

HARROGATE DISTRICT LOCAL PLAN:

Infrastructure Capacity Study –
Development Options

Infrastructure Appraisal

Stage 2 Report – July 2016



Chartered Town Planning Consultants

Richard Wood Associates

CONTENTS

1. Introduction	Page 4
2. Local Plan Context	Page 5
3. Engagement with Infrastructure & Service Providers	Page 6
4. Utilities and Environment	Page 8
5. Community Services and Facilities	Page 13
6. Travel and Transport	Page 16
7. Market Commentary	Page 24
8. Option Appraisal	Page 30
9. Conclusions	Page 38

1. INTRODUCTION

- 1.1 Harrogate Borough Council appointed a consultancy team of O'Neill Associates, Fore Consulting and Cushman & Wakefield (and now including Richard Wood Associates) to prepare an Infrastructure Capacity Study and Delivery Plan for the Harrogate District, as part of the evidence base for a new district-wide Local Plan that will cover the period up to 2035. This overall study will:
- determine the existing capacity of the district's infrastructure;
 - assess the implications of a number of potential growth scenarios;
 - inform the council's selection of a preferred development strategy and development sites; and
 - provide a detailed assessment of the requirements for, and deliverability of infrastructure necessary to support the selected strategy.
- 1.2 The Infrastructure Capacity Study is being undertaken in three stages to ensure that infrastructure considerations are taken into account at all stages of the Local Plan preparation process. A Baseline Report, the first stage, was completed in June 2015. It provided background evidence for a Local Plan Issues and Options consultation undertaken between 17 July and 28 August 2015.
- 1.3 This stage 2 report provides an infrastructure based appraisal of development scenarios based on the Local Plan growth options. It aims to ensure that infrastructure considerations proactively inform, alongside other evidence base work, the determination of a preferred development strategy for the Local Plan. More specifically this stage 2 work has sought to:
- Build upon the previous consultation with infrastructure providers (through the baseline report) to provide an updated picture of infrastructure issues in Harrogate district
 - Test development scenarios/options directly with 'critical' infrastructure providers
 - Undertake an integrated appraisal of the development scenarios
 - Establish key findings on the development scenarios from an infrastructure perspective
- 1.4 The third and final stage of work will be to produce an infrastructure delivery plan, detailing the specific infrastructure requirements of the council's preferred growth strategy and development site allocations. This will identify who is responsible for undertaking the required works and how they will be funded and brought forward in a timely manner to support growth.
- 1.5 The emerging Local Plan will be subject to an independent public examination by a Government appointed Inspector, who will need to be satisfied that growth proposals are consistent with existing, and where necessary increased, infrastructure and service provision, and that there is a reasonable prospect of this new infrastructure being delivered over the plan period.

2. LOCAL PLAN CONTEXT

2.1 Consultation took place on a Local Plan Issues and Options document in July and August 2015. Five different options for accommodating growth in Harrogate district were identified:

- Option 1** Focus growth in the main urban areas
- Option 2** Focus growth in the main urban areas and surrounding settlements
- Option 3** Growth around key public transport corridors, principally to the east
- Option 4** Growth around key public transport corridors, principally to the south
- Option 5** New settlement close to the A1 (M)

2.2 Since the Issues and Options consultation, further work has been ongoing on the Local Plan on key issues such as the need for housing through the Strategic Housing Market Assessment (SHMA), the detailed assessment of sites, consultation analysis and other evidence base studies.

Development Scenarios

2.3 Following the Issues and Option consultation, three development scenarios have been developed from the five growth options. These scenarios have been used as the key basis for traffic modelling work and for further engagement with infrastructure providers for Stage 2 of the Infrastructure Capacity Study.

2.4 The three scenarios all use a housing target of 621 new homes per year as a starting point, which allows for a sufficient buffer on top of the 518 homes objectively assessed need set out in the updated SHMA (September 2015). Taking current planned development into account, the council will be planning for around 6,364 new homes up to 2035.

2.5 The three development scenarios, to a greater or lesser extent, cover all of five growth options presented in the Local Plan Issues and Options consultation:

- i. **Scenario 1 is a combination of Options 1 & 2** concentrating growth in the main urban areas (and their immediate satellite settlements). This also tests Option 4 to a certain degree by placing a significant proportion of growth in Pannal along a key public transport corridor.
- ii. **Scenario 2** relates to Option 3 with growth concentrated on the key public transport corridors with a major expansion around Green Hammerton on the A59 and York-Harrogate rail line, and consequentially less growth in Harrogate.
- iii. **Scenario 3** reflects Option 5 with a new settlement at Flaxby, and consequentially less growth in Harrogate and Knaresborough.

3. ENGAGEMENT WITH INFRASTRUCTURE & SERVICE PROVIDERS

3.1 The Stage 1 Infrastructure Baseline Report engaged with infrastructure and service providers responsible for the following infrastructure types.

Utilities & Environment	Community Services	Travel & Transport
Water supply, treatment and sewerage. Gas. Electricity. Telecommunications. Flood protection. Drainage. Waste management.	Education. Health. Emergency services. Indoor sport facilities. Libraries. Public conveniences. Cemeteries and crematoria.	Local highway network. Strategic highway network. Rail. Bus. Coach and car parking. Cycling. Walking.

3.2 The Baseline Report identified key issues and implications for the Local Plan for all the above infrastructure types. This stage 1 work established that certain infrastructure types could potentially be a significant driver or barrier to future growth in the district whereas other infrastructure types and services would be more responsive to any future pattern of future growth. The stage 2 work has focussed on the former infrastructure types – ‘critical’ infrastructure that will be fundamental to the delivery of the development strategy and wider plan objectives and to support the intended levels and locations of future growth.

3.3 The focus of the Stage 2 work has therefore been on the following ‘critical’ infrastructure providers and types:

Infrastructure/Service Provider	Critical Infrastructure Type
Yorkshire Water	Water Supply and Sewerage
Northern Gas Networks	Gas
Northern Powergrid	Electricity
Local Education Authority (NYCC)	Education
Harrogate & District NHS Foundation Trust	Secondary Health Care
NHS Harrogate & Rural District CCG	Primary Health Care
Local Transport Authority (NYCC)	Transport

3.4 Further consideration of all infrastructure types (as under paragraph 3.1) will be given during stage 3, the preparation of the Infrastructure Delivery Plan.

Stage 2 Engagement

3.5 To initiate the consultation process each of the critical infrastructure providers were sent an invitation to attend a further consultation meeting, together with an information pack which included an explanation of the work undertaken to date on the Local Plan and Infrastructure Capacity Study. The information pack set out the 3 development scenarios, detailing the potential number and location of dwellings in settlements under each development scenario. In addition, key questions were set out for further discussion at the meeting to establish

- any changes to infrastructure services or capacity issues since Stage 1

- specific issues arising from Stage 1 and how these would be affected by the 3 scenarios
 - issues, opportunities and implications associated with the 3 development scenarios
- 3.6 Face to face meetings with the providers were held during May 2016. At the meetings, the 3 development scenarios were discussed and key infrastructure issues identified with the providers, along with constraints and opportunities, and the implications of each scenario discussed. The infrastructure study consultancy project team used this information in the meeting to propose a relative rating of the performance of each development scenario. This proposed rating was discussed with the provider (see section 8).
- 3.7 Following the individual meetings the infrastructure study consultancy team drew the findings together and summarised the key issues and ratings for each infrastructure types (for discussion at a team workshop). Infrastructure providers were also given the opportunity to review and comment on initial draft summaries and ratings.
- 3.8 The discussions with infrastructure providers focused on the key differences between the three development scenarios. There is much common ground between the three development scenarios, for example the amount of development proposed in places such as Masham, Boroughbridge, Pateley Bridge and rural settlements. The key differences between the three development scenarios are that there is a significant additional development focus:
- on urban extensions to Harrogate for Scenario 1, largely to the west of the town
 - around Green Hammerton (east of the A1) for Scenario 2, and
 - on a new settlement at Flaxby (west of the A1) for scenario 3
- 3.9 Further consideration was also given, in the discussions with providers, to the potential for the redevelopment of Ripon Barracks and the implications of an increase in the scale of proposed development at Green Hammerton under scenario 2.

4. UTILITIES AND ENVIRONMENT

- 4.1 **This section examines the critical infrastructure issues of gas, electricity and water supply & sewerage.**

Gas

- 4.2 Further to the Infrastructure Baseline Report, Northern Gas Networks (NGN) re-confirmed that its investment programme is based on meeting the demand in published Local Plans (and doesn't include any speculative investment). The investment emphasis has shifted more towards maintaining rather than expanding the gas network. In line with NGN's obligations, demand would be met in terms of connections with whichever growth option is taken forward in the Local Plan. Specific issues and implications were identified relevant to each development scenario.
- 4.3 **Scenario 1** would have important advantages in terms of locating development where it can access an existing robust gas network and limit requirements for new infrastructure. Development around the Harrogate and Knaresborough area would be in close proximity to the Local Transmission System (LTS) to the west of Harrogate, and the existing Medium Pressure ring main serving the area. The Medium Pressure network has some existing long-term capacity to incorporate further growth, although localised infrastructure reinforcement may be required depending on specific connection loads. Overall, the network is considered by NGN to be well-set to accommodate the level of growth outlined in Scenario 1.
- 4.4 **For Scenario 2**, major challenges were identified in relation to providing a connection to existing gas networks. Settlements to the east of the A1 are not currently connected to NGN's network. Major growth at Green Hammerton would therefore require either new infrastructure linking to the Intermediate Pressure Network for York to the east, or would need to connect to the Harrogate network to the west. Both options would require installation of significant new infrastructure over long distances and would need to overcome complex practical and logistical issues, with the former having to cross the River Nidd and the latter having to negotiate crossing of the A1. Although the issues are not considered insurmountable by NGN, the very major costs and long lead-in times involved would mean there would be significant uncertainty on how the gas infrastructure required to serve Scenario 2 would be funded and delivered.
- 4.5 The issues identified for serving Green Hammerton are to some extent also applicable to the new settlement option in **Scenario 3**, which would also require significant new infrastructure to provide a long-distance connection to the Harrogate network. Costs and deliverability issues would be somewhat reduced from those outlined in Scenario 2 as there is an existing supply to the Flaxby site, which is less distant from the existing network and west of the A1. However, NGN would still anticipate significant costs and lead-in times for providing the infrastructure required to serve Scenario 3, and that uncertainty would exist in terms of how this can be delivered or funded.

Other Locations

- 4.6 There could be investment implications at Masham beyond 2021, as the supply network is constrained from the North and there is demand outside the district to take account of. Some local reinforcement may be required at Ripon but the supply network should be able to cater for the proposed development levels.

Electricity

- 4.7 Further to the Infrastructure Baseline Report, the National Grid works to the overhead electricity line between Knaresborough and Bramham have been completed, which will ensure greater security of supply and some extra capacity to the local distribution network for Harrogate and Knaresborough. Completion of the new 11kV primary substation at Harlow Moor Road in west Harrogate has now been delayed until June 2017, but once operational this will provide significant extra capacity and resilience to the local network for the Harrogate area. Work is also being undertaken to upgrade the existing 33kV substation at Harrogate, and planned refurbishment works at Starbeck also provide opportunities to increase network capacity. Overall one of the key priorities for the industry has been to focus on security of supply.
- 4.8 In light of the existing situation and the above investments, **Scenario 1** would have significant benefits by locating growth within main urban areas already served by existing electricity infrastructure. Northern Powergrid anticipate that the above infrastructure works will help ensure there is long-term capacity for growth in the Harrogate and Knaresborough area, and that any future enhancement work required to deliver the scale of growth proposed in these areas in Scenario 1 would not be significant.
- 4.9 As with gas provision, provision of electricity connections to serve growth proposed at Green Hammerton under **Scenario 2** would present substantial challenges. A connection to the existing Harrogate/Knaresborough network to the west would need to cross the A1, but Northern Powergrid indicate this may be precluded due to logistical and installation costs and associated ongoing maintenance issues. The alternative would be to connect to transmissions systems coming from the bulk supply point in York. However, this network uses a different transformer configuration/vector ratio to surrounding areas (including Harrogate district) which would raise serious practical and maintenance issues for Northern Powergrid (a key issue is 'dead' switching in the event of a fault, when usually 'live' switching can be made without loss of supply).
- 4.10 **Scenarios 2 and 3** would both require provision of wholly new infrastructure to serve the growth respectively proposed at Green Hammerton or at Flaxby. This would involve very significant costs, with two cables required in order to ensure a back-up supply, and due to the required connection distances to a Primary Sub-Station that would be a crucial factor to determining viability and deliverability. Northern Powergrid's average budget costs for the installation of 33kV cable is £350,000 per kilometre, this is an average cost per cable and only covers installation. This average cost does not allow for route specific costs or any additional costs required to connect to the network (e.g. switchgear/substations). Both new settlement scenarios would also require the installation of a new substation within the site, costing in the region of £1.5m to £2m.

- 4.11 Given the above, Northern Powergrid indicated that **Scenario 3** would appear to have benefits over Scenario 2, as the Flaxby site is located in fairly close proximity (between approximately 1.5km and 3km) to the existing sub-station at Coneythorpe. By comparison, the Green Hammerton site would be around 12km from the York Outer Ring Road/Upper Poppleton, which may be on the limit of what would be considered practically and financially viable (i.e. the consultant team noted that the above cabling cost guide would provide a figure of around £9m for cable installation alone for 12km, excluding connection costs and route specific issues such as crossing the River Nidd and its floodplain). Northern Powergrid has also indicated that the Flaxby site may be more suitable to the provision of temporary works and connections to supply the initial phases of development. However, Northern Powergrid would require full assessment to provide a comprehensive assessment on viability.

Other Locations

- 4.12 The overhead line to Boroughbridge has recently been refurbished. Sub-stations in other settlements have a capacity which will need to be looked at in terms of proposed development levels. There are no current investment proposals for Ripon and there are no condition issues. Local rivers and roads could have cost implications in Ripon. Investment implications would be related to whether the development was phased and the primary network. The relatively low levels of development in rural settlements would have low cost implications such as the need to change transformers.

Water Supply and Sewerage

- 4.13 In terms of updating the Infrastructure Baseline Report, Yorkshire Water continues to operate under the current five-year asset management plan period, AMP6, which runs from 2015 to 2020. Yorkshire Water confirmed that AMP6 takes into account the previous iteration of Harrogate's Local Plan (Core Strategy 2009), and that programmed infrastructure assessments and works in the district are based on levels of growth outlined at that stage.
- 4.14 Offwat regulations require Yorkshire Water to this year, 2016, commence business planning for the next asset management plan cycle (AMP7) for 2020 to 2025. Investment in AMP7 will be set to maintain the existing water supply and sewerage network, and will follow demand for committed development with consideration for expected growth within published Local Plans.
- 4.15 Yorkshire Water will have a statutory duty to serve whichever of the development scenarios is taken forward, and will comprehensively assess infrastructure implications as part of the AMP process, rather than as part of the emerging Local Plan process. Nevertheless, the Stage 2 consultation did identify several issues relevant to an assessment of the development scenarios.

Water Supply

- 4.16 **For Scenario 1**, additional growth proposed around Harrogate would benefit from the significant water mains located in this area. Yorkshire Water confirmed the scale of development in this scenario could be supplied from the water distribution network. Local reinforcement works though may be required to mitigate adverse impacts, such as reduced

pressure, resulting from the additional load placed on the water supply network. Works in existing settlements were identified as being potentially disruptive and potentially costly.

- 4.17 **Scenarios 2 and 3** would each require significant levels of new infrastructure and substantial associated costs to serve new strategic development at Green Hammerton or Flaxby. **For Scenario 3**, Yorkshire Water indicated that the Flaxby site may be too distant from the existing water mains in the Harrogate area for a viable connection to be made from the west, in which case an alternative water supply connection would be required from the south or east. If from the east, the supply would need to negotiate crossing the A1. **For Scenario 2**, although Green Hammerton does have an existing water supply, this would require significant reinforcement work to serve the scale of development proposed. For both sites, Yorkshire Water would need to undertake feasibility studies to assess options. Subject to connections being assessed as viable, Yorkshire Water noted that large strategic (greenfield) sites do have benefits in being able to incorporate new and efficient infrastructure, which can reduce operational costs.

Sewerage

- 4.18 **Scenario 1** would have the advantage of making use of existing infrastructure in the Harrogate area, which Yorkshire Water indicated is easier to serve and potentially less likely to require feasibility and infrastructure work. Existing waste water treatment works are located at Harrogate (North and South) and at Knaresborough. Harrogate South has significant unused capacity and would likely accommodate the additional growth proposed without upgrade. It is anticipated that Harrogate North and Knaresborough treatment works would need reinforcement to provide additional capacity, and Yorkshire Water would require that new development is phased within these catchments to allow for provision of necessary infrastructure.
- 4.19 **Scenarios 2 or 3** would each necessitate significant and costly new infrastructure works to serve the strategic sites at Green Hammerton or Flaxby. It is estimated large-scale development at either site would require long distance new rising mains to connect to existing waste water treatment works (potentially Boroughbridge for Green Hammerton; Knaresborough (for Flaxby), together with reinforcement works at these existing plants. The Knaresborough works are limited in terms of space for expansion. Alternatively, a new waste water treatment works could be built to serve the development at a cost in the region of £10m to construct. Yorkshire Water would need to undertake full engineering feasibility studies to assess viable options for disposal of waste water, and would expect new development to be phased appropriately, including the use of temporary treatment facilities to serve early development stages. Yorkshire Water have a duty to sewer an area and temporary package plants can be used on large developments to enable phased delivery.

Other Locations

- 4.20 Yorkshire Water would expect new development to incorporate sustainable drainage systems wherever possible for surface water management in order to minimise the risk of flooding within the district. Existing flooding problems may have to be resolved in some areas and these issues may be complex and require investigation by other authorities. The potential growth at Ripon may require a drainage area study, which could indicate the need for a growth scheme at the sewerage works. Similarly, development at Boroughbridge may

need a growth scheme and a phased approach to new development. There are particular issues at Masham where the treatment works deal with a high organic loading related to a local brewery.

5. COMMUNITY SERVICES AND FACILITIES

5.1 This section examines the critical infrastructure issues of health and education.

Health

Secondary Care

- 5.2 The Harrogate and District NHS Foundation Trust reviews its health provision and capacity to meet future growth as part of its five-year Strategic Plan cycle. This includes assessment of health care and short-term infrastructure needs at Harrogate District Hospital and the community health services it provides within its boundaries. Since the production of the Infrastructure Baseline Report, the Trust has now confirmed it is commencing work on a strategic review of Harrogate District Hospital with a view to developing a longer-term strategy on accommodation and infrastructure requirements over the next 20 years.
- 5.3 As outlined in the Baseline Report, the Hospital site in Harrogate is restricted with no real scope for expansion, a strategic review is underway which will focus on assessing opportunities to secure operational efficiencies, and the potential for reconfiguration, reorganisation or redevelopment of accommodation to provide additional capacity within the hospitals existing footprint. The Trust is also considering (as part of the strategic review) the possible future relocation of the Hospital's Mental Health unit to a new location at Cardale Park, on the west side of Harrogate, which would free up further space within the site. However, at present there is uncertainty over how any redevelopment or site rationalisation works would be delivered. Parking and transport access remain a significant problem for the hospital site.
- 5.4 Whilst the scale and locations of growth are important considerations for secondary care provision, the key drivers are changes in the demography of the area and the resultant changes in the health care needs of the local population. An aging population presents significant challenges, with marked increases in the 80+ age group, and will change the way secondary care services are delivered in future. The Trust recognises it will need to deliver new models of care and work in a more integrated way, supporting patients in their own homes, as well as in hospital.
- 5.5 For this Stage 2 infrastructure appraisal, the Trust identified advantages and disadvantages to all three development scenarios, but acknowledged each would have an impact on future provision and place additional pressure on its hospital and community health care provision.
- 5.6 **Scenario 1** would provide development closer to existing resources, and fit with the emphasis on delivering care close to people's homes, but would have disadvantages in placing the most pressure on already stretched hospital and community care resources in the Harrogate area.
- 5.7 Large-scale growth outside existing urban areas in **Scenarios 2 and 3** may place less pressure on Harrogate District Hospital, as future residents may potentially go to York rather than Harrogate for care. However, those receiving care in the district would have to travel greater distances to existing resources than in Scenario 1, and providing services to patients

at home would be more challenging. The strategic sites in Scenarios 2 and 3 may provide opportunities for new community hub type elements, where secondary care services could be co-located with primary care and social service facilities, but there is uncertainty over how these would be funded, or what critical mass of development would be needed.

Other Locations

- 5.8 There will be implications and opportunities for the Ripon Community hospital, including the scope to link with local GP practices for outpatient care.

Primary Care

- 5.9 The NHS Harrogate and Rural District Clinical Commissioning Group (HaRD CCG) held specific discussions on the development scenarios, involving the Chief Officer, Clinical Chair and GP Governing Body members. There are significant costs associated with the provision of primary care facilities, with uncertainty over funding and delivery
- 5.10 **Scenario 1** places pressure on three large existing GP premises in Harrogate that are on constrained sites and in buildings not fit for purpose. New premises would be the best replacement solution. Overall Scenario 1 requires new investment/facilities in Harrogate but spread across a number of premises. This scenario does locate development close to existing primary care resources, and fits with the emphasis on delivering care close to people's homes. The numbers proposed should be manageable for the three GP practices in Knaresborough (for all 3 scenarios).
- 5.11 **Scenarios 2 and 3** would both require a major redevelopment of Green Hammerton GP premises (a small existing practice with limited capacity and no other practices serve this area). Other existing surgeries may also require new premises. These new settlement scenarios could provide opportunities (with their critical mass and new services and facilities) to provide for new community hub type facilities, integrating Primary and Secondary Care, and social services. The referral of patients to York may also ease pressures on secondary care in Harrogate.
- 5.12 Care closer to home for the new developments could be most easily achieved under Scenario 3 as new primary health care facilities would be needed and these could be designed to include space for hospital out-patient, community services and mental health services. However, it could equally be argued that new premises would be needed in Harrogate for all the options, and these would make care closer to home more available to new and current patients (as the hospital is closer to these new patients' homes than the patients in Green Hammerton).

Other Locations

- 5.13 All three development scenarios would have broadly the same effect on Ripon, Masham and Boroughbridge. The numbers proposed in Ripon should be manageable within Ripon and in Masham. Boroughbridge also has space to manage the projected growth, but the practices also cover a large proportion of the villages separately listed (as rural settlements) and these will add further pressure. Attracting new doctors is increasingly difficult, but not particularly a problem in these locations.

Education

- 5.14 Further engagement with the Local Education Authority, North Yorkshire County Council, confirmed that the issues outlined in the Infrastructure Baseline Report remained current. The recent increase in birth rate is feeding into North Yorkshire schools, with the impact felt initially in primary schools. This is particularly affecting urban areas of the district with Harrogate, Knaresborough and Ripon are forecast to reach capacity in the coming years, with need most pressing in Harrogate and Knaresborough. Conversely, pupil numbers are falling in some rural areas creating viability pressures for village schools. Any significant housing growth across the district is likely to require additional primary school places and increasingly secondary school places.
- 5.15 For **Scenario 1** there are significant capacity issues within Harrogate and Knaresborough schools, with both King James school Knaresborough and Pannal Primary school constrained. However, there is scope to expand Harrogate High school to provide additional secondary school capacity across Harrogate and Knaresborough and scope for additional classrooms at the existing Bilton Primary School. There are also planned new primary schools at Penny Pot Lane and Cardale Park to the west of Harrogate, and at Manse Farm in Knaresborough as part of permitted developments in these locations
- 5.16 For **Scenario 2** the proposed new settlement site would feed Boroughbridge High School, which is constrained for future expansion, and the level of development envisaged would not be sufficient to support a new secondary school within the site. The nearby existing primary school has no space for expansion. The creation of a new settlement would enable 1 or 2 new modern primary schools to be provided within the site and would avoid placing further pressures on Harrogate and Knaresborough schools.
- 5.17 With **Scenario 3** the site of the proposed new settlement at Flaxby would feed King James School Knaresborough and/or Boroughbridge High School as the site falls between both these secondary school catchments. However, both these secondary schools are constrained for future expansion. The indicative level of development envisaged would not be sufficient to support a new secondary school within the site. There is no existing primary school near to the new settlement site. The creation of a new settlement would enable 1 or 2 new modern primary schools to be provided within the site. A new settlement at Flaxby could utilise the scope to expand Harrogate High School to provide additional secondary school capacity across Harrogate and Knaresborough.

Other Locations

- 5.18 The secondary school at Ripon, Ripon Outwood Academy, has capacity for the proposed levels of development in the city. There are capacity issues with primary schools which would be further intensified by additional development at Ripon Barracks. The primary school site at Masham is very constrained with little scope for expansion, and pupils here would feed into the secondary school at Bedale which is also constrained. Boroughbridge primary school has capacity to expand, unlike the secondary school. Similarly, the primary school at Pateley Bridge has capacity.

6. TRAVEL AND TRANSPORT

- 6.1 **This section examines the critical infrastructure issues of the highway network, rail, bus network and walking & cycling.**
- 6.2 Since the production of the Baseline Infrastructure Report, two important strategy documents have been published by North Yorkshire County Council (NYCC) that are of relevance to the 3 development scenarios.
- 6.3 The first document is NYCC's fourth **Local Transport Plan (LTP4)**, which covers a 30-year period, from April 2016 until 2045. LTP4 is a four-tier document. The first part holds the Local Transport Strategy which sets out the context of the Plan and NYCC's Vision, Objectives and Commitment for transport in North Yorkshire. The second part contains the Objectives, and sets out further details of the main challenges to be addressed for each Objective, along with the approach NYCC and partners will take to achieving them. The third part contains thematic sections which considers transport based on themes and modes, and sets out in more detail what NYCC will do, will not do and what others can do to improve transport. The fourth part holds the Policies specifically adopted by NYCC as part of LTP4.
- 6.4 The objectives set out in LTP4 are as follows:
- Economic Growth - Contributing to economic growth by delivering reliable and efficient transport networks and services;
 - Road Safety - Improving road and transport safety;
 - Access to Services - Improving equality of opportunity by facilitating access to services;
 - Environment and Climate Change - Managing the adverse impact of transport on the environment;
 - Healthier Travel - Promoting healthier travel opportunities.
- 6.5 Within LTP4, NYCC identifies a number of priority east–west **strategic highway** routes for potential improvement, including the A59 between the A1(M), Skipton and onwards to East Lancashire, and notes that further highway improvements will be required to maintain east-west connectivity and to build resilience into the highway network.
- 6.6 On the **local highway** network, NYCC has identified 6 main towns as the priority, though not exclusive, areas to tackle congestion. One of these towns is Harrogate and Knaresborough (combined). To tackle traffic congestion, NYCC has adopted a combination of measures to both reduce traffic demand and to provide more highway capacity. Demand management measures will include both encouraging people to make fewer or shorter journeys and encouraging mode shift (i.e. from the private car to public transport, walking and cycling). Improved capacity will be provided on the highway network through localised improvements such as minor junction improvements, traffic management and improved traffic signals and parking management, as well as through major highway improvements such as relief roads.
- 6.7 For **rail**, LTP4 prioritises a number of rail related improvements such as twin tracking and electrification of the York – Harrogate – Leeds railway and improved access to conventional and future high speed rail stations.

- 6.8 LTP4 also recognises that the **bus network** is relied upon for connecting those without a car to travel to places of work, education etc. Helping to maintain core daytime bus services enables those without access to a car to reach essential and non-essential services for work, health, retail, leisure and socialising. However, there is a balance to be struck between accessibility and affordability in providing a stable bus network.
- 6.9 NYCC aims to address the health aspects linked to transport by encouraging healthier travel such as walking and cycling, and by reducing some of the negative effects of transport, such as air pollution. NYCC states that it will work closely with the District Councils to address any air quality issues that arise from traffic on our highway network, especially where an action plan has been developed for a management area.
- 6.10 Finally, LTP4 states that NYCC has a commitment to sustainable development and design, and that NYCC will, in particular, *“progress the preparation of local policies and protocols to assist with assessing the impact of development on the highway network in North Yorkshire.”*
- 6.11 The second document, published in late 2015, and supplementing LTP4, is the **Strategic Transport Prospectus for North Yorkshire**. It is intended to set out how NYCC would like to work with the Government, Transport for the North and the Northern City Regions to ensure that improved transport connections allow North Yorkshire to both contribute to, and share in the economic benefits of, the Northern Powerhouse.
- 6.12 As inferred by the title, it focuses on the **strategic road and rail transport connections**, particularly the east-west routes of the A59 and the Leeds-Harrogate-York rail line (providing access to high speed and conventional national rail links).
- 6.13 On the **A59**, three specific interventions are identified that are of relevance to this study:
- Introduction of three additional climbing lanes (overtaking opportunities) between Harrogate and Skipton, including a major realignment at Kex Gill which would also address a significant major landslip risk;
 - The review and further development of proposals for a Harrogate relief road, to help ease congestion through Harrogate town centre, which would address both urban congestion issues as well as improving journey time reliability along the A59 east-west corridor;
 - Improvements to Junction 47 of the A1(M) to increase capacity at this junction.
- 6.14 As set out in the Baseline Infrastructure Report, NYCC and HBC has commissioned traffic modelling work (see below) to look at the strategic traffic impacts of the council’s future options for housing and employment growth in the district. The work is utilising a new traffic model built by Jacobs in 2015, and the model is also being used by NYCC to test various options for relief roads in Harrogate, including one to the west of the town as well as northern route options.
- 6.15 The Prospectus states that NYCC has identified an initial scheme to improve capacity at Junction 47 of the A1(M), by providing two lane off-slip roads in both directions from the A1(M) and traffic signals on all entries and the circulatory carriageway of the roundabout. This initial scheme now has confirmed funding through the Local Growth Fund and will provide some additional capacity for growth on the network.

- 6.16 The long-term plan for the **Leeds-Harrogate-York rail line** is for a £170 million investment to bring about the electrification of the line, transformation and modernisation of Harrogate Station, double tracking all of the remaining single track sections to improve performance and resilience, and an initial proposal to remove the level crossing at Starbeck station. These works would be phased over the next 10 years, with the first sections of double track, funded by NYCC, to be completed by 2018/19.
- 6.17 At the same time, plans that City of York Council have for York Central/York Station will provide for an alternative north of the City approach to a new Platform 12. This will avoid crossing the East Coast Main Line (ECML) thus providing greater resilience, increasing capacity and further reducing journey times and/or providing the opportunity to investigate the delivery of new stations along the line.
- 6.18 In the longer term, the Prospectus identified that a new railway from Leeds to Harrogate, Ripon and then joining the ECML north of Northallerton will bring much needed resilience to the ECML and enable the East coast ports to expand. It could also potentially help with plans and aspirations for housing and business growth in the central A1(M)/ECML corridor.

Highway Network

- 6.19 The traffic modelling work commissioned by NYCC and HBC to look at the strategic traffic impacts of the council's future options for housing and employment growth included an assessment of the impacts of the 3 development scenarios on the highway network in two future years – 2025 and 2035.
- 6.20 Once satisfied that the demand in each zone was logical when compared to development locations, the traffic models were assigned and the results of the runs were analysed by comparing the results for the AM (0800-0900) and PM (1645-1745) peak periods between the “do minimum” (assuming only background traffic growth and committed improvement schemes) and “do something” (i.e. with future development) situations in each future year. The analysis focused on the difference in the volume of traffic, as well as the difference in delay at junctions between each test.

Modelling Results

- 6.21 With regards to the 2025 comparison tests, the majority of strategic routes in and around Harrogate and Knaresborough see a general increase in traffic in the AM peak of up to 100 vehicles. The greatest effect on traffic flows is exhibited to the south west of Harrogate on Lady Lane, where the increase is approximately 200 vehicles. These figures are similar across all 3 development scenarios, except at A1(M) Junction 47, where there is a significant increase in flow at this junction in scenario 3, which is to be expected given that the new settlement site is located adjacent to the junction.
- 6.22 In relation to traffic flows and delay around Ripon, the pattern across each of the 3 option tests is approximately the same, as the quantum of development coming forward in Ripon is the same for each option. The modelling shows that the majority of strategic routes seeing an increase in flow of less than 50 vehicles across the AM peak period.

- 6.23 For the PM peak period, strategic routes around Harrogate, Knaresborough and Ripon show an almost identical pattern for increased flow across the 3 development scenarios, save again for the increase in flow at A1(M) Junction 47 for scenario 3.
- 6.24 With regards to the AM peak tests in 2035, there are significant increases in traffic volumes and junction delay across all 3 development scenarios. There are a number of development sites located in south west Harrogate, and, as a result, there is a significant increase in traffic heading southbound on Crag Lane, as well as on Beckwith Head Road, and westbound on the B6162 extending from the Beckwith Head Road Junction to Harlow Moor Road. On the A658, there is also an increase of approximately 200 vehicles northbound between the A661 and the A59 in all 3 scenarios.
- 6.25 The modelling for all 3 scenarios also shows an increase in the volume of traffic on the A59 between the A658 and the Flaxby roundabout to the west of the A1 (M). The increase in flow is seen across all three options westbound on this link and eastbound on the A59 between the Flaxby roundabout and the A1(M). the most notable difference between the scenarios is the increase in traffic volume along the A59 away from the Flaxby roundabout due to the strategic housing site at Flaxby in scenario 3 and the strategic housing site at Great Hammerton in scenario 2.
- 6.26 Further comparison between the three options also demonstrated the effects of the Green Hammerton new settlement site, with a significant increase in traffic flow to the east of the A1(M) Junction 47 only evident in scenario 2. Westbound movements on the A59 from the Station Road junction to the A1 and southbound on Station Road/Cattal Street/Roman Road/Ox Moor Lane increase in flow by approximately 300 vehicles, in comparison to an increase of approximately 50 vehicles in the other two scenarios.
- 6.27 There is also a noted increase in traffic travelling via Kirk Deighton and North Deighton in the development scenarios with new settlements. This would suggest that the increase in traffic on the network from the Green Hammerton and Flaxby sites have caused traffic to reroute in order to avoid these areas, likely as a result of capacity limitations along the A59 corridor and at A1(M) Junction 47.
- 6.28 With regards to key links in and around Harrogate and Knaresborough in the PM peak, there is an increase southbound on Beckwith Head Road and westbound on the B6162 extending from the Beckwith Head Road junction to Harlow Moor Road, again due to the development located in south west Harrogate, and corresponding with the outflow of traffic in the AM peak.
- 6.29 Scenario 3 again shows the greatest increase in traffic around the Flaxby roundabout to the west of the A1, due to the location of the Flaxby new settlement site itself. The impact of the Green Hammerton new settlement site is also similar in the PM peak, as the traffic increases displayed to the east of the A1(M) and north of Wetherby in only noted in scenario 2. However, as with the increase on Crag Lane mentioned above, the direction of the primary increase has shifted from the AM peak, representing return journeys in the PM peak.
- 6.30 In Ripon, the development sites are mostly situated to the west of the town and are consistent across each development scenario. The main increase in traffic flow for each

option is therefore found on North Road, Bondgate Green and Harrogate Road for traffic heading to/from the north, east and south respectively.

- 6.31 An analysis of the performance of junctions on the network has also been undertaken for the Do Minimum and three development scenarios. The junction capacity assessments were undertaken in the detailed model area and identify a volume capacity ratio (VCR) and a total delay at each junction. VCR is a ratio representing the degree of saturation of a particular stretch of road, with values closer to 0 representing free flow conditions and values approaching or greater than 100 indicating high levels of congestion.
- 6.32 The 2035 Do Minimum network shows delays and congestion at a number of junctions, including the A59/A658, Bond End and A59 / B6164 junction in Knaresborough, the A658 / A661, Woodlands and A61 / Jennyfield Drive junctions in Harrogate and the A61 / Otley Road junction in Killinghall.
- 6.33 The main changes as a result of scenario 1 are as follows:
- The development sites coming forward in Pannal Ash result in congestion on the B6162 Otley Road / Crag Lane / Beckwith Head junction;
 - General increases in the VCR at the Woodlands junction;
 - The A61 / Otley Road junction in Killinghall shows an increase in the overall VCR;
 - On the bypass, the A59 / A658 and A658 / B6164 Wetherby Road junctions shows a noted increase in VCR.
- 6.34 For **scenarios 2 and 3**, the differences between in junction performance are mainly on the bypass and in particular the A59 / A658 and A658 / B6164 Wetherby Road junctions, as well as at A1(M) Junction 47.
- 6.35 As the quantum of development coming forward in Ripon is identical for each scenario, the impacts on junctions are very similar. The modelling particularly shows an increase in VCR at the Skellbank / Water Skellgate / Low Skellgate, Allhallowgate / St Marygate and North Street / A6108 Palace Road junctions, with addition VCR increases at the A61 / Bondgate Green and North Street / College Road junctions in the PM peak only.
- 6.36 Overall model statistics have also been calculated for the 3 development scenarios. These statistics take the form of the total vehicle hours and vehicle kilometres within the model, and cover both the entire model network and the individual modelled areas of Harrogate, Knaresborough and Ripon. All 3 scenarios show an increase the vehicle kilometres and vehicle hours within the model areas in comparison with the Do Minimum. In all cases, scenario 1 shows the increase in vehicle kilometres and vehicle hours to be less than the other two scenarios, with the differences between them being relatively minimal owing to there being only small differences between the new settlement scenarios and the associated quantum of development.

Overall Findings

- 6.37 A Highways England study is ongoing to look beyond the committed improvements planned at **Junction 47 of the A1(M). This study will consider whether some form of separation**

of the A59 through movement from the roundabout is required, as part of the next stage of improvement, particularly in light of the new settlement development **scenarios 2 and 3**. Such an improvement may even be needed with development scenario 1, given forecast traffic increases in the PM peak. Depending on where any new settlement is located along the A59 corridor, there may be a need for further improvements to some of the junctions along this corridor.

- 6.38 The growth in background traffic, coupled with the additional traffic related to future development in the district could require **a western or northern relief road in the future**. Further development work on the options for such a relief road is currently in progress, but the delivery of such an improvement cannot be linked specifically to either of the 3 development scenarios.
- 6.39 The assessment of local road network performance has identified **a number of junctions across Harrogate, Knaresborough and Ripon where future year congestion and delay will occur**. Mitigation measures will need to be identified to reduce additional congestion and delay to a level of performance that shows no detriment from the do minimum scenario.

Rail

- 6.40 The **new Northern Rail franchise** was awarded to Arriva in late 2015, and the franchise itself started in April 2016, running for an initial nine-year period. As part of the franchise commitment, frequencies between Leeds and Harrogate will be increased to 4 trains per hour (tph) throughout the day. There is also an aspiration within the franchise to increase the frequency on the Harrogate to York section to 2tph following the implementation of the double tracking east of Knaresborough in 2018/19.
- 6.41 In April 2016, the Office of Road and Rail confirmed that the existing one train per day in each direction direct rail connection between **Harrogate and London King's Cross** – a service operated by Virgin Trains East Coast – would be increased to six trains per day in each direction by 2019. When running, this will replace one of the Northern trains in the hour, retaining the 4tph overall frequency between Leeds and Harrogate.
- 6.42 Given that patronage on the line has increased by 20% in the last five years, it is clear that rail will continue to play an important role in the transport network of Harrogate and Knaresborough. When considering how the three options complement, or conflict with, the planned rail improvements, there are some noticeable differences between the three options.
- 6.43 With **scenario 1**, concentrating growth in the existing urban centres, particularly to the west of Harrogate, will mean that new houses will be relatively close to existing rail stations at Harrogate, Hornbeam Park and Pannal, which will benefit from a 4tph frequency service to/from Leeds. However, car parking is limited at each of these stations, and so there will be a need to provide sustainable transport links from sites to stations.
- 6.44 With **scenario 2**, a new settlement at Green Hammerton would be sited adjacent to existing rail stations at Cattal and Hammerton, which will benefit from a 2tph frequency to/from York. As previously, car parking is very limited at these stations, although there is the potential to provide a combined station solution as part of the site development that could also help to reduce the journey time between Harrogate and York.

6.45 For **scenario 3**, a new settlement at Flaxby, development could help make a better business case for a new station east of Knaresborough. However, journey time savings would need to be delivered elsewhere on this section of the network to allow an additional station stop in advance of the delivery of Platform 12 at York station.

Bus Network

6.46 The Baseline Infrastructure Report included a suggested core bus network for the district, taking into account settlement size and location. The suggested core bus network is as follows:

- Harrogate, Knaresborough and Ripon – better than half hour service;
- Boroughbridge – an hourly service;
- Masham and Pateley Bridge – a service that runs on 6 days a week or more enabling commuting to work;
- Other group B settlements and Group C villages – a service that operates on 6 or more days a week and where the bus service Monday - Friday operates at times to enable travel to and from the village to a main settlement offering employment opportunities (between 0800-0930 and 1645-1830).

6.47 Bus services are generally provided on a commercial basis by private bus operators, with routes and timetables for these commercial services determined by the operator. NYCC has powers and some funding available to support bus and community transport services, where an adequate level of service is not provided by private transport operators, and currently spends around £350,000 each year on supported bus services.

6.48 Providing a high level of public transport accessibility to any large housing site should be a pre-requisite, bearing in mind that, in a commercial world, it is easier (and therefore cheaper) to extend an existing service to provide public transport access to a site rather than establish a wholly new service. With that in mind, there are some evident differences between the three development scenarios.

6.49 With **scenario 1**, sites within the existing urban centres are relatively close to the existing bus stations in Harrogate and Ripon, and there are already a number of commercial services that run relatively close to the likely housing sites.

6.50 For **scenario 2**, a new settlement at Green Hammerton could provide additional demand for the existing Ripon-Boroughbridge-York tendered service that passes the site, and that may allow it to become a commercial service over time.

6.51 At Flaxby, under **scenario 3**, no direct commercial bus services currently serve the site, although development could provide the opportunity to extend existing Service 1 routes to serve the site at a relatively early stage in the build out of the site.

Walking and Cycling

- 6.52 Drawing on the objective in LTP4 about addressing the health aspects linked to transport, by encouraging healthier travel such as walking and cycling, and the statement regarding a commitment to sustainable development and design, it will be important for any site brought forward within the Local Plan to best integrate with existing sustainable transport networks and to minimise internal trip-making as much as possible.
- 6.53 This will be particularly important for **scenarios 2 and 3** with a new settlement, so, as the sites are somewhat remote from existing services, a mix of uses will be needed within the site to ensure sustainable development, and internal site layouts will be important. Local facilities within walking and cycling distance are likely to be delivered in later phases of development. In either case, a safe and convenient network of walking and cycling routes to nearby public transport services, employment opportunities and other community facilities within the new settlement will need to be provided.
- 6.54 For **scenario 1**, where growth is concentrated in the main urban centres, sites are relatively close to existing walking and cycling networks, and so there will need to be links to these existing networks, as well as sustainable transport links to nearby public transport networks. However, from outset, residents can walk and cycle to local facilities.

7. Market Commentary

- 7.1 **This section provides a high-level assessment of the potential for developer contributions towards infrastructure under the three development scenarios.**

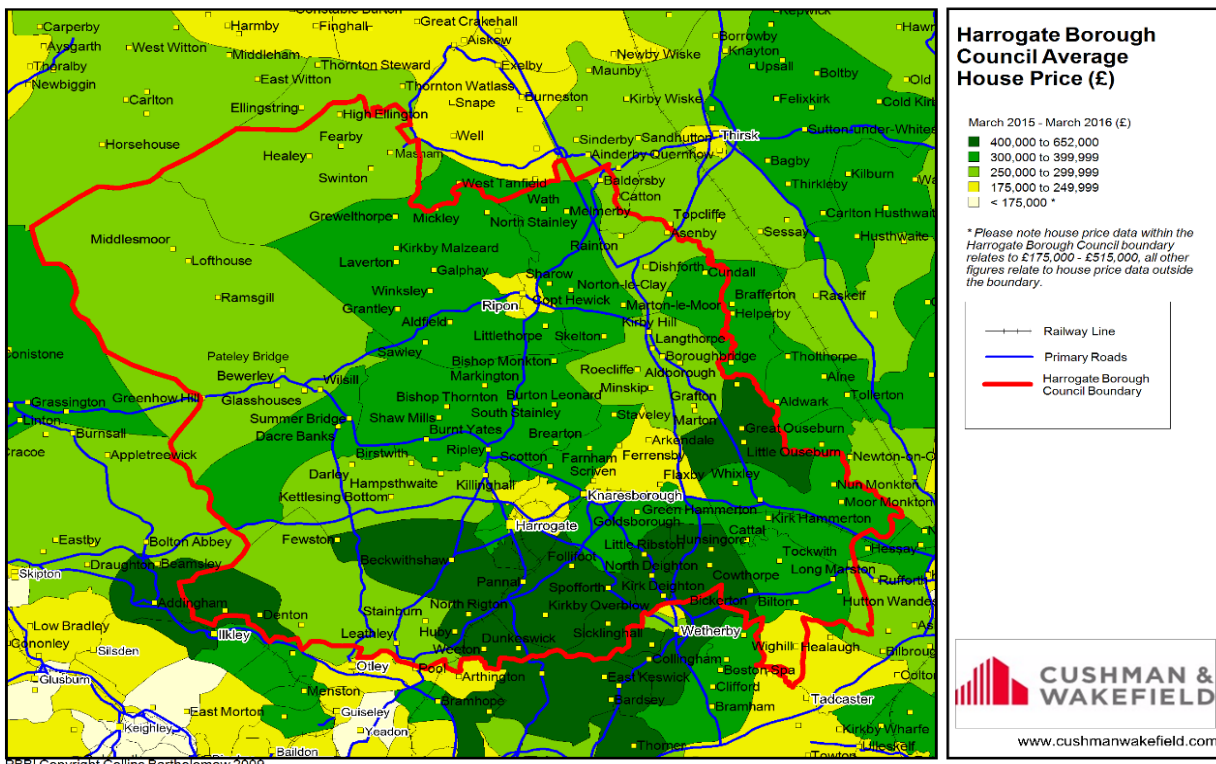
Methodology

- 7.2 The assessment is based on indicative area wide viability appraisals of hypothetical development schemes to determine the 'headroom' (that is, the amount available for meeting infrastructure costs) across the district. Headroom is assessed as the difference between Gross Development Value and Gross Development Costs including allowance for land and profit. Several different appraisals have been produced to reflect the variation in market strength and house prices across the district, which in turn drive differences in the amount of headroom potentially available. By relating the differences in headroom potential across the district to the 3 development scenarios, we have been able to compare differences in the scale of the potential for developer contributions under each spatial option.
- 7.3 The assessment has been carried out using Cushman & Wakefield's area wide viability model which has been used for numerous local plan and CIL viability exercises. The appraisals are based on hypothetical schemes and a series of generic assumptions; although they are considered to be broadly representative of typical development schemes within Harrogate district. The appraisals are based on a single standard scheme and should only be interpreted as a guide. It should also be noted that the appraisals are intended only to indicate the potential for development to contribute towards infrastructure and that the actual capture of headroom will rely on mechanisms such as CIL and S106 that are outside the remit of this study.

Value Areas

- 7.4 We have analysed HM Land Registry data of average achieved house prices across the Harrogate Borough Council local authority area over 12 months to March 2016.
- 7.5 During this period achieved house prices range from £175,000 to £515,000. We have used postcode data to produce a heat map of the Harrogate District to illustrate residential property market strength across the district. This is illustrated in Figure 7.1.
- 7.6 The heat map identifies the highest value areas in the south of the district including the settlements of Beckwithshaw, Pannal, Dunkeswick, Kirk Deighton, Worth Deighton, Great Ouseburn and Little Ouseburn.
- 7.7 Mid value areas of the district include the settlements of High Ellington, Pateley Bridge, Darley, Stainburn, Langthorpe, Grafton, Dishforth and Masham.
- 7.8 The lowest value areas are to the north east of Harrogate town centre, Ripon and the area surrounding the settlements of Arkendale, south-east of Ferrensby and north of Flaxby.

Figure 7.1 Residential property market heat map Harrogate District



7.9 In order to ascertain the headroom for infrastructure that could be realised from new build development across the district, we have created a bespoke development appraisal spreadsheet model. The model is designed to calculate the residual land value for a number of development scenarios across the district, through the input development appraisal assumptions.

7.10 The following development appraisal assumptions have been used in the model:

Development size and density

We have assumed an average gross site area of 2.22 hectares which equates to a net development size of two hectares (five acres) at a density of 35 dwellings per hectare. Therefore, the standard scheme has 70 dwellings in total.

Housing Mix

The following housing mix has been applied for market units:

1 bed	2 bed	3 bed	4 bed	5 bed
10%	45%	40%	3%	2%

The following housing mix has been applied for affordable units:

1 bed	2 bed	3 bed	4 bed	5 bed
15%	60%	25%	0%	0%

The housing mix above is in line with the SHMA, produced by GL Hearn, February 2015 and the Whole Plan and CIL Viability Assessment produced by HDH Planning and Development, August 2016. However, we would emphasise that in our experience the market will want to deliver a mix incorporating larger housing units (e.g. 40% two and three bed units and 60% four and five bed units) and adopting such a housing mix would increase the headroom and the amount of revenue available for infrastructure provision.

Unit size

The following average dwelling sizes have been applied which are based on National Space Standards (Minimum gross internal floor areas, 2016):

1 bed	2 bed	3 bed	4 bed	5 bed
58 sq m	70 sq m	85 sq m	100 sq m	110 sq m

Residential sales values

We have researched new build development across the Harrogate District in order to establish the average sale price per sq m for each of the four value areas illustrated in the heat map above:

- Value Area 1 £400,000 to £652,000 - £4,036 per sq m (£375 per sq ft)
- Value Area 2 £300,000 to £399,999 - £3,767 per sq m (£350 per sq ft)
- Value Area 3 £250,000 to £299,999 - £2,960 per sq m (£275 per sq ft)
- Value Area 4 £175,000 to £249,999 – £2,303 per sq m (£214 per sq ft)

The above new build values are related both to the ranges of average house prices illustrated on Figure 7.1 and also new build transactional evidence collected from Rightmove and Nethouseprice websites.

Development Costs

The following development cost assumptions have been used based on our experience of standard assumptions:

- Average build cost of £1,022 (£95per sq ft) inclusive of plot external works which is based on BCIS build costs rebased for Harrogate
- Professional fees – 8% of construction costs
- Contingencies – 3% of construction costs
- Finance costs – 6.5% annually on negative cash balance
- Marketing, sales agent and legal fees – 3.5% of revenue on private units
- Profit – A blended rate of 20% of Gross Development Value on market units and 6% on affordable units
- Stamp duty – the area wide model incorporates stamp duty at a fixed rate of 5%
- Purchasers agent and legal fees – 1.5% of land purchase price

Other development appraisal assumptions

- Site specific section 106 contribution of £2,000 per housing unit
- 40% affordable housing (75% affordable rented and 25% shared ownership included in accordance with Harrogate Affordable Housing Policy. The following housing mix has been applied to affordable units:

1 bed	2 bed	3 bed	4 bed	5 bed
15%	60%	25%	0%	0%

A standard blended transfer value (for all residential units) of £1,100 per sq m (£102 per sq ft) has been applied. This is based on the Harrogate District Local Plan Interim Affordable Housing Policy and Guidance (2015). It should be noted that the policy provides for a transfer price cap of 90 sq m for a 3 bed property and 100 sq m for a 4 bed property.

Affordable housing transfer values:

Value Area	% of Market Value based on £1,100 per sq m
1	27.25
2	29.20
3	37.16
4	47.75

Timescales

- Six month lead in period from the payment for land
- Housing sales rate of 35 units per annum
- Eight quarters (24 month) build period

Land Value benchmark

Based on discussions with residential land agents active in the marketing and sale of sites with residential planning consent within Harrogate at the current time, net land prices are typically around and in excess of £2.4million per ha (£1million per acre).

However, recognising that such current/historic market values do not necessarily reflect the total impact of future policies which will have an impact on prices, it is appropriate to set benchmarks at a discounted level in accordance with national planning practice guidance. There are no clear guidelines as regards what benchmark land values should be however planning guidance recognises both the importance of a competitive return (i.e. land owners should get the 'going rate') and also that land prices should exceed existing or reasonable alternative use values.

We have utilised the DCLG publication *Land Value Estimates for Policy Appraisal*, December 2015, as a guide to inform the assessment. This document indicates a gross land value of £2,525,000 per ha for Harrogate (£1million per acre), however this excludes allowances for affordable housing and other planning obligations. For the purposes of this high-level assessment, we have reduced this figure by 50% to £1,262,500 per hectare (£510,906 per acre). We consider that this offers a figure which is reasonably placed between market value and existing use value which offers the land owner an adequate return to incentivise release of sites.

We note that lower minimum land prices may be appropriate in certain circumstances. However, because we have not included any abnormal development costs in our appraisals

(effectively therefore, the prices represent the price of a net land parcel free from abnormals), and the very high level nature of this exercise, we consider this to be an appropriate minimum land price benchmark.

- 7.11 The following table illustrates the average residual land value for each value area in the district and the headroom for infrastructure costs per unit based on an average 70 residential unit (two hectare) development scheme.

Table 7.2 Headroom per unit for each residential value area across Harrogate

Value Area	Residual Land Value (£)	Net Benchmark Land Value (£)	Residual land value less land value benchmark (£)	Headroom for infrastructure costs per unit (£)
1	5,098,483	2,525,000	2,573,483	36,764
2	4,530,127	2,525,000	2,005,127	28,645
3	2,822,311	2,525,000	297,311	4,247
4	1,431,448	2,525,000	- 1,093,552	- 15,622

- 7.12 In order to calculate the headroom for infrastructure costs for each development scenario, we have calculated the total number of units to be delivered within each value area across the Harrogate District under each scenario. These have then been multiplied by the headroom per unit (£) to establish the total headroom per value area and the total headroom potentially available to cover the infrastructure costs for each scenario. This is illustrated in the tables below:

Table 7.3 Scenario 1 – Total headroom for infrastructure costs

	Housing Value Area 1	Housing Value Area 2	Housing Value Area 3	Housing Value Area 4	Total (£)
Scenario 1 (Option 1 & 2)					
Total units	170	960	1,765	3,490	6,385
Headroom per unit (£)	36,764	28,645	4,247	0	
Total Headroom (£)	6,249,887	27,498,882	7,496,488	0	41,245,257

Table 7.4 Scenario 2 – Total headroom for infrastructure costs

	Housing Value Area 1	Housing Value Area 2	Housing Value Area 3	Housing Value Area 4	Total (£)
Scenario 2 (Option 3)					
Total units	255	2,880	1,140	2,090	6,365
Headroom per unit (£)	36,764	28,645	4,247	0	
Total Headroom (£)	9,374,831	82,496,647	4,841,924	0	96,713,402

Table 7.5 Scenario 3 – Total headroom for infrastructure costs

	Housing Value Area 1	Housing Value Area 2	Housing Value Area 3	Housing Value Area 4	Total (£)
Scenario 3 (Option 5)					
Total units	230	680	1,060	4,395	6,365
Headroom per unit (£)	36,764	28,645	4,247	0	
Total Headroom (£)	8,455,730	19,478,375	4,502,140	0	32,436,245

- 7.13 As illustrated in Tables 7.3 – 7.5, using the development appraisal assumptions above there is headroom for development to contribute towards infrastructure costs in value areas 1-3, but no headroom for residential development in value area 4. Although it is noted that historically these locations have delivered affordable housing and s106 contributions.
- 7.14 Scenario 2 delivers the greatest headroom for infrastructure (£96,713,402) based on the delivery of 6,365 residential units. Scenario 1 has the ability to deliver a headroom of £41,245,257 for infrastructure costs (6,385 units) and Scenario 3 has the potential to deliver a headroom of £32,436,245 (6,365 units).

Conclusion

- 7.15 Based on an average development size of 70 dwellings and assuming the development assumptions in Section 7.10 which provide for a policy compliant development; **Scenario 2 has the potential to generate the greatest revenue towards the delivery of Harrogate's infrastructure requirements.**
- 7.16 It should be noted that adjusting the development assumptions will give rise to variations in the residual land values and revenues generated for development. For example, delivering a greater number of 4 and 5 bed units will result in higher revenues being generated from development.
- 7.17 Despite the fact that the proposed unit numbers in each of the three housing growth scenarios is broadly the same, the variance in the headroom for infrastructure delivery is due to Scenario 2 having a greater number of residential units proposed in higher value areas of the district compared to the other scenarios.
- 7.18 Scenario 2 focusses growth primarily in the settlements along the public transport corridors. There is more significant growth proposed in the villages to the east of the district, centred around the railway stations of Hammerton and Cattal. The remaining growth would be distributed in the main urban areas, other market towns and across a wider range of villages in the district.

8. OPTION APPRAISAL

- 8.1 As set out at paragraphs 2.3 to 2.5 of this report, three development scenarios have been developed for testing with the providers of a number of critical infrastructure types. The scenarios are all based on **using a target of 621 new homes per year** as the starting point and taking current planned development into account. On this basis, the council will be **planning for around 6364 new homes up to 2035**.
- 8.2 There is a lot of commonality between the three scenarios – the level and location of development indicated to smaller rural settlements and to Boroughbridge, Ripon, Masham and Pateley Bridge. The key difference is the additional focus on the urban areas of Harrogate and Knaresborough in **Scenario 1** compared to a focus on a new settlement at Green Hammerton under **Scenario 2** and on a new settlement at Flaxby for **Scenario 3**.
- 8.3 Information on each scenario was provided to infrastructure providers ahead of the one-to-one meetings and discussions. For each scenario, a table set out the proposed location of growth (by settlement), the scale of growth (number of dwellings) and potential allocations (sites). The proposed location of employment land was also set out. It was made clear that the inclusion of sites as part of the three scenarios should not be taken as an indication that they are necessarily suitable for development and will be allocated. The information was shared in confidence for the purposes of an infrastructure appraisal of the three development scenarios. Work remained ongoing to assess the suitability and deliverability of sites for inclusion as housing and employment allocations in the draft Local Plan.
- 8.4 As part of the one-to-one meetings and discussions with critical infrastructure providers, the issues, implications and opportunities of the three development scenarios were examined. The consultancy project team sought to draw their own conclusions from the meetings based on the discussion and evidence provided. A rating system was applied by the consultant project team to seek a comparative appraisal of the three development scenarios, the assessment and findings were tested with the infrastructure providers at the meeting/discussion and subsequently through review of a draft version of this report. The rating system used was:

Performance Rating	Criteria
5 - Very Strong	<ul style="list-style-type: none"> • Makes good use of existing infrastructure • Makes use of existing capacity • Reduces future investment needs
4 - Strong	<ul style="list-style-type: none"> • Makes good use of existing infrastructure • Reduces future investment needs
3 - Reasonable	<ul style="list-style-type: none"> • Mix of opportunities/constraints • Reduces future investment needs
2 - Poor	<ul style="list-style-type: none"> • Feasible but requires significant investment • Significant lead in/timing constraints • Significant financing and complex delivery issues
1 - Very Poor	<ul style="list-style-type: none"> • Requires significant investment • Not feasible

- 8.5 The remainder of this section of the report summarises the key findings for each infrastructure type and the respective ratings for each development scenario.

CRITICAL INFRASTRUCTURE TYPE 1: GAS (pages 8-9)		
Scenario 1 (Options 1 & 2)	Scenario 2 (Option 3)	Scenario 3 (Option 5)
<p><u>Pros</u></p> <ul style="list-style-type: none"> Growth close to existing infrastructure, LTS with off-take to existing Medium Pressure ring for Harrogate & Knaresborough. Existing network robust, with long-term capacity for growth at Harrogate & Knaresborough. <p><u>Cons</u></p> <ul style="list-style-type: none"> More localised infrastructure extension or reinforcement may be required in long-term. Significant number of limited/short-term reinforcement works would reduce cost-effectiveness and require disruptive work in existing settlements. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> Scale of growth could potentially generate critical mass for infrastructure. Subject to economic viability, NGN would have a duty to meet demand. <p><u>Cons</u></p> <ul style="list-style-type: none"> Area east of A1(M) not connected to NGN gas network. High costs to cross A1(M). May be significant + complex deliverability issues linking to York network. Uncertainty/complications in how new infrastructure could be delivered/funded. Long lead-in times for provision of infrastructure. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> Possible to connect to Medium Pressure ring. There is an existing supply to site. Scale of growth could potentially generate critical mass for infrastructure. Subject to economic viability, NGN would have duty to meet demand. <p><u>Cons</u></p> <ul style="list-style-type: none"> Installation/maintenance cost implications for length of connection from site to existing gas network. Long lead-in times for provision of infrastructure.
4	2	3
CRITICAL INFRASTRUCTURE TYPE 2: ELECTRICITY (pages 9-10)		
Scenario 1 (Options 1 & 2)	Scenario 2 (Option 3)	Scenario 3 (Option 5)
<p><u>Pros</u></p> <ul style="list-style-type: none"> Growth close to existing infrastructure. Recent works undertaken to strengthen security + capacity in Harrogate and Knaresborough area. New Primary Sub-Station at west Harrogate to be complete June 2017, also works to 33kv sub-station. Long-term capacity for growth anticipated around Harrogate and Knaresborough. <p><u>Cons</u></p> <ul style="list-style-type: none"> Potentially some local reinforcement works required in long-term (although anticipated these would not be significant). 	<p><u>Pros</u></p> <ul style="list-style-type: none"> Scale of growth could potentially generate critical mass for infrastructure. Subject to economic viability, NPG would have a duty to meet demand. Opportunity for developer(s) to provide plot for sub-station within site. <p><u>Cons</u></p> <ul style="list-style-type: none"> Area east of A1(M) fed from transmissions systems from bulk supply point in York. York uses different transformer configuration to surrounding area. Distance to Primary Sub-Station in York has significant impact on installation costs and maintenance costs e.g. two cables, from separate routes, are required for security of connection. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> Feasible to connect to existing Harrogate/ Knaresborough infrastructure. Potential for temporary works for 1st stages. Scale of growth could potentially generate critical mass for infrastructure. Opportunity to provide plot for sub-station within site. <p><u>Cons</u></p> <ul style="list-style-type: none"> Distances to Coneythorpe sub-station may have installation and maintenance cost implications. Potential for opposition to works for cabling out of Coneythorpe.
4	2	3

CRITICAL INFRASTRUCTURE TYPE 3: WATER SUPPLY

(pages 10-12)

Scenario 1 (Options 1 & 2)	Scenario 2 (Option 3)	Scenario 3 (Option 5)
<p><u>Pros</u></p> <ul style="list-style-type: none"> Significant water mains in area and YW can supply in terms of distribution network. <p><u>Cons</u></p> <ul style="list-style-type: none"> Major reinforcement may be required in some areas. Additional load on town water supply network might have adverse impact elsewhere, which would need to be mitigated by local reinforcement works. Potential disruption and cost for works in urban areas. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> Opportunity to provide new efficient and sustainable infrastructure. Existing water supply at Green Hammerton. <p><u>Cons</u></p> <ul style="list-style-type: none"> Would require significant levels of infrastructure with associated costs. Feasibility study required to assess options. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> Opportunity to provide new efficient and sustainable infrastructure. <p><u>Cons</u></p> <ul style="list-style-type: none"> Would require significant levels of infrastructure with associated costs. Possibly too far from Harrogate to supply from the west, so water supply likely to be from south or east. Feasibility study required to assess options.
3	3	2

CRITICAL INFRASTRUCTURE TYPE 4: SEWERAGE

(pages 10-12)

Scenario 1 (Options 1 & 2)	Scenario 2 (Option 3)	Scenario 3 (Option 5)
<p><u>Pros</u></p> <ul style="list-style-type: none"> Makes use of existing sewage treatment works + capacity. Less likely to require feasibility and infrastructure work. AMP6 allows for growth in 2009 Core Strategy + sites with planning permission. Harrogate South WWTW has significant unused capacity, and could accommodate level of growth without upgrade. <p><u>Cons</u></p> <ul style="list-style-type: none"> Harrogate North & Knaresborough WWTW likely to require reinforcement. YW would require phased development for infrastructure provision. Growth in existing settlements may require upgrade to sewers. Existing flooding issues may have to be resolved in some areas. Issues may be complex + require investigation by other authorities. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> Potential to achieve more sustainable drainage solutions - reduced operational costs. Potential for early phases to be served by temporary treatment facilities. <p><u>Cons</u></p> <ul style="list-style-type: none"> Would require significant levels of new infrastructure with associated costs. Existing infrastructure is limited. Long new sewers/rising main(s) needed to connect to receiving WWTW which may require significant expansion. Could warrant installation of new treatment works at significant cost. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> Potential to achieve more sustainable drainage solutions - reduced operational costs. Potential for early phases to be served by temporary treatment facilities. <p><u>Cons</u></p> <ul style="list-style-type: none"> Would require significant levels of new infrastructure with associated costs. Long new rising main needed to connect to receiving WWTW, which may not have scope for expansion. Could warrant installation of new treatment works at significant cost.
4	2	2

CRITICAL INFRASTRUCTURE TYPE 5: SECONDARY HEALTH

(pages 13-14)

Scenario 1 (Options 1 & 2)	Scenario 2 (Option 3)	Scenario 3 (Option 5)
<p><u>Pros</u></p> <ul style="list-style-type: none"> • Close to existing hospital + primary care resources - fits with delivering care close to people's homes. • Potential opportunities for improved facilities/operational efficiencies following strategic review at Harrogate Hospital. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Limited scope for expansion of Harrogate Hospital and uncertainty over funding for improvement works. • Car parking and transport access issues. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Potential opportunities for community hub, integrating Primary + Secondary Care, and social services. • May result in less pressure on Secondary Care in Harrogate, as some patients would be referred to York. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Distant from hospital resources, requiring patients to travel or provision of services to people at home. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Potential opportunities for community hub, integrating Primary + Secondary Care, and social services. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Distant from hospital resources, requiring patients to travel or provision of services to people at home.
4	4	4

CRITICAL INFRASTRUCTURE TYPE 6: PRIMARY HEALTH

(page 14)

Scenario 1 (Options 1 & 2)	Scenario 2 (Option 3)	Scenario 3 (Option 5)
<p><u>Pros</u></p> <ul style="list-style-type: none"> • Growth manageable for the 3 GP practices in Knaresborough, and may not require major redevelopment of Green Hammerton GP premises. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Would need new premises for existing GP Practices in Harrogate whose premises are constrained and not fit for purpose. • More investment would be required with more complex solutions involving the lack of suitability of existing premises and the need for new premises. • Uncertainty over how these would be funded/delivered, and critical mass required. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Clear new development/investment opportunity with new facilities. • Potential opportunities for community hub, integrating Primary + Secondary Care, and social services. • Numbers proposed should be manageable for the 3 GP practices in Knaresborough. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Would need major redevelopment of Green Hammerton GP premises and/or new facilities. Other surgeries may also require new premises. • Significant costs to provide new primary care facilities. • Uncertainty over how these would be funded/delivered, and critical mass required. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Clear new development/investment opportunity with new facilities. • Potential opportunities for community hub, integrating Primary + Secondary Care, and social services. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Would need major redevelopment of existing practice premises and/or new facilities. Other surgeries may also require new premises. • Significant costs to provide new primary care facilities. • Uncertainty over how these would be funded/delivered, and critical mass required.
2	4	4

CRITICAL INFRASTRUCTURE TYPE 7: EDUCATION

(page 15)

Scenario 1 (Options 1 & 2)	Scenario 2 (Option 3)	Scenario 3 (Option 5)
<p><u>Pros</u></p> <ul style="list-style-type: none"> • Scope to add classrooms at Bilton Primary. • Opportunity to provide additional classrooms related to planned new schools at Penny Pot Lane and Cardale Park (~3FE in total). • Scope to expand Harrogate High School to provide additional secondary school capacity across Harrogate and Knaresborough. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Significant capacity issues with Harrogate and Knaresborough schools. • Pannal Primary School is constrained. • King James School, Knaresborough is constrained. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Opportunity to provide 1 or 2 new modern primary schools within the site (~3FE). • Significant capacity issues with Harrogate and Knaresborough schools. <p><u>Cons</u></p> <ul style="list-style-type: none"> • No space to expand existing primary school near to site. • Would feed Boroughbridge High School, which is constrained for future expansion. • Insufficient level of development to support a new secondary school within the site. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Opportunity to provide 1 or 2 new modern primary schools within the site (~3FE). • Scope to expand Harrogate High School to provide additional secondary school capacity across Harrogate and Knaresborough. <p><u>Cons</u></p> <ul style="list-style-type: none"> • No existing primary school near to site. • Would feed King James School and/or Boroughbridge High School, both of which are constrained for future expansion. • Insufficient level of development to support a new secondary school within the site.
3	2	3

CRITICAL INFRASTRUCTURE TYPE 8: HIGHWAY NETWORK

(pages 18-21)

Scenario 1 (Options 1 & 2)	Scenario 2 (Option 3)	Scenario 3 (Option 5)
<p><u>Pros</u></p> <ul style="list-style-type: none"> • Site locations mean that traffic impacts are likely to be a little bit more dispersed, although there will be a requirement for major road improvements in Harrogate. • The highway network in Ripon is likely to be able to cope with the level of development currently assumed. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Major road improvements in Harrogate would be needed. • Additional impacts at junctions on key corridors, on the A61 and A661 corridors. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • There is likely to be less impact in Harrogate town centre due to more dispersed traffic patterns. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Major road improvements in Harrogate would be needed. • There is likely to be a need for a northern relief road/inner relief road in the future, given the proximity of the housing, but the number and relative remoteness of the sites makes the funding of any new schemes more difficult. • Major improvements at A1(M) Junction 47 would be needed - NYCC now has funding to provide two lane slip roads on the A1(M) arms and signalisation of Junction 47 and the A59/A168 priority junction, but beyond this, some form of separation of the A59 through movement from the roundabout will be the next stage of improvement, which will be needed with this scenario. • Additional impacts at junctions on A59 corridor. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • There is likely to be less impact in Harrogate town centre due to more dispersed traffic patterns. <p><u>Cons</u></p> <ul style="list-style-type: none"> • Major road improvements in Harrogate would be needed. • There is likely to be a need for a northern relief road/inner relief road in the future, given the proximity of the housing, but the number and relative remoteness of the sites makes the funding of any new schemes more difficult. • Major improvements at A1(M) Junction 47 would be needed - NYCC now has funding to provide two lane slip roads on the A1(M) arms and signalisation of Junction 47 and the A59/A168 priority junction, but beyond this, some form of separation of the A59 through movement from the roundabout will be the next stage of improvement, which will be needed with this scenario.
2	2	2

CRITICAL INFRASTRUCTURE TYPE 9: RAIL		
(pages 21-22)		
Scenario 1 (Options 1 & 2)	Scenario 2 (Option 3)	Scenario 3 (Option 5)
<p><u>Pros</u></p> <ul style="list-style-type: none"> Relatively close to existing rail stations at Harrogate, Hornbeam Park and Pannal. <p><u>Cons</u></p> <ul style="list-style-type: none"> Limited additional parking opportunities at stations. Need to provide sustainable transport links from sites to stations. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> Sited adjacent to existing rail stations at Cattal and Hammerton. Could provide a combined stations solution as part of the site development. <p><u>Cons</u></p> <ul style="list-style-type: none"> Limited additional parking opportunities at stations. Need to provide sustainable transport links from sites to stations. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> Could improve business case for a new station east of Knaresborough, and possibly replace the planned station at Manse Farm. <p><u>Cons</u></p> <ul style="list-style-type: none"> Not located near to an existing station, although proposed station at Manse Farm could be used, if no new station is provided on site.
4	3	2
CRITICAL INFRASTRUCTURE TYPE 10: BUS NETWORK		
(pages 22-23)		
Scenario 1 (Options 1 & 2)	Scenario 2 (Option 3)	Scenario 3 (Option 5)
<p><u>Pros</u></p> <ul style="list-style-type: none"> Relatively close to existing bus stations in Harrogate and Ripon, and there are already a number of commercial services near to the potential housing sites. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> Could provide additional demand for existing tendered service passing the site. <p><u>Cons</u></p> <ul style="list-style-type: none"> Less well related to existing commercial services. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> Could provide opportunity to extend existing commercial bus routes to serve site. <p><u>Cons</u></p> <ul style="list-style-type: none"> No direct commercial bus services currently serving the site.
4	3	3

CRITICAL INFRASTRUCTURE TYPE 11: WALKING & CYCLING

(page 23)

Scenario 1 (Options 1 & 2)	Scenario 2 (Option 3)	Scenario 3 (Option 5)
<p><u>Pros</u></p> <ul style="list-style-type: none"> Relatively close to existing walking and cycling networks in Harrogate and Knaresborough. From the outset, residents can walk and cycle to local facilities. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> Opportunity to create a new focus for walking and cycling networks. <p><u>Cons</u></p> <ul style="list-style-type: none"> Need to provide sustainable transport links from sites to nearby public transport networks. Site is somewhat remote from existing services, so mix of uses will be needed within the site to ensure sustainable development. Local facilities within convenient walking and cycling distance are likely to be delivered in later phases of development. 	<p><u>Pros</u></p> <ul style="list-style-type: none"> Opportunity to extend existing cycling network from Knaresborough to the site. <p><u>Cons</u></p> <ul style="list-style-type: none"> Need to provide sustainable transport links from sites to nearby public transport networks. Site is somewhat remote from existing services, so mix of uses will be needed within the site to ensure sustainable development. Local facilities within convenient walking and cycling distance are likely to be delivered in later phases of development.
5	3	4

MARKET ASSESSMENT

(pages 24-29)

Scenario 1 (Options 1 & 2)	Scenario 2 (Option 3)	Scenario 3 (Option 5)
<ul style="list-style-type: none"> Based on an area wide viability assessment of a 2ha residential development, which is policy compliant in terms of affordable housing contributions (40%), there is a potential headroom of £41,961,920 which could be realised to contribute to infrastructure costs. Comparing this headroom to the scale of utilities, community and transport infrastructure required, there is limited capacity to fund the required infrastructure improvements to the existing highway networks in Harrogate and Knaresborough. 	<ul style="list-style-type: none"> Based on an area wide viability assessment of a 2ha residential development, which is policy compliant in terms of affordable housing contributions (40%), there is a potential headroom of £102,390,915 which could be realised to contribute to infrastructure costs. Comparing this headroom to the scale of utilities, community and transport infrastructure required, there is more capacity to fund the infrastructure improvements required, although more detail is needed on the scale of costs of utility and highway improvements for this scenario in particular. 	<ul style="list-style-type: none"> Based on an area wide viability assessment of a 2ha residential development, which is policy compliant in terms of affordable housing contributions (40%), there is a potential headroom of £34,528,550 which could be realised to contribute to infrastructure costs. Comparing this headroom to the scale of utilities, community and transport infrastructure required, there is less capacity to fund the required infrastructure improvements, particularly the potentially significant water and highway improvement costs for this scenario.
3	4	2

9. CONCLUSIONS

- 9.1 Drawing together the results of the infrastructure appraisal summarised in the preceding section gives the results shown in the table below:

Critical Infrastructure Type	Scenario 1 (Options 1 & 2)	Scenario 2 (Option 3)	Scenario 3 (Option 5)
Gas	4	2	3
Electricity	4	2	3
Water	3	3	2
Sewerage	4	2	2
Secondary Health	4	4	4
Primary Health	2	4	4
Education	3	2	3
Highway Network	2	2	2
Rail	4	3	2
Bus	4	3	3
Walking & Cycling	5	3	4
Market	3	4	2
Unweighted Total	42	34	34

- 9.2 What the scores indicate is a clear preference, in infrastructure terms, to locate future housing growth in line with development scenario 1 – with a focus on Harrogate and Knaresborough. This arises from the fact that such locations already have access to existing infrastructure, and that any improvements required are generally based around enhancements rather than wholly new infrastructure, particularly in relation to utilities. The exception to this is highway network infrastructure, which will need significant improvement in all three scenarios.
- 9.3 The scores also show that there is relatively little difference in the unweighted totals between the two scenarios for a new settlement – each has similar transport impacts and requires major investment in at least one of the utilities which may require crossing the A1(M).
- 9.4 However, it was recognised that the financial viability for any new settlement is of critical importance to ensure that the development is a realistic proposition. Also, community facilities (health and education) are vital for the future growth of the town and any housing sites, but neither is within the control of the council and so both are wholly reliant on third parties for delivery.
- 9.5 A weighting approach has also been applied to the categories of critical infrastructure types used for the different sections of this report, so that each of the four sections within the Stage 2 Report has the same importance within the weighting. Utilities & Environment and Travel & Transport both have 4 critical infrastructure types and the ratings for each of the four types have therefore been added up. Community Services and Facilities has three types – thereby the combined scores have been multiplied by 1.33 for this category. The market assessment rating has been multiplied by 4. The resulting weighted assessment is shown in the table overleaf.

Category	Scenario 1	Scenario 2	Scenario 3
Utilities	15	9	10
Community	12	13	15
Transport	15	11	11
Market	12	16	8
Weighted Total	54	49	44

- 9.6 Principally due to the additional headroom in value that the Green Hammerton new settlement scenario would likely generate, the infrastructure appraisal weighted assessment indicates a preference for any new settlement to be located here, rather than at Flaxby. A key issue though for Green Hammerton is the potentially very significant cost of providing gas and electricity supply, given the distance and complexity of the required connections to existing networks around York.
- 9.7 The weighted assessment does not change the initial conclusion, however, that **concentrating future growth on the existing urban areas (Scenario 1) is preferable from an infrastructure appraisal perspective, in terms of cost, viability and delivery.**