will not always be able to meet this objective. It has been assumed that 60% of all open space will be provided on site with the rest as a financial contribution.

6.82 There is no overall built leisure requirement at Pershore. Whilst there is increased demand, it is not sufficient to support a new facility. Strategic leisure for Pershore should be considered alongside other settlements within Wychavon that will not receive sufficient development to warrant new facilities but could collectively require a strategic facility.

6.83 For Pershore, the planned increase in housing may require additional emergency resources such as an additional fire appliance. In addition there is a requirement for one new neighbourhood police post and additional ambulance equipment including a new ambulance and rapid response vehicle.

Transport

6.84 Pershore, located on the old A44, experiences a relatively high level of out commuting due to its size,

with the most popular destinations being Worcester and Malvern Hills. The town is served by the main bus route between Worcester and Evesham with further services to Cheltenham. The High Street suffers from heavy congestion, as do the A4104/A44 Pinvin Crossroads north of the town; measures will therefore need to be introduced to minimise the need to travel by private car.

6.85 In order to deliver Pershore's recommended new growth sustainably, accessibility by all modes will need to be improved to allow people to easily access locations, facilities and services. To help achieve this, enhanced parking will need to be provided at Pershore station to encourage rail commuting to Worcester and Evesham, as well as improved local bus, cycling and walking links between the station and the town centre. As with Evesham, enhancements will also be required to the existing bus network to accommodate additional trips that are likely to be generated to Worcester and Evesham.

6.86 In terms of highways, improvements will be required at the heavily congested A44/A4104 Pinvin Crossroads to ease the bottleneck at these signals for journeys to work in Worcester and beyond. Figure 6.5 in Appendix 2 illustrates the transport infrastructure requirements for Pershore to support the RSS housing.

Utilities and Waste

6.87 New residential dwellings at Pershore will require refuse and recycling equipment to ensure all new dwellings are included on kerbside collection rounds. There are no specific utility infrastructure requirements for the town. Table 6.5 below sets out the specific infrastructure requirements for Pershore:

Table 6.5: Pershore Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	Special School Financial Contributions	£234 k
Community	321 sq m of new community centre space, comprising one new centre or extensions to existing centres	£560 k
Community	102 sq m of new library provision, comprising extensions to existing facilities	£300 k
Community	55 religious participants @ 6%. Indicative requirement for 0.2 ha subject to local assessment of demand	Land Cost
Recreation	12 open space (on site)	Land Cost
Recreation	Contribution towards 1.1 ha (off site)	£584 k
Recreation	Open space maintenance for 5 years	£2 m
Emergency	Fire appliance	£220 k
Emergency	Neighbourhood police post	£250 k
Emergency	Ambulance station and equipment	£TBC
Highways	Improvements to Pinvin Crossroads to alleviate the bottleneck	£0.5 m contribution towards overall cost
Rail	Provide enhanced parking at Pershore railway station	£0.5 m*
Bus	Enhanced bus network, including ongoing revenue costs of infrastructure and services	£6 m
Walk / cycle	Improvements to walking and cycling links between the station and town centre	£0.25 m*
Waste and Recycling	1,285 kerbside recycling equipment sets	£64 k
Total		**£12.46 Million**

* Generic cost

Redditch Infrastructure Requirements

6.88 Based on future development of 6,600 dwellings, 24 ha of employment and 50,000 sq m of retail within the town centre, Redditch will require new infrastructure to support development within the existing urban area and at one potential urban extension location:

- North, North West Redditch - 4,357 dwellings and 24 ha employment.

6.89 NLP options for Redditch include:

- North, North West Redditch - 2,500 additional dwellings; or
- West Redditch - 2,500 dwellings.

6.90 The paragraphs below discuss infrastructure requirements and Table 6.6a sets out the infrastructure schedule and cost. Table 6.6b sets out the additional infrastructure requirements for the NLP options.

Social Infrastructure

6.91 In Redditch, there is a three tier system of education. Steps have been taken to reduce the high level of surplus places at all three phases. Numbers on roll in the first schools are expected to recover slightly following recent declines but the middle and high schools will continue to experience falling rolls. Future development levels will require 2 x first / primary schools to support the urban extension to the north at North, North West Redditch.

6.92 Currently, the Primary Care Trust is in the process of improving the quality of existing premises across Worcestershire. Existing premises capacity is sufficient to meet the majority of future patient needs in terms of increased GP, NHS dentistry and optician requirements. There is, however, a requirement to provide a new health centre to meet the needs of development at North, North West Redditch.

6.93 Based on standards of provision, there is a requirement for 830 sq m of new library provision and 2,650 sq m of community centre space. This level of provision could equate to two new community libraries and three new community centres if this was the desired size and spatial distribution of provision. Worcestershire County Council's existing strategy is to expand and improve existing facilities in Redditch rather than provide all new facilities.

6.94 There is no capacity within existing recreation and leisure provision. Based on the Redditch open space standard of 9.44 ha per 1000, Redditch could require the provision of 147.7 ha of new open space of a variety of typologies. Baker Associates consider that urban extensions will be able to provide their requirement on site. However, development within the urban area will not always be able to meet this objective. It has been assumed that 60% of all open space will be provided on site with the rest as a financial contribution.

6.95 A new sports hall will also be required. Like other leisure requirements across the County, this requirement is tied to the overall level of development rather than any one specific development or urban extension. It is likely that the urban extensions would be a suitable location for new leisure provision. There is a requirement for other built leisure facilities, but the requirement is not large enough to support a new facility. Leisure facilities for North Worcestershire should be considered in a holistic way to ensure that the collective requirement is addressed. It is considered that there is a requirement for a new swimming pool in North Worcestershire but the location of this facility is non specific.

6.96 For Redditch, the planned increase in housing may require additional emergency resources especially on the north of the town. Requirements include: an additional fire appliance, a new police section station and additional ambulance equipment, including a new ambulance and rapid response vehicle.

Transport

6.97 There are significant issues associated with Redditch's new status as a Settlement of Significant Development (SSD) and its emerging target of 6,600 new dwellings between 2006 and 2026. Redditch does not have the physical capacity to accommodate such growth within its boundaries, so the adjoining Districts of Stratford upon Avon and Bromsgrove have been identified as suitable locations to accommodate this overspill. A study into the growth options for Redditch[20] has identified a growth area located north/northwest of the town as a suitable location to accommodate 4,357 dwellings and 24 ha of employment land as an urban extension, with 2,243 dwellings to be accommodated within Redditch itself.

6.98 The 2,500 additional houses identified in the NLP report will also comprise urban extension of Redditch in Bromsgrove or Stratford upon Avon. For testing purposes, three alternative areas have been assumed; an extension to the growth area north/northwest of Redditch; a growth area west of Redditch; or extensions to the proposed areas for RSS housing located northwest of Bromsgrove (covered under Bromsgrove section).

6.99 To deliver the level of growth associated with the RSS and NLP housing allocations will require significant investment in sustainable modes (walking, cycling and passenger transport) as well as highways infrastructure. This will include improved transport infrastructure within Redditch town centre itself, as well as between Redditch and the strategic highway network; to bus and rail infrastructure and services; and to walking and cycling networks.

6.100 The provision of the allocated RSS development within Redditch itself and at the growth area north/northwest of Redditch would result in additional pressure on the M42 Junctions 2 and 3, due to the strong travel to work corridor between Redditch and Birmingham. The same would apply for the proposed NLP housing should it be sited as an extension to the growth area north/northwest of Redditch.

6.101 To support the RSS housing growth in Redditch town centre, improvements to the currently heavily congested Cross City Line South to Birmingham will be required. Network Rail proposes to increase the service frequency to three trains per hour, involving the addition of a second platform at Redditch station, so increasing passenger and operational capacity. Significant enhancements to the existing bus network, cycling and walking networks will also be required to accommodate demand.

6.102 The provision of the allocated RSS Preferred Option and the NLP growth option housing at the proposed growth area north/northwest of Redditch could concentrate growth as a Sustainable Urban Extension. The study into the growth implications for Redditch concluded that the concentration of development in this location would support the provision of public transport services and non-car use, although during peak hours the Dagnell End Lane and A441 junction would be approaching capacity, and so would require the construction of the Bordesley Bypass, along with improvements to the to the A441 south into Redditch. In addition to the proposed Cross City Line South upgrade, a new Redditch North station (an aspiration identified in the Worcestershire Rail Package) located in close proximity to the proposed housing would encourage commuting to Birmingham by rail.

[20] Study into the Future Growth Implications of Redditch Second Stage Report (October 2008)

Enhancements to the existing bus network and walk/cycle networks will also be required to provide access to Redditch town centre.

6.103 The potential area of land located west of Redditch to accommodate the NLP housing is located approximately two miles west of Redditch town centre and the site could be well served by public transport. Enhanced bus routes will therefore be required to serve the development, as well as walking and cycling links to Redditch town centre. The site would also require an upgrade of the existing junction with Bromsgrove Highway. The site is constrained by poor access to the north and being located far from employment sites, so would be likely to result in increased pressure on the A448 Bromsgrove Highway towards Bromsgrove and on the A38 to M42 Junction 1. To improve access to the north, enhancements would be required to the B4184 connecting to the A441, and subsequently the M42 Junction 2 would require improvements to accommodate the additional capacity. Figure 6.6 in Appendix 2 illustrates the transport infrastructure requirements for Redditch to support the RSS and NLP housing.

Utilities and Waste

6.104 Based on future household growth, Redditch could require additional refuse and recycling vehicles to enable new dwellings to be incorporated into existing collection rounds. In addition, the cost of including dwellings on refuse and recycling rounds in terms of equipment will generate a substantial infrastructure cost. There are no specific utility infrastructure requirements for Redditch.

6.105 Table 6.6a below sets out the specific infrastructure requirements for Redditch:

Table 6.6a: Redditch Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	2 x New primary school linked to North, North West Redditch	£13 m
Education	Special School Financial Contribution	£1.15 m
Health	New health centre at North, North West Redditch	£2.5 m
Community	1,650 sq m of new community centre space, comprising 2 new centres or extensions to existing centres	£2.8 m
Community	548 sq m of new library provision, comprising extensions to existing facilities	£1.6 m
Community	280 religious participants @ 6%. Indicative requirement for 1.1 ha subject to local assessment of demand	Land Cost
Recreation	147.7 open space (on site)	Land Cost
Recreation	Contribution towards 20.1 ha (off site)	£10 m
Recreation	Open space maintenance for 5 years	£22.1 m
Emergency	Fire appliance	£220 k
Emergency	New police section station	£4 m
Emergency	Ambulance station and equipment	£TBC
Highways	Improvements to M42 Junctions 2 and 3	£30 m each*
Highways	Bordesley Bypass	£10 m
Rail	Increase services along Cross City Line South & infrastructure enhancements on the Barnt Green – Redditch branch	To be undertaken by Network Rail
Rail	Redditch North station (aspiration)	£10 m
Bus	Enhanced bus network, , including ongoing revenue costs of infrastructure and services	£10 m
Walk/cycle	Improvements to walking/cycling network	£2 m*

Waste and Recycling	1 new refuse collection vehicle	£300 k
Waste and Recycling	1 new recycling collection vehicle	£180 k
Waste and Recycling	6,600 kerbside recycling equipment sets	£330 k
Total		**£150.2 Million**

* Generic cost

6.106. Table 6.6b below sets out the additional infrastructure requirements to accommodate the NLP options for Redditch:

Table 6.6b: Additional NLP Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	New primary school linked to North, North West Redditch/West Redditch	£6.5 m
Education	Special School Financial Contributions	£497 k
Community	625 sq m of new community centre space, comprising a new community centre	£1.1 k
Community	207 sq m of new library provision, comprising an extension to existing facilities	£600 k
Community	106 religious participants @ 6%. Indicative requirement for 0.3 ha subject to local assessment of demand	Land Cost
Recreation	55.9 ha open space (on site)	Land Cost
Recreation	Open space maintenance for 5 years	£8.4 m
Waste and Recycling	2,500 kerbside recycling equipment sets	£125 k
Waste and Recycling	1 new household waste recycling centre	£3 m
Total		**£20.22 Million**

Bromsgrove Infrastructure Requirements

6.107 Based on future development of 1,500 dwellings and 12 ha of employment, Bromsgrove will require new infrastructure to support development within the existing urban area and at one potential urban extension location:

- North West Bromsgrove - 1,000 dwellings and 12 ha of employment.

6.108 The paragraphs below discuss infrastructure requirements and Table 6.7a sets out the infrastructure schedule and cost of delivery of RSS provision. An additional 2,500 dwellings have been tested at Bromsgrove as part of the NLP options. Results are presented in table 6.7b.

Social Infrastructure

6.109 Bromsgrove has a three tier system of education and a slight decline in school rolls is expected at all phases, first, middle and high, over the next few years. Given the available capacity there is likely to be no new infrastructure required for education in Bromsgrove.

6.110 Currently, the Primary Care Trust is in the process of improving the quality of existing premises across Worcestershire. Existing premises capacity is sufficient to meet future patient needs in terms of increased GP, NHS dentistry and optician requirements in Bromsgrove.

6.111 Based on standards of provision, there is a requirement for 123 sq m of new library provision and 375 sq m of community centre space. This level of provision could equate to an extension to an existing library and an extension to an existing community centre. Worcestershire County Council's existing strategy is to expand and improve existing facilities in Bromsgrove and this requirement would support this objective.

6.112 There is no capacity within existing recreation and leisure provision. Based on the Bromsgrove open space standard of 3.037 ha per 1000, Bromsgrove could require the provision of 10.7 ha of new open space of a variety of typologies. Baker Associates consider that urban extensions will be able to provide their requirement on site. However, development within the urban area will not always be able to meet this objective. It has been assumed that 60% of all open space will be provided on site with the rest as a financial contribution.

6.113 There is no overall built leisure requirement at Bromsgrove. Whilst there is increased demand, it is not sufficient to support a new facility. Strategic leisure for Bromsgrove should be considered alongside other north Worcestershire settlements that will not generate a requirement large enough to warrant new facilities but could collectively require a strategic facility.

6.114 For Bromsgrove, the planned increase in housing may require additional emergency resources such as an additional fire appliance. In addition, there is a requirement for ambulance equipment including a new ambulance and rapid response vehicle.

Transport

6.115 In order to sustainably deliver the proposed housing for Bromsgrove, an integrated strategy of highways and public transport measures will be required, including bus, rail, walking and cycling. This will help deliver high quality accessibility between the housing areas and Bromsgrove itself, as well as within and outside Worcestershire.

6.116 The journey to work corridor between Bromsgrove and Birmingham is the strongest in the County,

resulting in heavy congestion on the A38 between Bromsgrove and the M42 Junction 1, as well as the M5 Junction 4. Travel demand on this corridor is likely to increase with the proposed RSS and potential NLP housing, as well as through development of the Bromsgrove Technology Park and Central Technology Belt developments within Birmingham, such as Longbridge. Additional pressure is also likely to be placed on the A38 between Bromsgrove and M5 Junction 5 towards Worcester. Improvements to the already heavily congested M42 Junction 1, particularly with the addition of the Redditch overspill NLP housing to the urban extension northwest of the town, as well as to M5 Junctions 4 and 5 will be required to support the proposed housing growth. This is in addition to the works due to be implemented at Junction 5 in early 2009.

6.117 The rail corridor between Bromsgrove and Birmingham will require improvements to provide an attractive alternative to those commuters currently travelling by car, as the line is currently running at 98% Capacity Utilisation Index (CUI), indicating minimal capacity for growth. Network Rail has proposed an extension of the Cross City Line South to Bromsgrove to increase service frequency to three trains per hour. As part of this upgrade, the heavily used Bromsgrove Railway Station is proposed to undergo a package of improvements to accommodate an increased number of trains, additional parking, improved bus interchange facilities, and improved access to the town centre. Both of these schemes are considered essential to support the proposed RSS housing growth for Bromsgrove.

6.118 To support the additional housing within the urban realm, the bus network will need to be enhanced to accommodate additional demand. Walking and cycling routes within the town and from the urban extension, including the addition of the NLP housing, into the town centre will also require extending and upgrading. Figure 6.7 in Appendix 2 illustrates the transport infrastructure requirements for Bromsgrove to support the RSS and NLP housing.

Utilities and Waste

6.119 New residential dwellings at Bromsgrove will require refuse and recycling equipment to ensure all new dwellings are included on kerb side collection rounds. There are no specific utility infrastructure requirements for the town.

6.120 Table 6.7a below sets out the specific infrastructure requirements for Bromsgrove:

Table 6.7a: Bromsgrove Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	Special School Financial Contributions	£227 k
Community	375 sq m of new community centre space, comprising an extension to an existing centre	£650 k
Community	123 sq m of new library provision, comprising an extension to existing facilities	£355 k
Community	64 religious participants @ 6%. Indicative requirement for 0.3 ha subject to local assessment of demand	Land Cost
Recreation	10.7 open space (on site)	Land Cost
Recreation	Contribution towards 1.4 ha (off site)	£710 k
Recreation	Open space maintenance for 5 years	£1.6 m
Emergency	Fire appliance	£220 k
Emergency	Ambulance station and equipment	£TBC
Highways	Improvements to M5 J5 (covered under Droitwich) ‡, M5 J4 and M42 J1	£30 m each*

Rail	Bromsgrove Station improvement package (multi modal interchange)	£17 m
Rail	Extension of the Cross City Line South suburban rail service	To be undertaken by Network Rail
Bus	Enhanced bus network, including ongoing revenue costs of infrastructure and services	£5 m
Walk/cycle	Improved walk/cycle links	£0.25 m*
Waste and Recycling	1,500 kerbside recycling equipment sets	£75 k
Total		**£86.08 Million**

* Generic cost
Ŧ Infrastructure would be required although costs covered under Droitwich proposals.

6.121 Table 6.7b below sets out the additional infrastructure implications of the NLP development option of increasing the urban extension at North West Bromsgrove.

Table 6.7b: Additional NLP Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	Special School Financial Contributions	£497 k
Community	375 sq m of new community centre space, comprising a new community centre	£650 k
Community	122 sq m of new library provision, comprising an extension to existing facilities	£355 k
Community	64 religious participants @ 6%. Indicative requirement for 0.3 ha subject to local assessment of demand	Land Cost
Recreation	17.8 ha open space (on site)	Land Cost
Recreation	Open space maintenance for 5 years	£2.6 m
Waste and Recycling	2,500 kerbside recycling equipment sets	£125 k
Total		**£4.22 Million**

Kidderminster Infrastructure Requirements

6.123 Based on future development of 1,870 dwellings and 33 ha of employment, Kidderminster will require new infrastructure to support development within the existing urban area. The paragraphs below discuss infrastructure requirements and Table 6.8 sets out the infrastructure schedule and cost. There are no additional NLP implications for Kidderminster.

Social Infrastructure

6.124. From September 2007, the current three tier system will be replaced by a two tier system of primary schools feeding into three secondary schools. Surplus places, particularly in the middle school tier, will be removed as part of the process. School numbers, overall, are expected to continue to decline. Given the available capacity there is likely to be no new infrastructure required for education in Kidderminster.

6.125 Currently, the Primary Care Trust is in the process of improving the quality of existing premises across Worcestershire. Existing premises capacity is sufficient to meet future patient needs in terms of increased GP, NHS dentistry and optician requirements in Kidderminster.

6.126 Based on standards of provision, there is a requirement for 150 sq m of new library provision and 474 sq m of community centre space. This level of provision could equate to an extension to an existing library and an extension to an existing community centre. Worcestershire County Council's existing strategy is to expand and improve existing facilities in Kidderminster and this requirement would support this objective.

6.127 There is no capacity within existing recreation and leisure provision. Based on the Wyre Forest open space standard of 5.341 ha per 1000, Kidderminster could require the provision of 23 ha of new open space of a variety of typologies. However, development within the urban area will not always be able to meet this objective. It has been assumed that 60% of all open space will be provided on site with the rest as a financial contribution.

6.128 There is no overall built leisure requirement at Kidderminster. Whilst there is increased demand, it is not sufficient to support a new facility. Strategic leisure for Kidderminster should be considered alongside other North Worcestershire settlements that will not generate a requirement large enough to warrant new facilities but could collectively require a strategic facility.

6.129 For Kidderminster, the planned increase in housing may require additional emergency resources such as an additional fire appliance. In addition, there is a requirement for ambulance equipment including a new ambulance and rapid response vehicle.

Transport

6.130 Kidderminster, the largest town in Wyre Forest, is constrained by congested junctions around the town, particularly at Horsefair where an Air Quality Management Area (AQMA) has been declared. The town has strong links with the West Midlands conurbation, demonstrated by strong journey to work movements, and the railway line from Stourbridge Junction and Cradley Heath to Birmingham currently experiences congestion. Kidderminster station is the second most heavily used station in the County, with demand figures forecast to grow by 5% - 6% year on year[21]. The station is limited due to poor access arrangements, no interchange with commercial bus services, and a low frequency of bus services that do operate via the station.

[21] Worcestershire's Local Transport Plan 2006/11

6.131 With the addition of the approximately 1,870 dwellings allocated as part of the RSS to be accommodated within the settlement, the pressure on the station to provide high quality and sustainable transport links is therefore likely to increase. The proposed Kidderminster Station package of improvements, comprising improved facilities; improved interchange with bus services; increased car parking; and improved pedestrian links to the town centre, is therefore considered to be essential to support the proposed development growth.

6.132 To facilitate the regeneration of the Stourport Road Employment Corridor (SREC), and in particular the British Sugar Site, the possibility of a new link road (Hoobrook Link Road) between the A451 Stourport Road and the A442/A440 Worcester Road across the Stour Valley has been identified in the LTP2 and in the Core Strategy Preferred Options Paper. A feasibility paper conducted into the provision of this road has been conducted by Worcestershire County Council[22], which concluded that the link road would help address congestion problems in both Kidderminster and Stourport as well as on sections of the A451, which in turn would reduce bus journey times on the existing road network. The scheme has also been identified as having the potential to enhance pedestrian/cycle infrastructure as part of the design. New junctions as part of the design on the A451 and A442 could, however, create new queues, with reduced congestion leading to negative affects of faster traffic speeds, potentially making car driving more attractive compared to public transport. Detailed feasibility work has yet to be completed, which will indicate environmental impact, timescales and funding for the scheme's delivery.

6.133 In addition to this, to improve accessibility across other sustainable modes, bus services within the town centre will require improvements to accommodate the additional housing demand, as will existing walking and cycling links. The transport infrastructure requirements proposed for Kidderminster are illustrated in Figure 6.8 in Appendix 2.

Utilities and Waste

6.134 New residential dwellings at Kidderminster will require refuse and recycling equipment to ensure all new dwellings are included on refuse and kerbside collection rounds. It is also considered that a redeveloped or new household waste recycling centre will be required to address the collective demand from residential development in Kidderminster. There are no specific utility infrastructure requirements for the town.

6.135. Table 6.8 below sets out the specific infrastructure requirements for Kidderminster:

Table 6.8: Kidderminster Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	Special School Financial Contributions	£339 k
Community	474 sq m of new community centre space, comprising an extension to an existing centre	£800 k
Community	150 sq m of new library provision, comprising an extension to existing facilities	£435 k
Community	80 religious participants @ 6%. Indicative requirement for 0.3 ha subject to local assessment of demand	Land Cost
Recreation	13.8 open space (on site)	Land Cost
Recreation	Contribution towards 9.2 ha (off site)	£4.6 m
Recreation	Open space maintenance for 5 years	£3.5 m

[22] Hoobrook Link Road Pre-Feasibility Study, Worcestershire County Council (October 2008)

Emergency	Fire appliance	£220 k
Emergency	Ambulance station and equipment	£TBC
Highways	Hoobrook Link Road	£2 m contribution to the overall cost
Rail	Kidderminster Station improvement package	£5.5 m
Bus	Enhanced bus network, including ongoing revenue costs of infrastructure and services	£5 m
Walk/cycle	Improved walking and cycling routes	£0.25 m*
Waste and Recycling	1,500 kerbside recycling equipment sets	£75 k
Waste and Recycling	1 new household waste recycling centre	£3 m
Total		**£25.7 Million**

* Generic cost

Stourport on Severn Infrastructure Requirements

6.136 Based on future development of 1,100 dwellings, Stourport on Severn will require new infrastructure to support development within the existing urban area. The paragraphs below discuss infrastructure requirements and Table 6.9 sets out the infrastructure schedule and cost. There are no additional NLP implications for Stourport-on-Severn.

Social Infrastructure

6.137 From September 2007, the current three tier system will be replaced by a two tier system of primary schools feeding into one secondary school. Surplus places will be removed as part of the process. There is considerable housing development taking place within the town which will generate sustainable primary schools and which could lead to pressure on the secondary school. Given the available capacity, there is likely to be no new infrastructure requirement for education in Stourport on Severn.

6.138 Currently, the Primary Care Trust is in the process of improving the quality of existing premises across Worcestershire. Existing premises capacity is sufficient to meet future patient needs in terms of increased GP, NHS dentistry and optician requirements in Stourport on Severn.

6.139 Based on standards of provision, there is a requirement for 150 sq m of new library provision and 474 sq m of community centre space. This level of provision could equate to an extension to an existing library and an extension to an existing community centre. Worcestershire County Council's existing strategy is to expand and improve existing facilities in Stourport on Severn and this requirement would support this objective.

6.140 There is no capacity within existing recreation and leisure provision. Based on the Wyre Forest open space standard of 5.341 ha per 1000, Stourport on Severn could require the provision of 23 ha of new open space of a variety of typologies. However, development within the urban area will not always be able to meet this objective. It has been assumed that 60% of all open space will be provided on site with the rest as a financial contribution.

6.141 There is no overall built leisure requirement at Stourport on Severn. Whilst there is increased demand, it is not sufficient to support a new facility. Strategic leisure for Stourport on Severn should be considered alongside other North Worcestershire settlements that will not generate a requirement large enough to warrant new facilities but could collectively require a strategic facility.

6.142 For Stourport-on-Severn, the planned increase in housing may require additional emergency resources such as an additional fire appliance. In addition there is a requirement for ambulance equipment including a new ambulance and rapid response vehicle.

Transport

6.143 Stourport-on-Severn, located south of Kidderminster, has been allocated a total of 1,105 dwellings to be accommodated within the settlement. This urban intensification is likely to add to the existing congestion on routes into the town centre, notably the A451 and A4025, during peak periods. To mitigate this, the provision of local services including high quality public transport, in the form of improved bus services within the town centre and towards Kidderminster, as well as well-designed routes for pedestrians and cyclists would minimise the need for journeys by car.

6.144 The traffic congestion in Stourport town centre, along with the congestion experienced in Kidderminster, will potentially constrain economic regeneration activity within the Stourport Road

Employment Corridor (SREC). The 24 ha site located between Kidderminster and Stourport was, in part, previously the location of the British Sugar refinery and has been allocated for redevelopment as employment land use in the Wyre Forest Local Plan, with half of the site being programmed for development by 2011, and the remainder beyond 2011. The site is well placed for access to labour catchments and travel demand to and from the site likely to increase significantly, so will place greater pressure on the local transport network at peak periods.

6.145 A Transport Study conducted for Stourport in 2004 identified the Stourport Relief Road as a worthwhile scheme to help ease congestion in the town centre and to improve accessibility to employment areas within the District. The Wyre Forest Transportation Study is expected to include further review of this scheme. The route for the Relief Road is safeguarded within the Wyre Forest Local Plan, so is therefore likely to secure planning approval, although risks include increased scheme costs and environmental problems associated with crossing the floodplain of the Rivers Severn and Stour.

6.146 The proposed Hoobrook Link Road between the A451 Stourport Road and the A442/A440 Worcester Road, proposed to support the Kidderminster housing growth, would help address congestion problems in Stourport as well as Kidderminster, and would facilitate the regeneration of the Stourport Road Employment Corridor (SREC). The transport infrastructure requirements proposed for Stourport-on-Severn illustrated in Figure 6.9 Appendix 2.

Utilities and Waste

6.147 New residential dwellings at Stourport-on-Severn will require refuse and recycling equipment to ensure all new dwellings are included on refuse and kerbside collection rounds. There are no specific utility infrastructure requirements for the town.

6.148 Table 6.9 below sets out the specific infrastructure requirements for Stouport-on-Severn:

Table 6.9: Stourport-on-Severn Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	Special School Financial Contributions	£200 k
Community	474 sq m of new community centre space, comprising an extension to an existing centre	£800 k
Community	150 sq m of new library provision, comprising an extension to existing facilities	£435 k
Community	80 religious participants @ 6%. Indicative requirement for 0.3 ha subject to local assessment of demand	Land Cost
Recreation	8 open space (on site)	Land Cost
Recreation	Contribution towards 5.4 ha (off site)	£2.7 m
Recreation	Open space maintenance for 5 years	£3.5 m
Emergency	Fire appliance	£220 k
Emergency	Ambulance station and equipment	£TBC
Highways	Stourport Relief Road	£2 m contribution to the overall cost of £65 m
Highways	Hoobrook Link Road	£2 m contribution to the overall cost of £30 m (covered under Kidderminster)[Ŧ]
Bus	Enhanced bus network, including ongoing revenue costs of infrastructure and services	£5 m
Walk/cycle	Improved walking and cycling links	£0.25 m*

Waste and Recycling	1,105 refuse and kerbside recycling equipment sets	£55 k
Total		**£15.16 Million**

* Generic cost
ǂ Infrastructure would be required although costs covered under Kidderminster proposals.

Rural Areas

6.149 Based on future development within the rural areas of Worcestershire, the County will require new infrastructure to support development within the existing villages and rural areas. The Infrastructure Study has looked at future provision in the following areas:

- Malvern Hills: Category 1 and 2 villages - 1,600 dwellings
- Wychavon: Category 1 and 2 villages; - 1,900 dwellings
- Bromsgrove: Other settlements and rural areas; - 600 dwellings
- Wyre Forest: Bewdley and rural areas; - 425 dwellings

6.150 At present, the location of future development outside the main nine settlements within rural area is unknown. The Infrastructure Study has assessed the infrastructure requirements in generic terms, i.e. the identification of cumulative impacts on social infrastructure based on standards of provision. The rural areas have not been assessed from a transport perspective or specifically for local utility infrastructure due to the site specific nature of these areas. Tables 6.10 to 6.13 set out some of the identifiable infrastructure schedule and costs:

Table 6.10a: Malvern Hills: Category 1 and 2 Villages Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	Special School Financial Contributions	£295 k
Community	400 sq m of new community centre space, comprising an extension to an existing centre	£690 k
Community	125 sq m of new library provision, comprising an extension to existing facilities	£360 k
Community	68 religious participants @ 6%. Indicative requirement for 0.3 ha subject to local assessment of demand	Land Cost
Recreation	25.3 ha open space (on site)	Land Cost
Recreation	Contribution towards 16.9 ha (off site)	£8.4 m
Recreation	Open space maintenance for 5 years	£6.3 m
Waste and Recycling	1,600 kerbside recycling equipment sets	£80 k
Total		**£16.1 Million**

Table 6.11a: Wychavon: Category 1 and 2 Villages Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	Special School Financial Contributions	£347 k
Community	475 sq m of new community centre space, comprising an extension to an existing centre	£820 k
Community	151 sq m of new library provision, comprising an extension to existing facilities	£440 k
Community	80 religious participants @ 6%. Indicative requirement for 0.3 ha subject to local assessment of demand	Land Cost
Recreation	11.7 ha open space (on site)	Land Cost
Recreation	Contribution towards 7.8 ha (off site)	£3.9 m
Recreation	Open space maintenance for 5 years	£2.9 m
Waste and Recycling	1,900 kerbside recycling equipment sets	£95 k
Total		**£8.5 Million**

Table 6.12: Bromsgrove: Other Settlements/Rural Areas Infrastructure Requirements & Costs

Type	Infrastructure	Estimated cost
Education	Special School Financial Contributions	£110 k
Community	150 sq m of new community centre space, comprising an extension to an existing centre	£260 k
Recreation	2.6 ha open space (on site)	Land Cost
Recreation	Contribution towards 1.7 ha (off site)	£850 k
Recreation	Open space maintenance for 5 years	£640 k
Waste and Recycling	600 kerbside recycling equipment sets	£30 k
Total		**£1.9 Million**

Table 6.13a: Wyre Forest: Bewdley and Rural Areas Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	Special School Financial Contributions	£77 k
Recreation	3.1 ha open space (on site)	Land Cost
Recreation	Contribution towards 2.1 ha (off site)	£1 m
Recreation	Open space maintenance for 5 years	£770 k
Waste and Recycling	425 kerbside recycling equipment sets	£21 k
Total		**£1.86 Million**

6.151 In addition, the following NLP development options have been considered.

- Malvern Hills: Category 1 and 2 villages - 525 additional dwellings
- Wychavon: Category 1 and 2 villages; - 975 additional dwellings
- Wyre Forest: Bewdley and rural areas; - 400 additional dwellings

6.152 Table 6.10b, 6.11b and 6.13b below sets out the additional infrastructure requirements from increased development levels suggested by NLP:

Table 6.10b: Malvern Hills: Category 1 and 2 Villages Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	Special School Financial Contributions	£104 k
Community	131 sq m of new community centre space, comprising an extension to an existing centre	£800 k
Community	40 sq m of new library provision, comprising an extension to existing facilities	£118 k
Community	22 religious participants @ 6%. Indicative requirement for 0.1 ha subject to local assessment of demand	Land Cost
Recreation	8.3 open space (on site)	Land Cost
Recreation	Contribution towards 5.5 ha (off site)	£2.7 m
Recreation	Open space maintenance for 5 years	£2 m
Waste and Recycling	525 kerbside recycling equipment sets	£26 k
Total		**£5.74 Million**

Table 6.11b: Wychavon: Category 1 and 2 Villages Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	Special School Financial Contributions	£193 k
Community	244 sq m of new community centre space, comprising an extension to an existing centre	£420 k
Community	78 sq m of new library provision, comprising an extension to existing facilities	£225 k
Community	41 religious participants @ 6%. Indicative requirement for 0.2 ha subject to local assessment of demand	Land Cost
Recreation	6 ha open space (on site)	Land Cost
Recreation	Contribution towards 4 ha (off site)	£2 m
Recreation	Open space maintenance for 5 years	£1.5 m
Waste and Recycling	975 kerbside recycling equipment sets	£49 k
Total		**£4.38 Million**

Table 6.13b: Wyre Forest: Bewdley and Rural Areas Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	Special School Financial Contributions	£80 k
Community	100 sq m of new community centre space, comprising an extension to an existing centre	£170 k
Community	32 sq m of new library provision, comprising an extension to existing facilities	£92 k
Community	17 religious participants @ 6%. Indicative requirement for 0.1 ha subject to local assessment of demand	Land Cost
Recreation	2.9 ha open space (on site)	Land Cost
Recreation	Contribution towards 1.9 ha (off site)	£970 k
Recreation	Open space maintenance for 5 years	£730 k
Waste and Recycling	400 kerbside recycling equipment sets	£20 k
Total		**£2.06 Million**

Cumulative Infrastructure Requirements

6.153 It has been identified that there is a cumulative requirement for built leisure infrastructure across the county and habitat attenuation. Development levels within settlements and rural areas generate a requirement for new built leisure infrastructure but this is not sufficient to warrant new facilities. However, cumulatively, it is considered that there is an unmet requirement for two swimming pools and two sports halls. The location of this infrastructure is unclear, but the requirement approximately relates to North Worcestershire and South Worcestershire equally.

6.154 The impact of development on natural resources, including important species and habitats will also have a County wide effect. Currently the initial assessment has not specifically identified the location of this infrastructure impact. Table 6.15 sets out these requirements and costs.

Table 6.15: Cumulative Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Recreation	Two new 25m swimming pools	£5 m
Recreation	Two new 4 court sports halls/gyms	£6 m
Recreation	Biodiversity action plan habitat mitigation and enhancement	£1.1
Total		**£12.1 Million**

NLP Development Options

6.155 The last area for consideration is the other NLP development option not considered under each settlement. It must be noted, the eco town NLP options has not been assessed as part of this study given the extensive work undertaken to date on this proposal. The remaining NLP option tested is:

- Birmingham Urban Extension - 3,000 to 5,000 dwellings

6.156 The additional 3,000 – 5,000 houses proposed in the NLP report as an extension of Birmingham in Bromsgrove District are anticipated to develop journey to work movements towards the conurbation. Within Worcestershire, this housing will again place pressure on the nearby M42 Junctions 2 and 3 for travel into the conurbation. The scale of the development would require the following social and transport infrastructure within Worcestershire:

Table 6.16: Birmingham Extension Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	2 x new primary school	£13 m
Education	Special School Financial Contributions	£1 m
Health	New health centre	£3.5 m
Highways	Improvements to M42 Junction 2 and 3	£30 m each* (covered under Redditch requirements) ǂ
Emergency	2 x neighbourhood police post	£0.5 m
Emergency	Fire station and equipment	£1.5 m
Emergency	Ambulance station and equipment	£TBC
Community	1250 sq m of new community centre space, comprising an extension to an existing centre	£2.17 m
Community	410 sq m of new library provision, comprising an extension to existing facilities	£1.18 m
Community	221 religious participants @ 6%. Indicative requirement for 0.8 ha subject to local assessment of demand	Land Cost
Recreation	35.5 ha open space (on site)	Land Cost
Recreation	Open space maintenance for 5 years	£5.32 m
Recreation	Sports hall	£3 m
Waste and Recycling	5000 kerbside recycling equipment sets	£0.25 m
Total		**£31.42 Million**

* Generic cost
ǂ Infrastructure would be required although costs covered under Redditch RSS proposals.

6.157 It must be noted that development at Birmingham Urban Extension are both likely to required additional infrastructure outside the County to facilitate a sustainable development such as transport infrastructure to access central Birmingham. These impacts have been beyond the scope of this study. In addition, the scale of the Throckmorton proposal is insufficient to generate a requirement for what should be considered essential local facilities such as a health centre and primary school. Development in this location would be very reliant on facilities in Pershore and subsequently unsustainable travel would increase.

Other Development Options

6.158 In addition, planning officers requested that we test development of 1,000 dwellings at Throckmorton Airfield. Located in Wychavon District, Throckmorton Airfield is expected to be self-sustainable and is

not anticipated to generate excessive additional trips on the highway network. However at this time the infrastructure required and amount of funding required to make the development sustainable cannot be identified. The scale of the development is would require the following social infrastructure:

Table 6.17: Throckmorton Airfield Infrastructure Requirements and Costs

Type	Infrastructure	Estimated cost
Education	Special School Financial Contributions	£198 k
Emergency	New police section station	£4 m
Emergency	Fire station and equipment	£1.5 m
Emergency	Ambulance station and equipment	£TBC
Community	250 sq m of new community centre space, comprising an extension to an existing centre	£0.43 m
Community	80 sq m of new library provision, comprising an extension to existing facilities	£0.23 m
Community	42 religious participants @ 6%. Indicative requirement for 0.2 ha subject to local assessment of demand	Land Cost
Recreation	10.3 ha open space (on site)	Land Cost
Recreation	Open space maintenance for 5 years	£1.53 m
Waste and Recycling	1000 kerbside recycling equipment sets	£50 k
Total		**£7.76 Million**

7 Funding, Development Viability and Developer Contributions

7.1 The importance of delivery cannot be underestimated. To ensure robust and sound LDF Core Strategy documents, local authorities must ensure that spatial strategies are deliverable. This effectively means that the infrastructure plans must be an integral part of spatial planning and therefore funding issues are becoming increasingly important. Section 7 looks at both private and public funding sources.

Funding Sources

7.2 Essentially, infrastructure will have to be funded from some combination of:

- developer contributions (private)
- the funds available to service providers from commercial investment decisions and from public funds such as through the operation of LTPs and major scheme bids (public).

7.3 The first of these two areas is developer contributions. The following paragraphs discuss development viability, the Worcestershire housing market and sets out example residual valuations to illustrate potential funding available from new residential development over time.

Development Viability

7.4 Viability, or a lack of viability, is a concept frequently referred to by developers and landowners in negotiating planning gain contributions. The argument put forward is that the overall burden of community gain items, such as affordable housing and education provision, can reduce the final land value below that of its existing or alternative value to such a level as to render it 'unviable', or simply not profitable enough to make a sale worthwhile to the owner, taking account of taxation liability.

7.5 Understanding viability is crucial in successfully determining a suitable proportion of planning gain. Policy should reflect an assessment of the likely economic viability of land for housing, taking account of risks to delivery, and be based upon an assessment of housing market demand qualified by an assessment of land value which can sustain the required proportion of planning gain, in the context of all the costs and constraints of development.

7.6 Developer contributions toward infrastructure, including affordable housing, have become expectations of the planning system. The cost of delivering contributions is factored into site financial appraisals by developers when land purchases are contemplated. Developers need to show that they have allowed for all costs to set against anticipated revenue from house sales. They also need to demonstrate a profit, if the business is to succeed.

7.7 Viability has a central role in policy evolution and negotiations, but there is little government guidance as to how viability negotiations are to be conducted and how local authorities are to make decisions based upon the outcome of a viability appraisal. The government's aim through planning is to ensure that enough land is identified and brought forward for housing, but it recognises that, in order to do so, residual land values must be high enough to encourage landowners to sell land for housing. It therefore requires local authorities not to impose a burden of planning gain that is so great as to depress the land value below that which is sufficient to bring land forward.

7.8 The viability of new development is inherently linked with existing market conditions. In assessing the economic viability of a new development it is important to have a good understanding of past and present market trends on both a national and local level. The following paragraphs:

- provide a brief overview of the existing national and local housing market;
- assess what is viability;
- identify common factors that can influence economic viability;
- produce an example viability assessment on two varying sites;
- provide a summary of the findings of the viability assessments and implications this has on planning gain.

Consultation Process

7.9 In order to obtain a true understanding of existing market conditions and the issues that developers face with the economic viability of new residential developments, consultations took place with 'stakeholders' such as house builders and local agents.

7.10 Discussions were undertaken to inform the study using these stakeholders' local knowledge of market conditions in different areas of the County for different types of housing. Views were sought on the state of the local housing market, land values in different parts of the County, sales values, the types of development targeted by developers on different sites and sales rates. The house building industry generally still works in imperial rather than metric measurements, and rather than confuse the situation with a mixture of both, or use metric for the sake of convention, imperial measurements, such as sq ft and acres are used here.

Market Assessment

National Market

7.11 Due to a reduced availability of credit apparent since September 2007, stakeholders have confirmed a significant downturn in the housing market. The three largest volume housebuilders have temporarily stopped land acquisition in response to reduced demand for new housing, preferring instead to rely on their current land banks. Developers are particularly wary of large schemes of flats, volume sales of which were highly dependant upon the buy-to-let market that relies on short-term capital growth, and which was frequently financed by mortgage schemes that are no longer viable. No one can predict the length or severity of the current downturn, but its effect will evidently be to limit market capacity in the short-term.

7.12 Property experts predict that, after a period of re-adjustment, underlying demand will return to recent levels, albeit at re-structured prices. The market emphasises that there must be a balanced delivery of a mix of house types, and an over-reliance on one type of dwelling, such as flats, creates over-supply and low demand problems.

7.13 As a result of these recent market difficulties, there is now evidence that residential land values have decreased by around 40% since September 2007, depending on individual and local circumstances. The most obvious change in the land market is that developers are less willing to compete against each other to acquire sites, and 2009 is likely to see a further softening of values due to this reduction in demand.

7.14 A number of recent research reports corroborate this position: Savills reported in December 2008 that transaction levels in all markets are at an all time low, down by between 60% and 65% from the peak of September 2007. In the new build market, this figure could be as much as 80%, unless very substantial price cuts have been made.

7.15 The consequence of this is that the price of new homes has fallen faster and further than the mainstream UK market. While average prices fell by some 14.6% in the ten months to October, according to the Nationwide indices, new build prices have typically fallen by 15% to 25%. In some

markets, an overhang of unsold stock means values have fallen even further.

7.16 Knight Frank's Residential Development Land Index showed similar falls in the value of residential sites over the past year. In November 2008, the Nationwide reported an annual 13.9% fall in average house prices (monthly 0.4%), significantly less than that seen in October when house prices fell by 1.3%. In January 2009, the Halifax states that for 2008 as a whole, prices fell 16.2%, down to the levels of August 2004.

7.17 Land trading has, with few exceptions, completely halted, as buyers for standard development sites with planning permission have all but disappeared. However, deals have been salvaged by restructuring to include joint ventures, build licences and phased payments, thus minimising the loss of overall value.

7.18 Not only have rate of sales slowed dramatically and achieved prices fallen rapidly, but developer confidence in future price movements remains negative. Land values have fallen sharply, in urban areas by 52% since September 2007. Values are now 43% lower than in 2001, according to the Savills land price index. The similar sized fall of 48% in the value of Greenfield development land during the last year is more rapid than was seen in the early 1990s when development land values fell by 60% over a two year period, at a time when house prices fell by 20% over a longer period.

Short Term Prospects for Recovery

7.19 The return of investment activity in the UK residential sector will be an early indicator of a change in market sentiment. Given that constraints on access to debt are likely to continue to suppress demand from the buy-to-let sector, equity investors are likely to be the first to respond to signals of an impending upturn.

7.20 Expectations are that a renewal of equity investment will be concentrated first in prime central London, elsewhere in London and the South East, together with the more affluent university cities, where housing scarcity is greatest, with good prospects of long-term capital and rental growth.

7.21 Once the market does turn, first time buyers will re-enter the market, driven by the renewed affordability of owning over renting, with shared ownership schemes in high demand, for example, the government's Homebuy scheme.

7.22 The government's house building targets of 200,000 annual completions appear now to be impossible to achieve, with just 75,000 likely to be started in 2009. Residential development will not proceed until land values increase sufficiently to incentivise owners to release land. This will happen in due course as the market recovers, and as developers seek to re-negotiate the terms of Section 106 requirements to achieve viability.

7.23 Land with higher infrastructure or remediation costs will experience a deeper and more prolonged downturn in residual site values. This may have significant implications for deliverability, and the five year land supply. Many complex sites may currently be unviable, and assumptions need to be made about delays in delivery.

7.23 Property experts expect a gloomy 2009, with a recovery starting in 2010 - 2011. The government's rescue package may not have averted recession, but intervention and policy initiatives look set to ease liquidity slowly. This will improve mortgage availability and increase residential market turnover towards levels more usually seen in a downturn, rather than the historic lows currently being experienced. Interest rates have already fallen sharply and further cuts are anticipated as the economy weakens. The rate was cut from 1.5% to 1% on 5 February 2008, and the probability is that it will fall to below 1%, before rising again as the economy strengthens beyond 2010.

Medium/Long Term Prospects

7.24 Whilst short-term demand has fallen, medium and long-term demand is still considered by the market to be strong. This is underpinned by government policy to deliver a much increased level of housing to meet a national shortage, arising from a continuing high level of new household formation. In the medium term, the housing land market in Worcestershire will continue to be comparatively strong for most house types in all locations, whilst housebuilders and private vendors will adjust prices to align with demand.

Worcestershire Market Area

7.25 Worcestershire covers a large and diverse area and there are variations in the market. Demand is strongest in Worcester, Bromsgrove and Droitwich where there is a range of employment opportunities. This is followed by Evesham, Redditch, Malvern, Pershore, Stourport on Seven and Kidderminster. Worcester is attractive because it is the focus for employment and higher level services and Bromsgrove and Droitwich have good transport connections to Birmingham and Worcester. In the rural areas of the County, sales prices and sales rates are generally lower, reflecting poorer accessibility to jobs and services.

7.26 Consultation respondents confirmed that prior to the current market collapse, 'clean' land values for open market housing across the County ranged from about £1million per net developable acre (£2.4m/hectare) in the smaller towns to £1.4 million per acre in the major urban areas (£3-4million per hectare). The upper figures were achieved on quality sites, with the provision that in June 2008 there was little or no demand for development land, and since then (by January 2009) values are in the range £500k-£800k per acre.

7.27 In terms of achievable existing sales prices, the open market for housing schemes in Worcestershire generally varies from around £150 up to £200 per sq. ft in the more attractive areas, and for up-market specifications. These values are down from September 2007, which at its peak values were in the region of £250 - £300 per sq ft. The schemes that generate the highest sales values are those in the favoured suburbs of Worcester, Bromsgrove and Droitwich as well as attractive towns like Malvern, Evesham, Stourport on Severn and Pershore.

7.28 Values are also affected by the size of the site, reflecting return on capital employed across a period of time, the cost of financing a purchase compared with the time taken to receive all site sales value. Sales rates have a major effect on the overall financing, and larger projects will seek to achieve 35-40 sales per year in order to justify the land economics upon which the land purchase is based. Development rates are generally slower on smaller sites. Currently, sales have collapsed with 1 or 2 sales per month being common, which if replicated across the year, will result in annual rates of around 15 dwellings per year, which would be disastrous particularly for the volume housebuilders who require high volume sales across the County to justify overheads and to maintain economies of scale.

7.29 Sales rates are not only governed by the capacity of the market, but also, particularly in flat schemes, by achievable construction programmes. The land value is also affected by development costs, physical as well as planning costs and other legal agreements.

7.30 The housing market is in a state of decline, not because of a lack of demand, but as result of external influences, such as the lack of mortgage availability. There remains an underlying demand for most open market housing throughout the County:

- 1 and 2 bed flats, are in low demand, expect in prestigious locations
- 2 and 3 bed 2 storey terrace 'mews' development are in relatively strong demand
- 3 bed 2 storey semis are in relatively strong demand
- 3 and 4 bed 2 storey traditional detached are in relatively strong demand
- 3 and 4 bed 2.5 and 3 storey town houses are in lower demand than 2 storey
- Large 4 bed+ on large plots, in relatively strong demand, in prestigious areas.

7.31 Traditional 2 storey developments until recently have been discouraged by government guidance, which sought high density development to minimise Greenfield land release. These house types produce a relatively low floorspace per acre, and so, frequently do not generate a sufficiently high land value to enable developers to purchase in competition. Since 2000, PPG3 encouraged developments of town houses and flats in 2.5-3 storey developments, where developers are making more efficient use of land, usually at much higher that the minimum density of 30 dwellings per hectare (dph), more often closer to, and frequently significantly in excess of 50dph.

7.32 There is a strong market for sheltered housing for the elderly, which achieves very high densities and land values because of both small unit area and low parking requirements.

7.33 The provision of affordable housing for both shared ownership and for social rent is a distinct market area. There is a strong demand for social rented housing and a lower demand of shared ownership housing. Most affordable housing is managed by Housing Associations/RSL's and often delivered by private developers through S106 agreements. Dwelling mixes are arrived by considering the local housing needs surveys currently being replaced by housing market assessments, and by reference to Council or Housing Association/RSL waiting lists, with the aim of meeting and matching local need. There is more demand in larger settlements for flats than in rural areas, reflecting the composition of households on the waiting lists.

7.34 A summary of the market in terms of the theoretically achievable land values, sales price per sq. ft, coverage and house types is shown in Table 6.1 below:

Table 6.1: Summary Table

Gross land value / dev acre	Sale price/ sq ft	Sales rates per year	Coverage sq ft / acre	Target house types by market
£500k - £800k	£150 - £200	15 – 30 (currently fewer)	15,000- 18,000 (currently much higher for flat schemes in areas like Worcester City Centre)	Underlying strong market (temporarily depressed) for traditional 2 & 3 bed properties with gardens and 4 & 5-bed detached dwellings in the right location. Weak market for flats particularly on large schemes.

7.35 Those familiar with the housing market over the long-term appreciate that any analysis is a view at a particular moment in time. The market will undoubtedly vary over the period considered by this study, and it should be reviewed at regular intervals. This is particularly relevant at the time of this study at the start of an economic recession

What is Viability?

7.36 The critical question is what is a 'viable' land value? What should be reasonably expected by landowners as a residual value, once all costs have been deducted? The approach we have taken to this concept is that it is rational to assume that if a valuation is arrived at which is in reasonable excess of the current or alternative site value, the landowner will be targeted by developers, and the site will be delivered through the operation of the market.

7.37 What is a 'reasonable excess' in practice? It must be a level sufficiently acceptable, given all the planning circumstances, to persuade the landowner to dispose to a developer.

7.38 The definition of 'viability' for the purposes of this assessment is the attainment of a site value sufficiently in excess of the current site value that all stakeholders, including the purchaser and landowner, all acting reasonably and rationally, would accept, thus securing delivery of the proposed development.

7.39 Clearly, not all landowners will adhere to the same concept of reasonableness and rationality in defining viability. Other studies of economic viability have taken two broad approaches. One relates to the acceptability of residential land prices to existing / alternative non-residential use values ('the economic approach'). The other relates acceptability to expectations based on residential land prices currently being achieved ('the psychological approach').

7.40 The outcome of whether an owner sells a site will depend on landowners' needs and expectations and no hard and fast rules can be set about these. The position of a developer who bought land many years ago with hope value and who may need to sell this land to keep their business running at a certain level is different from that of a farmer, whose business is farming and is under no pressure to sell, or a college or health authority needing to raise finance. So a site could be viable to one owner and not viable to another.

7.41 Expectations about trends in house prices and the direction in which planning policy is moving could both affect the decision to sell, since the landowner could consider whether things will get better or worse in future. A volume house-builder would consider its options in the context of its overall business including the availability of opportunities elsewhere.

7.42 Some studies (DTZ for Basingstoke & Deane, Winchester & East Hampshire, 2008) have used the concept of the Internal Rate of Return (IRR) as the benchmark of viability, assuming that all sites with an IRR of more than 10% will be viable. An IRR is an assessment of residual valuation through a discounted cash flow, in which all future cash flows are discounted to give the project a present value.

7.43 This study considers that IRR is a complex process and in the interests of greater clarity, it prefers to use the simpler comparison of relative land values, comparing the value achieved on the assumption of a planning consent with the existing use value. If a value with consent is sufficiently in excess of the current site value, then the site can be considered to be viable. The difference in values is measured by a simple **uplift factor**.

7.44 As an example, a typical 6 acre Greenfield site with an open market value of £300,000 (reflecting 'hope value') without planning permission might be worth say £2.7 million with a residential consent, having allowed for development costs and contributions. The significant increase in value of £2.4 million represents an **uplift factor of 9.0 (£2.7m/£300k)**, and would plainly demonstrate viability. The excess will be different in different circumstances, reflecting current use and taxation levels.

7.45 At the other end of the scale, a Brownfield site with an existing use value of £500,000 that could be worth £650,000 with a residential permission would probably consider that the increase of £150,000,

insufficient to persuade the owner to sell, particularly given taxation on capital gains, in addition to sale costs. For most sites, an uplift factor of at least 2 will be required to enable viability. These uplift factors have been used in the example site assessments to determine the achievement of viability.

7.46 Sites are often subject to option agreements, where the value is calculated at the time planning permission is granted, and where there is frequently a minimum value provision. In option agreements, the typical minimum land value is about £100,000 per gross acre, and sites that achieve less than this are deemed not to be viable. In times of market instability there may be occasions where viability is overturned because the minimum value is not reached because of falling revenues and fixed levels of contributions.

7.47 Where there is doubt about viability, this assessment has introduced the concept of **marginal viability**. This happens when it is unclear as to whether an owner would accept the uplift amount, and in these circumstances the 'psychological' approach would determine the outcome. The 'economic' approach finds that the site is strictly economically viable, but the increase in land value is such that it may be insufficient to tempt owners to sell. They may decide to wait for the optimum time in their lives to realise the asset, since the sale of a site by an individual is often a once in a lifetime opportunity that may lead to a life-changing circumstances, such as retirement.

Common Factors That Impact Viability

7.48 The main driver of viability for residential development, and indeed development generally, is the change in residual land value. If the residual land value created by the proposed development is not substantially in excess of the existing use value, then the development will not be considered viable in the market.

7.49 A site can be developed in a myriad of different ways, and the variables are so numerous that the valuation permutations are infinite. In reaching a final residual land value a number of assumptions are made about a site. Therefore the viability of a site is determined by a multitude of factors. Some of the most common factors are explored below.

i) Dwelling mix.

7.50 This reflects location and site characteristics, and the particular approach of the developer. Town centre sites are more likely to accommodate a mix of town houses and flats, whilst Greenfield urban extensions will have a wide range of dwellings across the board to reflect the entire range of market demand.

7.51 In practice, developers will build exactly what purchasers want to buy, subject to the planning permission for the site. Frequently, a purchaser prefers to buy a dwelling with more accommodation than they actually need to provide for flexible and changing lifestyles.

ii) Coverage or saleable floorspace.

7.52 In order to value the land for open market housing by the residual method, assumptions are made about the likely saleable floorspace. 'Coverage', which measures the efficiency of land use, varies according to individual types of scheme, from around 16,000 sq ft per acre (sfa) for a traditional 2 storey development often with larger detached houses, to 18,500 sfa for predominantly 2 - 2.5 storey development, and 18,000 - 21,000 sfa for 2.5 - 3 storey scheme. Multi-storey schemes of flats can achieve very high coverage.

7.53 Floorspace is also affected by the loss of land given over to uses other than residential. Housing needs to be serviced by roads for instance and, for larger developments, land is required for public open space, strategic landscaping, community buildings, employment, and possibly schools. The loss of such land uses have been taken into account in reaching net residential areas, and have

been considered in the Viability Assessments.

7.54 Evidently, coverage has a major effect on sales turnover, and in turn land value, which is a consequence of the relationship between sales turnover and development costs, profit, and overhead. Total turnover is dramatically increased by greater coverage; therefore, in most cases a high density scheme will generate a higher land value than a lower density scheme.

iii) Sales value.

7.55 To arrive at a total sales turnover, assumptions need to be made about sales values per sq. ft. These are often sourced from a market assessment of the area, for example; for Worcestershire a range of sales values from £150 to £200/sq.ft, were provided depending upon type of development (flats, townhouses, traditional 2-storey etc.) and location (town centre, suburbs, urban extension etc).

7.56 Sales values are also affected by the specification of the development. A high specification scheme, usually in a high demand location, can lead to premium sale prices, but to reach such high values, the construction costs will be commensurately higher. Open market sales values can also be affected by the proportion of affordable housing on a site, as well as the juxtaposition of open market housing with affordable housing.

iv) Build costs.

7.57 The overall build costs, including on-site infrastructure, must be deducted from total turnover to give an interim land value. After consultation with the housebuilding industry a range of build costs were provided. The range was quoted from £60 to £110 per sq. ft, with higher exceptions for up-market specification in quality developments. The major national housebuilders build at an average of about £70-80 per sq. ft., including normal infrastructure, and the range reflects the ability of the volume housebuilders to achieve significant economies of scale in the purchase of materials and the use of labour.

7.58 Many small developers are unable to attain these economies, so their construction costs will be higher; however, this can be compensated for by lower overheads, and this often enables smaller developers to acquire sites in competition.

7.59 Housing Associations also tend to specify higher build costs than the volume housebuilders. This is because they frequently employ a contractor for the construction of affordable dwellings, as opposed to developers who either employ construction workers, or engage in direct sub-contracting. In this way, the volume builders build at cost, whereas the Housing Associations will be paying a profit element on top of build costs to the contractor. Typically, a Housing Association might have build costs of £100 - £110/sq.ft (£1080 - £1180/sq.m.) To compensate for these higher build costs, a Housing Association will not require the profit levels sought by the private developers and in addition, part of the building costs fees may be absorbed in the contractor's build cost.

v) The Code for Sustainable Homes.

7.60 The possible increased costs for implementing the new Code have been estimated in a recent report by English Partnerships and the Housing Corporation, February 2007, entitles 'A cost review of the Code for Sustainable Homes'. The estimates vary significantly from site to site (e.g. depending whether site-wide combined heat and power generation is possible, whether small-scale wind-turbines could be used etc). The report suggests that Level 3 can be achieved for no more than a couple of thousand pounds per home in some instances, whereas the scenarios modeled for Level 4 show cost increases of between 4.8% and 16.6% for a detached house.

7.61 For the most widely applicable site/solution combination the report concluded that achieving Level 4 of the Code for Sustainable Homes would cost between 12% and 20% extra. For Level 5, the average increased cost per dwelling will be about £24,500, and taking the average house size as 950 sq ft (88.3 sq.m) the HMA dwelling type requirements) the increased cost is £26/sq ft

(£280/sq.m). The range across dwelling types is between £17/sq ft and £35/sq.ft (£183/sq.m - £377/sq.m), which if added to a volume builder's unit cost of £70/sq.ft (£753/sq.m), would result in £105/sq.ft (£1130/sq.m). Accordingly, it is sensible to consider a range of build costs to address the Code for Sustainable Homes at £70, £90 and £110 sq ft, (£753, £968 and £1184/sq.m).

7.62 As developers embrace the new standards, they will develop new technologies and become more efficient, leading eventually to lower costs. The Council will need to factor in actual build costs at the time a viability assessment is prepared, taking account of any new standards. The new standards may result in higher sale prices to reflect greater demand from the public for these enhanced products, which would have the effect of partially off-setting higher construction costs.

vi) Developer's Profit and professional fees.

7.63 All developers have a slightly different approach to levels of profit and overhead. Profits are derived from turnover across a number of sites, some of which may have been held long-term in land banks, and others acquired as a result of option agreements where price is established at a discount to open market value (OMV). The most appropriate profit level is that which most developers assume when appraising sites for purchase for immediate development. Following discussions with individual developers, the profit margins have increased to reflect the uncertainty of the housing market and an average of 20% of gross turnover is currently being sought. In addition, building cost fees, including the fees of architects, engineers, planning, survey, project manager and insurances, add up to 10% of the gross construction cost.

vii) Development costs and community gain package.

7.64 The development costs relate to costs incurred beyond those accounted for in the overall build costs. These will include physical items such as improvements to highway access, off-site highway improvements, additional drainage requirements, additional landscaping, setting out of public open space, play equipment, increased costs associated with development on excessive gradients, and costs of demolition and abnormal foundations.

7.65 There will be different levels of development costs according to the type and characteristics of each site. There is generally a relatively low level of abnormal development costs for small sites, and higher costs for the largest sites, where urban extensions will require considerable investment in new infrastructure. In most developments, in addition to physical costs, a community gain package will normally be required to cover such items as sustainable transport, community, loss of employment and education contributions. For large urban extensions, the community gain package will be substantial. For instance, new schools will be required to cater for the children generated by the development, in addition to buildings for community use. As a broad guide, a new 1-form entry primary school is required for a development of 800 - 1000 dwellings.

7.66 In recent years the most significant item of community gain sought from development sites is affordable housing. The provision of affordable housing inevitably produces a lower site value when compared with open market housing. This is particularly significant in the case of social rented units and more recently shared ownership units. The recent depression in the housing market has resulted in a substantial reduction in the value of shared ownership units, as the price is paid by the RSL for these units is related to the full market value. Affordable housing targets in adopted planning policies range from 30% to 50% on qualifying sites in urban areas and other specific settlements.

7.67 A developer bidding for land in competition will make its own assumptions about all the above factors, in the knowledge that in order to purchase a site it needs to maximize sales prices, minimise construction costs, minimise profit and overhead, and balance all these factors in the interests of the long-term financial stability of the company.

Viability Methodology and Assessment

7.68 A viability assessment has been undertaken to understand the economic viability of residential development in Worcestershire. Two 'typical example' sites have been assessed, which are designed to reflect the local housing market, and also to test key elements of the market and their impacts on viability. The use of hypothetical sites in preference to actual sites enables the testing of policy options across a range of likely scenarios in a consistent manner.

7.69 It is inevitable that results of the viability assessment will be significantly affected by the decline of the housing market. Therefore, it would be prudent to conduct two viability assessments for each site; a viability based on today's market (February 2009) and a viability based at the top of the last housing market boom (September 2007).

7.70 The sites assessed as part of the viability testing are intended to be typical sites that might be found in Worcestershire. They include;

Site 1 - A large Brownfield site. This is taken to be a 1.6 ha site (4 acres) with 100 dwellings, 30x1 bed flats, 30 x 2 bed townhouses, and 40x3-bed townhouses.

Site 2 - A large Greenfield site. This is taken to be a 40 ha (100 acres) accommodating 1000 dwellings, 100 2-bed flats, 350 2-bed houses, 350 3-bed houses, and 200 4-bed houses, again typical of the mix a developer might seek.

7.71 Each example site makes reasoned assumptions about the type of dwellings and density that would be appropriate for the location and size of the site. The dwelling mixes selected for each of the assessments reflect as closely as possible what a developer might choose to build.

7.72 As mentioned previously there are an infinite number of factors that can be considered when compiling a viability assessment. For the purposes of this assessment key factors which are relevant to Worcestershire, have been used. These include;

1. An allowance of **40% affordable housing**, which is taken from an average provision across the County based on existing planning policy. After consulting with developers the overriding consensus was that values achieved by affordable housing are the equivalent to the build costs, therefore, these units often generate nil value. This approach has been adopted in the viability testing.
2. An average **sales value of £175/sq/ft for February 2009** and an average **sales value of £275sqft for September 2007**. Evidently, the higher the sales value, the higher the chance of achieving viability.
3. Accordingly, this chapter has concentrated on private residential developers'. Most affordable housing is delivered through S.106 agreements and actually built by volume developers at their lower build rates. Therefore, for the purposes of the viability assessments an average **build cost of £75sqft** has been used. It should be noted that no account has been made for any additional build costs associated with Code for Sustainable Homes or any other such requirement.
4. A **developer's profit 20% of gross turnover**. This is an average figure of which developers are currently seeking, reflecting the uncertainty of the housing market.
5. Fees of architects, engineers, planning, survey, project manager and insurances, add up to **10% of the gross construction cost**. These costs have been factored into the assessment, in addition to allowances for marketing and legal fees, as well as financing and land acquisition costs
6. **No account has been taken of planning gain**. Results and recommendations about the quantity of planning gain for each site are made below, in the Viability Conclusion. If the Council wishes to test infrastructure costs and the overall community gain package according to

individual and actual circumstances, the level can be applied in viability assessments for specific sites.

7. For the large Greenfield urban extensions, 60% of the gross area is assumed as net residential land. This is because of the other uses that will have to be provided on site to make the development feasible, for example; new school, open space, road infrastructure.

7.73 A residual valuation is carried out for each assessment to arrive at an indicative land value, which is compared with the existing or alternative value. The valuation process follows these basic principles:

- Total sales turnover less all development costs less profit/overhead & community gain package = land value.

7.74 For each Viability Assessment, a conclusion is reached about viability, and the likelihood of the site being delivered through the operation of the market. An assessment is made between the current land value to give a 'value added' figure, and uplift factor to justify to the conclusion. An uplift factor of about 2.5 will be required to achieve viability. As discussed earlier, some small sites may be viable at as low as 1.8, and some sites may only be marginally viable at 2.6. For large Greenfield sites, the lowest viability uplift figure is 4.1, given the general requirement to achieve a minimum land value, and the not unnatural aspirations of landowners.

7.75 As part of the assessment a planning gain package for infrastructure is introduced for each site, which is deducted from the final land value. The assessments identify the impact that funding infrastructure will have on the land factor and subsequent land value. Where appropriate we have introduced a planning gain package that would be appropriate to ensure the site remains viable.

7.76 Each viability conclusion has to be judged not only against the 'economic' test but also against the 'psychological' approach.

Viability Conclusions

7.77 The results of the assessment are heavily influenced by existing market conditions in particular the variation in sales values. When assessed, the two sites provided the following results;

Site 1 – Large Brownfield site

February 2009
The existing market viability at February 2009, which used sales values of £175sqft, resulted in a land value of £827,400 on top of the existing use value (£600,000). This represents an uplift factor of 2.38.

Based on existing market conditions the viability of the large Brownfield site is 'marginal'. If a planning gain package were to be introduced at £2,500 per dwelling (£250,000 in total) the site would generate a land value of £602,000 on top of existing use value, reflecting an uplift factor of 2.0. Therefore, the site would remain 'marginal' and left to a 'physiological' approach as to whether the site is viable to the landowner. If a considerably higher planning gain package were introduced then the site would become unviable.

September 2007
The market viability at September 2007, which used sales values of £275sqft is noticeably different and provided a land value of £4,618,200 on top of existing use value (£600,000). This represents an uplift factor of 8.7.

Based on the market conditions in September 2007, the large Brownfield site is viable. If a planning gain package of £30,000 per dwelling (£30,000,000 in total) were introduced the site would generate a land value of £1,918,200 above existing use value resulting in an uplift factor of 4.2. If this planning gain package were to be introduced the site would remain viable. However, if a considerably higher planning gain package were

introduced it is likely that the site would become marginal or potentially unviable.

7.78 The above information demonstrates the impact of the recent downturn in market conditions and the impact that this has on residential economic viabilities. For the purpose of this exercise it is important to look ahead, and although it is impossible to identify when the housing market will recover, most professionals agree that it will recover.

7.79 If we assume that in 5 years time, sales values have increased to an average of £225sqft. (halfway between existing average sales vales and the average sales values of September 2007). This would result in a land value of £2,722,800 on top of the existing use value, which results in an uplift factor of 5.54. Therefore, a planning gain contribution of £7,500 per dwelling could be introduced (£750,000 in total). This would generate a land value of £2,047,800 above existing use value resulting in a land factor of 4.41.

7.80 If we assume that in 10 years time the sales values will have returned to those levels experienced in September 2007 (£275sqft), the planning gain package could increase to £30,000 per dwelling (£3,000,000 in total) and still remain viable.

Site 2 – Large Greenfield site
February 2009
The existing market viability at February 2009, which used sale values of £175sqft, resulted in the site making a profit of £5,074,113 on top of the existing use value (£2,000,000). This represents an uplift factor of 3.54.

Based on existing market conditions at February 2009 the viability assessment demonstrates that the large Greenfield site is unviable. This is not withstanding the fact that the site does not make any planning gain contributions other than affordable housing.

Given the general requirement to achieve a minimum land values, the recommended acceptable uplift factor for large Greenfield sites is 4.1 or greater. If, for example, the site was subject to a minimum price clause of £100,000 per gross acre the site would need to achieve at least £10,000,000 for it to be considered viable. As the site currently only achieves a total land value of £7,074,113 and an uplift factor of 3.54 it is considered unviable.

September 2007
The market viability at September 2007, which used sales values of 275sqft is noticeably different and demonstrated a land value of £47,829,963 on top of existing use value (£2,000,000). This represents an uplift factor of 24.91.

Based on the market conditions in September 2007, the large Greenfield site is viable. If a planning gain package of £40,000 per dwelling (£40,000,000 in total) were introduced the site would generate a land value of £11,829,963 above existing use value, resulting in an uplift factor of 6.91. If this planning gain package were to be introduced the site would remain viable. However, if a considerably higher planning gain package were introduced it is likely that the site would become marginal or potentially unviable.

7.81 Again, if we assume that in 5 years time sales values have increased to an average of £225sqft (halfway between existing average sales vales and the average sales values of September 2007). This would result in a land value of £28,861,788 on top of the existing use value, which results in an uplift factor of 15.43. Therefore a planning gain package of £20,000 per dwelling could be introduced (£20,000,000 in total). This would generate a land value of £10,861,788 above existing use value resulting in a land factor of 6.43.

7.82 Again, if we assume that in 10 years time the sales values will have returned to those levels experienced in September 2007 (£275sqft) the planning gain package could increase to £40,000 per

dwelling (£40,000,000 in total) and the site would still remain viable.

7.83 There are an almost infinite number of variables that could be modeled. The reduction of a particular cost will evidently increase profitably and viability. However, the two variable factors that would make the greatest difference to viability is the anticipated sales values and the proportion of affordable housing. Build costs are relatively consistent; all sites have an element of abnormal development costs, whilst profits and overheads are relatively similar. A lower proportion of affordable units and a correspondingly increased share of open market dwellings immediately adds turnover that translates directly to the bottom line land value and improved viability.

7.84 The previously developed site tends to have higher overall development costs, partly because of demolition and remediation, and partly because they are generally more complex urban sites that need to fit in with their surroundings, adjoin buildings, and frequently involve refurbishment of existing buildings. This is partly why Brownfield sites are viable on a lower uplift factor than the large Greenfield site.

7.85 Based on existing market conditions, the land value generated on

- the large Greenfield is insufficient to motivate an owner to sell, especially when tax liability and disposal expenses are taken into account.
- the large Brownfield site results in a marginal viability, which would be determined by the 'psychological' approach. However, it should be noted that this assumes a very low planning gain package. If a typical planning gain package were introduced then it is likely that the site would become unviable.

7.86 It is estimated that both sites will generate a strong land value in 10 years time, as a direct result of an increase in sales values. However, it is important to note that other common factors that influence a viability could also vary, for example; build costs, existing use value, housing densities, % of developers contribution and professional fees and the introduction of Community Infrastructure Levy. It is, therefore, important to maintain an up to date knowledge of the housing market and economic viability in order to make accurate assumptions in determining the planning gain package.

Conclusion

7.87 Although currently many sites are not viable, this is demonstrated through the viability assessment in the previous section. Most professionals consultants agree that there will be a recovery within about two years. When that takes place, land values will recover, and in those circumstances, it is unlikely that any competing uses or abnormal development costs would adversely affect the economic viability for housing of any of the identified sites.

7.88 Post recovery, most abnormal development costs, (such as piled foundations, or remediation of contaminated land) will be able to be absorbed without falling below the value for alternative uses, Developers are seeking to renegotiate planning obligations and will continue to do so until the market recovers.

7.89 However, this Assessment is being carried out at a time of serious downturn in the housing market, when the volume housebuilders have cut about 40% of workforces, and the Construction Products Association has predicted that UK housing starts will be reduced by around 147,000 in 2008, the lowest annual number since 1945, and 27% lower than 2007. According to the Halifax, house prices have fallen nearly £20,000 from last summer's peak. House prices fell by 2% in June 2008, and the average home is now 8.7% lower than a year ago at £180,344, and average prices are now at the same level as in August 2006.

7.90 This is not the ideal time in the economic cycle to seek increased proportions of affordable housing, or planning contributions towards infrastructure in general. However, this has indicated that the

combination of a large planning gain package including 40% affordable housing is not achievable when assessed against existing market conditions. Because of the fragile state of the housing market, policy needs to retain some flexibility so that in circumstances where a lack of viability can be demonstrated an alternative proportion may be negotiated.

7.91 Deliverability is not just a question of viability. What is acceptable to one landowner is unacceptable to another. A sense of built-up expectation of land value is a complicating factor in the housing market, and landowners with a certain expectation may choose not to sell a site if that expectation is not reached. The psychology of landowner behavior is a real issue that the Council will need to consider so that deliverability rates for both open market and affordable housing are not adversely affected.

Developer Contributions

7.92 Developers have an obligation to ensure that new development does not have a negative effect on the surrounding area and its infrastructure. In most circumstances this obligation is secured by the Local Authority via S106 agreement to address the infrastructure impacts of new development and make them it acceptable in planning terms. Specifically, new residential development facilitates population growth which leads to increased pressure on existing infrastructure and potentially creates demand for new infrastructure, such as schools and open space. To make the development acceptable and meet this obligation, developers can provide this infrastructure on their development site or where this is not possible or desirable, a contribution can be provided in terms of finance or land.

7.93 If infrastructure requirements are to be met the issue of development viability will have a significant impact on available developer contributions/planning gain packages to deal with infrastructure obligations. Throughout the consultation process with infrastructure stakeholder, a consistent message was received that the service was looking towards S106 or Community Infrastructure Levy (CIL) mechanisms to provide the required capital funding to deliver infrastructure.

National Policy Context

7.94 Circular 05/2005 provides detailed advice in respect of the use of planning obligations to deal with the direct impacts of development. The circular appreciates that the planning system operates in the public interest and should aim to foster sustainable development, providing homes, investment and jobs in a manner which positively intervenes in the quality and condition of the physical and built environment. The Secretary of State's policy requires, that planning obligations should only be sought where they meet all the following policy tests. The tests state that the obligations 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;
5. reasonable in all other respects.

7.95 PPS1 requires Planning Authorities to ensure that social inclusion, economic development, environmental protection and the prudent use of resources are at the forefront of policy making and implementation. These considerations have formed an important element of producing this draft document.

Community Infrastructure Levy

7.96 The Community Infrastructure Levy (CIL) Consultation (Aug 2008), will be a new charge which local authorities in England and Wales will be empowered, but not required, to charge on most types of

new development in their area. CIL charges will be based on simple formulae which relate the size of the charge to the size and character of the development paying it. The proceeds of the levy will be spent on local and sub-regional infrastructure to support the development of the area.

7.97 The Community Infrastructure Levy represents a major improvement to the current system. Until now, developers and councils have had to negotiate individual planning agreements for each new project and as a consequence only a minority of developments have contributed to the infrastructure needed to support development. The Levy will make the process fairer and faster for all, with almost all developments contributing a fair share.

7.98 At this point in time CIL is proposed to be introduced in Autumn 2009, but it must be noted that its form and therefore the implications for existing planning obligation and affordable housing policy have not been finalised.

7.99 Part of the CIL consultation included consultation on proposed changes to the existing planning obligations system. An important consideration in the preparation of this study has been the recommendation of a flexible approach to the collection of S106 via a planning tariff prior to the introduction of CIL and the ability to continue to secure planning obligation contributions and affordable housing over the long term, with or without the introduction of CIL.

Planning Tariff

7.100 There are four main approaches to securing planning obligations, negotiated, detailed policy, calculated or a hybrid. Audit Commission research has identified that Authorities that use a negotiated approach secured less contributions than other authorities that have a detailed policy or calculated approach in place such as a planning tariff. Current practice for securing obligations is moving in this direction with the success of the Milton Keynes Roof Tax and proposal for the Community Infrastructure Levy.

7.101 If the maximum benefit is to be secured for developer contributions whatever the development viability circumstances. The County Council with the agreement of individual Districts should coordinate the production of a standard approach to the identification of developer contributions and individual Districts should adopt this as a supplementary Planning Document. Baker Associates recommend a tariff-led approach to the negotiation of planning obligations. A hybrid approach could be employed based on two primary approaches:

1) **The Worcestershire Development Tariff** - could seek contributions for all residential developments from 1 dwelling or more and all commercial developments from 500 sq m by the means of a Planning Tariff, a standard charge to secure contributions in a clear, efficient and transparent way. Contributions will be secured through the use of standard S106 agreements and/or unilateral undertaking, or Community Infrastructure Levy if desired.

2) **The Negotiated Element (S106)** -The Worcestershire Development Tariff will not able to identify and calculate every impact that may need to be addressed through planning obligations. Where this is the case, for example in relation to affordable housing or delivering specific access arrangements to a development site, a negotiation or unilateral undertaking on those element may be required through existing S106 mechanisms. This will usually be related to larger residential and commercial developments.

7.102 It is considered that calculated approaches to transport, education, health, community, recreation emergency and waste infrastructure could be used to establish a planning tariff, based on available and emerging information that has informed the identification of future infrastructure requirements. The following paragraphs detail the recommendations on the procedural elements of implementing this recommended planning obligation policy.

Pooling of Contributions

7103 Individual authorities will be tasked with the collection of Tariffs via S102, once a universal approach has been agreed across the County. Collected tariffs should form a pool of contributions which will be used towards each infrastructure type, seperately acknowledging strategic infrastructure within each area. This approach is recommended in Circular 05/2005 which states that "where the combined impact of a number of developments creates the need for infrastructure, it may be reasonable for the associated developers' contributions to be pooled, in order to allow the infrastructure to be secured in a fair and equitable way. To achieve the overall implementation of the infrastructure it is recommended that the pooling of contributions should reflect the timescale of emerging Core Strategies and Council and the County should pool contributions over the 2006 -2026 period to ensure that the delivery and management of long term infrastructure.

Setting Thresholds

7.104 Current practice on the use of development thresholds is wide ranging between local authorities and specific planning obligations. The key principle is that all developments generate requirements that need to be addressed through planning obligation contributions. The impact of one dwelling in a development of hundred dwellings is the same as a development of a single dwelling. Therefore, there is a strong case for limiting the use of thresholds except where there is clear justification.

7.105 The key consideration is the separation of the practical application of a threshold, which decides which developments are required to contribute from the objective which the threshold was established to achieve. There are two reasons to set a threshold which will assist in the development of a County wide approach to calculating developer contributions. These are as follows:

- to ensure an appropriate balance between securing contributions and achieving regeneration and development objectives;
- optimise the use of Council resources.

7.106 In simple terms the implication of a low development threshold is the increase in developments requiring section 106 agreements and resources that are required to facilitate this process. There is a balance to be achieved between securing contributions and the cost effectiveness of doing so. There would be little benefit in securing a contribution towards the setup of kerbside recycling scheme of £50 from the development of one house, when the cost of negotiating and drafting the legal agreement would be many times more. By combining a number of individual requirements, it becomes financially viable to collect a tariff from individual properties, thereby spreading the burden and increasing resources to deliver public services and facilities.

Threshold Avoidance and Legal Penalties

7.107 Baker Associates is aware that some developers may attempt to avoid planning obligations by reducing the scale of their proposal to avoid a provision threshold, for example in terms of the provision of affordable housing. If it is considered that a proposed development is not maximising the use of a site to avoid an obligation threshold, the Council's should seek obligations from the developer which reflect the best or full use of the land. In addition if a potentially large development proposal site has been divided into smaller applications below the threshold, the Council's should require, for the purposes of a planning obligation, that all the individual proposals are treated as part of the whole development proposal, subject to an appropriate timescale being established for bringing forward subsequent phases of development.

7.108 In the case of non payment of financial contributions or the implementation of on site specific

obligations, the Council's should make it clear that they will pursue all legal means to secure agreed S106 requirements and additional legal penalties.

Development Viability and Spatial Priorities

7.109 It is acknowledged that in certain circumstances the costs associated with a development may be such that all the issues that should be addressed by planning obligations cannot be addressed, without the scheme becoming economically unviable. Additionally, in exceptional cases and where provided for specifically through Local Development Documents, certain planning obligation requirements of any SPD might be waived in order to emphasise the need for development to contribute to higher strategic and spatial priorities.

7.110 If a developer considers that the SPD is placing unreasonable obligations upon a proposal site, then an assessment of development viability could be conducted. The Councils would require a developer to adopt an 'open book' approach, whereby relevant development finances are subject to an independent financial appraisal in order to provide the appropriate and necessary information to support a claim. The cost of assessing development viability should be met by the developer who is claiming non-viability for the planning application. Abnormal costs should be reflected in the price paid for the site. Demolition of existing structures, site clearance and decontamination should be reflected in the land value. It should not be acceptable to make allowance for known site constraints in any financial viability appraisal.

7.111 The Councils or appropriate external body should employ confidentiality and discretion with any evidence provided, and this should only be utilised to address and evaluate a specific claim. However it may be necessary to report the key issues and broad conclusions in reports to elected members at the time of their consideration of a planning application. If it is agreed that a proposal cannot reasonably afford to meet all of the SPD's specified requirements, it should not result in the proposal receiving approval from the Council. It is quite possible that the issues will be so significant that the application will be refused. In this case it will be appropriate for the County and Individual Councils and the Local Strategic Partnership to have identified and agreed to infrastructure priorities for planning obligation in each area.

On or Off Site Provision

7.112 The application of the Worcestershire Development Tariff does not mean that developments can avoid making land available and delivering on-site local infrastructure (such as open space and play areas) where appropriate on-site infrastructure is required to ensure that the scheme is of an acceptable quality. However, there will be cases where this is neither practicable or appropriate within the emerging local policy context. In these instances, the Tariff or Negotiated Element will contribute towards these facilities at an appropriate alternative location or locations.

7.113 The Councils should consider the issue of whether facilities are to be provided on or off site on in advance based on evidence provide in this study and continued consultation with stakeholders. However it is expected that particular obligations will predominately be required on site such as affordable housing and open space. The SPD should make it clear what will be required on site as part of future development.

Outline Applications and Pre Application Discussions

7.114 In some cases where outline planning permission for development is applied for, it may not be clear whether the planning obligation thresholds will be exceeded. In these cases obligations should be negotiated on the presumption that the site exceeds the relevant threshold. Planning obligations should then be finalised as a reserved matter, however were possible a draft legal agreement and level of contributions should be drawn up early to clearly establish the requirements. This can then

be adjusted at reserved matters stage if the details of the development are revised.

7.115 We would encourage pre application discussions with regard to planning obligations. The early discussion of planning obligation matters, specific proposals and potential abnormal development costs will provide greater clarity and certainty for developers as to the type and scale of contributions potentially required.

Drafting of Agreements

7.116 Consistent Planning Agreements should be drafted by the Councils. Circular 05/2005 (paragraph B36) promotes the use of 'Standard Agreements' to speed up the preparation of the S106 agreement. The Council's should provide standard legal agreements and standard unilateral undertakings for use across the County. Developments required to contribute in the form of the Worcestershire Development Tariff should be required to use standard agreements to enable the determination of planning application within designated timescale.

Financial Contributions

7.117 All financial contributions contained in planning S106 agreements should be index linked to the date of the Committee, or delegated authority approval. Financial contributions will normally be expected to be paid upon commencement of development (as defined in Section 56 of the 1990 Town and Country Planning Act). However, in exceptional circumstances the payment can be made at various stages during the development process, for example, upon first occupation. Trigger dates for the payment of financial contributions will be included in the Planning S106 Agreement, as will any time periods by which the contribution is to be spent.

7.118 Following receipt by the specific Council, financial contributions should be held in interest bearing accounts. Contributions remaining unspent at the end of a time period specified in the planning S106 agreement should be returned to the payee along with any interest accrued. Given that the Tariff contributes to strategic infrastructure needs which can take a long time to deliver, the default period of 20 years from the date of the agreement is recommended.

7.119 Applicants should be required to meet their own and the Council's costs of producing planning obligation agreements, including associated legal costs.

Monitoring of Obligations

7.120 The monitoring of planning obligations should be undertaken across Worcestershire by the Council's on an individual basis and at a County level for strategic areas to ensure that all obligations entered into are complied with on the part of both the developer and the Council. Enforcement action should be taken by the Council where conditions or planning obligations are not being complied with.

7.121 Tariffs should be monitored and updated on a regular basis to ensure that costs and methods of calculation reflect current practices and national inflation rises. As new evidence on the cost of managing impacts and delivering strategic infrastructure for sustainable growth of the County emerges, this will be used to update the tariff cost in a fair and transparent way.

Potential Funding From Developer Contributions

7.122 Development viability discussed early has provided an indication that in the current market there is no or limited finance available towards infrastructure, but this will increase over time if the market returns to normal operation. Based on the residual valuation work but factoring in contingency to allow for variation in the numerous assumptions that could impact on developer contribution funding, such as:

- Dwelling mix.
- Coverage or saleable floorspace.
- Sales value.
- Build costs.
- The Code for Sustainable Homes.
- Developer's Profit and professional fees.

7.123 Table 7.2 below sets out the assumptions on the rates of potential developer contributions from development on Greenfield and Brownfield Sites. The information has been used to identify what might be available from developer contributions. The table shows that as the housing market recovers developer contributions available for infrastructure funding will increase over time. Given the current economic climate this will take some time and a cautious estimate has been used. In the long term reflecting the cyclical nature of the housing market, we have assumed that contribution will also reduce again.

Table 7.2: Potential Developer Contribution Rates

Year	Tariff per Dwelling (Greenfield)	Tariff per Dwelling (Brown)
2006	0	0
2007	0	0
2008	0	0
2009	0	1500
2010	2000	2500
2011	4000	3500
2012	6000	5000
2013	8000	6500
2014	10000	7500
2015	12000	8500
2016	14000	10000
2017	16000	11500
2018	18000	13000
2019	20000	15000
2020	20000	15000
2021	20000	15000
2022	20000	15000
2023	20000	15000
2024	18000	14000
2025	16000	13000
Average	11200	8575

7.124 Based on the development phasing set out in Section 4 table 4.3, which indicates that 66% of all development will be within urban extensions or rural areas, an assumption has be made to determine the likely level of developer contributions. It has been assumed that dwellings within urban extensions and rural areas will be predominately Greenfield and development within the urban area on Brownfield sites. Table 7.3 overleaf shows that indicative phasing and subsequent developer contributions by 2026 based on this assumption:

Table 7.3: Potential Developer Contribution Funding

Phasing	Worcestershire County	Potential Contributions
2006 - 2011	**Urban Areas:** 5,496 **Urban Extensions**: 225 **Rural:** 1,131 **Total 2006 - 2011**: 6,852	£5,072,300
2011 - 2016	**Urban Areas:** 5,494 **Urban Extensions**: 1,025 **Rural:** 1,131 **Total 2011 - 2016**: 7,650	£51,310,800
2016 - 2021	**Urban Areas:** 744 **Urban Extensions**: 9,178 **Rural:** 1,131 **Total 2016 - 2021:** 11,053	£191,036,000
2021 - 2026	**Urban Areas:** 744 **Urban Extensions**: 9,178 **Rural:** 1,131 **Total 2021 - 2026**: 11,053	£204,522,800
Totals	36,600 dwellings	£451,942,800

7.125 The phasing of development across the County could potentially provide up to £452 million by 2026. It must be noted that there are many assumptions that have lead to this figure and it is recommended that any future tariff approach will need to be revised on an annual basis to ensure that up to date development viability is taken into consideration, specific infrastructure needs of individual settlements and County wide variations in development values are considered.

7.126 Consideration has been given to seeking contributions from employment development, primarily towards transport infrastructure. It is considered that contributions could be collected on a floorspace basis (sq m). At present contributions would be limited, but they could potentially increase to provide a limited source of funding in the future. However this approach could potentially discourage economic development and significantly reduce the economic viability of employment development, both which are undesirable outcomes in the current economic climate. It is considered that this issue should be kept under view.

Public Funding

7.127 Through the study Baker Associates has identified how infrastructure providers deliver infrastructure and highlighted potential sources of funding. Importantly to establish a view on whether there is sufficient funding to provide future infrastructure requirements we need to identify existing Secured funding. Table 7.4 overleaf sets out existing secured funding and current funding bids. At present the outcome of the funding bids is unknown, but they do provide an indication of potential funding levels.

Table 7.4: Public Sector Transport Funding

Infrastructure Proposal	Funding Bids	Funding Secured
Worcester highway improvements, including dualling of the Southern Link Road (£66 m)	£46.5m	
New city centre river crossing (£31 m)	£20.5m	
Intelligent Transport Systems (ITS) (£9 m)	£4m	
Enhanced infrastructure at Worcester Foregate Street station (£1.5 m) and enhancements to Malvern stations (£4 m)	£3m	
Park & Ride interchanges & BRT network (£70 m)	£46m	£10m, IT Block £4 m Growth Point
Worcester city centre cycle/pedestrian routes (£14 m)	£7m	£0.85m Sustrans Connect2 (for Diglis Bridge)
Evesham Bridge & Viaduct Replacement (£9.5 m)	£8.5m	
Bordesley Bypass (£10m)	£41m (proportion of total bid = £22m)	
Enhanced Redditch bus network to serve the relevant development sites (£10 m)		
Improvements to Redditch walking/cycling network (£2 m)		
Bromsgrove Station improvement package (17 m)	£8.5m	£4m London Midland, £2.5m Network Rail, £2m Developer Contribution + LTP2 contribution
Kidderminster Station improvement package (£5.5 m)	£3.5m	£2m from TOC, NR and LTP2 contribution
Stourport Relief Road (£2 m contribution)	£45m (proportion of total bid = £4m)	£6m Developer Contribution (proportion of developer contribution = £0.37m)
Hoobrook Link Road (£2 m contribution)		
Total Funding	**£172.86 m**	**£25.72 m**

7.127 In some cases identified infrastructure schemes only comprise part of the funding bid. Therefore the totals do not represent the total funding secure or potentially available. Overall funding bids could provide £173.5 m towards the cost of specifically identified Infrastructure. In addition assuming all secure funding contributes to the implementation of theses schemes £25.72 million has been secured to address future infrastructure requirements.

8. Infrastructure and Phasing Frameworks

8.1 Infrastructure requirements identified in Section 6 have been combined to create two Infrastructure and Phasing Frameworks. The study has examined the indicative phasing of new development set out in Table 4.3 and infrastructure requirements have been positioned within time bands dependant on when they are required by new development. This creates a infrastructure and funding trajectory for Worcestershire. The Tables below take each of the main settlements in turn and then rural areas to identify the infrastructure Phasing and Funding for each location and Worcestershire as a whole.

8.2 The following Tables (8.1 and 8.2) present the Infrastructure Schedules from Section 7 within two Infrastructure and Phasing Frameworks. Table 8.1 presents Transport infrastructure across Worcestershire County:

Table 8.1: Transport Infrastructure Phasing Framework

Transport Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	2011-2016	2016-2021	2021-2026
Worcester		Worcester highway improvements, including dualling of the Southern Link Road (£66 m)		
			Improvements to M5 Junction 6 (£30 m)*	
			New city centre river crossing (£31 m)	
		Intelligent Transport Systems (£4.5 m)	Intelligent Transport Systems (£4.5 m)	
		Enhanced infrastructure at Worcester Foregate Street station (£1.5 m)		
			Rail halt at Rushwick (£2 m)*	

Transport Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	2011-2016	2016-2021	2021-2026
		Double track the Cotswold Line between Norton Junction (Worcester) and Pershore (aspiration)‡		
		Lower Broadheath & M5 South Parkway Park & Ride interchanges & associated BRT network (£35 m)	St. Peter's Park & Ride interchange & associated BRT network (£17.5 m)	Claines Park & Ride interchange & associated BRT network (£17.5 m)
	Worcester city centre cycle/pedestrian routes (£3.5 m)	Worcester city centre cycle/pedestrian routes (£3.5 m)	Worcester city centre cycle/pedestrian routes (£3.5 m)	Worcester city centre cycle/pedestrian routes (£3.5 m)
			Pedestrian/cycle bridge over the Southern Link Road (£2 m)*	
Sub Total	**£3.5 m**	**£110.5 m‡**	**£90.5 m***	**£21 m**
Evesham	Evesham Bridge & Viaduct Replacement (£9.5 m)			
		Improvements to M5 Junction 6 (and 7, combined with Worcester NLP allocation)‡	Improvements to M5 Junction 6 (and 7, combined with Worcester NLP allocation)‡	
	Improvements to localised junctions on the A46 (£1 m)*			
	Improved parking provision at Evesham Railway Station (£0.5 m)*			
	Increase frequency of trains from Evesham (aspiration) ‡			
	Enhanced Evesham bus network, including ongoing revenue costs of infrastructure and services (£2.5 m)	Enhanced Evesham bus network, including ongoing revenue costs of infrastructure and services (£2.5 m)	Enhanced Evesham bus network, including ongoing revenue costs of infrastructure and services (£2.5 m)	Enhanced Evesham bus network, including ongoing revenue costs of infrastructure and services (£2.5 m)

Transport Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	2011-2016	2016-2021	2021-2026
	Enhanced Evesham walk/cycle routes (£62 k)*	Enhanced Evesham walk/cycle routes (£62 k)*	Enhanced Evesham walk/cycle routes (£62 k)* New pedestrian/cycle bridge to Hampton (£2 m)*	Enhanced Evesham walk/cycle routes (£62 k)*
Sub Total				
Pershore		Improvements to Pinvin Crossroads to alleviate the bottleneck (£0.5 m)*		
	Provide enhanced parking at Pershore railway station (£0.5 m)*			
	Enhanced Pershore bus network, including ongoing revenue costs of infrastructure and services (£1.5 m)	Enhanced Pershore bus network, including ongoing revenue costs of infrastructure and services (£1.5 m)	Enhanced Pershore bus network, including ongoing revenue costs of infrastructure and services (£1.5 m)	Enhanced Pershore bus network, including ongoing revenue costs of infrastructure and services (£1.5 m)
	Improvements to walking and cycling links between Pershore station and town centre (£62 k)*	Improvements to walking and cycling links between Pershore station and town centre (£62 k)*	Improvements to walking and cycling links between Pershore station and town centre (£62 k)*	Improvements to walking and cycling links between Pershore station and town centre (£62 k)*
Sub Total	**£0.51 m**	**£0.51 m**	**£0.06 m**	**£0.06 m**
Droitwich Spa			Improvements to M5 J5 (£30 m)*	
	Droitwich Spa – Stoke Works track doubling (aspiration) (£25 m)			
	Increased parking at Droitwich Spa railway station (£0.5 m)*			

Transport Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	2011-2016	2016-2021	2021-2026
	Improved Droitwich bus services, including ongoing revenue costs of infrastructure and services (£0.5 m)	Improved Droitwich bus services, including ongoing revenue costs of infrastructure and services (£0.5 m)	Improved Droitwich bus services, including ongoing revenue costs of infrastructure and services (£0.5 m)	Improved Droitwich bus services, including ongoing revenue costs of infrastructure and services (£0.5 m)
	Improvements to Droitwich walking and cycling network (£62 k)*	Improvements to Droitwich walking and cycling network (£62 k)*	Improvements to Droitwich walking and cycling network (£62 k)*	Improvements to Droitwich walking and cycling network (£62 k)*
Sub Total	**£0.68 m****	**£0.18 m**	**£30.18 m**	**£0.18 m**
Malvern		Dualling of the Southern Link Road‡		
			Extensions to Townsend Way in Malvern (subject to Malvern Transport Study) (£1 m)*	
	Malvern stations improvements packages (£1.3 m)	Malvern stations improvements packages (£1.3 m)	Malvern stations improvements packages (£1.3 m)	
	Enhanced Malvern bus network, including ongoing revenue costs of infrastructure and services (£2.5 m)	Enhanced Malvern bus network, including ongoing revenue costs of infrastructure and services (£2.5 m)	Enhanced Malvern bus network, including ongoing revenue costs of infrastructure and services (£2.5 m)	Enhanced Malvern bus network, including ongoing revenue costs of infrastructure and services (£2.5 m)
	Improvements to Malvern walking/cycling network (£62 k)*	Improvements to Malvern walking/cycling network (£62 k)*	Improvements to Malvern walking/cycling network (£62 k)*	Improvements to Malvern walking/cycling network (£62 k)*
Sub Total	**£2.18 m**	**£2.18 m**	**£3.18 m**	**£0.18 m**
Redditch		Improvements to M42 Junctions 2 and 3 (£20 m)*	Improvements to M42 Junctions 2 and 3 (£20 m)*	Improvements to M42 Junctions 2 and 3 (£20 m)*
			Bordesley Bypass (£10m)	

Transport Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	2011-2016	2016-2021	2021-2026
	Increase services along Cross City Line South & infrastructure enhancements on the Barnt Green – Redditch branch‡‡			
			Redditch North station (aspiration) (£10 m)	
	Enhanced Redditch bus network, including ongoing revenue costs of infrastructure and services (£2.5 m)	Enhanced Redditch bus network, including ongoing revenue costs of infrastructure and services(£2.5 m)	Enhanced Redditch bus network, including ongoing revenue costs of infrastructure and services(£2.5 m)	Enhanced Redditch bus network, including ongoing revenue costs of infrastructure and services(£2.5 m)
	Improvements to Redditch walking/cycling network (£0.5 m)*	Improvements to Redditch walking/cycling network (£0.5 m)*	Improvements to Redditch walking/cycling network (£0.5 m)*	Improvements to Redditch walking/cycling network (£0.5 m)*
Sub Total	**£1 m ****	**£21 m**	**£31 m**	**£21 m**
Bromsgrove			Improvements to M5 J5‡	
		Improvements to M5 J4 and M42 J1 (£30 m)*	Improvements to M5 J4 and M42 J1 (£30 m)*	
	Bromsgrove Station improvement package (multi modal interchange) (£17 m)			
	Extension of the Cross City Line South suburban rail service to Bromsgrove‡‡			
	Enhanced Bromsgrove bus network, including ongoing revenue costs of infrastructure and services (£1.25 m)	Enhanced Bromsgrove bus network, including ongoing revenue costs of infrastructure and services (£1.25 m)	Enhanced Bromsgrove bus network, including ongoing revenue costs of infrastructure and services (£1.25 m)	Enhanced Bromsgrove bus network, including ongoing revenue costs of infrastructure and services (£1.25 m)
	Improved Bromsgrove walk/cycle links (£62 k)*	Improved Bromsgrove walk/cycle links (£62 k)*	Improved Bromsgrove walk/cycle links (£62 k)*	Improved Bromsgrove walk/cycle links (£62 k)*

Transport Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	2011-2016	2016-2021	2021-2026
Sub Total	**£17.58 m****	**£30.18 m**	**£30.18 m**	**£0.18 m**
Kidderminster	Hoobrook Link Road (£2 m contribution)			
	Kidderminster Station improvement package (£5.5 m)			
	Enhanced Kidderminster bus network, including ongoing revenue costs of infrastructure and services (£1.25 m)	Enhanced Kidderminster bus network, including ongoing revenue costs of infrastructure and services (£1.25 m)	Enhanced Kidderminster bus network, including ongoing revenue costs of infrastructure and services (£1.25 m)	Enhanced Kidderminster bus network, including ongoing revenue costs of infrastructure and services (£1.25 m)
	Improved Kidderminster walking and cycling routes (£62 k)*	Improved Kidderminster walking and cycling routes (£62 k)*	Improved Kidderminster walking and cycling routes (£62 k)*	Improved Kidderminster walking and cycling routes (£62 k)*
Sub Total	**£5.68 m**	**£0.18 m**	**£0.18 m**	**£0.18 m**
Stourport on Severn	Stourport Relief Road (£2 m contribution)			
	Hoobrook Link Road (£2 m contribution) ǂ			
	Enhanced Stourport bus network, including ongoing revenue costs of infrastructure and services (£1.25 m)	Enhanced Stourport bus network, including ongoing revenue costs of infrastructure and services (£1.25 m)	Enhanced Stourport bus network, including ongoing revenue costs of infrastructure and services (£1.25 m)	Enhanced Stourport bus network, including ongoing revenue costs of infrastructure and services (£1.25 m)
	Improved Stourport walking and cycling links (£62 k)*	Improved Stourport walking and cycling links (£62 k)*	Improved Stourport walking and cycling links (£62 k)*	Improved Stourport walking and cycling links (£62 k)*
Sub Total	**£1.18 m**	**£0.18 m**	**£0.18 m**	**£0.18 m**
County Wide Costs	**£133.684 m**	**£77.684 m**	**£156.184**	**£25.184 m**

* Generic cost
ǂ Infrastructure would be required although costs covered under another settlement's proposals.
‡ Would be beneficial to the proposed housing growth, but not essential.

[#] Will be fundamental to the support of the proposed housing growth. Cost to be informed by Network Rail in the Network Rail's Strategic Plans.

8.3 Table 8.2 presents Social Infrastructure requirements across Worcestershire County for the main settlements and rural areas.

Table 8.2: Social Infrastructure Phasing Framework

Social Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	2011-2016	2016-2021	2021-2026
Worcester			Secondary School at Worcester West £35	
			Primary School at Worcester West £6.5	
			Primary School at Worcester South £6.5	
	Special Education contribution £0.46 m	Special Education contribution £0.46 m	Special Education contribution £0.46 m	Special Education contribution £0.46 m
			Relocation of Fernhill Heath £4.5	
			Health Centre at Worcester West £1.5	
	Community Centre space at Worcester £1.14	Community Centre space at Worcester £1.14	Community Centre space at Worcester £1.14	Community Centre space at Worcester £1.14
	Library provision at Worcester £0.6	Library provision at Worcester £0.6	Library provision at Worcester £0.6	Library provision at Worcester £0.6
	Off site open space at Worcester £3.55	Off site open space at Worcester £3.55		
		Open space maintenance at Worcester £5.83	Open space maintenance at Worcester £5.83	Open space maintenance at Worcester £5.83

Social Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	2011-2016	2016-2021	2021-2026
				Swimming pool at Worcester £2.5
				Sports Hall at Worcester £3
			Police Station at Worcester West £4	
			2 x Neighbourhood police posts at Worcester £0.5	
			Fire Station at Worcester West £1	
			Ambulance Station at Worcester £TBC	
			Refuse collection vehicle at Worcester £0.3	
			Recycling collection vehicle £0.18	
	Kerbside recycling sets £0.13	Kerbside recycling sets £0.13	Kerbside recycling sets £0.13	Kerbside recycling sets £0.13
				Household waste recycling centre £3
	£5.88 m	**£11.71 m**	**£61.14 m**	**£16.66 m**
Malvern			Primary School at Malvern North £6.5	
			Primary School at Malvern Vale £1.3	
	Special Education contribution £0.15	Special Education contribution £0.15	Special Education contribution £0.15	Special Education contribution £0.15

Social Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	2011-2016	2016-2021	2021-2026
			Community Centre Space at extensions £0.65	Community Centre Space at extensions £0.65
			Library provision at extensions £0.38	Library provision at extensions £0.38
	Off site open space at Malvern £3.12	Off site open space at Malvern £3.13		
		Open space maintenance at Malvern £1.78	Open space maintenance at Malvern £1.78	Open space maintenance at Malvern £1.78
			Fire Engine £0.22	
			2 x Neighbourhood police posts £0.5	
			Ambulance Station and Equipment £TBC	
	Kerbside recycling sets £0.04	Kerbside recycling sets £0.04	Kerbside recycling sets £0.04	Kerbside recycling sets £0.05
	£3.31 m	**£5.1 m**	**£11.52 m**	**£3.02 m**
Evesham		Relocation of Bengeworth First School £3		
			Extensions of St Andrews CE First School £3	
			New First School £6.5	
	Special Education contribution £0.16	Special Education contribution £0.16	Special Education contribution £0.16	Special Education contribution £0.16
	Community Centre Space at Evesham £0.32	Community Centre Space at Evesham £0.32	Community Centre Space at Evesham £0.33	Community Centre Space at Evesham £0.33

Social Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	**2011-2016**	**2016-2021**	**2021-2026**
	Library provision at Evesham £0.2	Library provision at Evesham £0.2	Library provision at Evesham £0.2	Library provision at Evesham £0.2
	Off site open space at Evesham £1.21	Off site open space at Evesham £1.21		
		Open space maintenance £1.78	Open space maintenance £1.78	Open space maintenance £1.79
			Fire Station Improvements £0.35	
			2 x Neighbourhood police posts £0.5	
			Ambulance Equipment £TBC	
	Kerbside recycling sets £0.04	Kerbside recycling sets £0.04	Kerbside recycling sets £0.04	Kerbside recycling sets £0.05
	£1.93 m	**£6.7 m**	**£12.85 m**	**£2.53 m**
Droitwich Spa	Special Education contribution £0.11	Special Education contribution £0.11	Special Education contribution £0.11	Special Education contribution £0.11
	Community Centre space at Droitwich Spa £0.25	Community Centre space at Droitwich Spa £0.25	Community Centre space at Droitwich Spa £0.25	Community Centre space at Droitwich Spa £0.25
	Library provision at Droitwich Spa £0.14	Library provision at Droitwich Spa £0.14	Library provision at Droitwich Spa £0.14	Library provision at Droitwich Spa £0.14
	Off site open space £0.39	Off site open space £0.39		
		Open space maintenance £1.24	Open space maintenance £1.25	Open space maintenance £1.25
			Fire Engine £0.22	
			Police Station £4	

Social Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	2011-2016	2016-2021	2021-2026
			Ambulance Station and Equipment £TBC	
	Kerbside recycling sets £0.03	Kerbside recycling sets £0.03	Kerbside recycling sets £0.03	Kerbside recycling sets £0.04
	£0.92 m	**£2.16 m**	**£6 m**	**£1.79 m**
Pershore	Special Education contribution £0.06	Special Education contribution £0.06	Special Education contribution £0.06	Special Education contribution £58 k
	Community Centre Space at Pershore Spa £0.14	Community Centre Space at Pershore Spa £0.14	Community Centre Space at Pershore Spa £0.14	Community Centre Space at Pershore Spa £0.14
	Library Provision at Pershore Spa £0.07	Library Provision at Pershore Spa £0.07	Library Provision at Pershore Spa £0.08	Library Provision at Pershore Spa £0.08
	Off site open space at Droitwich Spa £0.29	Off site open space at Droitwich Spa £0.29		
		Open Space maintenance £0.66	Open Space maintenance £0.66	Open Space maintenance £0.67
			Fire Engine £0.22	
			Neighbourhood Police post £0.25	
			Ambulance Station and equipment £TBC	
	Kerbside recycling sets £0.01	Kerbside recycling sets £0.01	Kerbside recycling sets £0.02	Kerbside recycling sets £0.02
	£0.57 m	**£1.23 m**	**£1.43 m**	**£0.97 m**
			Primary School at North, North West Redditch £6.5	Primary School at North, North West Redditch £6.5

Social Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	**2011-2016**	**2016-2021**	**2021-2026**
	Special Education contribution £0.28 m	Special Education contribution £0.28 m	Special Education contribution £0.28 m	Special Education contribution £0.28 m
			Health Centre at North, North West Redditch £2.5	
	Community Centre space £0.7	Community Centre space £0.7	Community Centre space £0.7 m	Community Centre space £0.7 m
	Library provision £0.4	Library provision £0.4	Library provision £0.4	Library provision £0.4
	Off site Open Space £5	Off site Open Space £5		
		Open Space maintenance £7.36	Open Space maintenance £7.36	Open Space maintenance £7.37
			Fire Engine £0.22	
			Police Station £4	
			Ambulance station and Equipment £TBC	
			Refuse collection vehicle £0.3	
			Recycling collection vehicle £0.18	
	Kerbside Recycling sets £0.08	Kerbside Recycling sets £0.08	Kerbside Recycling sets £0.08	Kerbside Recycling sets £0.09
	£6.46 m	**£13.82 m**	**£22.52 m**	**£15.34 m**
	Special Education contribution £0.07	Special Education contribution £0.07	Special Education contribution £0.07	Special Education contribution £0.07
	Community Centre Space £0.16	Community Centre Space £0.16	Community Centre Space £0.16	Community Centre Space £0.17

Social Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	2011-2016	2016-2021	2021-2026
	Library Provision £0.09	Library Provision £0.09	Library Provision £0.09	Library Provision £0.09
	Off site open space £0.35	Off site open space £0.36		
		Open space Maintenance £0.53	Open space Maintenance £0.53	Open space Maintenance £0.54
			Fire Engine £0.22	
			Ambulance Station and Equipment £TBC	
	Kerbside Recycling sets £0.02	Kerbside Recycling sets £0.02	Kerbside Recycling sets £0.02	Kerbside Recycling sets £0.02
	£0.69 m	**£1.23 m**	**£1.09 m**	**£0.89 m**
Kidderminster	Special Education contribution £0.08	Special Education contribution £0.08	Special Education contribution £0.08	Special Education contribution £0.08
	Community Centre Space £0.2	Community Centre Space £0.2	Community Centre Space £0.2	Community Centre Space £0.2
	Library Provision £0.11	Library Provision £0.11	Library Provision £0.11	Library Provision £0.11
	Off site Open space £2.3	Off site Open space £2.3		
		Open space maintenance £1.17	Open space maintenance £1.17	Open space maintenance £1.17
			Fire Engine £0.22	
			Ambulance Station and equipment £TBC	
			Household Waste Recycling Centre £3m	

Social Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	2011-2016	2016-2021	2021-2026
	Kerbside recycling sets £0.02	Kerbside recycling sets £0.02	Kerbside recycling sets £0.02	Kerbside recycling sets £0.02
	£2.71 m	**£3.89 m**	**£3.8 m**	**£1.59 m**
Stourport on Severn	Special Education contribution £0.05	Special Education contribution £0.05	Special Education contribution £0.05	Special Education contribution £0.05
	Community Centre Space £0.2	Community Centre Space £0.2	Community Centre Space £0.2	Community Centre Space £0.2
	Library Provision £0.11	Library Provision £0.11	Library Provision £0.11	Library Provision £0.11
	Off site open space £1.35	Off site open space £1.35		
		Open space maintenance £1.17	Open space maintenance £1.17	Open space maintenance £1.17
			Fire Engine £0.22	
			Ambulance Station and equipment £TBC	
	Kerbside recycling sets £0.01	Kerbside recycling sets £0.01	Kerbside recycling sets £0.01	Kerbside recycling sets £0.02
	£1.71 m	**£2.88 m**	**£1.76 m**	**£1.55 m**
Cumulative Impact				Swimming pool at Worcester £2.5
				Sports Hall at Worcester £3
				Swimming pool at North Worcestershire £2.5
				Sports Hall at North Worcestershire £3

Social Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	2011-2016	2016-2021	2021-2026
	£0 m	£0 m	£0 m	£11 m
Malvern Hills Category 1 and 2 Villages	Special Education contribution £0.07	Special Education contribution £0.07	Special Education contribution £0.07	Special Education contribution £0.07
	Community Centre Space £0.17	Community Centre Space £0.17	Community Centre Space £0.17	Community Centre Space £0.17
	Library Provision £0.09	Library Provision £0.09	Library Provision £0.09	Library Provision £0.09
	Off site open space £2.1	Off site open space £2.1	Off site open space £2.1	Off site open space £2.1
		Open space Maintenance £2.1	Open space Maintenance £2.1	Open space Maintenance £2.1
	Kerbside recycling sets £0.02	Kerbside recycling sets £0.02	Kerbside recycling sets £0.02	Kerbside recycling sets £0.02
	£2.45 m	£4.55 m	£4.55 m	£4.55 m
Wychavon Category 1 and 2 Village	Special Education contribution £0.08	Special Education contribution £0.08	Special Education contribution £0.08	Special Education contribution £0.08
	Community Centre Space £0.2	Community Centre Space £0.2	Community Centre Space £0.2	Community Centre Space £0.2
	Library Provision £0.1	Library Provision £0.1	Library Provision £0.1	Library Provision £0.1
	Off site open space £1	Off site open space £1	Off site open space £1	Off site open space £1
		Open space Maintenance £1	Open space Maintenance £1	Open space Maintenance £1
	Kerbside recycling sets £0.02	Kerbside recycling sets £0.02	Kerbside recycling sets £0.02	Kerbside recycling sets £0.02
	£1.4 m	£2.4 m	£2.4 m	£2.4 m

Social Infrastructure Requirements from all new development between 2006 – 2026 (millions)				
	2006-2011	2011-2016	2016-2021	2021-2026
Bromsgrove: Other Settlements and Rural Area	Special Education contribution £0.03	Special Education contribution £0.03	Special Education contribution £0.03	Special Education contribution £0.03
	Community Centre Space £0.07	Community Centre Space £0.07	Community Centre Space £0.07	Community Centre Space £0.07
	Library Provision £0.03	Library Provision £0.03	Library Provision £0.03	Library Provision £0.03
	Off site open space £0.2	Off site open space £0.2	Off site open space £0.2	Off site open space £0.2
		Open space Maintenance £0.2	Open space Maintenance £0.2	Open space Maintenance £0.2
	Kerbside recycling sets £0.007	Kerbside recycling sets £0.007	Kerbside recycling sets £0.007	Kerbside recycling sets £0.007
	£0.33 m	**£0.53 m**	**£0.53 m**	**£0.53 m**
Wyre Foreset: Bewdley and Rural Areas	Special Education contribution £0.02	Special Education contribution £0.02	Special Education contribution £0.02	Special Education contribution £0.02
	Off site open space £0.25	Off site open space £0.25	Off site open space £0.25	Off site open space £0.25
		Open space Maintenance £0.025	Open space Maintenance £0.025	Open space Maintenance £0.025
	Kerbside recycling sets £0.005	Kerbside recycling sets £0.005	Kerbside recycling sets £0.005	Kerbside recycling sets £0.005
	£0.27 m	**£0.3 m**	**£0.3 m**	**£0.3 m**
County Wide Costs	**£28.63**	**£56.6 m**	**£129.89 m**	**£63.12 m**

Note: Rounded to the nearest ten thousand, Framework does not include the expected provision on site of open space and religious facilities which will have some land costs

8.4 Table 8.3 and 8.4 below set out summary tables of the Infrastructure Phasing Frameworks:

Table 8.3: Transport Infrastructure Summary Table

Infrastructure Requirements from all new development between 2006 – 2026 £ (millions)					
Settlement	**2006-2011**	**2011-2016**	**2016-2021**	**2021-2026**	**2006-2026**
Worcester	3.50	110.50	90.50	21.00	225.50
Malvern	3.86	3.86	4.86	2.56	15.15
Evesham	13.56	2.56	4.56	2.56	23.25
Droitwich	26.06	0.56	30.56	0.56	57.75
Pershore	2.06	2.06	1.56	1.56	7.25
Redditch	3.00	23.00	43.00	23.00	92.00
Bromsgrove	18.31	31.31	31.31	1.31	82.25
Kidderminster	8.81	1.31	1.31	1.31	12.75
Stourport-on-Severn	3.31	1.31	1.31	1.31	7.25
TOTAL	**£82.48 m**	**£176.48 m**	**£208.48 m**	**£55.81 m**	**£523.14 m**
Secured Funding	**£11.09 m**	**£7.21 m**	**£4.71 m**	**£2.71 m**	**£25.72 m**

8.5 Table 8.3 illustrates that the total cost of Transport infrastructure required to support future development levels is £523.14 million. The desired phasing trajectory for this infrastructure highlights that the greatest cost demand for infrastructure are the periods 2006 to 2011 and 2016 to 2021.

Table 8.4: Social Infrastructure Summary Table

Infrastructure Requirements from all new development between 2006 – 2026 £ (millions)					
Settlement	**2006-2011**	**2011-2016**	**2016-2021**	**2021-2026**	**2006-2026**
Worcester	5.88	11.71	61.14	16.66	95.39
Malvern	3.31	5.1	11.52	3.02	22.95
Evesham	1.93	6.7	12.85	2.53	24.01
Droitwich	0.92	2.16	6	1.79	10.87
Pershore	0.57	1.23	1.43	0.97	4.2
Redditch	6.46	13.82	22.52	15.34	58.14
Bromsgrove	0.69	1.23	1.09	0.89	3.9
Kidderminster	2.71	3.89	3.8	1.59	11.99
Stourport-on-Severn	1.71	2.88	1.76	1.55	7.9
Cumulative Impacts	0	0	0.5	11.6	12.1
Malvern Hill: Category 1 and 2 Villages	2.45	4.55	4.55	4.55	16.1
Wychavon Category 1 and 2 Villages	1.4	2.4	2.4	2.4	8.6
Bromsgrove: Other Settlements and Rural Areas	0.33	0.53	0.53	0.53	1.92
Wyre Forest: Bewdley and Rural Areas	0.27	0.3	0.3	0.3	1.17
TOTAL	**£28.63 m**	**£56.5 m**	**£130.39 m**	**£63.72 m**	**£279.24 m**
Secured Funding	**£0**	**£0**	**£0**	**£0**	**£0**

8.6 Table 7.4 illustrates that the total cost of social infrastructure required to support future development levels is £279.24 million. The desired phasing trajectory for this infrastructure creates the highest

cots demand in the period 2016 to 2021. Overall the total Infrastructure cost taking into consideration identified secured funding is £802.38 million.

8.7 Section 7 identified current secured funding was £25.73 m and funding bids totaling approximately £172.86 million could potentially be available towards transport infrastructure. Assuming that over the 2009 to 2026 period this level of public funding could be secured this could potentially reduce the funding shortfall further to £603.79 million.

8.8 Section 6 also provided an assessment of development viability and potential developer contribution which might be securable from new development with the introduction of a planning tariff approach to S106. A total of £451.94 million was considered a realistic level of funding assuming the market returns to similar levels before the economic downturn. This level of funding could potentially reduce the funding shortfall to £151.85 million

8.9 Table 8.5 below sets out the overall funding trajectory for Worcestershire County.

Table 8.5: Overall Funding Trajectory

Infrastructure Funding Trajectory 2006 – 2026 £ (millions)					
	2006-2011	2011-2016	2016-2021	2021-2026	2006-2026
Transport Infrastructure	£82.48	£176.48	£208.48	£55.81	£523.14
Social Infrastructure	£28.63	£56.50	£130.39	£63.72	£279.24
Total Infrastructure Cost	£111.11	£232.98	£338.37	£118.93	£802.38
Secured Funding	£11.09	£7.21	£4.71	£2.71	£25.73
Funding Bids	£28.89	£77.83	£49.83	£16.33	£172.86
Developer Contributions	£5.07	£51.31	£191.03	£204.52	£451.94
Trajectory Shortfall	-£66.06	-£96.63	-£93.30	£104.03	-£151.85

8.10 Table 8.5 shows that there are potential funding shortfalls for the first three time periods 2006-2011, 2011-2016 and 2016-2021. Balancing this is a funding surplus of £104.03 million in the 2021-2026 period. Overall there is a funding shortfall of £151.85 million, but the funding trajectory issue is also a significant constraint to the delivery of future sustainable development.

District Summary Tables

8.11 Table 8.6 to 8.11 summarise the overall funding trajectories for the nine main settlements and four rural areas by District. The first is Worcester City:

Table 8.6: Worcester City Funding Trajectory

Infrastructure Funding Trajectory 2006 – 2026 £ (millions)					
	2006-2011	2011-2016	2016-2021	2021-2026	2006-2026
Worcester	£9.38	£122.21	£151.64	£37.66	£320.89
Secured Funding	£0.21	£7.21	£4.71	£2.71	£14.85
Funding Bids	£2.50	£74.75	£36.50	£13.25	£127
Developer Contributions	£1.28	£16.32	£67.20	£61.10	£135.90
Trajectory Shortfall	-£5.39	-£23.93	-£43.23	£39.40	-£43.14

8.12 Table 8.6 Shows that Worcester potentially has funding deficit and also has trajectory problem with deficiencies in three time bands. It must be noted that Worcester is heavily reliant on the outcome of public funding bids.

Table 8.7: Wychavon Funding Trajectory

Infrastructure Funding Trajectory 2006 – 2026 £ (millions)					
	2006-2011	2011-2016	2016-2021	2021-2026	2006-2026
Evesham	15.49	9.26	17.41	5.09	47.26
Droitwich Spa	26.98	2.72	36.56	2.35	68.62
Pershore	2.63	3.29	2.99	2.53	11.45
Wychavon Rural	1.4	2.4	2.4	2.4	8.6
Wychavon Total	46.5	17.67	59.36	12.37	135.93
Secured Funding	£0	£0	£0	£0	£0
Funding Bids	£8.50	£0	£0	£0	£8.50
Developer Contributions	£1.02	£11.36	£51.48	£54.99	£118.86
Trajectory Shortfall	-£36.98	-£6.31	-£7.88	£42.62	-£8.57

8.13 Table 8.7 shows that Wychavon potentially has a funding deficit and has a trajectory problem with deficiencies in three time bands.

Table 8.8: Malvern Funding Trajectory

Infrastructure Funding Trajectory 2006 – 2026 £ (millions)					
	2006-2011	2011-2016	2016-2021	2021-2026	2006-2026
Malvern	7.17	8.96	16.38	5.58	38.1
Malvern Rural	2.45	4.55	4.55	4.55	16.1
Malvern Total	9.62	13.51	20.93	10.13	54.2
Secured Funding	£0	£0	£0	£0	£0
Funding Bids	£0	£0	£0	£0	£0
Developer Contributions	£0.84	£8.47	£21.56	£22.56	£52.99
Trajectory Shortfall	-£8.78	-£5.04	£0.63	£12.43	-£1.21

8.14 Table 8.8 shows that Malvern potentially has surplus funding due to potential developer contributions, but has a trajectory problem with deficiencies in two time bands.

Table 8.9: Redditch Funding Trajectory

Infrastructure Funding Trajectory 2006 – 2026 £ (millions)					
	2006-2011	2011-2016	2016-2021	2021-2026	2006-2026
Redditch	9.46	36.82	65.52	38.34	150.14
Secured Funding	£0	£0	£0	£0	£0
Funding Bids	£3.08	£3.08	£13.33	£3.08	£22.25
Developer Contributions	£0.89	£6.95	£38.34	£40.95	£87.15
Trajectory Shortfall	-£5.49	-£26.79	-£13.85	£5.69	-£40.74

8.15 Table 8.9 shows that Redditch has and overall deficiency in funding with particularly trajectory

problems in the first 15 years.

Table 8.10: Bromsgrove Funding Trajectory

Infrastructure Funding Trajectory 2006 – 2026 £ (millions)					
	2006-2011	2011-2016	2016-2021	2021-2026	2006-2026
Bromsgrove	19	32.54	32.4	2.2	86.15
Bromsgrove Rural	0.33	0.53	0.53	0.53	1.92
Bromsgrove Total	19.33	33.07	32.93	2.73	88.07
Secured Funding	£8.50	£0	£0	£0	£8.50
Funding Bids	£8.50	£0	£0	£0	£8.50
Developer Contributions	£0.26	£2.75	£11.44	£12.22	£26.67
Trajectory Shortfall	-£2.07	-£30.32	-£21.49	£9.49	-£44.40

8.16 Table 8.10 shows that Bromsgrove has and overall deficiency in funding with particularly trajectory problems in the first 15 years.

Table 8.11: Wyre Forest Funding Trajectory

Infrastructure Funding Trajectory 2006 – 2026 £ (millions)					
	2006-2011	2011-2016	2016-2021	2021-2026	2006-2026
Kidderminster	11.52	5.2	5.11	2.9	24.74
Stourport on Severn	5.02	4.19	3.07	2.86	15.15
Wyre Forest Rural	0.27	0.3	0.3	0.3	1.17
Wyre Forest Total	16.81	9.69	8.48	6.06	41.06
Secured Funding	£2.38	£0	£0	£0	£2.38
Funding Bids	£6.31	£0	£0	£0	£6.31
Developer Contributions	£0.63	£5.46	£11.46	£12.70	£30.26
Trajectory Shortfall	-£7.49	-£4.23	£2.98	£6.64	-£2.11

8.17 Table 8.11 shows that Wyre Forest potentially has funding deficit and has a trajectory problem with deficiencies in two time bands.

Regionally Significant Infrastructure

8.18 It is important that consideration is given to the significance of infrastructure. Baker Associates conclude that all infrastructure in Worcestershire identified by this study is important. The study process as acted as the first sieve to remove infrastructure requirement that were not truly essential. To help identify regional significant Infrastructure we have considered infrastructure in terms of the following hierarchy:

- Strategic infrastructure to facilitate development within the High Tech Growth Corridor and Growth Pint of Worcester.
- Strategic Infrastructure that facilitates the development at more than one settlement, e.g. strategic transport and sub regional provision.
- Community infrastructure requirements identified in the study

8.19 Strategic is seen as integral to the regional and sub regional spatial strategies, with its provision necessarily integrated with the implementation of strategic development, and where there is a

significant funding requirement from public funds. Community infrastructure essentially is infrastructure which is delivered with new development to create sustainable communities. Table 8.12 overleaf sets out strategic infrastructure requirements, their costs, available funding and delivery agency along with the required phasing:

Table 8.12 Strategic Infrastructure Requirements

Theme	Scheme	Outcome/ Impact	Proposing Agency	Delivery Agency	Cost	Funding Source	2006-2011	2011-2016	2016-2021	2021-2026
Public Transport	Enhanced infrastructure at Worcester Foregate Street station	Improves rail access to employment opportunities in Worcester and the wider area.	Worcestershire County Council	Worcestershire County Council	£1.5 m	RFA / Developers / CIF / NGP / IT Block		■		
	Rail halt at Rushwick, (Worcester)	Provide links to Worcester employment areas, the University & the city centre.	Worcestershire County Council	Network Rail	£2 m*				■	
	Double Track the Cotswold Line between Norton Junction and Pershore	Increase rail capacity Worcester & Pershore.	Worcestershire County Council	Network Rail	Considered beneficial but not essential so no cost included ‡			■		
	Network of Park & Ride interchange hubs & associated BRT network (Worcester)	Provides sustainable transport links between Worcester housing areas & city centre.	Worcestershire County Council	Worcestershire County Council	£70 m	RFA / Developers / CIF / NGP / IT Block		■	■	■
	Worcester City Centre Cycle and Pedestrian route improvements	Creates & improves walk/cycle links between housing & city centre.	Worcestershire County Council	Worcestershire County Council	£14 m	RFA / Developers / CIF / NGP / IT Block	■	■	■	■
	Pedestrian/Cycle Bridge over Southern Link Road	Creates walk/cycle link between Worcester housing & city centre.	Worcestershire County Council	Worcestershire County Council	£2 m*	RFA / Developers / CIF / NGP / IT Block			■	
	Improved Parking Provision at Evesham Railway Station	Encourages rail commuting between Evesham, Worcester & South East.	Worcestershire County Council	Worcestershire County Council	£0.5 m*		■			
	Increase frequency of trains from Evesham	Encourages rail commuting between Evesham, Worcester & South East.	Worcestershire County Council	Network Rail	Considered beneficial but not essential so no cost included		■	■	■	■
	Enhanced Bus network for Evesham	Creates & improves sustainable transport links between Evesham, Pershore & Worcester.	Worcestershire County Council	Worcestershire County Council	£10 m		■			
	Enhanced walk/cycle routes (Evesham)	Creates & improves walk/cycle links between housing & Evesham town centre.	Worcestershire County Council	Worcestershire County Council	£0.25 m*		■	■	■	■
	New pedestrian/cycle bridge to Hampton (Evesham)	Creates walk/cycle link between housing at Hampton & city centre.	Worcestershire County Council	Worcestershire County Council	£2 m*				■	
	Improved Parking Provision at Pershore Railway Station	Encourages rail commuting between Pershore, Worcester & Evesham.	Worcestershire County Council	Worcestershire County Council	£0.5 m*		■			
	Enhanced bus network (Pershore)	Creates & improves sustainable transport links between Pershore, Evesham & Worcester.	Worcestershire County Council	Worcestershire County Council	£5 m		■	■	■	■
	Enhanced walk/cycle routes (Pershore)	Creates & improves walk/cycle links between housing, rail station & Pershore town centre.	Worcestershire County Council	Worcestershire County Council	£0.25 m*		■	■	■	■
	Stoke Works Track Doubling (Droitwich Spa)	Improves rail links between Worcester and the North.	Network Rail	Network Rail	£25 m		■			
	Improved parking provision at Droitwich Spa railway station	Encourages rail commuting between Droitwich, Worcester & the conurbation.	Worcestershire County Council	Worcestershire County Council	£0.5 m*		■			
	Improved bus services (Droitwich Spa)	Creates & improves sustainable transport links between housing & Droitwich town centre.	Worcestershire County Council	Worcestershire County Council	£2 m		■	■	■	■
	Improvements to Walking and Cycling Network (Droitwich Spa)	Creates & improves walk/cycle links between housing & Droitwich town centre.	Worcestershire County Council	Worcestershire County Council	£0.25 m*		■	■	■	■
	Malvern Station Improvements (part of WTS)	Improves sustainable transport links between Malvern & Worcester.	Worcestershire County Council	Worcestershire County Council	£4 m	RFA / Developers / CIF / NGP / IT Block	■	■	■	
							■	■	■	■

	Enhanced bus network (Malvern)	Creates sustainable transport link between housing, railway stations & town centre.	Worcestershire County Council	Worcestershire County Council	£10m		■	■	■	■
	Improvements to Malvern Walking and Cycling Network	Creates & improves walk/cycle links between housing & Malvern town centre.	Worcestershire County Council	Worcestershire County Council	£0.25 m*		■	■	■	■
	Increased Service Frequency on Cross City Line and Infrastructure enhancements on the Barnt Green - Redditch Branch	Improves rail services between Redditch & Birmingham.	Network Rail	Network Rail	To be undertaken by Network Rail‡‡		■			
	Redditch North station	Creates rail link between housing, Redditch town centre & Birmingham.	Worcestershire County Council	Network Rail	£10 m				■	
	Enhanced Redditch Bus Network to serve urban extensions	Creates & improves sustainable transport links between housing & Redditch town centre.	Worcestershire County Council	Worcestershire County Council	£10 m	RFA / Developers / IT Block	■	■	■	■
	Improvements to Redditch walking and Cycling network	Creates & improves walk/cycle links between housing & Redditch town centre.	Worcestershire County Council	Worcestershire County Council	£2 m*	RFA / Developers / IT Block	■	■	■	■
	Bromsgrove Station Improvement package (multimodal interchange)	Improves sustainable travel to/from Bromsgrove.	Network Rail, Worcestershire County Council	Network Rail Worcestershire County Council	£17 m	NR / TOC / RFA / Developers / IT Block	■			
	Bromsgrove bus network town centre improvements	Creates & improves sustainable transport links between housing & Bromsgrove town centre.	Worcestershire County Council	Worcestershire County Council	£5 m		■	■	■	■
	Improve Bromsgrove walking and cycling links	Creates & improves walk/cycle links between housing & Bromsgrove town centre.	Worcestershire County Council	Worcestershire County Council	£0.25 m*		■	■	■	■
	Extension of Cross City Line South suburban rail service to Bromsgrove	Improves rail services between Bromsgrove & Birmingham.	Network Rail	Network Rail	To be undertaken by Network Rail‡‡		■			
	Kidderminster Station Improvement Package	Improves sustainable travel to/from Kidderminster.	Network Rail	Network Rail	£5.5 m	NR / TOC / RFA / AWM / Developers / IT Block	■			
	Enhanced Kidderminster Bus Network	Creates & improves sustainable transport links between housing & Kidderminster town centre.	Worcestershire County Council	Worcestershire County Council	£5 m		■	■	■	■
	Improved Kidderminster walking and cycling routes	Creates & improves walk/cycle links between housing & Kidderminster town centre.	Worcestershire County Council	Worcestershire County Council	£0.25 m*		■	■	■	■
	Enhanced Stourport Bus Network	Creates & improves sustainable transport links between housing & Stourport town centre.	Worcestershire County Council	Worcestershire County Council	£5 m		■	■	■	■
	Improved Stourport walking and cycling routes	Creates & improves walk/cycle links between housing & Stourport town centre.	Worcestershire County Council	Worcestershire County Council	£0.25 m*		■	■	■	■
Road	Worcestershire Highway improvements, including dualling of the Southern Link Road (Worcester)	Increases highway capacity to sustain Worcester housing growth.	Worcestershire County Council	Worcestershire County Council	£66 m	RFA / CIF / NGP / IT Block / Developers (S106)		■		
	New city centre river crossing	Increases highway capacity for access to/from Worcester.	Worcestershire County Council	Worcestershire County Council	£31 m	RFA / CIF / NGP / IT Block / Developers (S106)			■	
	Intelligent Transport Systems (ITS)	To better inform travellers and to maximise confidence and capacity for the sustainable transport network.	Worcestershire County Council	Worcestershire County Council	£9 m	RFA / CIF / NGP / IT Block / Developers (S106)		■	■	
	Improvements to M5 Junction 6 (Worcester)	Increases highway capacity for access to/from Worcester & Evesham.	Worcestershire County Council and Highways Agency	Highways Agency	£30 m*				■	
	Evesham Bridge & Viaduct Replacement	Supports delivery of housing growth and critically retains accessibility to Evesham town centre.	Worcestershire County Council	Worcestershire County Council	£9.5 m			■	■	
	Improvements to localised junctions on the A46 (Evesham)	Increases highway capacity for access to/from Evesham.	Worcestershire County Council and Highways Agency	Worcestershire County Council	£1 m*		■			
Road	Improvements to Pinvin Crossroads (Pershore)	Increases highway capacity for access to/from Pershore.	Worcestershire County Council	Worcestershire County Council	£0.5 m*			■		

	Improvements to M5 Junction 5 (Droitwich Spa)	Increases highway capacity for access to/from Droitwich & Bromsgrove.	Worcestershire County Council and Highways Agency	Highways Agency	£30 m*				■	
	Extensions to Townsend Way (Malvern)	Creates link between housing & strategic highway network.	Worcestershire County Council	Worcestershire County Council	£1m*				■	
	Improvements to M42 Junctions 2 and 3 (Redditch)	Increases highway capacity for access to/from Redditch.	Worcestershire County Council and Highways Agency	Highways Agency	£60 m*			■	■	■
	Bordesley Bypass (Redditch)	Creates highway link between housing & strategic highway network.	Worcestershire County Council	Worcestershire County Council	£10 m	RFA / Developers / IT Block			■	
	Improvements to M5 junction 4 and M42 Junction 1	Increases highway capacity for access to/from Bromsgrove.	Worcestershire County Council and Highways Agency	Highways Agency	£60 m*			■	■	
	Stourport Relief Road	Increases highway capacity for access to/from Stourport.	Worcestershire County Council	Worcestershire County Council	£2 m contribution	RFA / AWM / Developers / IT Block	■			
	Hoobrook Link Road	Creates highway link between the Stourport Road Employment Corridor & the strategic highway network.	Worcestershire County Council	Worcestershire County Council	£2 m contribution	RFA / AWM / Developers / IT Block	■			
Water Supply and Treatment	New river intake and Water Treatment Works at Ombersley, near Worcester	Increases Water Supply and treatment for the Severn Water Resource Zone	Severn Trent	Severn Trent		Severn Trent AMP			■	■
	Increasing the Capacity of the Derwent Valley Aqueduct	Increases Water Supply for the Severn Water Resource Zone	Severn Trent	Severn Trent		Severn Trent AMP	■			
	Granular Activitated Carbon Treatment, (Frankley)	Improves water supply resilience, treatment and storage capacity	Severn Trent	Severn Trent		Severn Trent AMP		■		
Education	New Secondary School at Worcester West	Creates Sustainable communities and meets statutory duty to ensure adequate school place provision	Worcestershire County Council	Worcestershire County Council	£35 m				■	
	New Primary School at Worcester West	Creates Sustainable communities and meets statutory duty to ensure adequate school place provision	Worcestershire County Council	Worcestershire County Council	£6.5 m				■	
	New Primary School at Worcester South	Creates Sustainable communities and meets statutory duty to ensure adequate school place provision	Worcestershire County Council	Worcestershire County Council	£6.5 m				■	
	New Primary School at Malvern North	Creates Sustainable communities and meets statutory duty to ensure adequate school place provision	Worcestershire County Council	Worcestershire County Council	£6.5 m			■	■	
	Primary School at Malvern Vale	Creates Sustainable communities and meets statutory duty to ensure adequate school place provision	Worcestershire County Council	Worcestershire County Council	£1.3 m				■	
	Relocation of Bengeworth First School (Evesham)	Creates Sustainable communities and meets statutory duty to ensure adequate school place provision	Worcestershire County Council	Worcestershire County Council	£3 m			■		
	Extension of St Andrews CE First School (Evesham)	Creates Sustainable communities and meets statutory duty to ensure adequate school place provision	Worcestershire County Council	Worcestershire County Council	£3 m				■	
	New First School (Evesham)	Creates Sustainable communities and meets statutory duty to ensure adequate school place provision	Worcestershire County Council	Worcestershire County Council	£6.5 m				■	
	2 x Primary School at North, North West Redditch	Creates Sustainable communities and meets statutory duty to ensure adequate school place provision	Worcestershire County Council	Worcestershire County Council	£13 m				■	■
Green Infrastructure	New Leisure complex, including Sports hall and Swimming Pool (Worcester)	Support development across Worcester and address increase leisure demand	Worcestershire County Council	Worcestershire County Council, Worcester City Council	£5.5 m					■
	Leisure Centre at North, North West Redditch	Support development within the urban extension and address increase leisure demand	Worcestershire County Council	Worcestershire County Council	£3 m					■

	North and South Worcestershire strategic leisure provision, including two facilities with swimming pools and sports hall/gum etc	To address the cumulative impact of development within rural areas and settlements and meet the demand for increase leisure provision.	Worcestershire County Council	Worcestershire County Council	£12 m					
	Habitat mitigation to address the County wide effect of new development on the natural environment	To address the cumulative impact of development within rural areas and settlements on the natural environment	Worcestershire County Council	Worcestershire County Council	£1.1 m					
Social Infrastructure	Extension to Police Custody Unit (Worcester)	To address the increased level of emergency incidents, resulting from new development	West Mercia Constabulary	West Mercia Constabulary	£2 m	Developer Contributions via S106 or CIL				
	Police Section Station at Worcester West	To address the increased level of emergency incidents resulting from new development	West Mercia Constabulary	West Mercia Constabulary	£4 m	Developer Contributions via S106 or CIL				
	2 x Neighbourhood policing posts (Worcester)	To address the increased level of emergency incidents resulting from new development	West Mercia Constabulary	West Mercia Constabulary	£0.5 m	Developer Contributions via S106 or CIL				
	Fire Station and Fire Engine at Worcester West	To enable adequate response times and increased levels of emergencies	Hereford and Worcester Fire and Rescue Services	Hereford and Worcester Fire and Rescue Services	£1 m	Developer Contributions via S106 or CIL				
	Ambulance Station at Worcester West, with ambulance and rapid response vehicle	To meet response time targets and increased demand on the Trust	Hereford and Worecester Ambulance Trust	Hereford and Worecester Ambulance Trust	£TBC	Developer Contributions via S106 or CIL				
	2 x Neighbourhood policing posts (Malvern)	To address the increased level of emergency incidents resulting from new development	West Mercia Constabulary	West Mercia Constabulary	£0.5 m	Developer Contributions via S106 or CIL				
	2 x Neighbourhood policing posts (Evesham)	To address the increased level of emergency incidents resulting from new development	West Mercia Constabulary	West Mercia Constabulary	£0.5 m	Developer Contributions via S106 or CIL				
	Police Section Station at Droitwich Spa	To address the increased level of emergency incidents resulting from new development	West Mercia Constabulary	West Mercia Constabulary	£4 m	Developer Contributions via S106 or CIL				
	Ambulance Station, with ambulance and rapid response vehicle (Droitwich Spa)	To meet response time targets and increased demand on the Trust	Hereford and Worecester Ambulance Trust	Hereford and Worecester Ambulance Trust	£TBC	Developer Contributions via S106 or CIL				
	Ambulance Station, with ambulance and rapid response vehicle (Bromsgrove)	To meet response time targets and increased demand on the Trust	Hereford and Worecester Ambulance Trust	Hereford and Worecester Ambulance Trust	£TBC	Developer Contributions via S106 or CIL				
	Police Section Station at Reddtich	To address the increased level of emergency incidents resulting from new development	West Mercia Constabulary	West Mercia Constabulary	£4 m	Developer Contributions via S106 or CIL				
	Neighbourhood Police Post (Pershore)	To address the increased level of emergency incidents resulting from new development	West Mercia Constabulary	West Mercia Constabulary	£0.25 m	Developer Contributions via S106 or CIL				
	Ambulance Station, with ambulance and two rapid response vehicles (Redditch)	To meet response time targets and increased demand on the Trust	Hereford and Worecester Ambulance Trust	Hereford and Worecester Ambulance Trust	£TBC	Developer Contributions via S106 or CIL				
Health	New Health Centre at Worcester West	Improved health facilities to serve large urban extension	Worcestershire PCT	Worcestershire PCT	£2.5 M	Developer Contributions via S106 or CIL				
	New Health Centre at North, North West Redditch	Improved health facilities to serve large urban extension	Worcestershire PCT	Worcestershire PCT	£2.5 m	Developer Contributions via S106 or CIL				
Waste	Additional Household Waste Recycling Centre and Refuse/recycling vehicles (Worcester)	Ensure appropriate facilities to collect household waste	Worcestershire County Council	Worcestershire County Council	£3.5 M	Developer Contributions via S106 or CIL				
	Additional Household Waste Recycling Centre and Refuse/recycling vehicles (Kidderminster)	Ensure appropriate facilities to collect household waste	Worcestershire County Council	Worcestershire County Council	£3.5 M	Developer Contributions via S106 or CIL				
Total					**£514.15 M**					

* Generic cost
‡ Would be beneficial to the proposed housing growth, but not essential.
‡‡ Will be fundamental to the support of the proposed housing growth. Cost to be informed by Network Rail in the Network Rail's Strategic Plans.

8.20 Strategic infrastructure requirements will costs £514.15 million pounds. Baker Associates have made the distinction between strategic and community infrastructure to assist in the prioritisation process, in the face of a funding deficit and trajectory shortfall. Strategic Infrastructure represents 64% of the total Infrastructure costs identified in Table 8.5.

Additional Infrastructure Implications of NLP Options

8.21 Table 8.13 below combines the identified transport and Infrastructure costs in section 6 for the NLP options:

Table 8.13: NLP Funding Trajectory

Infrastructure Funding Trajectory 2006 – 2026 £ (millions)					
	2006-2011	2011-2016	2016-2021	2021-2026	2006-2026
NLP Worcester	£0.13	£0.13	£29.82	£29.82	£59.90
NLP Redditch	£0.13	£0.13	£14.64	£5.32	£20.22
NLP Bromsgrove	£0.13	£0.13	£1.98	£1.98	£4.22
Birmingham Urban Extension	£0.25	£0.25	£17.21	£13.71	£31.42
NLP Malvern Rural	£1.43	£1.43	£1.44	£1.44	£5.74
NLP Wychavon Rural	£1.09	£1.09	£1.10	£1.10	£4.38
NLP Wyre Forest Rural	£0.51	£0.51	£0.52	£0.52	£2.06
NLP Total	£3.7	£3.7	£66.7	£53.9	£127.9
Secured Funding	£0	£3	£0	£0	£3
Funding Bids	£0	£9.50	£0	£0	£0
Developer Contributions	£1.35	£27	£59.40	£63.45	£151.20
Trajectory Shortfall/Surplus	-£2.32	**£35.83**	-£7.31	**£9.56**	**£26.26**

Note: Does not include implications of Middle Quinton Eco Town

8.22 Table 8.13 shows that the NLP development options could potentially be self funding, however the infrastructure requirements from the additional development then Middle Quinton is taken into consideration is unlikely to provide additional funding to address infrastructure requirements to deliver RSS development levels.

9 Recommendations

9.1 Section 9 provides recommendations on the approaches to address the funding shortfall and manage the infrastructure funding trajectory presented in Section 8. It also discusses other influencing factors that could affect infrastructure delivery.

Addressing the funding shortfall?

9.2 Section 8 has identified a total cost of Infrastructure of approximately £802.38 million and a potential shortfall of £151.85 million. However it is important to note at present only £25.75 m of funding has currently been secured. The remaining £776.63 could be reduced through successful funding bids, currently (£172.86 m) is requested through funding bids which have not been agreed and future developer contributions (£451.93 m) will need appropriate mechanisms to secure and should not be banked on event the level of economic uncertainty at present. The addition of the NLP options does not make a positive or negative impact in terms of funding provision and there are therefore no additional funding benefits to recommend additional growth to fund infrastructure.

Secure Increased Levels of Public Funding

9.3 At present limited secured public funding has been identified. There are further public funding streams such as:

- Regional Funding Allocation
- Integrated Transport Block
- Community Infrastructure Fund
- Growth Fund
- Advantage West Midlands
- Transport Innovation Fund
- Sport England Lottery Funding
- Reaching Communities
- Football Foundation
- New Youth Facilities Funding; and
- Local Authority Capital Funding

9.4 It is important that now that infrastructure requirements have been identified public funding avenues are rigorously pursued. Public funding streams will be available over the 2006-2026 period and new rounds of funding and new sources of public funding will become available for assist infrastructure delivery.

Secure and increased Level of Private Funding

9.5 As identified in Section 7, developer contributions could potentially contribute a significant amount of funding toward infrastructure delivery. Even though in the current economic climate, contributions from this source are likely to be nominal, the long term potential is considerable. The slow down should be seen as an opportunity for the County and District Councils to formulate a comprehensive approach to securing developer contributions via S106.

9.6 Baker Associates recommend a planning tariff approach that will maximise contributions but provide a transparent and fair system for the development industry. Given the strategic County wide nature of several infrastructure areas, we recommend that the County Council is well placed to take a lead

role, working with the Districts to ensure a consistent approach to S106 is adopted across the County. The individual authorities should work with the County and ultimately adopt individual Supplementary Planning Document (SPD) to facilitate the collection of S106 contributions. The co-ordination at a County level will allow strategic infrastructure to be provided and allow pooling of funds, which can be ring fences for individual infrastructure types.

Advantage West Midland Funding

9.6 A potential solution to address the funding trajectory is the use of Advantage West Midlands Gap Funding Initiative or Regional Infrastructure Fund (RIF). Nearly £61 million of infrastructure funds for development, comprising £48 million Gap Funding initiative, until 2010, to encourage commercial property developers into the market, and a £13 million Regional Infrastructure Funding programme that will act as a catalyst to lever additional funding into projects that might not otherwise be delivered in current market conditions. Applications to secure funding are based on future repayment. In Worcestershire forward funded Infrastructure could be paid back with developer contribution surpluses in the 2021-2026 period.

9.7 Funding is limited and infrastructure is likely to need to be considered of strategic significance. There is a clear distinction between strategic infrastructure and community infrastructure. The former is seen as something integral to the regional and sub regional spatial strategies, with its provision necessarily integrated with the implementation of strategic development, and where there was a significant funding requirement from public funds. The latter – community infrastructure essentially – is seen as something delivered with new development, including as part of the general uplift in activity as well as identifiable components of strategic development.

9.8 Within Worcestershire major transport schemes are considered of strategic significance, particularly schemes which are required to ensure development delivery in multiple settlements e.g. (Motorway junction improvements) or settlements with relatively large levels of development reliant on particular schemes e.g. Worcester, Dualling the Southern Link Road.

The impact of affordable housing

9.9 Within the residual valuations we have assumed that affordable housing will be provided at 40%. To increase the potential contributions towards infrastructure from development Local Authorities could consider a lower level of provision, especially in the earlier years of delivery when developer contributions are already very low. This approach will help secure infrastructure but will ultimately be a trade off between the objectives of increased affordable housing provision and providing infrastructure requirements.

Code for sustainable homes

9.10 The Code for Sustainable Homes, DCLG (December 2006) is the national standard for sustainable homes. The increase construction cost of meeting the Code for Sustainable homes Level 3 and above will need to be considered if Worcestershire is to improve the carbon emissions and increase the use of renewable energy. Achieving this objective will come at a cost to potential developer contributions. Example of costs of achieving different levels of the Code for Sustainable Homes are set out overleaf:

Table 8.1: Cost of Sustainable Homes

Code level	Carbon Saving (%)	Development scenario	
		Small Scale Rural	Market Town
		Cumulative capital cost (range)	
1	10	£275	£275
2	18	£1,648 - £1,778	£720 - £1,127
3	25	£3,407	£1,000 - £1,566
4	44	£5,500 - £7,458	£1,593 - £2,600
5	100	£8,539 - £18,722	£2,600 - £3,053
6	Zero Carbon	£24,721 - £36,583	£8,685 - £13,065

9.11 Examples of the types of technologies that can be used to achieve these levels will depend on the location and dwelling type. The technology is likely to include energy efficiency measures, improved controls, air tightness and insulation levels, micro wind, photo voltaics, Biomass heating and wind turbines.

9.12 PPS 1 now requires local authorities to set targets for the proportion of the energy supply of new developments to be from renewable energy sources. Merton Council pioneered this approach and have estimated that the costs of achieving a target of 10% of renewable energy on sites over 1000sqm is approximately 3-4% of the overall build costs. By requiring a certain percentage of a building's carbon emissions to be met by renewables, it is clear that these costs will have to be incorporated into the general development costs rather than being identified as a specific infrastructure cost. It is possible to include provisions to offset carbon emissions in a Planning Obligations SPD. Plymouth City Council require all major residential and commercial development to deliver CO2 reductions through the use of appropriate energy efficiency and renewable energy technologies on site. Exceptionally a contribution to the delivery of offsite targets will be required. This is based on a one-off payment of £1,000 per tonne of carbon dioxide and calculated using the difference between the levels of CO2 reduction (beyond the requirements of Building Regulations 2006)

Spatial Priorities and Delayed Infrastructure Phasing

9.13. Financial resources will rarely meet all the identified needs for infrastructure and there will inevitably be a requirement to phase and prioritise projects across an area. As a result, a qualitative framework and a decision-making body will need to be defined to prioritise between geographical areas, categories of infrastructure and individual projects.

9.14 Considerations that could form the basis for prioritisation criteria include:

- Strategic fit with regional, sub regional and local strategies;
- Significance to the realisation of a wider vision;
- Deliverability/ robustness;
- Value for money; and
- Contribution to critical interdependencies & sequencing of development activity

9.15 As collectors of developer contributions and custodians of relevant policy, it is likely that LPAs will need to promote a corporate prioritisation process as the demand on planning obligations increases

in scope. A framework for prioritisation will need to operate taking account of three main elements:

- Prioritisation between areas - Prioritisation of the Phasing Infrastructure Framework will need to reflect the intended spatial pattern of growth and be presented so that the infrastructure requirements for each area within a sub region, such as particular districts of a city or growth corridor, are clearly defined. In this context, infrastructure related to strategic growth corridors that are programmed to come forward in the first five or ten years of the plan period are likely to form the initial focus for investment.

- Prioritisation between types of infrastructure (where funding is not ring fenced to certain types of investment) - Clearly, a balance needs to be struck between different types of infrastructure needed to make viable places aligned to government thinking on sustainable development. There may well be tensions between whether available

9.16 It is considered that this process must involve, Local authority officers, infrastructure stakeholders and ultimately elected members. Throughout the workshop discussion for the Infrastructure study, participants expressed a desire for the Local Strategic Partnership (LSP) to take the lead in this process if it was required in Worcestershire. Baker Associates consider that all infrastructure identified in this study is important to the deliver sustainable communities and that non delivery of infrastructure will not be an acceptable outcome for Local authorities or Infrastructure providers. We have identified strategic and community infrastructure to help in the prioritisation process.

9.17 Prioritising infrastructure within the phasing trajectory, so that infrastructure is provided slightly later than desired is considered a potential solution towards trajectory funding issues. Community infrastructure in particular could potentially be delayed to assist in the smooth delivery of development and associated strategic infrastructure. It is considered that Strategic infrastructure should be prioritised over community infrastructure in terms of funding and delivery.

.

Appendix 1: Development Options Maps

Appendix 2: Transport Infrastructure Figures

Appendix 3: Infrastructure Stakeholders

A3.1 The table below provides details of infrastructure stakeholders consulted as part of the study:

Name	Organisation
Valerie Houghton	Worcestershire County Council (Education)
Sarah Smith	Worcestershire County Council (Education)
Stuart Bourne	Worcestershire Primary Care Trust
Nigel Higgenbottam	Worcestershire Primary Care Trust
Jane Beckett	Worcestershire Mental Health Partnership NHS Trust
Amanda Smith	Worcestershire County Council (Community)
Dr Martin Doughty	University of Worcester
Rev. John Paxton	Diocese of Worcester
Jennifer Springer	Worcestershire Partnership
Sophie McCarroll	Hereford and Worcester Fire and Rescue
Paul Amos	Hereford and Worcester Fire and Rescue
Andy Husband	West Mercia Constabulary
Andrew Morgan	Atisreal (West Mercia Constabulary)
Nick Henry	The Ambulance Service, Hereford, Worcester & Shropshire Locality
Nick Riding	Worcestershire County Council (Emergency)
Justin Burnett	Environment Agency
Lawrence Price	Environment Agency
Hilary Berry	Environment Agency
Andy Magginis	Worcestershire County Council (Countryside)
Christine Hemming	British Waterways
Steven Bloomfield	Worcestershire Wildlife Trust
Tim Slater	CENTRO
Vaughan Welch	The Inland Waterways Association
Steve Harrison	Worcestershire County Council (Transport)
Michael Chu	London Midland
Steve Zanker	First Midlands
Shaun Simpson	First Midlands
Ray Ramsey	Stage Coach
Austin Birks	Diamond Bus Company Ltd
Malcolm Richardson	Network Rail
Chris Aldridge	Network Rail
Kevin Harvey	Highways Agency
Chris Holloway	Worcestershire County Council (Buses)
Ed Dursley	Worcestershire County Council (freight, cycling, walking)
David Bame	Worcestershire County Council (Rail)
Eric Homer	Eon Central Networks
Leslie Morris	National Grid
Malcolm Gomm	National Grid
Amarjt Shargill	National Grid

Name	Organisation
Steve Gray	Wales and West Utilities
Pat Spain	Severn Trent Water
Dawn Williams	Severn Trent Water
Matthew Hudson	South Staffordshire Water plc
Gordon Clarke	British Telecom
Phil Jordan	British Telecom
Dale Bristow	Worcestershire County Council (Policy)
Ben Horovitz	Worcestershire County Council (Policy)
Natasha Amos	Worcestershire County Council (Policy)
Martyn Wilson	Worcestershire County Council (Policy)
David Hobbs	Worcester City Council
Adrian Becker	Worcester City Council
Andrew Ford	Wychavon District Council
Gill Colin	Wychavon District Council
Rebecca Maymen	Wyre Forest District Council
Emma Baker	Redditch Borough Council
Alison Grimmett	Redditch Borough Council
Alexa Williams	Redditch Borough Council
Rosie Murray	Malvern Hills District Council
James Brain	Malvern Hills District Council
Mike Dunphy	Bromsgrove District Council
Andrew Fulford	Bromsgrove District Council
Paul Sampson	Advantage West Midlands
Angela Smith	Federation of Small Businesses
Geoff Palmer	WCC (Economic Development)

Baker Associates
The Crescent Centre
Temple Back
Bristol
BS1 6EZ

www.bakerassocs.com

t 0117 933 8950

f 0117 925 7714

e all@bakerassocs.com