

Yorkshire and Humber
Assembly

**Regional Integrated
Infrastructure Scoping
Study**

Issue

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Assembly

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Issue

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Executive Summary

Background and Introduction

The Housing Green Paper 2007 provides for 'improved infrastructure planning' in relation to housing growth. To meet this requirement for the Regional Spatial Strategy (RSS) Update 2009, the Yorkshire and Humber Assembly (YHA), as the Regional Planning Body (RPB), has commissioned this scoping study to help it consider how infrastructure should inform the growth options. Its aims and objectives are to:

- set out the key utility/infrastructure providers/ their duties and key issues faced;
- summarise key implications/ recommendations from recent infrastructure work elsewhere;
- outline infrastructure issues in the region, with diagrams;
- define strategic/ sub-regional infrastructure;
- establish a common framework to enable partners to consider strategic infrastructure in a consistent manner;
- advise how a GIS mapping based approach can be used to determine broad locations for growth; and
- advise how the RSS Update workstream should develop as a result of this scoping study.

Arup and the Centre for Sustainable Urban and Regional Futures (SURF) have undertaken this study, gleaning views and data directly and indirectly from a range of organisations, working with the RPB and its steering group and collating key issues emerging from a regional workshop held in March 2008.

This scoping study has taken place concurrently with several other studies to inform the RSS Update 2009 (e.g. Regional Transport Constraints Study, Regional Green Infrastructure Evidence Base Study), and should be considered alongside these. Whilst the scoping study has considered critical, green and social infrastructure, in view of the foregoing it has focused on critical infrastructure, leaving a more detailed consideration of transport and flood risk to other studies.

Context for Infrastructure Provision and Planning in the UK

Planning for growth and change requires an understanding of the constraints and opportunities in any given area. This is underlined by the Housing Green Paper which requires improved infrastructure planning and pro-active planning for housing that ensures deliverability. A number of important messages emerge from this overview of the current context for infrastructure planning and provision, including:

- structural problems with infrastructure planning in the UK, including over-centralisation, regulatory and financial fragmentation, poor coordination, and a lack of cross-sectoral understanding, and the relative autonomy of the utility providers themselves in terms of engaging with strategic forward planning.
- there is a changing statutory and policy framework for improved infrastructure planning, with the current Planning Reform Bill, the housing growth agenda, planning for climate change, (including the need for increased resilience), Community Infrastructure Levy and the need for decentralisation is particularly important;
- the plan-led system provides an excellent medium around which partners can co-ordinate planning and provision of infrastructure – however a recent lack of genuine planning for growth inhibit the ability to realise this potential;
- the recent change in the planning system from land use planning to spatial planning, coupled with the hierarchy of plans principle and the requirement for a robust evidence base for planning, means that the RSS will need to take a GIS based approach to identifying strategic infrastructure work in an "up front" way.

- the consideration of planning, and infrastructure in PPS12 provides a basis for the RPB to engage more with infrastructure providers (i.e. these providers can help shape the pattern of development so it takes into account of likely infrastructure limitations and makes the best use of existing capacity), also provide providers with better impacts for their own forward planning.
- the development of the Northern Way and the emergence of the city regions provides an opportunity for improved infrastructure planning at the city region level for critical, social and green infrastructure, using the RSS as the expression of planning aspirations, and the RPB for its GIS capability.
- in the long term, it appears likely that the current model of centrally networked infrastructure will recede in favour of local networks of supply and collection – although uncertainty remains as characterised by the proposed nuclear power station programme.

Infrastructure planning is complex and sophisticated. In virtually all sectors, genuine forward planning is made more challenging by relatively short-term spending periods for utility providers, regulatory price-control mechanisms and the degree of autonomy afforded to utilities and other providers by primary legislation. However, there is a clear incentive for infrastructure providers, particularly utilities, to engage pro-actively in spatial planning in order to realise investment efficiencies, especially when larger scale growth is occurring.

At the same time, there are a number of external drivers of change in relation to climate change, policy changes (in particular for reducing CO₂ output), regulatory and statutory changes as well as advances in technology, amongst others. Many of these issues are picked up in the published industry planning documents.

It is crucial that utilities providers become more involved in strategic plan policy making so that there is an increased level of understanding across disciplines and more proactive engagement in the context of critical infrastructure.

The National Framework for Infrastructure Provision

The utilities vary in statutory make-up, spatial remit and regulatory frameworks. Whilst the other current studies address transport, flood defence and green infrastructure issues in more detail, it is worth noting:

- the severity of flood and/or drainage incidents largely depends on topography, flooding history and age/condition of the infrastructure concerned; this has knock-on effects in terms of waste water;
- there is a lack of clarity around the relevant flood-related organisations and their responsibilities (as stated by the Pitt Review), and in particular relating to the exact age/condition of drainage infrastructure (because much of it was built prior to the need to require records of the precise location), which can exacerbate drainage and wastewater related problems;
- the Water Framework Directive will have major implications in terms of cost and land use, as it requires an 'ecological' standard of water quality by 2015 at a time when climate change could reduce the seasonal availability of water to dilute pollution; this will necessitate upgrading and possibly increasing waste water treatment infrastructure, and could cause major problems in areas already at full capacity; RPBs will therefore need to study water investment programmes more closely to assess fixed and variable capacity accordingly;
- the Urban Waste Water Treatment Directive requires coastal waters with expanding adverse effects to be identified as 'areas sensitive to eutrophication'; significantly, the EU considers the Humber should be designated as such, and the UK Government has made a legal challenge accordingly; if the EU view is confirmed, this will have major implications to water treatment costs in the region;
- Ofwat's current periodic review ("PRO9") will determine the water companies investment programme for 2010-2015; whilst this will therefore be 'fixed' in the short term to 2015, there is

perhaps greater scope for RSS growth options to influence investment programmes in the medium to long term (i.e. 2015-2020 and 2020-2025);

- the Landfill Directive 1999 provides for challenging targets in reducing the amount of biodegradable municipal waste (BMW) to landfill, and imposes severe financial penalties for non-implementation; this will result in a 'decentralisation' away from single mega-landfills to the provision of more but smaller/specialised waste facilities closer to sources of production, with greater opportunities for recycling and energy-to-waste plants;
- electricity distribution is currently very centralised, with the National Grid providing a network for the 14 licensed electricity distribution operators; as OFGEM are yet to agree tariffs (based on investment plans) for 2010-15, an opportunity exists for growth patterns to inform these accordingly (and vice-versa);
- the lack of access to gas could act as a constraint on growth, especially in rural areas; however, the potential exists for off-takes from the main pipelines in local distribution zones (LDZs); also, whilst some commercial uses rely on a gas supply, this is not essential for housing and likely to diminish in importance for future housing growth;
- telecoms traffic travels on several major national networks and between access networks; major providers include BT, Cable and Wireless, Virgin Media. Generally, the provision of telecoms infrastructure is undergoing a major overhaul, as operators increasingly develop/replace traditional copper wire access networks with fibre to the home (FTTH) provision (i.e. to facilitate greater broadband access); telecoms provision is unlikely to be a constraint to growth, except in isolated rural areas; and
- primary schools and primary health/social care tend to take place in 'localised' locations, thereby reducing travel; however, secondary schools and healthcare (i.e. hospitals) tend to operate on a larger scale, and generate wider travel patterns; there is a need therefore to identify these secondary facilities and ensure growth occurs in proximity to those wherever possible so as to reduce journeys and/or provide access by public transport as much as possible in line with PPS1.

In more general terms, the main issues emerge:

- there are constraints at a national level that block better planning for infrastructure;
- the planning and regulation of the utility companies and therefore critical infrastructure (water supply and sewerage treatment, electricity distribution and gas distribution) are amongst the most inflexible due to regulatory constraints and as a result do not currently relate well to regional forward planning at present;
- other significant parts of infrastructure planning are within the overall control of the public sector, and there are established links to regional planning, including the regional transport strategy, regional waste policy and flood risk management – although there is scope for better integration; and
- a number of infrastructure types are predominantly planned for at a local or sub-regional level and do not have major significance in planning for growth at the regional level.

In addition to transport, flood risk/defence and green infrastructure, water supply and treatment, electricity supply, health and education emerge as important considerations for planning for growth at the regional and sub-area level.

Spatial and Infrastructure Planning in Other Regions

The different approaches in the English regions to integrated infrastructure provision can be summarised as:

- little or no consideration of the planning and/or delivery of infrastructure, other than green infrastructure (E Midlands);

- strategies with sound strategic aspirations for the planning and delivery of infrastructure but no clear mechanisms to ensure delivery and/or integration with planning (N East, Greater London);
- preliminary attempts to assess infrastructure capacity constraints and opportunities in relation to spatial growth and development (North West, West Midlands, Yorkshire and the Humber); and
- focus on delivery mechanisms, and in particular the establishment of Regional Investment Funds with which to facilitate and/or accelerate delivery of key infrastructure (South East, South West, East of England).

Many studies undertaken by the regions are approaching the issue of infrastructure provision retrospectively. This is because most RSSs have either been recently issued or are nearing their issue date, and are due to be revised, in whole or part, by 2011. With growth locations already embedded within RSSs, the focus in some regions is on targeting how best to prioritise schemes and understanding the financing options for delivering the planned growth concerned (S West, S East).

This is distinct from the approach in Yorkshire and the Humber which is seeking to inform the selection of growth locations up front and at a high-level during the RSS 2009 Update. This is similar to the approach in the North West and West Midlands which provides comprehensive information on utilities in particular and identifies transport capacity and waste water treatment capacity as being potential barriers to growth in specific locations.

Clearly there are a number of more fundamental longer-term actions to embed a pro-active and coordinated approach to spatial, economic and critical infrastructure planning in the region. Clearly these longer term issues need to be addressed in the development of the Single Regional Strategy.

Review of Other Specific Studies into Infrastructure and Housing and Economic Growth

Analysis of other specific studies highlights the following:

- the existing disconnection between spatial planning and infrastructure planning;
- the helpfulness of a commonly agreed set of demographic change scenarios to enable infrastructure providers to have a consistent set of data for short, medium and long term planning (Plymouth case study);
- many infrastructure providers are working on outdated assumptions that assume low levels of growth in spatially uniform development patterns (Manchester City Region);
- potential mismatch between spatial policy and infrastructures which are not sensitive to the city region scale (Manchester City Region);
- the particular sensitivity to the growth agenda (Manchester City Region);
- the need to build better relationships and understanding between spatial planners and infrastructure providers, founded on a thorough understanding of roles and responsibilities;
- that detailed studies need to occur at the sub-regional level to fully understand the nature of infrastructure issues in relation to growth and change, and even at this level assembling the data requires persistence and dedication (Plymouth case study);
- that some infrastructure types and in particular green infrastructure also contribute to social, economic and environmental policy outcomes;
- that planned growth itself could adapt where necessary to fit with available resources; and
- the longer term need to ensure that integrated infrastructure planning takes into account the economic as well as housing growth aspects of spatial planning.

Significantly, the Manchester City Region case study led to the formulation of a 5 stage framework to consider and integrate planning for infrastructure as follows:

- Stage 1 – “Understanding the existing context”, to gather relevant data and intelligence so as to assess current level of knowledge on the spatial distribution of assets, quantity, quality, use, accessibility and connectivity i.e. what critical infrastructure currently exists? Who provides it? What quantity is there and how is it distributed? What are the new pressures on that critical infrastructure? What challenges do these pose for current capacity? What connectivity and cost issues are raised? How network provision is currently managed? What are the growth/targets/aspirations of the region, city/sub-region for housing, economy and transport and what demand does this place on infrastructures? Does capacity (quantity, quality and distribution) meet standards and growth targets?
- Stage 2 – “Establishing the Existing Framework for Infrastructure Provision”, to understand the extent to which strategic direction and implementation of critical infrastructure is currently joined up spatially (and also with other strategies delivering social and economic interactions), and to what extent will these deliver the outcomes to be determined in the Action Plan (Stage 4) (i.e. what strategies currently refer to critical infrastructure and what do they aim to achieve? What programme activity and priorities exist which implement critical infrastructure? Who are the key stakeholders? Are their views and priorities regarding critical infrastructure planning and investment consistent? Are all the relevant stakeholders engaged? Where are the potential synergies and conflicts in strategic terms between critical infrastructure and planned interventions?).
- Stage 3 – “Gap Analysis”, to understand where the opportunities are likely to arise for improved planning of and enhanced investment in critical infrastructure, spatially, temporally and in terms of quality and quantity (i.e. where are the resources currently under-represented spatially? How the city regions’ economic plans need to be reflected in terms of critical infrastructure provision and planning? Are quantity and quality standards met or planned to be met? Where are the mismatches between distribution/quality and different needs and growth aspirations? What opportunities exist to create these connections?)
- Stage 4 – “Better Integration Planning in the Long Term” to formulate and implement a prioritised action plan with policy and programme interventions (i.e. where can critical infrastructure contribute spatially and thematically to decoupling resource use and economic growth? Where will actions have the highest impact? What opportunities are there for “quick wins”? What opportunities are there to promote the development of exemplar projects? What best practise can be developed or imported? What supporting structures will help to see through this action plan to delivery - planning guides, capacity building, pilot projects? How will the plan be monitored, evaluated and reviewed?)
- Stage 5 – “Preparing for the Future” to establish ownership of the critical infrastructure agenda (strategy and Action Plan) in terms of appropriate partnerships, for a, delivery vehicles or other structures and to identify where gaps exist that can be filled as appropriate (i.e. what would the terms of reference be for any strategic partnership? What would its priorities be? What opportunities are there to identify a champion for critical infrastructure in the city region? How should any strategic partnership/group seek to integrate with other city regional/regional structures? What will its communications strategy be?)

Unsurprisingly, the findings of the Manchester City Region work stress the importance of capacity building and the need for consistency of approaches at different spatial levels.

Infrastructure Provision in Yorkshire & the Humber

This section of the report includes territorial maps and plans of areas of operation of the main utilities in the region and provides details of the main contacts, where available, and signposts the main providers of infrastructure throughout the region and main data sources. Appendix A provides further information on who does what where.

The main findings arising from this section are:

- RSS needs to be clearer about what development will be like in 15-20 years time;
- many utilities are at or close to capacity in the region already;
- knowledge on flood risk in the region is generally good but poor on drainage, avoiding locating vulnerable networked infrastructure or facilities in floodplains needs to be considered;
- need to consider “strategic infrastructure” as that which applies to “broad areas”, not just specific sites, schemes and local areas;
- Anglian Water takes a very pro-active approach to planning for growth, and is actively seeking to steer growth to “optimal” locations in terms of waste water treatment capacity;
- adequacy of water management infrastructure in the region will depend on topography, flooding history, age/condition, funding/resources for new investment;
- need to discuss growth options with water companies and others to identify relevant issues, in particular potential for inflationary pressure;
- waste is unlikely to be a constraint on growth planning at a regional level;
- the review of investment programming by the utility operators for 2010-15 provides an opportunity to identify optimal areas for growth;
- there are no major gas or electricity constraints to urban areas, indeed there may be some capacity resulting from industrial decline in areas where major industries have closed or scaled back, but gas supply is limited in rural areas;
- there are telecommunication and broadband constraints in Hull and rural areas; and
- the region needs a broad strategic map for green infrastructure, showing areas of constraint and opportunity.

Infrastructure and Regional Planning: Moving Forward

In Yorkshire and the Humber, most infrastructure appears to be operating at or close to capacity at present, with good infrastructure provision in urban areas (i.e. the focus of growth in the RSS). However, there is clearly a considerable disconnection between strategic spatial planning and infrastructure provision, which is in the interests of neither the RPB nor the infrastructure providers.

To help address this, the RPB needs to identify strategic infrastructure relevant to RSS objectives (i.e. infrastructure relating to an area of more than just local or site-specific importance). It also needs to build better relations with providers and operators. Clearly the RSS Update 2009 provides an opportunity for it to do this. Whilst there is a limited timescale for RSS setting up an ‘up-front’ transport evidence base for infrastructure capacity, there is scope for informal discussions with the infrastructure providers to establish pinch-points and spare capacity, if any, and to test growth options. GIS coverage may follow in due course.

In addition, and looking towards the long term, there is a considerable overlap between RSS and the infrastructure providers own investment programmes (and planning). The new (spatial) planning system also provides an opportunity for better engagement/consideration of infrastructure in the long term. The RPB needs to build on these opportunities.

In view of the foregoing, and the experience of the study team elsewhere, it is proposed that the RPB adopts a 5 stage framework of action broadly comprising the stages as outlined below. Whilst it is unlikely to be able to progress beyond stage 2 or 3 within the stringent timescale of the RSS Update 2009, the implementation of the actions identified would comprise a significant start in terms of better and more integrated planning for infrastructure. The proposed Action Plan is overleaf.

Proposed Action Plan

Stage	Short Term (2008/9)	Medium Term (preparing for SRS)	Longer Term
1	<p>This study delivers the majority of the necessary actions for Stage 1 at a regional level.</p> <p>Further study at the regional level should draw on the results of other studies. Sub-area partners to refine level of detail for their localities.</p>	<p>In the medium term the RPB should take ownership of the information in the scoping study and keep it up to date as necessary.</p>	<p>Baseline of infrastructure information maintained by RPB in partnership with sub-area partners.</p>
2	<p>This study partially addresses some of these actions. The RPB should continue to build on established links with utilities and agencies. Establishing better links with strategic service providers will also assist in building capacity ahead of the SRS.</p> <p>Sub-area partners to start considering how infrastructure issues relate to growth and change plans, and identify key sub-area contacts.</p>	<p>Sub-area partners should establish and build relationships with providers at the appropriate level, building on the existing regional links.</p> <p>Infrastructure providers engaged by sub-regional partners in identifying main issues at existing identified growth / change opportunity areas.</p>	<p>N/A</p>
3	<p>This should be identified through the RPB testing the options with service providers to ensure there are no major delivery issues for the RSS 2009 Update. Sub-area partners can augment capacity if available.</p>	<p>In the medium term the sub-area partners should lead on this in response to planned growth and change and building a detailed picture of barriers and opportunities with infrastructure providers. RPB will have a co-ordinating role concurrent with co-ordinating sub-area inputs to SRS.</p>	<p>Ongoing integrated joint working with infrastructure providers, with overall co-ordination by RPB.</p>
4	<p>In the short term this is likely to be limited by time and resources to the RPB identifying the major issues to be address by the SRS and infrastructure providers at a later stage – essentially setting the agenda for the medium term.</p>	<p>Established joint working at the sub-area level will mean infrastructure providers have a much clearer picture of growth and change policies, and within the possible scope be preparing their own investment and delivery plans in response to these. Similarly, sub-area policy-making will be informed by a robust understanding of infrastructure issues.</p>	<p>Ongoing integrated joint working with infrastructure providers, with overall co-ordination by RPB.</p>
5	<p>The RPB needs to consult on proposals to establish a framework for dialogue, based on protocols for joint working with the infrastructure providers. This is considered in more detail below. This will establish the basis for much of the medium term activity and beyond.</p>	<p>Focused on long-term planning aspirations wider policy propositions in relation to climate change, understanding changing future models of provision and technological changes will be well understood and</p>	<p>Review established models to ensure ongoing relevance and effectiveness.</p>

1 Introduction

1.1 Background and Objectives

This scoping study has been commissioned by the Yorkshire and Humber Assembly in its role as Regional Planning Body (RPB) to consider how the region should take infrastructure forward in an integrated way at a strategic level, and help scope work to inform the RSS Mini Review. The need to consider infrastructure stems largely from the Housing Green Paper 2007, which provides for “improved infrastructure policy” in relation to increased housing growth.

The Study Brief specifies that the study will need to:

- set out a profile of key utility/infrastructure providers in the Region, their responsibilities/remit and key issues faced;
- summarise and draw out implications/recommendations from recent and current infrastructure work elsewhere;
- provide an initial overview of infrastructure issues in the Region, including plans/diagrams of strategic infrastructure networks where these exist;
- provide advice on/define ‘strategic’/“sub-regional” infrastructure (required to support development in broad locations/areas rather than on specific sites);
- set out common framework to enable further city/sub regional work to take place in a consistent way and assess whether any further regional overview work should take place alongside this;
- establish how a GIS mapping based approach can be used to put the results of further infrastructure work in to practice in determining future broad locations for growth across the Region and within the Plan’s sub areas; and
- provide advice as to how the infrastructure workstream for the RSS review should be taken forward in the light of the intended approach set out in this brief and the work undertaken through this study.

1.2 Study Process

This study has been undertaken by a team of planners and others within Arup, working together with the Centre for Sustainable Urban and Regional Futures (SURF) focusing on issues relating to long term futures and case studies from other city regions.

The process has comprised: gleaning information directly and indirectly from a range of organisations, including utilities; a regional workshop in April 2008 to discuss related issues; consulting with the RPB and Steering Group for the study (including GOYH, RDA, etc) on draft outputs.

It has become clear from this process that generally planners are often not aware of how utilities operate or provide infrastructure, due to the relative autonomy of utilities providers. Clearly this represents a major challenge for the region to address.

1.3 Structure of the Infrastructure Workstream

1.3.1 Introduction

This scoping study is the first phase of three intended phases of work on infrastructure during 2008 to help inform the RSS Update 2009. The role of the scoping study is described above; to provide a common understanding of the main infrastructure providers, operational frameworks and contacts, and to provide a common framework for the delivery of Phases Two and Three of the work. It should be stressed at the outset that the need to

consider infrastructure is in its infancy, and that the workstream will be developing long after the RSS Update 2009.

1.3.2 Phase Two

Having established a common framework it was envisaged that, Phase Two of the workstream will look to identify and explore infrastructure provision in more detail. Further work will analyse the capacity and constraints within existing infrastructure, the current mechanisms for the provision of infrastructure, and seek to understand potential blockages to service delivery over the longer term.

This assessment work will be undertaken with city-region and sub-area partners within Yorkshire and Humber, namely Leeds City Region, Sheffield City Region, Hull and Humber Ports City Region and the North Yorkshire sub area. Providing an identification and assessment at the city region level allows for infrastructure provision to be considered in an integrated manner and should ensure consistency of approach across the region.

At this stage it is likely the city/sub regional partners will carry out 'scenario-testing'. This provides an opportunity to consult the utilities specifically, and explore and appraise infrastructure delivery options and extract more detailed and locational specific information as to capacity and constraints within infrastructure provision.

In doing so, it will be possible to consider constraints and opportunities linked to housing growth and provide evidence and information at the most appropriate scale to feed into decision making for RSS 2009 Update.

1.3.3 Phase Three

Phase Three will be required to draw together the work from the different city/sub regions and draw this together to inform options for the Regional Spatial Strategy. A key requirement at this stage will be to spatially map the infrastructure assessment work and related implications. This will enable the outputs of the infrastructure work stream to be used alongside the outputs of other work streams to identify and evaluate different options for accommodating longer term growth in the Region.

It is important for the different studies to have the relevant information and evidence in presentable, GIS-linked formats, so as to be readily utilised.

The benefit of this three staged approach to infrastructure assessment and planning include: establishment of a robust evidence base; more informed planning; optimisation of funds available; cost savings for city/sub regional work from regional scale economies; added value from common methodology/framework (i.e. gaps less likely); and partnership working likely to avoid tensions at a later stage in the RSS Update 2009.

At this point the Regional Assembly may use the information gathered to undertake some 'options-testing', where growth scenarios can be modelled, using evidence gathered, to test the current policy approach of the RSS and inform and revision in policy approach.

1.4 Relationship with other Work

1.4.1 Introduction

The infrastructure workstream is just one of a number of workstreams that comprise the programme of work for the RSS 2009 Update. The other workstreams are identified and summarised below.

1.4.2 Background to the RSS 2009 Update

The requirement to review the Regional Spatial Strategy – The Yorkshire and Humber Plan, stems from the Housing Green Paper "Homes for the Future: More Affordable, More Sustainable" which was published in July 2007. The Green Paper sets out that by 2011 Assemblies' will review Regional Spatial Strategies to reflect the Government's plans for increased rates and levels of house building. This Green Paper also requires a much

greater consideration of infrastructure issues than has been the case to date. This is addressed in Section 2.3.3 of this report.

The Yorkshire and Humber Regional Planning Board considered a broad approach to the RSS Review in December 2007. The Board stressed the need for the Review to be seen as a continuous development of the Yorkshire and Humber Plan, rather than a wholesale review. The Regional Planning Board agreed that the focus of the RSS would be on three overall themes:

- levels of growth;
- locations for growth; and
- infrastructure for growth.

Within the broad approach agreed by the Regional Planning Board work has already begun on reviewing the evidence base for many of the work streams. The aim of the evidence base review is to ensure that work being undertaken in the Region such as housing land assessments and infrastructure studies will cover the whole of the Region in a consistent way.

1.4.3 Work streams

In line with the broad approach the RSS 2009 Update will consist of the following work streams:

- Work stream 1: Sustainability Assessments
- Work stream 2: Scale and Type of Housing Growth
- Work stream 3: Possible Locations of Growth
- Work stream 4: Infrastructure
- Work stream 5: Adaptation
- Work stream 6: Consultation and Engagement
- Work stream 7: Option Analysis
- Work stream 8: Policy Revisions

Clearly the work streams overlap in places and link together but identifying these work streams helps to organise and articulate the RSS Review work programme, including the review and development of the evidence base, options analysis, developing policies and preparing materials and information.

1.4.4 Specific Other Studies

In view of the ongoing workstreams, there are several concurrent studies taking place. These include:

Assessment of the Use of Evidence on Transport Constraints and Opportunities in the RSS 2009 Update

This study looks at ways of using existing transport evidence base on transport constraints and opportunities to proactively inform options for housing growth. This is an important companion study to this scoping study. This Regional Integrated Infrastructure Scoping study defers to the transport constraints study in a number of areas.

Regional Flood Risk Appraisal (SRFRAS) in the Yorkshire and Humber

The aim of this study is to consider findings from Strategic Flood Risk Assessments from across the Region, identify strategic implications at the sub area level and thereby inform options for growth..

Mapping the Policy Implications of LDF Core Strategies

The purpose of this study is to test the ability of the current policy approach in RSS and other options investigated by LPAs in their core strategy work to accommodate higher levels of growth.

Green Infrastructure – Evidence Base Study

The purpose of this study is to contribute to the development of a strategic approach to Green Infrastructure by establishing evidence base requirements, ensuring that Green Infrastructure has a pro-active and informed influence upon decisions regarding future locations for growth and development.

Regional Climate Adaptation Study

This study will examine future impacts on the region in line with the UKCIP08 scenarios, and will in doing so will consider specific impacts and implications with regard to infrastructure.

1.5 Types of Infrastructure

1.5.1 Introduction

This scoping study considers a number of different types of infrastructure, in varying detail subject to the likely relevance for regional spatial planning. In broad terms, infrastructure can be categorised into three sets, as set out below.

1.5.2 Critical Infrastructure

Critical infrastructure is that considered essential for development, and tends to comprise physical infrastructure such as transport, utilities and in some cases protective infrastructure (such as flood defences). The delivery of critical infrastructure is often a pre-requisite to the delivery of new residential and commercial development, and often requires significant up-front capital investment. Funding the provision of new critical infrastructure is perceived as a major barrier to achieving growth and is the subject of a number of initiatives (set out in this scoping study) to facilitate delivery. Critical infrastructure capacity and funding (or the lack of it) is often cited as a barrier to economic growth. The most obvious example of this is in respect of transport infrastructure.

Critical infrastructure was traditionally within the control of the public sector. The public sector maintains an important co-ordination and regulatory role in many types of critical infrastructure, but in many cases delivery is now a private sector activity.

1.5.3 Social Infrastructure

Social infrastructure helps to support the functioning of society. Although capital investment forms part of social infrastructure, the revenue element of social infrastructure tends to be more significant. It includes the provision of public services, such as health, social services, education, police and fire services.

Social infrastructure tends to be almost exclusively in the public sector, certainly with regard to specification and procurement. However the actual delivery of some aspects of service delivery of social infrastructure is undertaken by the private sector.

In general terms, social infrastructure is not a barrier to growth. However, the long-term planning of social infrastructure needs to be undertaken in association with regional, sub-area and local spatial planning to ensure services are available and responsive.

In many cases, at the local level, it is important to understand the capacity of local social infrastructure in order to ensure that development contributes to the necessary physical upgrades to capacity. It is generally assumed that the revenue implications of additional service provision will be covered by commensurate increase in the local tax base and / or service charges.

A number of aspects of social infrastructure are co-ordinated and even delivered on a regional basis, including aspects of the health service. Where these regional structures exist it is important to ensure dialogue is taking place.

The delivery of social infrastructure is subject to ongoing changes in models of procurement and delivery, including at the spatial scale. Examples include development of regional (or even inter-regional) hospital specialisms, centralisation of post-16 education, and different models of service provision, such as for mental healthcare. These changes occur and are likely to continue to occur out-with the wider spatial planning process. This reinforces the underlying message of ensuring lines of dialogue between those that procure social infrastructure and spatial planning professionals.

1.5.4 Green Infrastructure

Green infrastructure is a network of multi-functional green space which sits within, and contributes to, the type of high quality natural and built environment required to deliver sustainable communities. Delivering, protecting and enhancing this network requires the creation of new assets to link river corridors, woodlands, nature reserves and urban green space and other existing assets. If properly planned and managed, green infrastructure should also contribute to wider environmental infrastructure through local climate change and air quality amelioration, floodplain management and coastal sea defences.

1.5.5 Summary

The Housing Green Paper 2007 provides for 'improved infrastructure planning' in relation to housing growth, to meet this requirement for the Regional Spatial Strategy (RSS) Update 2009. The Yorkshire and Humber Assembly (YHA), as the Regional Planning Body (RPB), has commissioned this scoping study to help it consider how infrastructure should inform the growth options according to its aims and objectives are to:

- set out the key utility/infrastructure providers/ their duties and key issues faced;
- summarise key implications/ recommendations from recent infrastructure work chambers;
- outline infrastructure issues in the region, with diagrams;
- define strategic/ sub-regional infrastructure;
- establish a common framework to enable partners to consider strategic infrastructure in a consistent manner;
- advise how a GIS mapping based approach can be used to determine broad locations for growth; and
- advise how the RSS Update workstream should develop as a result of this scoping study.

Arup and the Centre for Sustainable Urban and Regional Futures (SURF) have undertaken this study, gleaning views and data directly and indirectly from a range of organisations, working with the RPB and its steering group and collating key issues emerging from a regional workshop held in March 2008.

This scoping study has taken place concurrently with several other studies to inform the RSS Update 2009 (e.g. Regional Transport Constraints Study, Regional Green Infrastructure Evidence Base Study), and should be considered alongside these. Whilst the scoping study has considered critical, green and social infrastructure, in view of the foregoing it has focused on critical infrastructure, largely defining a more detailed consideration of transport and flood risk to other studies.

2 Context for Infrastructure Provision and Planning in the UK

2.1 Introduction

Planning for growth and change requires an understanding of the constraints and opportunities in any given area. This is underlined by the Housing Green Paper 2007 which requires improved infrastructure planning and pro-active planning for housing to ensure deliverability.

This section summarises the background and context for infrastructure networks, planning and the need for new and upgraded infrastructure nationally. It also begins to explore what the implications of these regulatory processes are for infrastructure provision in the Yorkshire and Humber region.

2.2 Overall Background and Context

2.2.1 Introduction to Development Planning and Infrastructure

Major property and infrastructure developments are complex and require extensive negotiation in order to get off the ground. There is a broad consensus that there is a “bottleneck” in the process when it comes to forward-funding urban infrastructure. This bottleneck is attributable to four major weaknesses in the UK’s infrastructure delivery framework:

- centralisation;
- fragmentation;
- poor coordination;
- skills shortages; and
- autonomy.

Taken together, these weaknesses create additional costs and delays, significantly increasing risk, and sometimes threaten the viability of entire development schemes. It is therefore necessary to consider these issues in more detail.

2.2.2 Over-centralisation

The Treasury and other Whitehall departments control the great majority of infrastructure financing levers. Local authorities do not have adequate powers or financial resources to deliver large-scale infrastructure projects on their own, and they are, at present, forced to rely heavily on Section 106 (S106) agreements (private sector development contributions) for infrastructure improvements related to individual development sites. This reliance can lead local authorities to ‘load-up’ S106 agreements with additional requests for developers, creating complex and unpredictable negotiations with would-be investors.

In 2004, the Greater London Authority (GLA) highlighted the financial restrictions faced by local government. It pointed out that:

- 95 per cent of all taxation is set by central government;
- all capital expenditure by English regional and local government is subject to Treasury control; and
- the ability of local or regional government to adopt mechanisms for public private co-investments is significantly constrained.

Centralised public finance is, therefore, a major constraint on infrastructure investment at the city region and other levels.

2.2.3 Financial Fragmentation

Local leaders and private investors also see the fragmentation of infrastructure funding as a major issue. The high number of central government funding streams creates a huge amount of confusion, and generates significant delays as stakeholders try to navigate bureaucratic processes and piece together viable funding packages.

2.2.4 Weak Strategic Coordination

With financial fragmentation comes the need to align a wide array of public bodies with different targets. When it comes to infrastructure, public sector strategies, targets and investment activities are poorly coordinated – both with each other and with private-sector timescales. The lack of alignment between the strategic objectives of different agencies can lead to unnecessary delays. Economic development actors and agencies need to find ways of working in partnership effectively, and government has a responsibility to ensure that economic development powers are devolved to the appropriate spatial scale.

The recent Barker Review of Land Use Planning and the Eddington Transport Study recommended a system of national policy statements – setting out the Government's 'strategic' national projects in transport, energy, utilities and other key types of infrastructure – with decisions taken by an Independent Planning Commission. Mismatched public and private sector timescales can frustrate the development process. Public financing needs to match development cycles – we need a better integrated framework.

Uncertainty around the availability of public sector pump-priming funds can place both infrastructure and subsequent development at substantial risk of delay or cancellation.

Risk is a critical issue. Delivery timescales can make development schemes more risky by increasing the potential for damaging delays in the provision of infrastructure. At a time when the Government wants increased delivery and greater certainty from the planning system to enable quicker decisions to be taken, planning for infrastructure is a major challenge. It will be necessary for spatial planners to re-engage with infrastructure planners, and there is an evident willingness to do this.

2.2.5 Lack of Capacity and Skills

In many areas of the UK, local authorities are seen as lacking in capacity and expertise, with planning departments overstretched and high staff turnover generating instability and delay.

This is a particular concern for transport infrastructure projects, as capacity issues and perverse incentives can induce local authorities to take an anti-development stance.

Independent evaluations provide support for this assessment. For example, a recent Audit Commission report found that many local authorities lacked the capacity to make good use of S106 powers – with development contributions ranging between £500 and £30,000 per dwelling. Anecdotal comments noted that city councils are not doing enough to extract public value from developments, due to capacity issues; with a need to have greater expertise, wherewithal and resources to optimise funding.

2.2.6 Autonomy

The utility providers were reformed largely as private sector utilities in the late 1980s and early 1990s, a time when there was a presumption in favour of development (unless material considerations indicated otherwise). This means the utilities have developed and remain largely outside the forward planning process, especially at a regional and sub-regional level. Although there is a statutory requirement for them to be involved in strategic spatial forward planning, it is nevertheless in their interests to do so, and in national interests too, to ensure development occurs to optimal locations and at least cost to the Exchequer and others as much as possible. Involving and persuading utilities in strategic planning is therefore a major challenge to the RPB and others.

2.3 Legislation and Policy

2.3.1 Introduction

Adequate infrastructure is essential for place-shaping and sustainable development. Its provision has emerged recently as a key issue in statutory planning, together with concepts such as “critical”, “green” and “social” infrastructure. These can be seen to broadly equate to “economic”, “environmental” and “social” infrastructure respectively, although there is a sophisticated inter-relationship between these categories.

There is a need then to consider and assess infrastructure needs and provision in a comprehensive and “integrated” way. This section outlines some key legislation and aspects of national policy.

2.3.2 Context

Recent national policy and legislation sets out a more proactive approach to infrastructure. Both the Planning Reform Bill 2007 and The Housing Green Paper 2007 build on the findings of the Barker, Eddington and Lyons Reviews. These national reviews considered the planning system, transport and local government respectively. In broad terms they identified the need for better planning for infrastructure and better delivery of development and transportation.

2.3.3 Housing Green Paper 2007

The Housing Green Paper 2007 provides for both increased housing supply and the delivery of necessary infrastructure to unlock land and address related issues such as “access to schools, health care, roads, public transport, water, energy sources and public spaces”.

It states the Government’s commitment to housing growth being accompanied by the:

“social, transport and environmental infrastructure needed to deliver sustainable development at the local level”, and that “improved infrastructure planning” is needed to “plan effectively to supply and manage the demand for water, provide facilities for waste water and mitigate the risks of flooding”.

It identifies the benefits of doing so as being reduced overall costs and the achievement of better environmental outcomes. It states:

“Planning and delivering local and strategic infrastructure is critical to ensuring the Government meets its new commitment to increase housing supply to 240,000 homes per year by 2016. Supporting the timely delivery of infrastructure can help to shape and attract new housing development and is vital for long-term sustainability, including economic sustainability. Conversely, uncertainties about the timing and delivery of infrastructure can cause unnecessary delays in construction.”

It therefore identifies a crucial lead role for local authorities and regional bodies in supporting growth, particularly through RSSs, Local Development Frameworks (LDFs) and the “coordination of infrastructure”.

It recognises that increased housing supply requires a coordinated approach at the regional and local level, including “better coordination between infrastructure and provision and housing growth”. It sees this as a two-way relationship, stating:

“...public services will need to be available when people move into new houses, providing appropriate confidence for infrastructure providers and house builders, but also...that local planning authorities will need to be more responsive to the plans of public service providers, when deciding where to build houses, including making most efficient use of existing capacity and demand management measures.”

It provides for growth areas, new growth points and eco-towns, including the provision of £300 million via the new Community Infrastructure Fund (CIF).

It also provides for a “mini-review” of some RSSs, within twelve months of their publication, focusing on growth delivery issues. It also requires these to consider the delivery of housing growth in relation to existing infrastructure capacity, and states that:

“In the future, housing, economic and environmental issues will be much better integrated with infrastructure needs as part of a single regional strategy”.

2.3.4 The Planning Reform Bill

The Planning Reform Bill was before parliament in 2007/8 and builds on the findings of the above-mentioned Reviews, the Housing Green Paper and the Planning White Paper. It introduces a new Infrastructure Planning Commission to determine major infrastructure schemes so as to speed up the delivery of essential projects.

It also puts forward provisions for the introduction of the Community Infrastructure Levy (CIL) for local planning authorities (LPAs) to impose on all new residential and commercial developments so as to contribute towards infrastructure needed for viable communities.

2.3.5 Utility Legislation

Although the next chapter addresses the legislative frameworks in which the major utilities operate, it needs to be noted that the current utilities enjoy a degree of autonomy and have little or no legal obligation to play a part in the strategic forward planning process (see Section 2.2.6). As such, planning for integrated infrastructure in line with the Housing Green Paper represents a major challenge to the RPB and others.

2.4 National Policy

2.4.1 Planning Policy Statement (PPS1): Delivering Sustainable Development

PPS1 sets out principles to ensure that development plans and development contribute to the delivery of sustainable development.

It highlights that in preparing development plans planning authorities should bring forward sufficient land, in appropriate locations to meet expected needs, whilst also considering the provision of essential infrastructure (including for sustainable waste management), and the need to avoid flood risk and other natural hazards.

Throughout the preparation of development plans (at both regional and local level), PPS 1 states that sustainable development should be pursued in an integrated manner, supported by a common, robust, evidence base. In addition, those preparing spatial development plans should seek to integrate a wide range of activities relating to development and regeneration, taking full account of other relevant strategies and programmes and, where possible, drawn up in collaboration with those responsible for them.

PPS1 also requires development plans to include policies that reduce energy use, reduce emissions, and promote renewable energy resources. It states that RPBs should promote resource and energy efficient buildings, but that RSS planning policies “should not replicate, cut across or detrimentally effect matters within the scope of other legislative requirements, such as those set out in Building Regulations for energy efficiency.”

2.4.2 Planning Policy Statement 3 (PPS3): Housing

Strategic housing policy objectives

PPS3 identifies a number of criteria which should be taken account of when determining local, sub-regional and regional levels of housing provision.

Specifically, it states that LPAs and RPBs, working together, should take into account an assessment of the impact of development upon existing or planned infrastructure and of any new infrastructure required.

Providing housing in suitable locations

In support of its objective of creating mixed and sustainable communities, PPS3 seeks to ensure that housing is developed in suitable locations which offer a range of community facilities and with good access to jobs, key services and infrastructure. This should be achieved by making effective use of land, existing infrastructure and available public and private investment, and include consideration of the opportunity for housing provision on surplus public sector land.

In considering housing provision at the regional level, PPS 3 is clear that the Regional Spatial Strategy should identify broad strategic locations for new housing developments and that RPBs should, working with stakeholders, set out the criteria to be used for selecting suitable broad locations for new housing, taking account of various factors, including , infrastructure and services. The location of housing should facilitate the creation of communities of sufficient size and mix to justify the development of, and sustain, community facilities, infrastructure and services.

Role for Local Authorities

PPS3 goes on to highlight that LPAs will be responsible for determining, in consultation with developers, infrastructure providers and the wider community, the most appropriate strategy and policies for addressing current and future need and demand for housing in their local areas within the context of delivering the overall spatial vision.

It also states LPAs should develop housing density policies having regard to the current and future level and capacity of infrastructure, services and facilities such as public and private amenity space, in particular green and open space.

2.4.3 Planning Policy Statement 10 (PPS10) Planning for Sustainable Waste Management

PPS10 (2005) provides for a waste hierarchy (i.e. reduce, re-use, then recycle – but only dispose of to landfill as a last resort). It requires RPBs to provide sufficient opportunities to meet the identified needs of their area for waste management, and for RSSs to include both apportionments (i.e. waste tonnage requiring management) and a pattern of waste management facilities of national, regional and sub-regional significance (including broad locations where facilities can be accommodated). It also requires LPAs to prepare Local Development Documents (LDDs) to reflect their contribution to delivering RSS (i.e. LDDs should allocate sites to support the apportionment and pattern of facilities set out in RSS).

Both RSSs and LDDs should provide for municipal and commercial/industrial wastes, including hazardous and construction/demolition wastes. RPBs and WPAs should monitor their strategies annually, and should include changes in waste management facilities, waste arisings and the amount of waste recycled, recovered and disposed to landfill. They should also reflect changes to the national waste strategy and occur every five years or sooner if there are signs of under-provision or over-provision which might undermine movement up the hierarchy.

PPS10 and its Companion guide identify a key role for the Environment Agency in providing data and information at all stages of development, monitoring and review of strategies.

2.4.4 Planning Policy Statement 11 (PPS11): Regional Strategies

PPS11 sets out the procedural requirements for Regional Spatial Strategies (RSS).

It states that RSS should: set out a spatial vision for the Region; be regionally specific, addressing matters of regional or sub-regional importance; provide spatially specific policies; identify broad areas for development. It should not: repeat national policies; address local issues, which should be the subject of a local development document; identify specific sites as suitable for development.

PPS11 makes it clear that growth should be supported by infrastructure provision. Paragraph 1.3 emphasises that infrastructure should be taken into account in the development of the RSS. It states that the RSS should provide a broad development strategy for the region for a fifteen to twenty year period taking the following matters into account:

- identification of the scale and distribution of provision for new housing;
- priorities for the environment, such as countryside and biodiversity protection; and
- transport, infrastructure, economic development, agriculture, minerals extraction and waste treatment and disposal.

PPS11 also provides that the RSS should take into account the Water Framework Directive (WDF).

2.4.5 Planning Policy Statement 12 (PPS12): Local Spatial Planning

PPS12 requires local planning authorities (LPAs) to ensure adequate provision for development and infrastructure provision in Local Development Frameworks (LDFs).

It stresses the importance of the overall evidence base in preparing local development documents (LDDs) and notes that LPAs should ensure that the delivery of housing and other strategic and regional requirements is not compromised by unrealistic expectations about the future availability of infrastructure, transportation and resources.

So as to give effective direction, LDDs should be based on realistic assumptions about the resources likely to be available. To do so they should reflect market expectations, national economic policies, financial policies of the various national and regional agencies and the likely availability for use of land, labour and other material resources. The reasoned justification should include an indication of the assumptions made about the resources likely

to be available for carrying out the policies and proposals formulated, and for the associated infrastructure.

Infrastructure Provision

PPS12 recognises infrastructure is important in all major new developments. Annex B notes that the capacity of existing infrastructure and the need for additional facilities should be taken into account in the preparation of all LDDs; and encourages LPAs to develop a strategic approach to infrastructure provision when preparing LDDs.

PPS12 underlines the link between a LPA's approach to new development and infrastructure by stating that the core strategy LDDs should look over these issues and project forward over a reasonable length of time. In doing this, it will allow the bodies responsible for infrastructure provision to plan on the basis of a clear picture of the future shape of the community. Equally in contributing to the preparation of LDDs these infrastructure bodies can also influence the pattern of new development so that it takes account of likely infrastructure limitations and makes best use of existing infrastructure.

In adopting a proactive approach to the plan-led system, PPS 12 aims to ensure that the links between infrastructure and development is properly investigated and that as infrastructure agencies have greater certainty in terms of their own investment programmes, so infrastructure provision will be more intrinsically linked to development foreshadowed in the LDF.

LDDs provide the utility companies responsible for electricity, gas and water supply, sewerage and telecommunications with essential inputs for their own planning. Consultation with the utility companies and their regulators on such issues at the information gathering stage of the preparation of a LDD is an essential requirement within PPS 12. Indeed bodies such as the water companies and the Environment Agency are statutory consultees in any consultation on local development documents.

In particular, PPS12 recognises the adequacy of existing infrastructure may well influence the timing of development. Provision of completely new infrastructure in some cases might take several years from identification of need to commissioning, so local authorities should discuss the possible phasing of development during their discussions with utility companies.

2.4.6 Planning Policy Statement 22 (PPS22): Planning for Renewable Energy

PPS22 sets out the Government's planning policies for renewable energy. It states RSSs and LDDs should contain policies designed to promote and encourage (rather than restrict) the development of renewable energy resources. It states RPBs and LPAs should not make assumptions about technical and commercial feasibility of renewable energy developments, as technological change can mean sites currently excluded as locations for particular types of renewable energy development may become suitable in the future. However, it does state that RSSs should include the regional targets for renewable energy potential to 2010 and 2020, expressed as the minimum amount of installed capacity for renewable energy, in megawatts. Where appropriate, targets in RSSs should be disaggregated into sub-regional targets, but should not set fixed targets for specific technologies.

Paragraph 6 of PPS22 states that LPAs should only allocate specific sites for renewable energy in plans where a developer has already indicated an interest in the site, and has confirmed that the site is viable. However, paragraph 7 states that criteria based policies should be developed and used to identify broad areas at a regional/sub-regional level where development of renewable energy may be appropriate.

2.4.7 Planning Policy Statement 23 (PPS23): Pollution Control

Although PPS23 does not address infrastructure specifically, it advises (amongst other things) that:

- any consideration of the quality of land, air or water and potential impacts arising from development, possibly leading to impacts on health, is capable of being a material

planning consideration, in so far as it arises or may arise from or may affect any land use;

- the planning system plays a key role in determining the location of development which may give rise to pollution, either directly or indirectly, and in ensuring that other uses and developments are not, as far as possible, affected by major existing or potential sources of pollution; and
- where pollution issues are likely to arise, intending developers should hold informal pre-application discussions with the LPA, the relevant pollution control authority and/or the environmental health departments of local authorities (LAs), and other authorities and stakeholders with a legitimate interest.

PPS23 attaches great importance to controlling and minimising pollution. It stresses that RSSs and LDDs, which set the policy framework for the development of an area, can prevent harmful development and mitigate the impact of potentially polluting developments over the medium to long term.

2.4.8 Planning Policy Statement 25 (PPS25): Planning for Flood Risk

PPS25 aims to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas of highest risk. Where, in exceptional circumstances, new development is necessary in such areas, policy aims to make it safe without increasing flood risk elsewhere, and, where possible, reducing flood risk overall.

Paragraph 6 states that RPBs and LPAs should prepare and implement planning strategies that help to deliver sustainable development by appraising risk, managing risk and reducing risk.

PPS 25 states that there should be early consideration of flood risk in the formulation of Regional Spatial Strategies, Local Development Documents and proposals for development by regional planning bodies, local planning authorities, the Environment Agency, other stakeholders and developers. This should identify opportunities for development of infrastructure that offers wider sustainability benefit; these include dual use (i.e. flood storage and recreation) and realising cost effective solutions for the reduction and management of flood risk.

PPS25 encourages LPAs to take a risk-based sequential approach to planning for development, and provides for the adoption of sustainable drainage systems. It also provides for RPBs to undertake Regional Flood Risk Assessments (RFRA). Surface water management plans (SWMPs) are referred to in PPS25 as a tool to manage surface water flood risk on a local basis by improving and optimising coordination between relevant stakeholders.

2.4.9 Water Framework Directive (WFD)

The WFD requires the publication of the River Basin Management Plan (RBMPs) by 2009, and all surface water bodies to meet good ecological status standards by 2009. It seeks to provide a more integrated approach to the planning and management of water and water related issues (flooding, water quality, abstraction, use, shape, coastal zone management). This has major implications for the supply, consumption and discharge of water in the region.

2.5 Wider Issues in the Long Term

2.5.1 Introduction

This scoping study focuses on 'taking stock' of the existing legal, delivery and financing structures for infrastructure delivery. It signposts where infrastructure constraints and opportunities might exist that are relevant to the development of spatial options for the

forthcoming Regional Spatial Strategy 2009 Update, and to inform more detailed work into these issues at the sub-area level.

It is important to get the existing evidence base into shape to ensure that in the short-medium term the RSS is setting out a spatial strategy that is deliverable. However, looking forwards, there are a number of wider issues and challenges that will need to be addressed as part of the production of the Single Regional Strategy. This sub-section of the study explores these issues.

2.5.2 Paying for Infrastructure

There are numerous different models for financing infrastructure that vary across types and sectors. The different models, current and proposed are examined in more detail in Appendix C. The financing of infrastructure is an ongoing national debate, in particular with respect to financing infrastructure to support housing and economic growth. The national picture has evolved in this respect with proposals for planning gain supplement failing to gain support. Government is pressing ahead with legislation to enable the formulation of a Community Infrastructure Levy (CIL), described in more detail in Appendix C. In addition, new local revenue-raising powers in the form of Business Rates Levy will help to pump-prime investment in infrastructure of economic significance.

Meanwhile, Section 106 (including more recent 'roof tax' style approaches) provides a useful mechanism to collect developer contributions towards necessary infrastructure upgrades (whether critical, social or green). Utilities infrastructure is more complex, with major renewal and upgrades funded through the revenue ultimately generated by bill payers. However, specific reinforcements to networks necessary as the result of specific development proposals will remain liable to help fund the necessary upgrade work through private agreements outside the planning process.

With the forthcoming consultation on the scope of the Regional Funding Allocations process, it is an important time for the region to consider how it will respond to the wider challenge of funding infrastructure for growth. Models being developed in other regions, in particular, the South West, will be of interest.

2.5.3 Climate Change

Introduction

Climate change is a major issue for infrastructure planning and provision into the future. The focus of this scoping study has been to provide a common understanding of existing networks and frameworks for provision, but the future implications of climate change will need to be considered in longer-term thinking.

Warming up the Region Climate Change Impact Study

The warming up the region climate change impact scoping study was undertaken in 2002. This provided an initial analysis of the main likely impacts and opportunities arising in the region as a result of climate change. Particular infrastructure issues highlighted include:

- increased risks of tidal and fluvial flooding, and increased demands on urban drainage systems as a result of increased rainfall intensity;
- possible increased demand for water in summer months, offset by increased rainfall overall; and
- increased impacts on transport, as a result of flooding in particular.

A full summary of the outcomes of this study are provided in Appendix C. This is now being followed up by a detailed regional Climate Adaptation Change Study using UKCIP08 Scenarios. The results of this study will be important in informing the future approach to infrastructure planning alongside this study.

2.5.4 Resilience

Resilience is a particular issue for critical infrastructure and is growing in importance associated with climate change as well as other factors. Networked infrastructure in particular is at risk from a number of external factors. Terrorism in particular is a major concern of recent times.

The flood events of 2007 in the region and nationally demonstrated how susceptible networked infrastructure can be to extreme weather events – events that are widely anticipated to increase in frequency and severity in the future.

A major issue for networked infrastructure is the possible impact that a single event in a single location can have on the wider network. By way of example, the Walham electricity substation, a National Grid Electricity Transmission facility that supplies the distribution network in Gloucestershire, almost flooded in July 2007. Had this site become inundated, electricity supply would have been lost for an unknown amount of time to over 500,000 homes and businesses.

Within the Yorkshire & Humber Region, a number of important rail routes were disrupted by the flooding in summer 2007 at a relatively small number of important locations, with similar impacts across a wider area over a number of weeks afterwards.

In the short-term, resilience will mean 'defending' important and vulnerable sites. In the longer term it is likely that a more planned approach to locating critical infrastructure in less vulnerable locations will be necessary. Ultimately, along with other developments, a move away from an over-reliance on networked infrastructure will help reduce the overall vulnerability of utility infrastructure in particular.

2.5.5 Longer-term Challenges for Networked Infrastructure

In addition to the resilience issues noted above, there are a number of potential future drivers of change that will impact on the future shape and role of networked infrastructure, in particular for the utility networks:

- the increased incidence of distributed electricity generation and what this means for the established electricity distribution network architecture;
- the retirement of the existing coal-fired power stations and likely new generation of nuclear power stations and large off-shore wind farms (with potentially profound impacts for the region on the shape of the upper-tiers of the electricity transmission network);
- the likelihood that gas will become increasingly expensive and incompatible with achieving the highest standards of compliance with the Code for Sustainable Homes (NB: Code Level 6 - zero carbon - is due to become mandatory for new development by 2016);
- the introduction of local-level planning incentives to develop local onsite generation or local area combined heat and power (CHP) networks to help reduce the CO₂ impact of the energy needs of new development; and
- the impact of the Water Framework Directive on water resources, and the parallel plans to manage demand through increased water efficiency measures and significant investment to achieve further leakage reductions.

It is assumed that the UK is moving towards a model where there is less reliance on nationally networked infrastructure, with more emphasis on local networks, for example with electricity. However this shift is being challenged by the proposed nuclear power station programme, demonstrating how quickly policy can change in this area. These are just a few of the main issues and challenges facing the utility providers. In addition, there are wider impacts on other sectors, particularly transport, although these drivers of change are perhaps better understood and more readily responded to by spatial planners on account of the existence of a related transparent evidence base.

In conclusion, spatial growth and change (in terms of the spatial distribution of jobs and industry, population growth and the increasing number of households) is only one of a series of major issues that need to be planned for by the utility providers, in a tight regulatory framework that can make swift responses difficult to achieve.

In the case of the utility providers, these issues are understood and the main issues identified in the strategic regulatory documents that they are required to produce. However, the utility providers are not engaged at a regional level. Whilst it will be important therefore for spatial planners to have a broad understanding of these issues when considering more detailed investigation of utility and wider critical infrastructure issues, it is also important that they consider how to integrate utilities in strategic forward planning.

2.6 Inter-regional Policy – The Northern Way

2.6.1 Introduction and Background

An increasingly important driver of growth is the emergence of City Regions, as stimulated by the Northern Way and its Growth Strategy (2004).

The Northern Way Growth Strategy entitled “Moving Forward: The Northern Way” was established to try and address the £30 billion output gap between the northern regions and the rest of the country. It is an ambitious 20-year economic strategy, which is being driven by the three regional Development Agencies and their partners. It aims to improve the economy of the North of England, by building upon and adding value to the substantial impact of the three Regional Economic Strategies and Regional Spatial Strategies.

This gap between the northern regions and the rest of the country has been attributed to the fact that in the north:

- there are too few people in employment (under-employment), with the North West providing 2-3% less labour than the England average;
- the skills profile is relatively low compared to the England average – the proportion of the working age with no qualifications or qualified below level 2 is substantially greater at 33% compared to the England average at 29.5%; and
- the economy lacks dynamism – the north is said to exhibit significantly lower business start ups than other parts of the UK.

The Northern Way Business Plan 2005-8 identifies the key actions needed to implement the NWGS, and identifies investment which will:

- add value;
- build up the North’s strengths;
- define actions at the most appropriate scale; and
- complement the three Economic Strategies.

It has ten main groups of investment projects and priorities:

- bring more people into employment;
- strengthen the North’s knowledge base;
- build a more entrepreneurial North;
- capture a larger slice of global trade: key clusters;
- meet employers skill needs;
- improve access to Northern airports;
- improve access to the North’s sea ports;

- create premier transit systems in each city region and stronger linkages between regions;
- create truly sustainable communities; and
- market the North to the world.

A £100 million Growth Fund has been established by the three northern Regional Development Agencies and the Government to develop and implement the strategy.

Eight 'City Regions' are identified as the key to the North's progress. They contain 90% of the North's population and more than 90% of its economic activity. In this Region, the Northern Way City Regions are:

- Leeds;
- Sheffield; and
- Hull and the Humber Ports.

2.6.2 City Region Development Programme

Each city region has prepared a City Region Development Programme (CRDP) to demonstrate how each city region would contribute to driving up the economic performance of the North. Each City Region should:

- have a clear view on their distinctive contribution to the Northern Way;
- demonstrate a strong connection between the revised CRDPs and the 10 Northern Way Investment Priorities;
- include clear description of how the Growth Strategy will be delivered at the City Region scale;
- present an evidence-based understanding of the national policy banners to accelerating economic growth and what is needed to address them; and
- show how resources can best be used and provide sector funding attended.

The CRDP Vision/Outcomes for the three Northern Way City Regions as expressed in September 2005 were as follows:

- **Hull & Humber Ports City Region** – A Global Gateway – with a thriving, outward-looking sustainable economy building on the unique assets of location, the estuary, ports connectivity and physical environment perpetually changing for the benefit of people businesses and the environment, whilst making significant and distinctive contributions to the sustainability of regional, national and European economies.
- **Sheffield City Region** – By 2025 the Sheffield City Region will be 'a pivotal international business location and one of the most successful city regions in the North of England'. It will be characterised by its innovative and creative economy, strong connections to key markets, unrivalled quality of life and vibrant and cosmopolitan population.
- **Leeds City Region** – The Leeds City Region partners have joined forces to deliver a dynamic, successful and prosperous city region that supports innovation and enterprise and is capable of competing with the best Europe has to offer. The shared vision is to 'work together differently: to develop an internationally recognised city region; to raise our economic performance; to spread prosperity across the whole of our city region, and to promote a better quality of life for all of those who live and work here'.

The Northern Way Growth Strategy and the CRDPs are important influences on the RSS, RES and RHS, which in turn will provide means to implement the aims and objectives of the NWGS and the CRDPs.

2.6.3 Work Streams and Consideration of Infrastructure

In addressing the structural problems facing economic development in the North, the Northern Way considered five major work streams including sustainability and connectivity.

Specific consideration was given to infrastructure, including green infrastructure and its potential impact on the region's "housing offer". This found that the benefits of Green Infrastructure can be seen to have a considerable and measurable impact upon quality of place and liveability at a local neighbourhood level. When strategically planned and measured across a City Region, Green Infrastructure can be seen to have the potential to create a truly sustainable community by integrating environmental assets and processes with key elements of economic renaissance such as housing renewal, inward investment, site and infrastructure development. These studies are considered in more detail in Section 5. However, whilst the economic focus of the city regions provides a good base to consider and develop better infrastructure planning, the current lack of coordinated GIS and planning skills is a concern in how city region bodies take infrastructure forward.

2.7 Summary and Conclusions

Planning for growth and change requires an understanding of the constraints and opportunities in any given area. This is underlined by the Housing Green Paper which requires improved infrastructure planning and pro-active planning for housing that ensures deliverability. A number of important messages emerge from this overview of the current context for infrastructure planning and provision, including:

- structural problems with infrastructure planning in the UK include over centralisation, regulatory and financial fragmentation, poor coordination, and a lack of cross-sectoral understanding, and the relative autonomy of the utility providers themselves in terms of engaging with strategic forward planning;
- there is a changing statutory and policy framework for improved infrastructure planning, with the current Planning Reform Bill, the housing growth agenda, planning for climate change, (including the need for increased resilience) Community Infrastructure Levy and the need for decentralisation is particularly important;
- the plan-led system provides an excellent medium around which partners can co-ordinate planning and provision of infrastructure – however a recent lack of genuine planning for growth inhibit the ability to realise this potential;
- the recent change in the planning system from land use planning to spatial planning, coupled with the hierarchy of plans principle and the requirement for a robust evidence base for planning means that the RSS will need to take a GIS based approach to identifying strategic infrastructure work in an "up front" way;
- the consideration of planning and infrastructure in PPS12 provides a basis for the RPB to engage more with infrastructure providers (i.e. these providers can help shape the pattern of development so it takes into account of likely infrastructure limitations and makes the best use of existing capacity), also provide providers with better impacts for their own forward planning;
- the development of the Northern Way and the emergence of the city region provides an opportunity for improved infrastructure planning at the city region level for critical, social and green infrastructure, using the RSS on the expression of that planning, and the RPB for its GIS capability; and
- in the long term, it appears likely that the current model of centrally networked infrastructure will recede in favour of local networks of supply and collection – although uncertainty remains as characterised by the proposed nuclear power station programme.

Infrastructure planning is complex and sophisticated. In virtually all sectors, genuine forward planning is made more challenging by relatively short-term spending periods for utility providers, regulatory price-control mechanisms and the degree of autonomy afforded to utilities and other players by primary legislation. However, there is a clear incentive for infrastructure providers, particularly utilities, to engage pro-actively in spatial planning in order to realise investment efficiencies, especially when larger scale growth is occurring.

At the same time, there are a number of external drivers of change in relation to climate change, policy changes (in particular for reducing CO₂ output), regulatory and statutory changes as well as advances in technology, amongst others. Many of these issues are picked up in the published industry planning documents.

It is crucial that, in attempting to understand and then plan pro-actively in the context of critical infrastructure, to understand these issues, and to involve the utilities providers more in strategic forward spatial policy.

3 The National Framework for Infrastructure Provision

3.1 Introduction

The utility industries vary in statutory make-up, spatial remit and their respective regulatory frameworks. This section sets out briefly the structure of each of these together with other forms of infrastructure to help provide an understanding of how they operate. It is worth noting that the long term development strategies published by the network providers consider future investment plans and operational objectives to fulfil related regulations. These documents provide an ideal starting point to understand the utilities concerned. Details of the individual players and issues in the region are set out in more detail in Section 6.

3.2 Transport

A detailed summary of the transport networks and roles and responsibilities is included in the table in Appendix A. As noted earlier, a separate study considers transport constraints and opportunities.

Primary Legislation:	Transport and Works Act 1992, Planning and Compulsory Purchase Act 2004
Main Players in Y&H:	Department for Transport, PTAs/PTEs, NYCC, Unitary Authorities, Network Rail, Highways Agency, Rail and Bus Operators.

3.3 Water Management

This section covers water supply and water resources, water treatment, drainage and flood risk, flood defences and drainage, water resources and water supply and treatment.

Primary Legislation:	Water Resources Act 1991, Water Industry Act 1991, Environment Act 1995, Water Act 2003
Main Players in Y&H:	OFWAT, DWI, Yorkshire Water, Anglia Water, Severn Trent Water, Environment Agency

3.3.1 Water Supply and Treatment

Water supply and treatment is undertaken by a series of water companies and sewerage undertakers. These are not always the same company, with different territories for water supply and sewerage treatment, and with some companies exclusively supplying water.

The industry is heavily regulated - every five years, the Water Services Regulation Authority (Ofwat) carries out a periodic review of water companies future investment needs and determines how much it can charge customers to help finance its activities. Ofwat's latest periodic review is due to be completed in 2009 and will cover the period 2010 to 2015. This will establish:

- how much does it cost to run business now?
- how much more will it cost to deliver more infrastructure in the future?
- how much more will it cost customers?

The answers to these issues will determine capital investment.

An important part of the process of approving the five year business plans is the production of a Strategic Direction Statement (SDS). The strategic direction statement, signed off by a water company board, will set out for their consumers, regulators and other stakeholders their direction of travel over the long term – usually 25 years. It is their opportunity to set out their vision clearly and show how it will deliver for their consumers and the environment. For the period 2010-2035 the SDS will assist the regulator, and others, to consider each company’s draft and final 5 year business plans in a long-term context.

Water companies are statutory consultees in relation to Local Development Frameworks and also respond to consultation on planning applications, although practice on the latter varies nationally. Water companies have a duty to provide water supply and sewerage treatment to development identified in adopted development plans. The content of adopted development plans is therefore vitally important to investment planning by water companies.

As the RSS comprises the first part of the development plan for any given area, it should be in a water company’s interest to be involved in the preparation on an RSS.

Figure 3.1 provides an overview of the territorial extent of water and sewerage companies in the North of England.

Figure 3.1 Water Companies Serving in the North



Notes: All water companies within Yorkshire and the Humber deal with both water supply and waste water treatment- boundaries indicative only – some water supply companies (outside the region) excluded for clarity.

3.3.2 Flood Risk, Flood Defences and Drainage

Flooding is a naturally occurring phenomenon and has become a major national issue following a number of high profile flood incidents, most recently in 2007. The issue is likely to become more topical due to the prevalence of high flood risk areas and the growing impact of climate change. It is important therefore to consider this context, and also the regimes for flood defence/protection, managing surface water flooding and drainage,

planning for flood risk, and catchment management, before addressing the implications for integrated infrastructure.

Flood Defences

Flood defence and/or protection refer to the development and maintenance of flood defences and related measures, and the operation of emergency procedures (e.g. early warning systems) to ensure the safety of communities who live in areas vulnerable to flooding. Increasingly, as noted in the recommendations from the Pitt Review (June, 2008)¹, a greater emphasis needs to be placed on creating procedures which help to manage and limit the impact of surface water flooding.

Whilst many land uses (e.g. ports, freight) require a location with access to water, the practice of building flood defences has led to the development of communities in flood risk areas behind these defences.

Hard flood defences can be problematic however, on account of the following:

- defences are by definition interventions in functional floodplains: as such, they can and do constrict the natural flow of water (ironically thereby increasing the chances of flooding elsewhere, typically downstream);
- defences require extensive maintenance over time to remain effective: unfortunately, this fact is not widely understood, and has led to the misplaced belief that many communities are protected by nearby defences when in fact they are not, because the defences concerned may have not been well-resourced or managed, and therefore may be at breaking point;
- the maintenance of flood defences entails a substantial cost: who pays for this cost depends on the circumstances. Generally, individual or riparian landowners are responsible for the development and maintenance of defences relating to new development; and
- wherever there are flood defences, there must also be emergency planning, and in particular early warning systems to alert communities at risk of impending flood incidents and measures to address these (including evacuation if necessary).

As such, it is highly desirable from a policy perspective to ensure a pro-active, strategic, integrated approach to land use management, wherever possible, to reduce the causes of flooding. Aspects of such an approach could include: reversing gripping measures in upper catchment areas; increasing planting in mid-catchment areas; identifying and providing/enhancing extended and/or extensive washlands² in lower catchment areas. In general taken the severity of a flooding incident depends on the location concerned- its topography, flooding history and age/condition of the infrastructure concerned.

Drainage

In managing surface water flooding, the Pitt Review (June, 2008) highlighted that very little is known about surface water flood risk as current modelling techniques and technology are not designed to consider the complexities of this type of flooding. It goes on to stress that there is also a distinct lack of clarity around the responsibilities of the relevant organisations, resulting in frustration for the public and emergency responders.

Indeed the Review highlights this by noting that responsibilities for managing surface water drainage are currently split between the following:

¹ Learning Lessons from the 2007 Floods – An independent review by Sir Michael Pitt (Final Report, June 2008) http://www.cabinetoffice.gov.uk/thepittreview/final_report.aspx

² Washlands are areas which can accommodate large volumes of water during flood events, and thereby help avert flooding in settlements upstream or downstream.

- the Environment Agency, which has responsibility for river and coastal flooding and a general supervisory role for all flooding but no statutory role in relation to surface water flooding;
- water companies, which have a duty (under Section 94 of the Water Industry Act 1991) to 'effectually drain' areas for which they are responsible, but it is not clear what this means in practice and they are not responsible for runoff from open land;
- local authorities, which are responsible for ordinary watercourses and parts of the drainage system, including drainage from public spaces and local highways;
- the Highways Agency, which maintains drainage from the strategic road network (i.e. trunk roads and motorways);
- internal drainage boards, which are responsible for land drainage and water levels within their drainage districts (which are mostly in rural areas); and
- others involved in a more limited capacity, such as navigation authorities (e.g. British Waterways) and riparian owners.

Drainage is complicated by the fact that it refers to both surface water run-off and to discharges to foul sewer: sometimes surface water run-off will "drain" straight into an ordinary watercourse, but more often than not it drains into a sewer, (i.e. a "combined" sewer) in order to provide the water to facilitate the conveyance of waste solids to waste water treatment works. A further complication is that much of the drainage infrastructure was built prior to any statutory requirement to keep records of the exact location of the drains; this means operators often will not know the age, condition or location of the drain concerned. Nevertheless, in general terms drainage is by definition a local matter, and only assumes significance at a strategic level if there is a malfunctioning or other of the local network that causes problems beyond a local scale.

Planning and flood risk

Whilst it is generally deemed better to locate new development in low flood risk areas that do not require new flood defences, there is still a need to protect existing settlements in high flood risk areas. There must also be recognition that new development and extensions to settlements are placed in higher flood risk areas in the interests of other sustainability considerations (e.g. reduction of journeys to work, social inclusion). This is particularly the case in coastal areas, where the risk of tidal inundation poses a considerable and significant threat that can be difficult to address even with hard defences. Indeed in some locations it will not be feasible to defend with hard measures and alternative types of management solutions will need to be sought. This is also an issue for many urban areas in need of regeneration where brownfield land lies in areas of flood risk (and emphasised by increased instances of surface water flooding). All this presents a considerable conundrum to policy makers, especially in the light of decreasing insurance cover for properties located in flood risk areas.

Whilst clearly much depends on the circumstances of a specific area, there is still a great need to identify high flood risk areas, and wherever possible to provide washlands and other alleviation measures to address flood risk in a strategic, pro-active and integrated manner. But equally there needs to be a realisation that this is not always possible, for social and economic reasons. The Regional Flood Risk Appraisal addresses this issue in more detail in regard to the region.

Implementation

Whilst the implementation of planning policy comes about by way of LPAs' planning policies and determinations, the operational responsibility for flood management is undertaken by a number of different stakeholders. Of particular note are the roles and responsibilities of the following:

- the EA is responsible for flood management on main river and critical ordinary watercourses (i.e. minor rivers, becks and streams which can lead to significant flooding);
- the Internal Drainage Boards (IDBs) are responsible for flood management in areas below sea level which require special consideration (including pumping stations); and
- local authorities are responsible for flood management on ordinary watercourses (i.e. minor rivers, becks and streams which are unlikely to lead to significant flooding).

The EA now receives a block grant from DEFRA for its national and regional operations, which replaces the regional levy formerly raised. It apportions this block grant to defence schemes according to a national priority scoring system, though it can still raise extra revenue for projects from a local levy for schemes which are considered of special local, sub-regional or regional merit. The IDBs receive funding from the local authorities, who receive funding from local council tax and central government through the Comprehensive Spending Assessment.

Given that water flows do not respect administrative boundaries, and that flood defence projects are strategic in nature (i.e. long lead-in and build times, addressing issues of complexity and uncertainty), clearly there is a need for a strategic, pro-active and pan-catchment evidence base to inform flood risk management and spatial planning. The EA's catchment flood management plans (CFMPs) provides this evidence base. However, these CFMPs do not comprehensively take into account conflicting land uses (particularly transport and economic development), and so have tended not to lead to the identification of washlands for specific protection and enhancement in spatial plans.

To support a greater understanding of local flooding problems, the Pitt Review (June, 2008) recommends that local authorities take a leadership role, but work alongside the Environment Agency, water companies, the Highways Agency, internal drainage boards, riparian owners and others to establish a baseline on the source of local flooding and understand where responsibility lies for addressing them. This is a particularly important for understanding who is responsible for sustainable urban drainage systems (SUDS).

In terms of surface water drainage, the Review recommends that in order to tackle the problem and clear up the lack of clarity on who is responsible for management and drainage, there needs to be an improved understanding of local flood risk in general and much better coordination of the organisations involved. The Review believes that the role of local authorities should be enhanced so that they take on responsibility for leading the coordination of flood risk management in their areas:

"...local authorities' roles should be enhanced to take on responsibility for leading the coordination of surface water flood risk management and improving knowledge of all local flood risk in their areas. This is consistent with their place-shaping role...."

Implications for integrated infrastructure

Flood risk and drainage are not straightforward issues. Flooding is a natural phenomenon, and occurs in existing settlements. Whilst clearly much depends on the circumstances of a specific area, there is a need to both identify high flood risk areas and avoid development in these wherever possible, but also to protect existing settlements, and in particular to identify and provide both defences here and/or washlands and other alleviation measures.

As such, there is a need to take into account the EA's CFMPs, flood map and LTP for flood defence projects, and identify the need for both defences and/or washlands accordingly.

Understanding the impacts of flood risk on growth options is superficially an easy task, and GIS datasets are available to map this. The wider challenges will arise when other policy

indications strongly indicate that development in given areas would otherwise achieve sustainable development.

Detailed drainage issues are a local area consideration, this viewpoint is strengthened by the recommendations from the Pitt Review for greater leadership and responsibility for local authorities. However, it is evident that more general drainage constraints are most likely to be identified through 'testing' of broad areas and then detailed options as part of the regional planning process. If current trends continue then it is anticipated that run-off should become less of an issue with the installation of more sustainable urban drainage systems.

3.3.3 Water Resources

Introduction

The availability of water for development has become a major planning issue in some regions recently, and is likely to remain so on account of the impact of climate change. The quality of water is also likely to become a key issue, in view of the impact of climate change, and more immediately in view of the Water Framework Directive, the implementation of which has major implications in terms of both cost and land use. It is important therefore to consider the regimes for drainage in terms of water resources/supply and also water quality/treatment, including the special considerations of estuaries and bathing waters, before addressing the implications for integrated infrastructure.

Background

The availability of water resources in the Region has influenced the development of industry and settlements, and influenced the location of power stations on both the River Ouse and the Aire and Calder Navigation.

The Building Regulations already encourage water conservation measures, and the Environment Agency's Regional Water Resources Strategy (2001) and related Catchment Abstraction Management Strategies (CAMS) provide a framework for management of water resources.

Policy position

In addition to PPS1 and PPS11 (as covered earlier) PPS23 on "Planning and Pollution Control" (2004) stresses that statutory frameworks already exist for regulating water quality, and provides for Local Authorities to minimise pollution from land uses accordingly. It provides that RSSs should indicate potentially polluting development, and any regional constraints on development arising from cumulative impacts.

Water Resource Management

The Environment Agency, water and sewerage companies, developers, landowners, Local Authorities and others have an important role to play in taking a strategic, pro-active approach and work together to identify, characterise, plan and manage the water environment (including biodiversity) in line with the following: CAMS, groundwater source protection maps, water and sewerage companies business plans, the Regional Water Resources Strategy and River Basin Management Plans. They also have a role in defining what/where the broad water/development issues are and to ensure appropriate development taking into account biodiversity sites of international importance.

Local Authorities and Water and Sewerage Companies should: identify water-sensitive areas; consider policies for new development that encourage best practice for water resource management, including rainwater harvesting; ensure that the rate and location of development is in step with current and planned provision of adequate water supply, sewerage and waste water treatment infrastructure capacity; encourage best practice (e.g. Sustainable Drainage Systems, BREEAM, and Code for Sustainable Homes).

Developers should consider development in terms of water resource availability; provide adequate design and mitigation measures (e.g. water efficiency, rainwater harvesting) as

appropriate, especially in water-sensitive areas, in line with best practice (e.g. BREEAM, Sustainable Drainage Systems, Code for Sustainable Homes).

Water Quality

Climate change will put pressure on water resources, for example it could impact on water quality due to the reduced ability of surface and ground water sources to dilute pollution. Revised standards arising from new legislation (Water Framework Directive, Freshwater Fisheries, Habitats Directive, Urban Wastewater Directive) will necessitate upgrading and possibly increasing treatment infrastructure, potentially with major cost implications. In particular, the Water Framework Directive requires surface waters and groundwater sources to meet 'good' ecological status by 2015, and the preparation of river basin management plans by 2009. This will be a particular issue in settlements where infrastructure for sewage discharge and treatment is already at full capacity. Water and Sewerage Companies will therefore need to continue to maintain a high level of investment in related infrastructure for 2005-2010 and beyond.

The discharge of sewage effluents and runoff from agricultural land result in nitrogen and phosphorous entering rivers and estuaries. Elevated levels of these nutrients can result in excessive growth of plants and algae which causes damage to the ecology - this is called eutrophication. As a requirement of the Urban Wastewater Treatment Directive, rivers and coastal waters experiencing such adverse effects have to be identified as "areas sensitive to eutrophication". The European Union has expressed a view that the Humber should be designated as an "area sensitive to eutrophication" and making this the subject of a legal challenge. If the European Union view is upheld, this will have a very significant impact on the cost of waste water treatment in the catchments draining to the Humber which will require additional treatment to remove nutrients.

Implementation

Whilst the implementation of planning policy comes about by way of LPAs' planning policies and determinations, the operational responsibility for the provision and protection of water resources is undertaken by:

- water and sewerage companies (e.g. Anglian Water, YWS) manage reservoirs and other sources of abstraction, and provide drinking water through a water supply grid; they operate wastewater treatment plants and the drainage network, and release treated effluent into watercourses; and
- The Environment Agency manages water resources in England and Wales. Through abstraction licensing, they can control the level of abstraction to balance the needs of society, the economy and the environment.

Implications for integrated infrastructure

Whilst much depends on the circumstances of a specific area, there is a need to identify water sensitive areas, and avoid development in these wherever possible. As such, there is a need to take into account the EA's CAMS, and also the water investment plans prepared and implemented by the water and sewerage companies.

Given that Ofwat's periodic review will be completed in 2009, the availability of water supply and treatment will be relatively fixed for 2010-2015. It is important that the RPB studies these water investment programmes and meets with water utilities so as to glean fixed capacity for growth accordingly, and explore phasing issues thereafter.

3.4 Waste

3.4.1 Introduction

This section sets out the main considerations for waste infrastructure in the region, including the national policy context and implementation issues.

In the UK, waste has traditionally been classified by origin into the following waste streams:

- Municipal Solid Waste (MSW);
- Industrial & Commercial Waste (ICW);
- Hazardous Waste;
- Construction and Demolition Waste (CDW); and
- Agricultural Waste.

These terms are used throughout this subsection of the report, and also in Section 6.

3.4.2 National Policy Context

EU legislation

The need to reduce levels of untreated biodegradable material waste (BMW, i.e. that part of the current MSW waste stream that can “rot down”) going to landfill is based on concerns over greenhouse gas emissions, particularly methane. The European Landfill Directive 1999 provides for the following targets to divert municipal waste from landfill:

- by 2010, only 75% of BMW (1995 quantities) can go to landfill;
- by 2013, only 50% of BMW (1995 quantities) can go to landfill; and
- by 2020, only 35% of BMW (1995 quantities) can go to landfill.

These are extremely challenging targets, which are made more difficult to achieve in the region due to uncertainty over increasing MSW arisings and its historic reliance on landfill. Failure to meet these targets will result in fines for the UK (considered to be c.£0.5 million per day).

UK Legislation

The Landfill Regulations 2002 and Waste & Emissions Trading (WET) Act 2003 transpose the EU targets into law and provide for greater treatment capacity, particularly for biodegradable waste. However, landfill capacity still needs to be provided for, and on the basis of forecasted arisings (i.e. not just past arisings). The WET Act 2003 requires all local authorities to have a municipal waste management strategy (MWMS)³.

National Waste Strategy 2000

This seeks to improve the sustainability of waste management, and provides for:

- a shift of emphasis from waste to resource management (i.e. to look upon materials as a potential resource of valuable recyclates and recoverable fuels rather than waste streams);
- statutory Best Value Performance indicators for Waste Planning Authorities (WPAs), which set targets to promote composting and recycling for household waste; and
- direct financial incentives to seek alternatives to landfill: Landfill Tax is set to rise at £3/tonne pa increments from £15/tonne in 2004/5 to £35/tonne in 2011/12, thereby providing for the framework for private sector investment in waste management facilities.

Waste Strategy for England 2007

The WSE 2007 seeks to reduce greenhouse gas emissions from waste (the target being 10 million tonnes of CO₂ equivalents by 2020), through a range make better use of resources. It sets out 5 key principles:

³ Although it provides for the exemption of high-performing authorities, DEFRA encourages the production of MWMSs for all authorities.

- decouple waste growth from economic growth and stress waste prevention/re-use;
- meet and exceed Landfill directive diversion targets for BMW;
- increase diversion from landfill of non-municipal waste and secure better integration of treatment for municipal and non-municipal waste;
- secure investment in infrastructure needed to divert waste from landfill and for management of hazardous waste; and
- maximise environmental benefit from investment through recycling resources and recovery of energy from residual waste using mix of technologies.

In effect, this reinforces the drive for reducing waste and related costs, and provides considerable pressure on RPBs and LPAs to provide more sustainable patterns of growth and sites to handle waste arisings. PPS10 (as addressed earlier) provides for how spatial planning should implement the WSE 2007.

3.4.3 Implications for Integrated Infrastructure

Data

Data collection and analysis represents a major issue in making progress towards as more sustainable waste management. To this end, the Assembly and the Environment Agency have entered into a formal “Memorandum of Understanding”, the first of its type in England. This sets out future responsibilities and working arrangements on waste data, setting out roles for the EA and RTAB (hosted by the YHA).

Infrastructure

The main implication of the foregoing is a ‘decentralisation’ or shift from single mega- sites for waste (i.e. landfills) to a substantial increase in the total number of (smaller) waste sites with new specialisms including:

- bring sites and Civic Amenity (CA) sites;
- separation sites;
- composting sites;
- Anaerobic Digestion sites;
- Mechanical Biological Treatment sites;
- Energy from Waste plants; and
- Advanced Thermal Treatment sites.

This shift will have major implications for spatial planning, and in particular lead to a greater need to plan for the provision of more but smaller waste sites in order to facilitate waste, reduce waste-related journeys and provide waste sites closer to the sources of consumption and disposal. In many respects this indicated an increasingly decentralised approach to waste management in land-use terms. It is unlikely that waste management will have a major bearing on the locations for new growth, but will be an important consideration in detailed considerations, especially at a sub-regional level.

3.5 Electricity Distribution

Primary Legislation:	Electricity Act 1989, Utilities Act 2000, Energy Act 2004, Electricity Regulation Act 2006
Main Players in Y&H:	OFGEM, CE Electric UK , United Utilities

3.5.1 Structure of the Industry

Electricity is generated by major generators, in a competitive marketplace. These generators sell the electricity generated to the supply companies that sell electricity to consumers and businesses. In general, the major power stations are connected to electricity distribution networks by the transmission network, which is operated by National Grid Electricity Transmission. There is a degree of vertical integration between generators and suppliers. Some suppliers use several consumer and business-facing brands.

There are 14 licensed electricity distribution network operators (DNOs) each responsible for a distribution services area. The 14 DNOs are owned by seven different groups. There are also four independent network operators who own and run smaller networks embedded in the DNO networks.

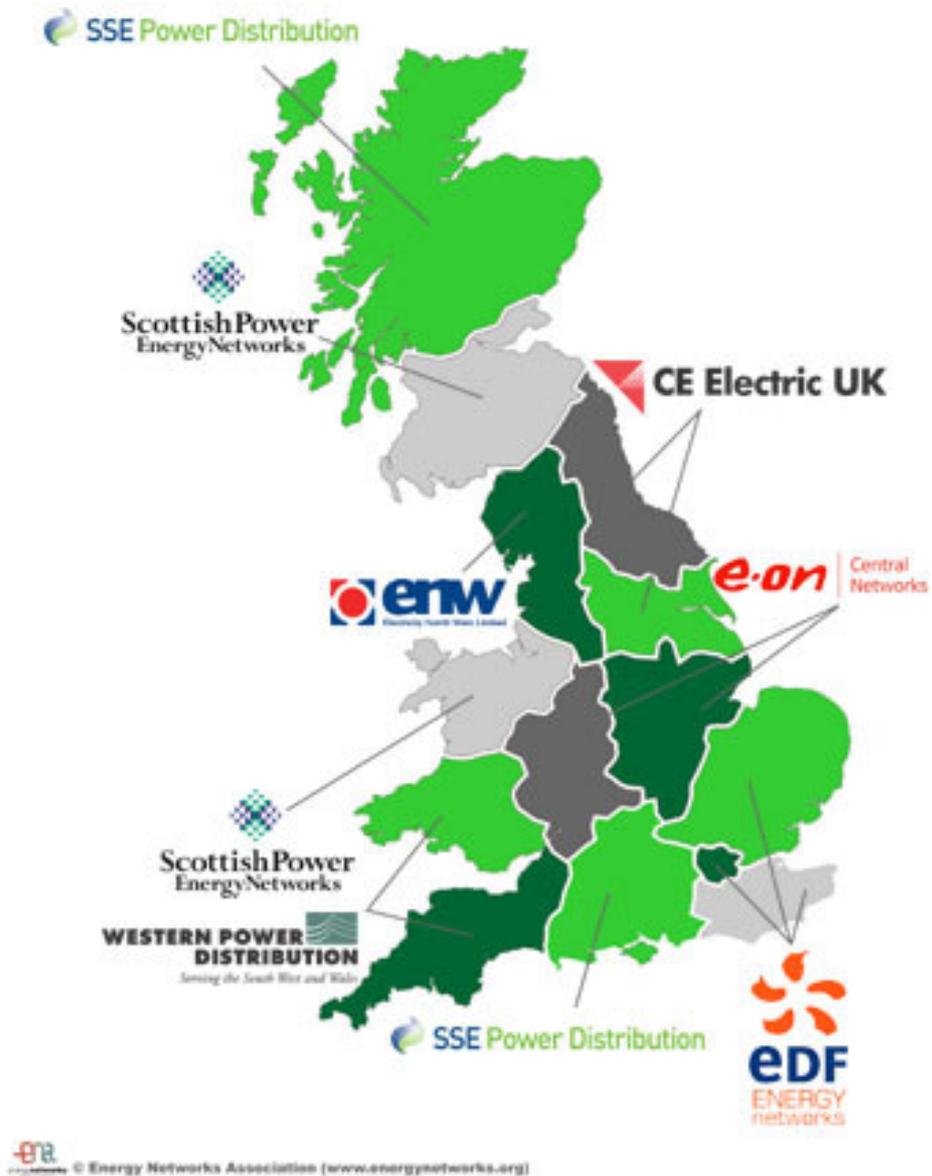
The supply companies pay National Grid Electricity Transmission and the electricity distribution network operators for the use of their networks to carry electricity to their customers.

The tariffs levied by National Grid Transmission and the DNOs are heavily regulated by the Office of Gas and Electricity Markets (OFGEM). This is based on 5-year control periods over which the companies and the regulator agree tariffs based on investment plans. Price controls are generally set for five year periods and the current price control runs from 1st April 2005 to 31st March 2010. These investment plans are based on the need for asset renewal and system reinforcement to cope with anticipated increases in demand.

3.5.2 Implications for Integrated Infrastructure

In terms of regional and sub-area planning, it is the distribution networks that are of most interest. Figure 3.2 shows the spatial extent of the various electricity distribution networks in the UK. Whilst the National Grid Transmission network is important, with the exception of the largest commercial customers, all direct supplies tend to come via the distribution networks.

Figure 3.2 Electricity Distribution Networks



Source: Energy Networks Association

3.6 Gas Distribution

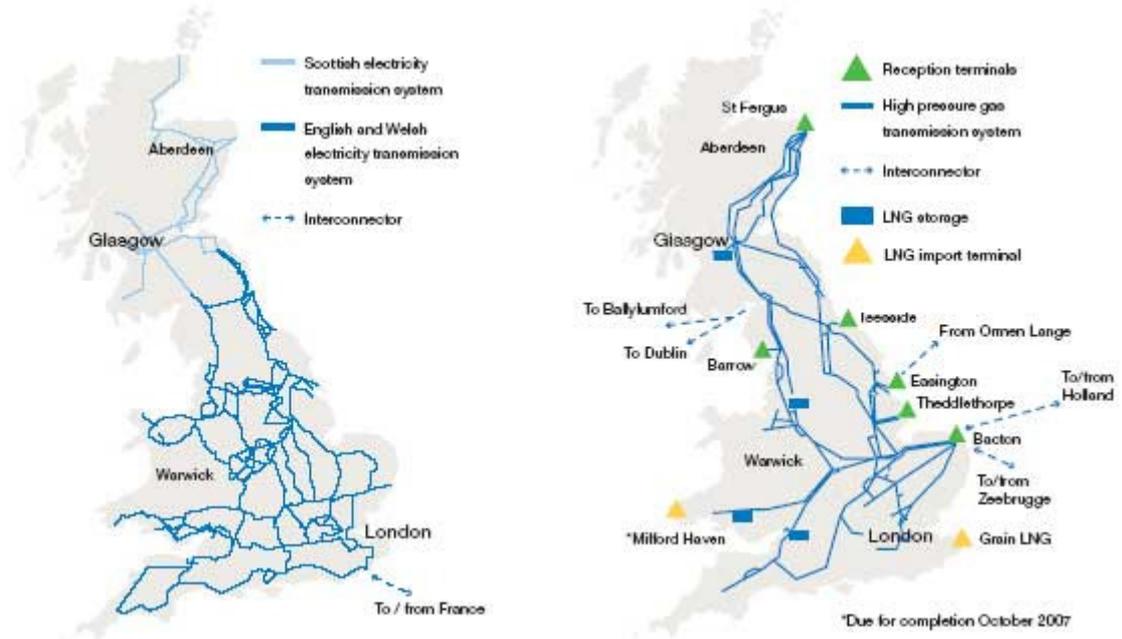
Primary Legislation:	Gas Act 1986, Utilities Act 2000, Energy Act 2004
Main Players in Y&H:	OFGEM, Northern Gas Networks (Northern and North East LDZs) and National Grid (East Midlands LDZ)

3.6.1 Introduction

Similar in structure to the electricity industry, gas is distributed nationally via the high the pressure National Transmission System (operated by National Grid Transmission) to a series of Local Distribution Zones (LDZs), which are based on the former British Gas

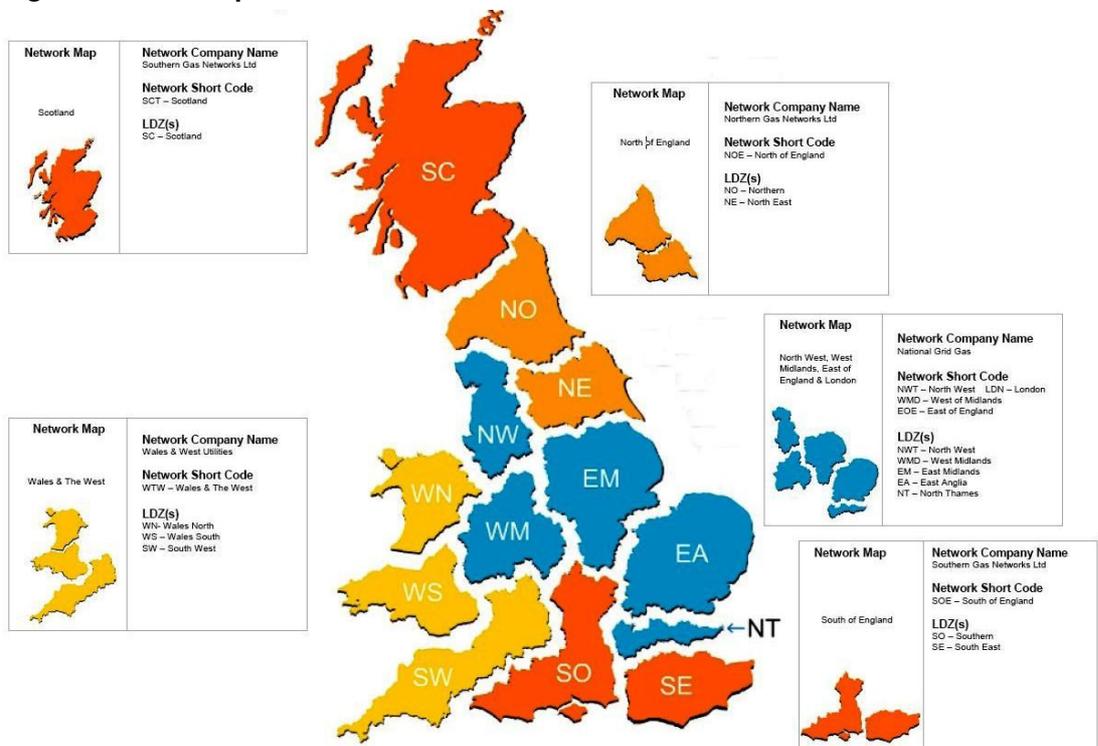
regions. The LDZs are operated by Gas Distribution Operators (DOs). The gas supply companies pay National Grid Transmission and the DOs a tariff for the use of the gas networks for access to their end-customers. The tariffs are set over 5-year control periods based on approved investment plans agreed with OFGEM.

Figure 3.3 National Grid Gas and Electricity Transmission Networks



Source: National Grid Company

Figure 3.4 Map of Gas Distribution Networks and Local Distribution Zones



Source: xoserve Limited

3.6.2 Gas Network Connections and Capacity

Operating under the Gas Act 1986, the Distribution Operators have an obligation to develop and maintain an efficient and economical pipeline system and, subject to that, to comply with any reasonable request to connect premises, provided that it is economic to do so. However, in some instances, specific system reinforcement may be required to maintain system pressures for the winter period after connecting a new supply or demand.

The Distribution Operators use an Economic Test to calculate the maximum economic investment for Specific Reinforcement, which the Distribution Operators can make for any specific load. A load is deemed to be economic where the incremental transportation income from the additional load exceeds the incremental costs of the load. The test shall be applied over the anticipated life of the load.

Specific Reinforcement occurs when the Distribution Operator has to undertake system reinforcement, or additional system reinforcement, as a result of one or more of the following:

- an increase the rate of gas consumption at a supply point; or
- an increase in the rate of gas consumption of a Connected System; or
- the connection of a new supply point where the consumer in question is anticipated to be likely to consume more than 73,200kWh per annum; or
- the connection of a Connected System; or
- where there has been an interruptible to firm load transfer.

3.6.3 Implications for Integrated Infrastructure

As with electricity distribution, in regional planning terms, the transmission network is only of contextual relevance, as almost all gas supplies come via the LDZ networks to end-users and this (together with the capacity of off takes from the transmission network) are where constraints are likely to exist. Rural areas often have no networked gas provision at all.

Gas supply is currently commercially preferable for the delivery of new housing, but not essential. Some commercial users do however currently rely on a gas supply. Using gas as a fuel source is incompatible with achieving the highest standards of compliance with the Code for Sustainable Homes, and is therefore currently likely to diminish in importance for future housing growth.

3.7 Telecommunications and Broadband

3.7.1 Introduction

The telecommunications industry has undergone significant change since privatisation in the early 1980s. The industry is regulated by Ofcom, although this has become 'lighter touch' as the post-privatisation industry has matured and competition to BT has improved.

There are three main fixed-line networks that provide telecommunications access to homes and businesses that operate in the region; Openreach (the main access network owned by BT, and the most significant), Virgin Media (the cable television networks) and Kingston Communications (in the Hull area). In addition, large commercial users may bypass these access networks to get direct access to other national networks.

Telecommunications traffic (data and voice) travels on several major national networks and between access networks. Major providers include BT, Cable & Wireless, Virgin Media and Thus. These providers connect to the access networks at exchanges, or in the case of large commercial customers, directly to end-users.

Finally, there is an open market for the provision of telecoms access networks to new development, similar to that in other utility sectors. This is set out below.

3.7.2 The Openreach Access Network (BT)

Most residential customers and small businesses access telephone and broadband services via the Openreach network. Openreach owns, maintains and develops the telecommunications network between local exchanges and users' homes and businesses – the part of the network often referred to as the 'local loop', 'final mile' or 'access network'. Openreach is currently part of BT, operating as an independent business unit. The formation of Openreach as a separate entity within BT was part of an agreement with Ofcom to ensure that this essential final component of the network was available to all providers, including BT itself on an equal basis. In this respect, Openreach and its access network now operates in a similar model to the gas and electricity distributors.

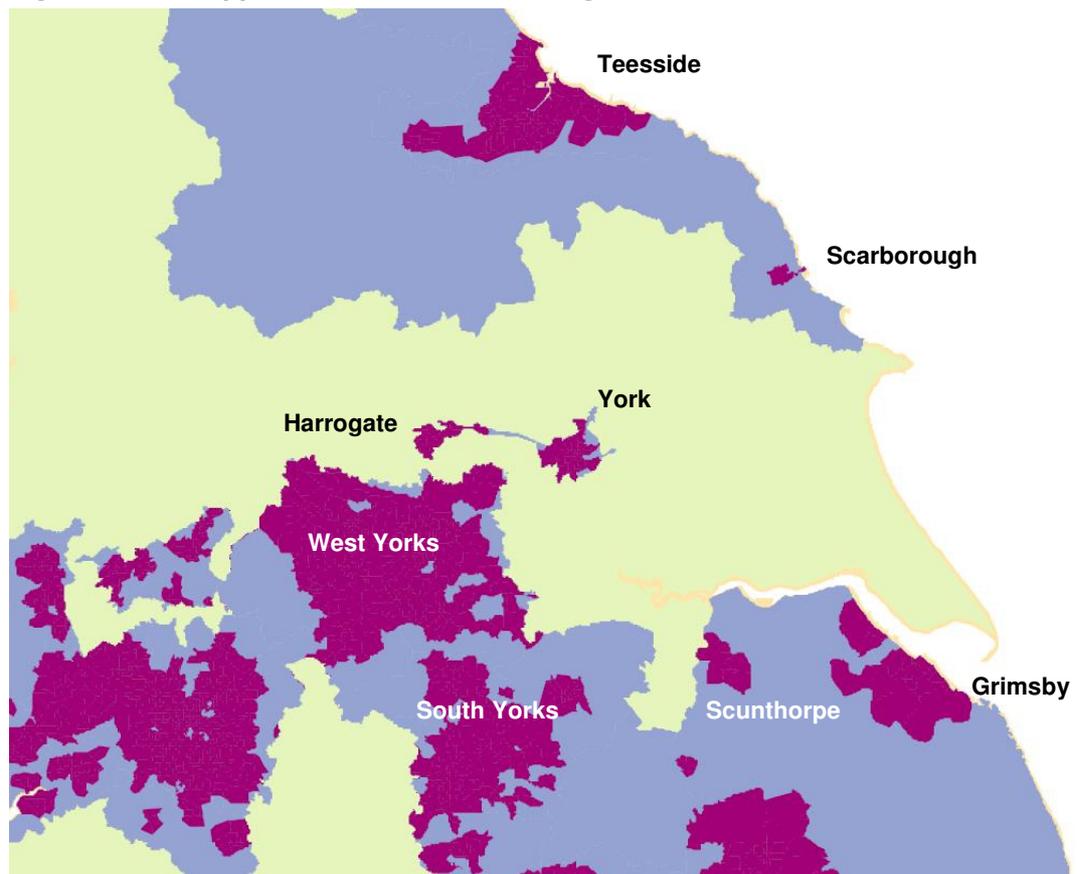
Similarly, there is an open market for the provision of telecoms networks to new developments – although this is developing market, and generally only major new residential schemes are being served in this way. However, these networks include FTTH (Fibre to the Home) provision, also known as Next Generation Access. FTTH offers significantly faster and more reliable and consistent broadband connections than is possible using the copper wire access networks. Openreach is undertaking a FTTH trail as part of new residential development at Ebbsfleet in the Thames Gateway.

3.7.3 Virgin Media

The main urban areas in the region (excluding Hull) are served by the Virgin Media network. The Virgin Media network is the result of consolidation in the Cable TV industry, and is an amalgamation of Cable TV franchises awarded and developed in the 1980s and 1990s, most recently with the merger of NTL and Telewest. Whilst there are still some Cable TV networks outside the control of Virgin Media, there are none in the Yorkshire & Humber Region. Maps showing the broad extent of the Virgin Media controlled franchise areas and core network are enclosed with this report.

The Virgin Media network is notable for a number of reasons. Firstly it is the only major network that provides a physical alternative to the Openreach access network for fixed-line telephony and broadband services to a significant proportion of existing homes and businesses in the region. Secondly, its basic system architecture is significantly different from the Openreach network, insofar as high capacity fibre optic cabling is used to street-cabinet level, with services from street cabinets to the end users delivered using high-capacity co-axial cable for broadband and television services as well as a traditional copper telephone line for voice calls. As a result much higher broadband speeds are possible compared to the Openreach copper wire network and (subject to being served by the network) there is no degradation in broadband service in relation to proximity to an exchange.

However, Virgin Media is generally not investing in speculative investment in expanding the network any further, and those homes and small businesses without access to the network are unlikely to get it in the future, including new development. An important reason for this is the debt accrued by the Cable TV companies building the network which now exists, with the commercial emphasis now on generating income. Major commercial customers can still expect investment to be made to secure a connection to the network.

Figure 3.5 Approximate Extent of the Virgin Media Cable Network

Notes *Blue areas show the extent of Virgin Media Cable TV franchises, the purple areas show the actual extent of network deployment*
Virgin Media also operates a national network of trunk routes (not shown).

3.7.4 Implications for Integrated Infrastructure

The telecoms industry is generally competitive in the region, and network capacity should not generally be an issue that shapes or constrains the spatial options for development in the region.

Developments in technology, together in extensive ongoing investment in the core of the main networks mean that the capacity and capability of the networks continues to improve in response to demand.

There are wider policy implications for the development of telecoms services in Hull as a result of the unusual historic circumstances there, with some implications that the situation could be economically disadvantageous for the area, and this has been the subject of separate studies, and is explored in Section 6.

Rural areas are generally not covered by the Virgin Media network or any other access networks, and residents and small businesses rely exclusively on Openreach for fixed line telephone services. In these areas the constraints of the copper wire network for broadband services are also the most apparent, particularly in respect of broadband speeds in relation to the distance from the exchange. This issue has been studied in depth and ongoing investment and developments in technology now mean some type of broadband service is now available to almost all rural areas in the region. Technology continues to develop, with particular advances in wireless solutions in recent times which could boost access in rural areas.

Nonetheless, it currently seems self-evident that rural areas will always suffer from inferior levels of fixed-line provision compared to urban areas. The future development of wireless services may change this situation in the medium-long term.

Overall, the availability of the telecommunications network, and network capacity are not seen as major constraining factors to future homes growth, or growth in businesses, except perhaps in relation to accommodating isolated growth in isolated areas.

3.8 Education

3.8.1 Introduction

Education provision includes pre-school, primary, secondary and post-16 education. Pre-school education is provided on a part-commercial basis in response to demand. Primary and Secondary education is provided at a local scale by local education authorities, and therefore needs to be planned at that level, and is considered in more detail below. Post-16 education tends to be provided for on a more centralised basis in major service centres, with an expectation that students will travel further than for primary and secondary education.

The provision of post-16 education varies with wider policy choices in relation to education and funding decisions. The same population projections that inform regional planning also influence the longer-term planning of further and higher education provision.

3.8.2 Primary and Secondary School Provision

Generally primary and secondary education is provided by local education authorities (LEAs). Planning for education provision is undertaken using population estimates and demographic data. In general terms, changing demographics resulted in the remodelling of education provision in many areas in the 1980s and 1990s in response to falling numbers of children.

Major new residential development tends to increase the demand for school places, and most LEAs have in place established mechanisms for collecting developer contributions towards new school places where existing schools do not have sufficient capacity to accommodate additional pupils. These mechanisms tend to be based on likely 'child yield' information relating to the type and mix of dwellings provided.

It is normal for large new residential developments to provide new primary schools as part of the infrastructure provided by the developer on-site. In the case of Eco-towns and large new settlements it is likely that some secondary schools might even be provided in this way.

Until recently, LEAs were under a legal requirement to produce a Schools Organisation Plan (SOP), which set out the capacity and utilisation of school places at primary and secondary schools, together with forecasts of future utilisation based on demographic modelling and known plans for development. SOPs were a useful tool for planning investment and were a known and consistent tool for identifying the need for developer contributions towards new provision or opportunities to make the best of existing provision.

The new requirement to produce a single Children and Young Peoples Plan replaced the requirement to produce a SOP, and does not include the same level of detail on schools places. Recognising the value of SOPs, a number of LEAs have continued to produce them on a voluntary basis.

3.8.3 Implications for Integrated Infrastructure

Primary and Secondary education are not generally major constraints on future growth options. Most LEAs have in place established models for growing education provision, including with developer contributions if necessary.

Post-16 education is generally planned for at a higher-level and can vary significantly on the basis of wider education policy choices. Given that secondary education tends to operate as a scale economy, and needs critical mass, its ability to generate more journeys than primary education means that there is a need to identify such secondary facilities and seek

to ensure that growth takes place in these areas wherever possible so as to reduce journeys and maximum use of transport.

3.9 Healthcare Services

3.9.1 Introduction

There is a range of different types of health service provision. Many are provided privately or quasi-privately on an opportunistic and demand-responsive basis, including dentists and opticians. For this reason, these services are not covered in this section.

For National Health Service (NHS), the majority of health services are accessed via General Practitioners (GPs) who act as a 'gateway' to other NHS services. GPs come under the remit of the Primary Care Trusts (PCTs), bodies which are the main procurer of health services for local populations, and are therefore the most relevant part of the NHS in terms of spatial planning, together with the Strategic Health Authority at a regional level.

3.9.2 Implications for Integrated Infrastructure

Healthcare service generally responds to spatial patterns of growth, and local services improved as expanded in line with new development, sometimes by developer contributions. They appear not therefore to be a major issue in considering future growth areas. However, it would be helpful to ensure dialogue with the Strategic Health Authority occurs with regard to the main spatial options at a regional level to ensure integrated planning.

There are many factors impacting on NHS service provision, and models of provision are constantly changing. At a macro-level provision takes account of the same regional population and demographic projections that inform the RSS. However, there is useful scope for dialogue on regional and sub-regional matters to ensure better co-ordination of forward plans. For example, for wider reasons it might be proposed to downgrade a given hospital at the same time that proposals for major plan-led growth are coming forwards. Better integrated planning would help avoid such issues.

Moreover, secondary healthcare (i.e. hospitals) tend to operate as a scale economy, and need critical mass to be viable; its ability to generate more journeys than primary healthcare means that there is a need to identify such secondary facilities and seek to ensure that growth occurs in these places wherever possible so as to reduce journeys and maximise use of public transport in line with PPS1.

3.10 Social and Care Services

Social and care services encompass a range of services. These are mainly provided and procured in England by upper-tier and unitary authorities as part of Adult Social Services and Children and Young People's Services. In a number of areas around the country formal partnerships between local authorities and Primary Care Trusts are helping to integrate the planning and provision of social and care services with healthcare services.

The main issues for integrated infrastructure are very similar in nature to healthcare services. Similarly, provision tends to be made in response to demand, and services planned on the basis of forecasts of future need. The major planning interface is therefore at the Local Development Framework level. The provision by developers of new facilities for social and care services on the largest developments is likely to be justified, and community facilities often feature as planning gain.

Changing models of service provision also have a major influence over the form and nature of social and care service provision.

3.11 Green Infrastructure

Green infrastructure is a term used both to describe an approach to future planning and development, as well as short-hand for "all things green" inside and outside built-up areas which contribute to biodiversity, environmental quality and people's quality of life.

Although the consideration of green infrastructure in land use and spatial planning is therefore largely nothing new, and indeed is integral to place-shaping, the emergence of the term is a relatively recent phenomenon. It carries with it both an implication and impetus to consider environmental assets as an integrated whole and/or in an integrated manner; as such, green infrastructure is an important component of integrated infrastructure. Although there is no national policy as such on green infrastructure, some assets already attract national designation. The Regional Green Infrastructure Evidence Base Study provides more detail.

3.12 Summary and Conclusions

The utilities vary in statutory make-up, spatial remit and regulatory frameworks. Whilst the other current studies address transport, flood defence and green infrastructure (which have overview of the transport data and maps), on characteristics relating to each of the other infrastructure providers shows the following:

- the severity of flood and/or drainage incidents largely depends on topography, flooding history and age/condition of the infrastructure concerned;
- there is a lack of clarity around the relevant organisations and their responsibilities (as stated by the Pitt Review), and in particular relating to the exact age/condition of drainage infrastructure (because much of it was built prior to the need to require records of the precise location), which can exacerbate drainage related problems;
- the Water Framework Directive will have major implications in terms of cost and land use, as it requires an 'ecological' standard of water quality by 2015 at a time when climate change could reduce the seasonal availability of water to dilute pollution; this will necessitate upgrading and possibly increasing waste water treatment infrastructure, and could prove major problems in areas already at full capacity; RPBs will therefore need to study water investment programmes more closely to assess fixed and variable capacity accordingly;
- the Urban Waste Water Treatment Directive requires coastal waters expanding adverse effects to be identified as 'areas sensitive to eutrophication'; significantly, the EU considers the Humber should be designated as such, and the UK Government has made a legal challenge accordingly; if the EU view is completed, this will have major cost implications to water treatment costs in the region;
- Ofwat's current periodic review ("PRO9-") will determine the water companies investment programmes for 2010-2015; whilst these will therefore be 'fixed' in the short term to 2015, there is scope for RSS growth options to influence investment programmes in the medium to long term (i.e. 2015-2020 and 2020-2025);
- the Landfill Directive 1999 provides for challenging targets in reducing the amount of biodegradable municipal waste (BMW) to landfill, and imposes severe financial penalties for non-implementation; this will result in a 'decentralisation' away from single mega-landfills to the provision of more but smaller/specialised waste facilities closer to sources of production, with greater opportunities for recycling and energy-to-waste plants;
- electricity distribution is currently very centralised, with the National Grid providing a network for the 14 licensed electricity distribution operators; as OFGEM are yet to agree tariffs (based on investment plans) for 2010-15, an opportunity exists for growth patterns to inform these accordingly (and vice-versa);
- the lack of access to gas could act as a constraint on growth, especially in rural areas; however, the potential exists for off-takes from the main pipelines in local distribution zones (LDZs); also, whilst some commercial uses rely on a gas supply, this is not essential for housing and likely to diminish in importance for future housing growth;

- telecoms traffic travels on several major national networks and between access networks; major providers include BT, Cable and Wireless, Virgin Media and Thus; generally, the provision of infrastructure is undergoing a major overhaul, as operators increasingly develop/replace traditional copper wire access networks with fibre to the home (FTTH) provision (i.e. to facilitate greater broadband access); telecoms provision is unlikely to be a constraint to growth, except in isolated rural areas; and
- primary schools and primary health/social care tend to take place in 'localised' locations, thereby reducing travel; however, secondary schools and healthcare (i.e. hospitals) tend to operate on a larger scale, and generate wider travel patterns; there is a need therefore to identify these secondary facilities and ensure growth occurs in proximity to those wherever possible so as to reduce journeys and/or provide access by public transport as much as possible in line with PPS1.

In more general terms, the main issues emerge:

- there are constraints at a national level that block better planning for infrastructure;
- the planning and regulation of the utility companies and therefore critical infrastructure (water supply and sewerage treatment, electricity distribution and gas distribution) are amongst the most inflexible due to regulatory constraints and as a result do not currently relate well to regional forward planning at present;
- other significant parts of infrastructure planning are within the overall control of the public sector, and there are established links to regional planning, including the regional transport strategy, regional waste policy and flood risk management – although there is scope for better integration; and
- a number of infrastructure types are predominantly planned for at a local or sub-regional level and do not have major significance in planning for growth at the regional level, including.

In addition to transport, flood risk/defence and green infrastructure water supply and treatment, electricity supply, health and education emerge as important considerations for planning for growth at the regional and sub-area level.

4 Spatial and Infrastructure Planning in other Regions

4.1 Introduction

This section summarises the current understanding of how other regions are approaching meeting growth targets and providing infrastructure, and also begins to outline new options for delivering infrastructure. These findings will be used to the approach in Yorkshire & the Humber.

4.2 North East

One NorthEast (the regional development agency) commissioned Roger Tym & Partners to undertake a study to understand the Strategic Framework for Infrastructure Policy & Investment in the North East (September 2006)⁴.

One NorthEast's rationale for the study was that whilst significant economic gains had been made in the region past investment decisions had not always been sufficiently aligned with the region's core economic aims. Furthermore, the RDA recognised that investment had previously been broadly distributed evenly across the region, possibly reflecting local rather than key strategic priorities. In creating a Strategic Framework, the RDA felt that their role could be enhanced through a more concentrated and targeted approach.

The Framework is intended to provide a rigorous approach for the prioritisation and programming of single programme capital investment. Its scope covers One NorthEast's project investment in 'Place', which encompasses land, property and infrastructure.

It aims to promote a high quality of place and foster best practice for infrastructure procurement, ownership and management, by:

- reinforcing strategic direction;
- establishing clear rules for infrastructure investment by articulating the roles and responsibilities of partners in increasing the region's infrastructure assets;
- assisting partners in effective capital investment planning;
- driving project performance and maximising economic effects;
- improving overall project development, delivery and management;
- supporting innovative and creative ways to meet the regions infrastructure needs;
- facilitating best practice in infrastructure planning, financing and procurement; and
- actively encouraging partners to effectively engage the private sector in building, renewing and managing infrastructure assets and optimising public-private collaboration.

There are links between the approach being followed by One NorthEast and that proposed by Yorkshire and Humber Assembly. Developing a common framework so that regional and city/sub regional partners can consider the relationship between core objectives (namely housing and economic growth) and infrastructure provision and optimise decision-making.

⁴ One NorthEast Physical Regeneration Investment Framework, September 2006
(<http://www.onenortheast.gov.uk/lib/libDownload/10074/ONE%20Infrastructure%20%20Policy%20%20Investment%20Framework%20September%202006.pdf>)

4.3 North West

The North West Regional Development Agency (NWDA) has identified 'Infrastructure' as one of its 5 key priorities and work areas. Within this priority are four sub-topic areas: Land Use, Housing, Planning and Transport, and Energy. Recent work has been undertaken to identify property assets held by the NWDA, and also to put together a list of regionally strategic sites.

North West Regional Development Agency has recently commissioned Ecogen to undertake a study looking at issues, constraints and delivery of infrastructure in the North West Region.

The North West Regional Assembly (NWRA), as part of its scrutiny role, tasked the Review and Scrutiny Group to undertake inquiries into each of the 5 Regional Economic Strategy (RES) themes between April 2006 and October 2007.

'Infrastructure' Theme Inquiry

The final RES thematic inquiry was on 'Infrastructure' and started in May 2007. Deloitte, the consultants advising the Group on this inquiry, produced a Briefing Paper prior to a Select Committee Hearing on the topic in July 2007. In this paper, it was noted within this review that the infrastructure theme has a number of links to cross cutting issues within the RES. These are:

- Improved infrastructure should encourage greater retention of the regional population;
- The use of sustainable construction techniques utilised in all major infrastructure projects;
- Improved efficiency of existing infrastructure will minimise growth in carbon emissions;
- A focus on energy efficiency, renewable energy production and resource efficient housing will make a positive contribution to reducing climate change and energy use;
- Increase public transport usage throughout the region should reduce vehicle emissions, improving air quality and road safety;
- Infrastructure improvements will improve accessibility to job opportunities, basic services and facilities;
- The creation of a high quality and diverse housing stock will provide strong support for the sustainable communities agenda; and
- Create and maintain employment opportunities for the socially excluded.

Infrastructure issues and the opportunities and threats they pose to delivering both Regional Economic Strategy and Regional Spatial Strategy have been considered within the North West. Issues of maximising current infrastructure and delivering future provision have become an intrinsic part of both NWDA's and NWRA's everyday working.

4.4 West Midlands

The West Midlands RSS is being reviewed in three phases, with the scale and distribution of housing being a key part of the Phase 2 review.

In developing the Preferred Option within the RSS Phase 2 Revision, the West Midlands Regional Assembly (as the Regional Planning Body) were concerned that proper consideration was given to the infrastructure implications and to ensure that these feed through to the development of the Revised Implementation Plan to be submitted in late 2007. To this end, in May 2007, Mott MacDonald and GVA Grimley were commissioned to undertake a study entitled "The West Midlands RSS and Infrastructure Study"

The final report was published in November 2007 and provides a first review of the degree to which infrastructure might represent a constraint to the achievement of the RSS housing projections. The emphasis of the report is the identification of infrastructure showstoppers and serious constraints in specific locations to facilitate the selection of a preferred option, given the increased emphasis on housing growth in a number of the regional centres, the overall infrastructure demands for the region may change significantly.

The report focussed substantially on issues which have emerged as potential constraints: Utilities (water, electricity etc), Impact (environment, land etc), Resource (plant and material) and Amenities (facilities). The report was based upon a desk-top review of available data undertaken in order to support RSS development.

The report concluded that constraints such as transport and land availability are significant and have the potential to restrict the implementation of the RSS, but also that these are potentially solvable. The key transport problem is the tension between the desire to develop housing in accessible areas and the fact that these areas are the most congested.

The report also highlighted tensions between the strategy's need to develop housing in locations which are not protected, nor at risk of flooding, whilst at the same preserving the greenbelt, and ensuring the necessary enabling infrastructure is provided as part of the development process.

In terms of utilities infrastructure provision, only water services were regarded as a constraint to overall growth targets. Significant concerns surround both the adequate supply of clean water and waste water and sewage disposal. A number of locations where new water infrastructure is required have been identified and this is perceived as a fundamental constraint on RSS implementation. There is no evidence to date to suggest that this represents a "showstopper" but it may preclude development in some Districts during the early years of the RSS.

The other utilities (electricity, gas etc) do not represent fundamental constraints provided early dialogue is initiated with service providers to ensure that infrastructure is planned and implemented in a timely manner in readiness for development.

The emerging recommendations that came from the study are as follows:

- further research into the transport and water issues relating to development sites will be essential at local level;
- in light of recent events at Tewkesbury and Gloucester, the WMRA should undertake a review of regionally significant infrastructure in relation to flood risk in partnership with other organisations, for example, water treatment works, waste water treatment works, electricity;
- substations, gas suppliers, etc; and
- the RSS Implementation Strategy will need to set out the life cycle of the planning of a new development to indicate the timescale needed to ensure that all essential facilities are in place.

The West Midlands RSS and Infrastructure Study considered individual infrastructure types (water, transport, electricity etc) and the specific infrastructure issues affecting the delivery of the Regional Spatial Strategy. The report considered infrastructure provision in its totality and commented on preferred policy options. The study identified that water services, transport and land availability may significantly restrict the implementation of RSS, especially in the early years of the RSS, but that these infrastructure 'constraints' were potentially solvable, through proactive planning, increasing certainty in the development process and by providing funding to support provision.

4.5 South East

The South East Plan stresses that new infrastructure must support new development. This is outlined in detail in its Implementation Plan, which identifies infrastructure requirements for the next 20 years. The original Implementation Plan was submitted prior to the Examination in Public (EiP) of the draft South East Plan (2006) and was partly based on an infrastructure study carried out for the South East Counties by Roger Tym & Partners. The study provided a valuable insight into the likely additional infrastructure costs that may arise from the provision of new housing.

The updated Implementation Plan has been informed by extensive work with sub-regional partners and other stakeholders, and will form the basis of the Assembly's evidence at the EiP on matters relating to implementation and infrastructure delivery.

The Implementation Plan is an integral element of the South East Plan and is in effect a business plan for the South East Region. It identifies what needs to happen, when it needs to happen and who needs to take the action in order to facilitate delivery of the levels of growth set out in the Plan.

The South East England Regional Assembly (SEERA) hosted a Regional Infrastructure Summit in September 2006 to share progress on delivering the South East Plan with members and regional stakeholders. Around 150 participants included councillors and senior representatives from local authorities, business, voluntary sector and delivery agencies.

SQW Limited was commissioned by SEERA to investigate the processes surrounding infrastructure investment in the South East. In May 2006 Infrastructure Investment in the South East was published. The research looked at the feasibility of improving coordination of regionally significant capital investment decisions in the South East. The findings of the study have been used to inform the South East Regional Assembly's work to implement the South East Plan.

As part of the changes identified in the Sub National Economic Development and Regeneration Review, SEERA is now looking to producing a single regional delivery plan to implement both the Regional Economic Strategy and the Regional Spatial Strategy and streamline delivery ahead of a single regional strategy. They are also working towards updating the Implementation Plan, particularly given the Panel's recommendation that the region should accommodate a higher level of housing growth.

The South East region has proactively developed an Implementation Plan which looked to understand and programme infrastructure provision alongside growth targets, and has even held a Regional Infrastructure Summit to share progress on delivery issues. SEERA is therefore able to adapt the evidence base and update the Implementation Plan to recognise higher housing growth targets, and has sought to investigate infrastructure investment options, particularly for regionally significant projects. This highlights the importance of evidence base gathering and using data to inform an Implementation Plan at the regional scale and the need to consider possible options for financing infrastructure investment at city/sub regional or regional scale.

4.6 South West

The South West Assembly has recently appointed Arup to carry out work to develop an Infrastructure Co-ordination Framework. Arup has produced an advice note which will be used as a tool to help local authority better plan for, assess, and manage infrastructure requirements. Arup is also looking to produce a database which will be used by the Assembly as a template to keep track of and monitor sub-regional and regional infrastructure whether identified, or yet to be identified through the RSS and LDF processes.

As part of the study the South West Assembly have also appointed Knight Frank to carry out some valuation work exploring a guide for local authorities undertaking land valuation and understanding residuals. The study is due to report in May 2008 when the South West will undertake two local authority Peer Reviews (sponsored by the LGA) looking at the delivery of major development at urban extensions and urban regeneration sites.

The South West Regional Development Agency (SWRDA) has established the South West Regional Infrastructure Fund (RIF) and formed an Investment Panel that will advise the Agency on all aspects of potential investments from the RIF. The Investment Panel is drawn from both the public and private sector.

The RIF is an innovative method of removing barriers to development by ensuring that essential infrastructure to support growth is provided in a timely manner. RIF works by forward-funding developer contributions to infrastructure schemes, recouping these investments at a later date through legal agreements under the planning obligations framework.

SWRDA's establishment of a Regional Infrastructure Fund and related investment panel represents an innovative approach, and highlights the importance of a coordinated approach to considering infrastructure provision. In this case, the emphasis has been more local in level, focusing on the delivery of growth on the ground and the means of financing the necessary levels of infrastructure investment. The Framework, which can then be rolled-out by local authorities, ensures consistency and will result in a two-way source of data to help feed back into the RSS and also inform necessary infrastructure provision at a local or sub-regional scale.

South West have progressed their understanding of infrastructure provision to begin to identify possible funding mechanisms. This is something that could be explored during Phase 3 of this study into Integrated Infrastructure.

4.7 East of England

As of an announcement in April 2008, the East of England Development Agency (EEDA) is exploring a regional infrastructure fund which could be worth £1 billion and pay for the accelerated delivery of transport and other infrastructure projects in the region.

EEDA has commissioned Colin Buchanan and Hewdon Consulting, to work up options for a regional infrastructure fund (RIF).

The East of England has recognised that the ambitious growth plans advocated within the Further Proposed Changes to the RSS cannot be realised without capital investment in its infrastructure. EEDA has stated that funds to deliver infrastructure are often not available in time to support development and that a RIF can be used to accelerate funding and plug the gap.

EEDA envisages that the fund could provide upfront funding from banks or government sources to pay for infrastructure such as transport schemes and the fund replenished from future incomes such as a levy on new developments. In creating options for the RIF, he consultants have also been tasked exploring other funding mechanisms. Infrastructure projects which could ultimately be supported by the RIF include, transport schemes, flood defence schemes, utilities as well as other smaller infrastructure schemes.

A Transport Economic Evidence Study and an evidence-based Integrated Development Programme are also currently being progressed by EEDA. The evidence gathered by these other studies will help determine the key infrastructure priorities that could be enabled by the fund. Throughout this process the RDA has encouraged the input from local authority and business partners and EEDA is taking the lead in building up the critical mass which is needed in the region.

As the East of England is nearing the issue date for its RSS, it is concentrating on how it can deliver both housing and economic growth, and the necessary infrastructure to support it. The RDA and the RPB are looking to work with partners across the region to help formulate the Regional Infrastructure Fund framework; this will aid prioritisation of schemes.

For the Yorkshire and Humber Assembly it should be noted that considering future funding mechanisms for infrastructure should form an important part of Phase 3 working.

4.8 East Midlands

The East Midlands region currently has no formal studies or strategies investigating the delivery of housing and economic development and the provision of supporting strategic infrastructure.

The region is quite well advanced with understanding its Green Infrastructure network. In 2005 the East Midlands Regional Assembly (EMRA) and a number of its regional partners commissioned a scoping study of Green Infrastructure (GI) in the East Midlands. This study investigated the potential for mapping the functionality of open spaces in a number of study areas across the region. These study areas were located in existing economic and social regeneration initiative areas.

Ensuring the delivery of green infrastructure is one of five key priorities in the Integrated Regional Strategy, which is the East Midlands' sustainable development framework. The Regional Assembly's Environment group has been working with partners to link regional environmental policy to the delivery mechanisms at regional, sub-regional and local levels.

There has been little progress in the East Midlands with regards to understanding infrastructure at the strategic level. This is particularly the case for critical and social infrastructure. However, the RPB has progressed studies into the Green Infrastructure network and has engaged city/sub-regional partners to link GI to overall objectives for delivery of development.

4.9 South East and South West

A Regional Infrastructure Fund (RIF) Prospectus (December 2006) has been jointly prepared by the South East and South West Regional Assemblies and Regional Development Agencies. The Prospectus has been submitted to the Treasury, Department for Communities and Local Government and the Department for Transport, and makes specific propositions in relation to policy areas of each department.

The Prospectus provides further details on the proposal that was put forward in the respective regional submissions to Government in relation to the Comprehensive Spending Review 2007.

Both regions view the RIF as an essential mechanism for ensuring the timely delivery of critical infrastructure to support housing growth as set out in their respective Regional Spatial Strategies and Regional Economic Strategies.

The proposal also addresses some of the key propositions in the Pre Budget Report 2006 and the related Eddington and Barker reviews including:

- the need to prioritise infrastructure investment to deliver critical outcomes and align funding mechanisms accordingly;
- the benefits of taking investment decisions in accordance with strategic priorities as established in regional spatial and economic strategies;
- maximising the use of **Planning Gain Supplement** and road user charging to facilitate the timely delivery of strategic infrastructure; and
- establishment of effective regional governance arrangements building on the existing **Housing** and **Transport** Boards to further extend the Regional Funding Allocations process and align spatial priorities with infrastructure investment decisions.

The development of a joint RIF provides context and understanding for the regions and RPBs can bring about financing to deliver critical and strategic infrastructure. A joint approach presents opportunities for scale economics, especially where there may be the possibility of cross-border infrastructure provision, i.e. motorway upgrading, and gas and/or electricity transmission networks.

The work undertaken links the housing growth agenda and infrastructure provision and seeks to embed decision-making on infrastructure provision and funding within the wider strategic policy making agenda.

4.10 Greater London

4.10.1 Introduction

Greater London is a special case amongst the English regions, both in terms of infrastructure demands and administrative powers. London is also facing a significant growth challenge, and the infrastructure requirements for preparing London for growth have

been a particular issue. As part of its city region analysis, SURF has undertaken detailed case study⁵ on London, and this is summarised here.

4.10.2 Preparing Infrastructure for Sustainable Growth

The mayor and the GLA has a clearly articulated strategy characterised by three key features. First, preparing London’s infrastructure for major economic, population and housing growth in a style of development that enables London to become the national and international exemplar of a sustainable city. Second, in order to fit in growth of 800,000 jobs and 400,000 homes by 2016 - equivalent to a city the size of Leeds - a complete suite of strategies are designed to (attempt to) guarantee the infrastructural underpinnings for this growth while reducing resource use and carbon emissions. Finally, central to this approach is seeing climate change as an opportunity for developing a new logic of (global) city-regional infrastructure and growth that is an “exemplary” model for others to follow.

4.10.3 Developing Systemic Transitions in London’s Infrastructure

The mayor and GLA have used their powers, their own strategies (formal and informal), the London spatial plan, directly funded agencies and specialist intermediaries to develop the most systemic, comprehensive and long-term response to the infrastructure challenges of supporting high levels of growth in period of resource constraint and climate change of any city-region. Taken together the five strategic objections of London’s’ response (see Table 4.1) constitutes what can be termed a “new paradigm of city-regional infrastructural development” whose implications are poorly understood in general elsewhere.

Tale 4.1 London’s Five Strategic Responses

STRATEGY	KEY COMPONENTS
<p>1. Prioritising the (long term) protection of London’s infrastructure as a (shared) national responsibility.</p>	<p>Short-term the GLA is currently implementing, (along with other city-regions) PPS25 on flooding - there is concern that post-2030 existing flood defences will no longer be able to protect London from climate change induced flooding.</p> <p>National government has been positioned to take lead responsibility for a study of flood protection options 2030 - 2100.</p> <p>The mayor and GLA are seeking a central government commitment to fund as a national priority the investment (£4bn estimated by the mayor) required to protect London from flood risk.</p>
<p>2. Decoupling London’s metabolism from national and regional infrastructures to increase self-reliance.</p>	<p>A suite of infrastructure strategies for energy, waste and water are explicitly designed to:</p> <ul style="list-style-type: none"> minimise the consumption of resources and production of wastes; to consider reuse, develop decentralised energy production and waste treatment technologies; and reduce reliance on external infrastructure to increase the relative self-sufficiency of London. <p>Consequently in 2025 the GLA aims to:</p> <ul style="list-style-type: none"> treat over 85% waste in London reducing reliance on landfill from 75% to 11%; increase renewable energy production to meet 60% of electricity and over 40% of heat demands within London; substantially reduce inefficient water networks, prioritising the efficiency of networks, reduced leakage, conservation methods and prioritising water reuse in new development prior to considering new supply options.

⁵ City-Regions Shaping Transitions in Critical Infrastructure: A comparative review of relevant and transferable lessons from city-regional frameworks in the UK. The London Case Study, June 2007

STRATEGY	KEY COMPONENTS
3. Reconfiguring of intra-city-regional transport infrastructure	<p>Through the congestion charge and proposed emission zone, encouraging modal shift from private to public transport.</p> <p>Reinvesting in existing public transport networks and building new strategic infrastructures.</p> <p>Investment in new transport infrastructures, estimated to cost between £10.5 and £17.5bn.</p>
4. Prioritising inter-global city transportation infrastructures	<p>Despite having few direct powers the mayor is working to improve London's international connections by shaping the investment priorities of other agencies and ensuring intra-city-regional connections with international airport hubs.</p>
5. Using climate change as an (additional) strategy to reinforce London's global pre-eminence.	<p>Establishing the London Climate Change Agency (LCCA) in partnership with EDF to use three sets of London's resources to position London as the world's leading and emblematic city in actively embracing and responding to the Stern agenda on climate change, carbon trading expertise in the City, the city's energy and infrastructural strategies and the wider local expertise and knowledge</p> <p>London is also working with other global cities and with corporate interests to establish this as the dominant response to roll-out as the infrastructure model.</p>

As illustrated in Figure 4.1 London has the most complete and systemic set of objectives for its short and longer term infrastructure requirements. Across the package of infrastructures there is a shared understanding of the infrastructure network and territorial issues in the longer term, the joint development and appraisal of options for providing a fix between these priorities, and with the sole exception of water a clear sense of the strategic priority selected. London's understanding of its infrastructural requirements and both the scope and scale of its ambition is impressive and ahead of other UK city-regions.

Figure 4.1 London - Comparative Summary

	Transport	Waste	Flooding	Energy	Waste
Shared understanding of problem	✓	✓	✓	✓	?
Joint development of options	✓	✓	✓	✓	✓
Selection of solution	✓	✓ (?)	✓ (??)	✓	???

4.10.4 Limitations, Opportunities and Lessons

The key limitations of the London approach are:

- much of London's response is at the level of aspiration, need considerable work to translate into practice and, consequently, success is not guaranteed;
- the strategy of reducing reliance on national and regional infrastructure raises wider questions about the degree to which London is seeking to become more self-reliant rather than participate in the development of more collective and inclusive responses;

- there are questions about the fit between this new infrastructural logic, exemplified by London, and its potential relevance elsewhere, especially in those cities that do not have such a strong city-regional governance framework; and
- political will, in view of the change of governance during the local elections.

The London approach offers the most systemic and integrated attempt in the UK to think through the transitions required in infrastructure to meet the growth ambitions of a city-region whilst also directly addressing and internalising questions of climate change and environment. It is perhaps also the first example of using climate change as an opportunity for reinforcing and developing a new trajectory of growth within a city-region. Finally it carries the potential for offering relevant lessons in the development of city-regional capacity and capability to shape infrastructure.

The key lessons from the London approach are that the city's history and positioning implicate it as "the lead" and exemplar on issues of coordinating city-regional growth and critical infrastructures. As the lead, and de facto national exemplar, key elements of the London model are effectively cascaded onto other city-regions through targets set by national government that are cascaded down through regional strategies and then to sub-regions and city-regions. In this cascading process, a key issue is whether other city-regions actively interpret the London approach within the context of their own city-region or whether the London model is imposed on them.

4.11 Summary and Conclusions

It is apparent from the foregoing that the different approaches in the English regions to integrated infrastructure provision can be summarised as:

- little or no consideration of the planning and/or delivery of infrastructure, other than green infrastructure (E Midlands);
- strategies with sound strategic aspirations for the planning and delivery of infrastructure but no clear mechanisms to ensure delivery and/or integration with planning (N East, Greater London);
- preliminary attempts to assess infrastructure capacity constraints and opportunities in relation to spatial growth and development (North West, West Midlands, Yorkshire and the Humber); and
- focus on delivery mechanisms, and in particular the establishments of Regional Investments Funds with which to facilitate and/or accelerate delivery of key infrastructure (South East, South West, East of England).

Many studies undertaken by the regions are approaching the issue of infrastructure provision retrospectively. This is because most RSSs have either been recently issued or are nearing their issue date, and are due to be revised, in whole or part, by 2011. With growth locations already embedded within RSSs, the focus in some regions is on infrastructure provision is targeting how best to prioritise schemes and understanding the financing options for delivering the planned growth concerned (S West, S East).

This is distinct from the approach in Yorkshire and the Humber which is seeking to inform the selection of growth locations up front and at a high-level during the RSS 2009 Update. This is similar to the approach in the North West and West Midlands which provides comprehensive information on utilities in particular and identifies transport capacity and waste water treatment capacity as being potential barriers to growth in specific locations.

Clearly there are a number of more fundamental longer-term actions to embed a pro-active and coordinated approach to spatial, economic and critical infrastructure planning in the region. Clearly these longer term issues need to be addressed in the development of the Single Regional Strategy.

5 Review of Other Specific Studies into Infrastructure and Housing and Economic Growth

5.1 Introduction

This section of the report examines other specific approaches that have recently been taken in relation to infrastructure, generally in relation to planning for growth. These examples are reviewed in order to understand what issues they raise, and any lessons for this Scoping Study.

5.2 Plymouth Strategic Infrastructure Study

Plymouth's LDF provides a framework within which the spatial aspects of the city's vision can be delivered. The RSS incorporates the growth agenda arising from these initiatives.

Headline expansion targets for the city include building 32,000 homes in the period to 2021 and creating 42,000 new jobs. Achieving these levels of development will require a massive investment in new infrastructure, as well as the need for new facilities to serve the growing population. Recognising the contribution that Plymouth can make to national and regional housing needs, Plymouth was designated as a New Growth Point.

It is vital that the necessary infrastructure is planned in sufficient detail to access funding and provide a framework for the growth of the city - and is delivered within budget against a pre-determined schedule. To enable this Plymouth City Council has commissioned work to:

- identify the key infrastructure interventions needed to enable the growth of Plymouth to be delivered in a sustainable manner;
- establish the points on Plymouth's population growth trajectory when these interventions will be required;
- determine a common set of demographic change scenarios to enable infrastructure providers to have a consistent set of data for short, medium and long term planning;
- identify the key implementation agencies and potential delivery mechanisms for each infrastructure sector;
- understand broad-brush cost estimates for the delivery of the infrastructure;
- identify funding - and a vehicle for coordinating the delivery of this infrastructure; and
- establish an evidence base that will be used to set in motion and maintain the momentum of the delivery process.

The key infrastructure sectors covered were:

Transport	Marine and estuarine elements
Children's Services	Flood risk management
Health care	Sports and leisure
Adult and community services	Children's playspace
Water supply, treatment & sewerage	Waste management
Energy (traditional and renewable)	Libraries
Strategic ICT	Emergency services
Strategic greenspace	Other community infrastructure

The study is ongoing (summer 2008) and is currently attempting to collect and map information on the various networks in the area. The aspiration is to produce a database of all the planned investments and upgrades to the different networks and services linked to a GIS system so that this information can be plotted spatially. This is proving to be a challenging task requiring very close dialogue and cooperation between all the parties involved.

This study attempts to understand the baseline surrounding matching infrastructure provision with growth targets, develops a range of growth scenarios to add evidence to the scale of delivery, and begins to identify possible funding mechanism to realise the scale of delivery needed. It is particularly useful to note how the local planning authority has sought to provide data for use by the Utilities in order to secure their engagement.

The Plymouth study also shows the benefit of including a range of scenarios in considering the scale, type and timing of infrastructure delivery. A comprehensive database and GIS system is being produced to help to understand planned investments and upgrades, but is proving challenging to assemble.

5.3 City Regions and Critical Infrastructure: Meeting growth targets sustainably - Manchester City Region

5.3.1 Introduction

This study, undertaken by SURF for the Northern Way Sustainable Communities Team (July 2007) explores how the Northern city regions can better understand the implications of their new growth aspirations and how this relates to the demands, pressures and future provision of critical infrastructure. New accelerated growth ambitions of the Northern city-regions places challenging new demands on their critical infrastructures, especially where there are likely to be significant variations in infrastructural demands (e.g. energy, where growth may vary from less than 1% in rural areas to over 5% in the city-region).

The report notes that many infrastructure providers are working on outdated assumptions that assume low levels of growth to occur, and in spatially uniform demand patterns. This means that infrastructure planning is locked in to old assumptions and investment strategies that will not meet the needs of the new city-regional growth agenda.

Furthermore, with most infrastructure providers organised on a national and even international basis (although electricity, gas and water networks tend to be organised regionally) there is a potential mismatch in the planning and coordination of many infrastructures which are not sensitive to the city-regional scale.

5.3.2 Emerging evidence in the Manchester City Region

The study specifically analysed current practice and ways of working within the Manchester City Region (MCR). In the MCR current coordination between spatial priorities and network infrastructures, is variable. In the short-term, across most infrastructure networks there is a strategy to deliver 'temporary fixes' until 2009/2010. These strategies will 'sweat' infrastructural assets to meet growth priorities over that period. However, the study notes that there is a consensus amongst policy makers that such fixes do not provide a longer-term strategy for managing territorial and network priorities.

5.3.3 Infrastructure sectors analysed through Manchester City Region case study

The study provides a synopsis of the issues surrounding critical infrastructure provision, co-ordination and delivery within the Manchester City Region. They are:

Transport

- sector of infrastructure where there is most advanced understanding of the common problems of joining up the development of options and the selection of solutions; and
- a Strategy Planning Model has been developed within MCR which examines the relationship between assumptions in regional and sub-regional development plans so as to provide estimates of transport patterns and models up to 2011.

Waste

- there is some understanding amongst decision-makers that waste-streams over the next 10 years will be subject to a major transition and that this will have significant regional and city-regional implications;
- however it is noted that there is a lack of consensus about the location of new treatment facilities. To begin to gain some more understanding progress is being made on the Greater Manchester Joint Waste Development Plan Document. This is as an attempt to provide some certainty within waste infrastructure sector providers and to attempt to link growth patterns with waste treatment.

Flooding

- the study points to an Association of Greater Manchester Authorities (AGMA) led assessment of flood risk in MCR and notes that it will look more systemically at the interrelations between development priorities and flood risk, and look to provide an application of the sequential test and assess its implications for MCR.

Water and Sewerage

- currently, there is little shared understanding between spatial planning policy makers and infrastructure network representatives. With continued challenges being placed on this sector by growth agenda, the study highlights that this is potentially problematic situation for planning for long-term growth; and
- there is minimal collaboration between utility providers, regulators, and planning authorities, which is compounded by a lack of alignment between infrastructure network provider's assessment forecasts, spending targets, and planning periods with those within the RSS, CRDPs and RES.

Energy

- there is little shared understanding between spatial planning policy makers and network representatives, despite new challenges placed on this sector by growth agenda;
- there is also no strategic overview of energy issues at the MCR scale. As such there are issues surrounding how targets and priorities can be cascaded from national to regional to CR and local levels; and
- the uniform growth assumptions from network providers do not accord to the MCR growth – either past or forecast.

Figure 5.1 below shows a summary of the levels of coordination between decision makers in the MCR. It shows that there are considerable problems in achieving the steps towards coordinated delivery of infrastructure. It also identifies where there has been some joint development of options between spatial plan makers and infrastructure providers. However, it must be noted that at the time of publication, only transport infrastructure providers were actively working with spatial planning decision makers to select optimal solutions to delivering development and providing infrastructure.

Figure 5.1 Manchester City Region Comparative Summary

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

The Need to Develop Capacity and Capability for More Effective Coordination

Given the disconnection between network and territorial priorities, the study highlighted a need to develop a collective approach to enhance capacity and capability for more effective coordination.

In terms of practical action towards improved communications, there was some acceptance that there had been a movement towards a better dialogue over the past 12 months but that more was required. More was required to avoid dialogue being merely a talking shop and to circumvent a lack of mutual understanding, a lack of trust, the differing geographical remits of different social interests and the incompatibility of timeframes of existing social interests and to avoid institutional inertia.

This required developing shared understanding, shared priorities and understanding conflicting priorities. In particular, this necessitated a genuine desire to co-create solutions, forward-thinking and building partnerships where no one group is dominant and where dialogue is about trust and openness rather than just a seat at the table.

Good facilitation was seen as necessary as was trust and openness and informality but importantly so was gaining a clarity of agendas from the different perspectives and having 'the right people' in the room to achieve this clarity. The Chatham House Rule was seen as further helping to facilitate this co-creation of solutions and to encourage openness. Importantly it also required a commitment to doing this through developing the skills and knowledge to engage and making time to do this. It was also seen to need a commitment to different social interests speaking with a single consistent voice and developing 'effective structures' in doing this and getting away from ad hoc arrangements.

Overall, three recommendations fell out of the analysis as highlighted below.

Recommendation 1: How are infrastructures organised? - Work with the key infrastructure providers and territorial planners and regulators to understand and share the key features of the social and technical organisation, drivers and signals and current pathways of development of network technologies:

- How is the sector organised? What is the role of policy and or regulators? How are infrastructure networks planned and according to which criteria?
- What are the key drivers, signals, and pressures on the system that have territorial implications? How do these manifest themselves in management strategies and the city-regions of the North?
- What is the current logic of network development? Is this sustainable in the longer term? Are there pressure for more systemic changes in the socio-technical organisation of the networks and what implications do this have for management strategies and city-regions?

Recommendation 2: Understanding the Future: assumptions, techniques and pathways - Work with the key infrastructure providers and territorial planners to understand how they currently 'think' prospectively about the development of their systems and places focusing on:

- How are techniques and models used to support prospective development? What key assumptions, timescales, spatial units and data inform the development of such techniques?
- What is the sensitivity to differential growth projections and nodes within city-regions? What are the relationships between territorial and infrastructural growth assumptions?
- How do these compare across networks – what are the resonances and dissonances between approaches?

Recommendation 3: Developing a Combined view of networks and territory - Work with the key infrastructure providers and territorial planners to understand where there are currently opportunities for the combined planning of networks and territory at different scales including:

- When considering new development what are the opportunities for development that more accurately reflects network priorities (e.g. more energy efficient, etc)?
- At what type of scale are there opportunities for joint planning of networks and territories – regeneration schemes, URCs, regional centre, corridors, districts, industrial estates etc – to more effectively mesh network and territorial priorities?
- What is implied for the city in rethinking its relations to network priorities? More self-sufficiency? Greater autonomy? More external dependence on clean resources? New systems of pricing and harder demand management?
- How are all these linked to wider challenges and issues – low income households, economic opportunities and specialities?

This study is of particular relevance as it focuses on the sub-area level of planning, and it is clear that the sub-area level is where much of the infrastructure issues need to be resolved.

The study highlights the importance of ensuring that investment plans within the various infrastructure providers need to have greater alignment with the spatial and development plans at local, city-regional and regional levels. Aligning the evidence base across spatial plans and infrastructure investment plans is a priority to give added certainty and facilitate investment.

For the Yorkshire and Humber study, the analysis of the Manchester City Region (MCR) demonstrates that the lack of understanding amongst decision-makers (both spatial and infrastructure) is perpetuating a mismatch in delivery. With growth targets set high, this lack of shared understanding is a potentially huge stumbling block to sustainable development.

The MCR study also underlines the importance of considering these issues at the city/sub-regional scale. The study is clear that this scale represents the optimum scale for prioritising development strategy options and also for facilitating infrastructure investment. This has implications for the Phase 2 component of this study and stresses the need for the city regions in Yorkshire and Humber to take a proactive approach in understanding growth targets and infrastructure delivery.

The work on the Manchester City Region led to the formulation of an “ideal” framework by which to consider and integrate planning for infrastructure, and complement the recommendations set out above. The five stages of the framework were:

- **Stage 1** Understanding Existing Context
- **Stage 2** The Strategic Landscape

- **Stage 3** Gap Analysis
- **Stage 4** An Action Plan
- **Stage 5** Preparing for the Future?

The key message of the report concerned is the importance of a joined-up and interrelated approach to regional / sub area / city-regional priorities and critical infrastructure priorities. The findings emphasise the importance of building effective capacity and capability to address the challenges and opportunities facing spatial planning and critical infrastructures.

5.4 City Region Green Infrastructure Strategic Planning – Raising the Quality of the North’s City Regions

The Northern Way commissioned ECOTEC to carry out this study in 2006. The study firstly defines and describes Green Infrastructure, and sets out the case for it to be properly planned for and networked in a manner which creates real benefits for businesses, communities and the landscape’s ecological integrity.

The study notes that planning for Green Infrastructure needs to take place at the City Region spatial level, as this enables a strategic view to be taken across a geographic area which is large enough for real impact to be seen, measured and monitored. It also allows for the development of that network to be properly joined up across artificial political boundaries.

To assist City Regions further, the report then shows how real value can be added to current activity, undertaken at a variety of spatial levels, and it outlines a framework for its use in the strategic planning process.

The study is clear that the benefits of Green Infrastructure strategic planning are:

- **Economic** - The tangible benefits that an attractive environment and investment in green spaces brings in terms of attracting and retaining both business and a skilled workforce. Green Infrastructure additionally creates real opportunities for new commercial activity, for instance in tourism, conservation, agriculture and the renewable energy sectors, creating new employment in and around our towns and cities;
- **Social** - The benefits accessible green spaces bring to public health through increased opportunities for exercise and recreation, its contribution to community cohesion and enhancing quality of place through improving the environment of residential neighbourhoods – all key components for sustainable regeneration strategies; and
- **Environmental** - The conservation and creation of wildlife habitats and corridors, reductions in air and water pollution and the contribution made towards reducing climate change impact. This allows the urban areas of the Northern Way to showcase a product where high quality physical regeneration is matched by a high quality environment.

The study outlines that when taken together, the benefits of Green Infrastructure can be seen to have a considerable and measurable impact upon quality of place and liveability at a local neighbourhood level. When strategically planned and measured across a City Region, Green Infrastructure can be seen to have the potential to create a truly sustainable community by integrating environmental assets and processes with key elements of economic renaissance such as housing renewal, inward investment, site and infrastructure development.

Significantly, the Manchester City Region case study led to the formulation of a 5 stage framework to consider and integrate planning for infrastructure as follows:

- **Stage 1** – “Understanding the existing context”, to gather relevant data and intelligence so as to assess current level of knowledge on the spatial distribution of assets, quantity, quality, use, accessibility and connectivity i.e. what critical infrastructure currently

exists? Who provides it? What quantity is there and how is it distributed? What are the new pressures on that critical infrastructure? What challenges do these pose for current capacity? What connectivity and cost issues are raised? How network provision is currently managed? What are the growth/targets/aspirations of the region, city/sub-region for housing, economy and transport and what demand does this place on infrastructures? Does capacity (quantity, quality and distribution) meet standards and growth targets?

- Stage 2 – “Establishing the Existing Framework for Infrastructure Provision”, to understand the extent to which strategic direction and implementation of critical infrastructure is currently joined up spatially (and also with other strategies delivering social and economic interactions), and to what extent will these deliver the outcomes to be determined in the Action Plan (Stage 4) (i.e. what strategies currently refer to critical infrastructure and what do they aim to achieve? What programme activity and priorities exist which implement critical infrastructure? Who are the key stakeholders? Are their views and priorities regarding critical infrastructure planning and investment consistent? Are all the relevant stakeholders engaged? Where are the potential synergies and conflicts in strategic terms between critical infrastructure and planned interventions?).
- Stage 3 – “Gap Analysis”, to understand where the opportunities are likely to arise for improved planning of and enhanced investment in critical infrastructure, spatially, temporally and in terms of quality and quantity (i.e. where are the resources currently under-represented spatially? How the city regions’ economic plans need to be reflected in terms of critical infrastructure provision and planning? Are quantity and quality standards met or planned to be met? Where are the mismatches between distribution/quality and different needs and growth aspirations? What opportunities exist to create these connections?)
- Stage 4 – “Better Integration Planning in the Long Term” to formulate and implement a prioritised action plan with policy and programme interventions (i.e. where can critical infrastructure contribute spatially and thematically to decoupling resource use and economic growth? Where will actions have the highest impact? What opportunities are there for “quick wins”? What opportunities are there to promote the development of exemplar projects? What best practise can be developed or imported? What supporting structures will help to see through this action plan to delivery - planning guides, capacity building, pilot projects? How will the plan be monitored, evaluated and reviewed?)
- Stage 5 – “Preparing for the Future” to establish ownership of the critical infrastructure agenda (strategy and Action Plan) in terms of appropriate partnerships, for a, delivery vehicles or other structures and to identify where gaps exist that can be filled as appropriate (i.e. what would the terms of reference be for any strategic partnership? What would its priorities be? What opportunities are there to identify a champion for critical infrastructure in the city region? How should any strategic partnership/group seek to integrate with other city regional/regional structures? What will its communications strategy be?)

Unsurprisingly, the findings of the Manchester City Region work stress the importance of capacity building and the need for consistency of approaches at different spatial levels.

This study emphasises how when infrastructure is considered and analysed at the city region level, the efficiencies and benefits are maximised. Considering infrastructure in an integrated way provides new opportunities to plan strategically for investment, creating a joined up approach between national, regional and city/sub regional priorities for investment, enabling smart growth to be planned for at the City Region spatial scale, simultaneously addressing agendas previously regarded as competing for land and resource.

5.5 Summary and Conclusions

Analysis of other specific studies highlights the following:

- the existing disconnection between spatial planning and infrastructure planning;
- the helpfulness of a commonly agreed set of demographic change scenarios to enable infrastructure providers to have a consistent set of data for short, medium and long term planning (Plymouth case study);
- many infrastructure providers are working on outdated assumptions that assume low levels of growth in spatially uniform development patterns (Manchester City Region);
- potential mismatch between spatial policy and infrastructures which are not sensitive to the city region scale (Manchester City Region);
- the particular sensitivity to the growth agenda (Manchester City Region);
- the need to build better relationships and understanding between spatial planners and infrastructure providers, founded on a thorough understanding of roles and responsibilities;
- that detailed studies need to occur at the sub-regional level to fully understand the nature of infrastructure issues in relation to growth and change, and even at this level assembling the data requires persistence and dedication (Plymouth case study);
- that some infrastructure types and in particular green infrastructure also contribute to social, economic and environmental policy outcomes;
- that planned growth itself could adapt where necessary to fit with available resources ;
and
- the longer term need to ensure that integrated infrastructure planning takes into account the economic as well as housing growth aspects of spatial planning.

6 Infrastructure Provision in Yorkshire & the Humber

6.1 Introduction

This section considers the headline issues for regional infrastructure. Building on the national picture and institutional relationships set out in Section 3 it identifies the main players in the Yorkshire and Humber region, together with territorial responsibilities and the main issues arising in the region, including the main constraints and opportunities.

6.1.1 Utility Strategies

As set out in Section 3, the network providers for electricity, gas and water are required to publish periodic strategy and investment documents as part of the regulatory process setting out investment plans and operational objectives. These documents are an ideal starting point for anyone seeking to understand the immediate investment priorities of the utilities. The context for those in this region are set out below.

Water

Every five years, the Water Services Regulation Authority (Ofwat) carries out a review of Yorkshire Water's future investment needs and determines how much Yorkshire Water can charge customers to help finance their activities. Ofwat's latest review is due to be completed in 2009 and will cover the period 2010 to 2015.

To assist the regulator, Yorkshire Water have recently published their 25-year Strategic Direction Statement (SDS) which sets out their aspirations for service, the environment, prices and returns over the period 2010 to 2035. In future, Ofwat will benchmark all the subsequent five-year business plan submissions against the 25-year aspirations.

Electricity

The Long Term Development Statement has been compiled in accordance with Distribution Licence Standard Condition 25 and is revised and published by 31st October each year. The purpose of the Statement is to assist existing and future users of NEDL's/YEDL's network in assessing opportunities available to them for making new or additional use of the network.

The aim of the long-term development statement is to improve the availability of information about the distribution network, furnish developers with sufficient information to carry out initial assessments of network capability, inform users of our distribution network development proposals, and inform relevant people of the correct points of contact within NEDL/YEDL for specific enquiries.

Gas

The Long Term Development Statement, published annually, provides a ten-year forecast of transportation system usage and likely system developments that can be used by companies contemplating connecting to the gas network, entering into transport arrangements, or wishing to identify and evaluate opportunities. It is produced in accordance with Standard Condition D3 of Northern Gas Networks' Gas Transporters Licence.

The Statement explains the latest volume forecasts, system reinforcement projects and investment plans. It was published at the end of the 2007 planning process following an appraisal of current market conditions.

6.2 Transport

Transport has been considered in detail in the parallel Regional Transport Capacity and Constraints Study. Transport is part of infrastructure, and the recommendations of the Scoping Study also apply to transport.

6.3 Water Management

6.3.1 Introduction

This section looks at the following issues in the region: flood defence and drainage; water resources; water supply, waste water treatment and water quality. It then considers the utility providers concerned.

6.3.2 Flood Risk, Flood Defence and Drainage

The 2000 floods caused extensive and protracted damage throughout the region, which has the highest asset value at risk from flooding outside London. The Environment Agency (EA) stated the region's defences were in the poorest condition of any region and considered the existing level of investment in flood defence was wholly inadequate given the region's vulnerability to periodic flooding. The EA therefore asked the local authority members of its Yorkshire Regional Flood Defence Committee (YRFDC) for a large increase in the regional flood defence levy. This led to a full debate between local authority leaders within the YHA, and this in turn led to:

1. The YHA lobbying Government successfully to review the existing regime for flood defence funding, and to change its basis from affordability to need.
2. In line with this new funding regime, the YHA and the EA were able to increase the total investment in the region's Ten Year Programme for Flood Defence from £93 million in 2000 to £523 million in 2003.
3. The YHA, as RPB, reviewed its RSS policy on flood risk to provide for LPAs to conduct strategic flood risk assessments (SFRAs) to maintain the region as a sound place in which to live, work and invest in. The Inspector's report commended the RPB's approach as national lead, which led to the review of PPS25 and the requirement for all LPAs to conduct SFRAs. All the region's LPAs have now done an SFRA.

The EA's flood map of England and Wales, shows areas of general flood risk, and Yorkshire Futures has established an environmental baseline which shows that:

- More than 244,000 people in the region live in an area at risk of flooding and a sixth of the region's land area lies within the tidal (sea) or fluvial (river) floodplain;
- The Environment Agency is responsible for around 1,700 kilometres of flood defences in the region that are maintained and improved in order to protect people and property-; 90% of the regions defences are now in a good or fair condition; its long term programme for flood defence projects itemises those projects that will be delivered in the next ten years;
- About £24 million a year is spent on development of flood defences in the region, and a further £20 million on related management to maintain a good asset condition;
- More than 205,500 properties (around 75% of those at risk) in Yorkshire and Humber were covered by the EA's flood warning service in February 2004; the aim is to ensure that 77% of properties at risk are covered by 2007; and
- The Humber Estuary is a major estuary draining one fifth of the land area of England and Wales. It is also of national and international conservation value.

The main features of RSS policy ENV1 are:

- to manage flood risk pro-actively by reducing the causes of flooding to existing/new development, especially in tidal areas, and avoid development in high flood risk areas where possible;
- to follow a sequential approach and undertake SFRA to allocate areas for development in lowest risk sites; and

- flood management will need to facilitate development in main cities (Leeds, Bradford, Hull, Sheffield and York), coastal towns, land on the south bank of the Humber, and inland urban areas where there is little development outside high flood risk zones (e.g. Doncaster, Goole, Halifax); protect strategic transport network (especially Selby-Hull, Doncaster-York and Doncaster-Immingham corridors); provide for managed realignment in and around the Humber and other river corridors; provide positive land use management for flood alleviation in upland areas (e.g. Dales, Moors, Pennines).

The provision of an extensive washland in the Lower Aire Valley, for example, using a series of excavated quarries and opencast sites, has helped lower the overall level of flood risk in central Leeds, for example, without recourse to extensive hard defences (i.e. flood barriers/walls). It also provides other benefits, in particular to wildlife. Given that Leeds acts an engine for growth for the whole of the region, this washland is of considerable strategic economic value to the region.

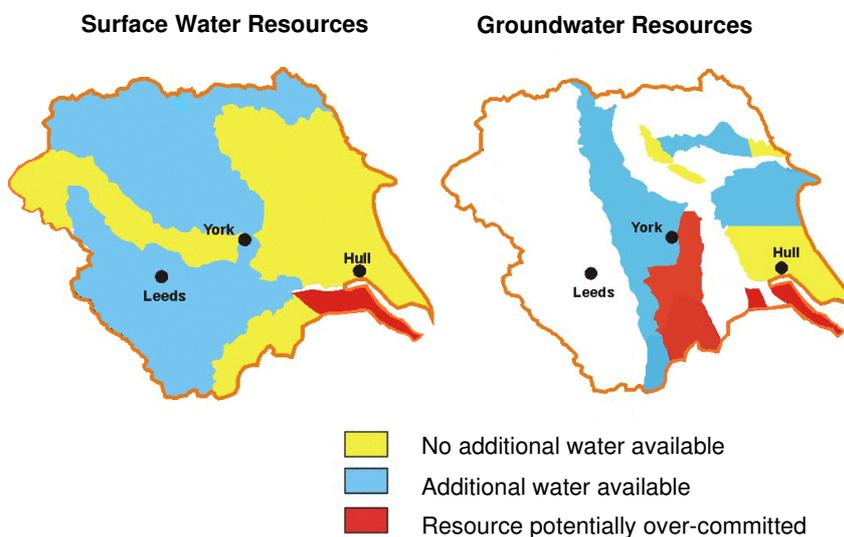
As identified in Section 3, the flood defence infrastructure in any given location will depend on: topography; flooding history; age and condition of the infrastructure concerned. The Regional Flood Risk Appraisal (RFRA) contains more details as appropriate. Flood risk remains a wider issue in relation to the resilience of networked infrastructure, in particular key transport links and electricity sub-stations, for example. This will be a factor to consider in future planning decisions.

As also identified in Section 3, the drainage infrastructure of a given area are unlikely to assume significance at a strategic level, however, recent ‘pluvial’ flooding in Sheffield and Hull shows drainage can be of regional/sub-regional importance, and points to the conclusion that any settlement in a high flood risk area with ageing infrastructure (the condition of which may often be unknown) is especially vulnerable).

6.3.3 Water Resources and Availability

The abstraction of water from surface and ground water sources for domestic and drinking purposes takes place throughout the Region, with most reservoirs located in the west and centre. Generally the availability of water resources is good, with some seasonal variations. However, there is little or no additional groundwater or surface water available in the east and the remoter rural areas. The water resource is already over-committed along the Sherwood Sandstone aquifer, which covers a large area from Selby to Doncaster and into the East Midlands Region in summer (see Figure 6.1).

Figure 6.1 Current water availability for surface water resources and major aquifers



Source Environment Agency 2003.

Climate change will put increased pressure on related infrastructure and water resources. There could also be impacts on water quality, due to the reduced ability of surface and ground water sources to dilute pollution. There is therefore a need for the Region to carefully consider water-intensive uses and development (e.g. food production).

Regional Policy

Policy ENV2 on Water Resources in the RSS states the region will safeguard water resources and encourage water efficiency, and that plans, strategies, investment decisions and programmes should:

- **A** Ensure water resource capacity and provide reliable and efficient supply of drinking water to settlements throughout the region whilst safeguarding the integrity of internationally important biodiversity sites and the wider environment.
- **B** Maximise water efficiency measures, and in particular avoid depleting the Sherwood Sandstone aquifer in Selby and Doncaster.

Planning for water

Water-intensive development is unlikely to be located in areas identified as having limited water available for further abstraction (e.g. Sherwood sandstone aquifer) as a lack of sufficient supply would not support this type of user (e.g. heavy industry). However, there is also a need to maintain existing development in these areas, for socio-economic reasons, and often to provide new development and extensions to those settlements in the interests of other sustainability considerations (e.g. reduction of journeys to work, social inclusion). This presents problems to policy makers and development in water sensitive areas must be appropriate to local water supply and quality conditions.

6.3.4 Water Supply, Waste Water Treatment and Water Quality

Water Quality

Although the prevalence of industry in the Region once led to poor water quality, especially in South and West Yorkshire, the last 15 years has seen a dramatic improvement. In 2006, 91% of river length in the Region was of good or fair chemical water quality, and 92% in terms of biological quality. The Region has several nitrate vulnerable areas, mostly in the centre and south east of the Region, which are particularly vulnerable to diffuse pollution from agriculture. 21 of the Region's 22 beaches meet the 'mandatory' standards of the Bathing Water Directive and 20 meet its tighter 'guideline' standards. (see Figure 6.3 for beaches in the region). Compliance with the mandatory standard was achieved in 2004 and 2005 at Flamborough North Landing, despite the difficulties caused by the large colony of seabirds there. Beaches with "blue flag" status (i.e. those meeting the tighter guideline standards and with adequate tourism facilities) include: Whitby, Scarborough North, Bridlington North, Cleethorpes, Filey and Hornsea.

Regional Policy

Policy ENV3 on Water Quality in the RSS (May, 2008) provides that the region will maintain high standards of water quality, and that plans, strategies, investment decisions and programmes should:

- **A** Prevent development that could pollute surface and underground water resources especially in Source Protection Zones and close to above ground water resources of reservoirs and some rivers.
- **B** Provide for adequate sewerage infrastructure and treatment capacity
- **C** Continue to improve bathing waters at Staithes and Flamborough Head North
- **D** Achieve and maintain a high standard of coastal water quality at Whitby, Scarborough, Filey, Bridlington, Hornsea and Cleethorpes

- **E** Protect and improve water quality at internationally important biodiversity sites at Denby Grange Colliery Ponds, Hornsey Mere, Kirk Deighton and the Humber Estuary.

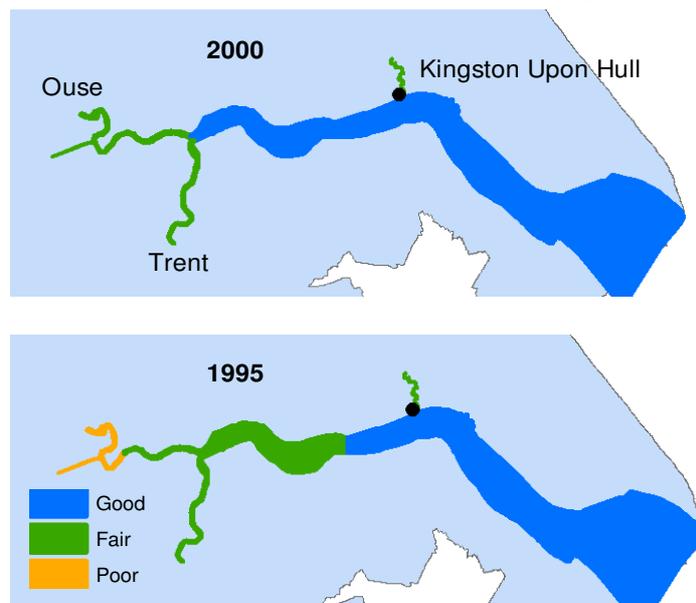
More than 4,000 km of river in the region is routinely monitored to assess biological and chemical quality. About a quarter of this river length is in the urban areas of South and West Yorkshire and these rivers have improved dramatically as a result of better treatment of waste water and industrial effluents over the last fifteen years. These urban rivers now have considerable recreational and amenity value and this has helped attract a range of waterside developments.

Further water quality improvements are expected to inland waters as a result of committed water company capital investment in waste water treatment and sewerage infrastructure up to 2005. There will be further schemes within the 2005-2010 water company investment period mainly to meet the requirements of EU legislation, including the Freshwater Fishery Directive, Habitats Directive Urban Wastewater Treatment Directive and Water Framework Directive. There remains a range of significant pressures on inland water, particularly as a result of pollution incidents, diffuse pollution from agriculture and chemicals that affect the reproductive capability of fish (endocrine disrupters). The Water Framework Directive will lead to the preparation of river basin management plans by 2009 which will in time lead to a more integrated approach to flood risk and quality management, though this will also lead to sustainability increased costs as well.

The Humber Estuary is a major estuary draining one fifth of the land area of England and Wales. It is of national and international conservation value and contains a range of important habitats including mudflats, saltmarsh, reedbeds and coastal lagoons and supports more than 20,000 wintering waterfowl.

Estuary water quality is assessed every five years based on the Classification of Estuaries Working Party Scheme. This is a scoring system that combines biological quality, aesthetic quality and chemical quality. There are 114.3 km of saline waters in the Humber Estuary and the region also contains the Esk estuary, which flows through Whitby and adds a further 4.7 km of saline water. The most recent assessment was carried out in 2000 and this identified that 100% of the estuarine waters in the region was of "good" or "fair" quality.

Figure 6.2 Improvements in Water Quality in the Humber Estuary, 1995-2000



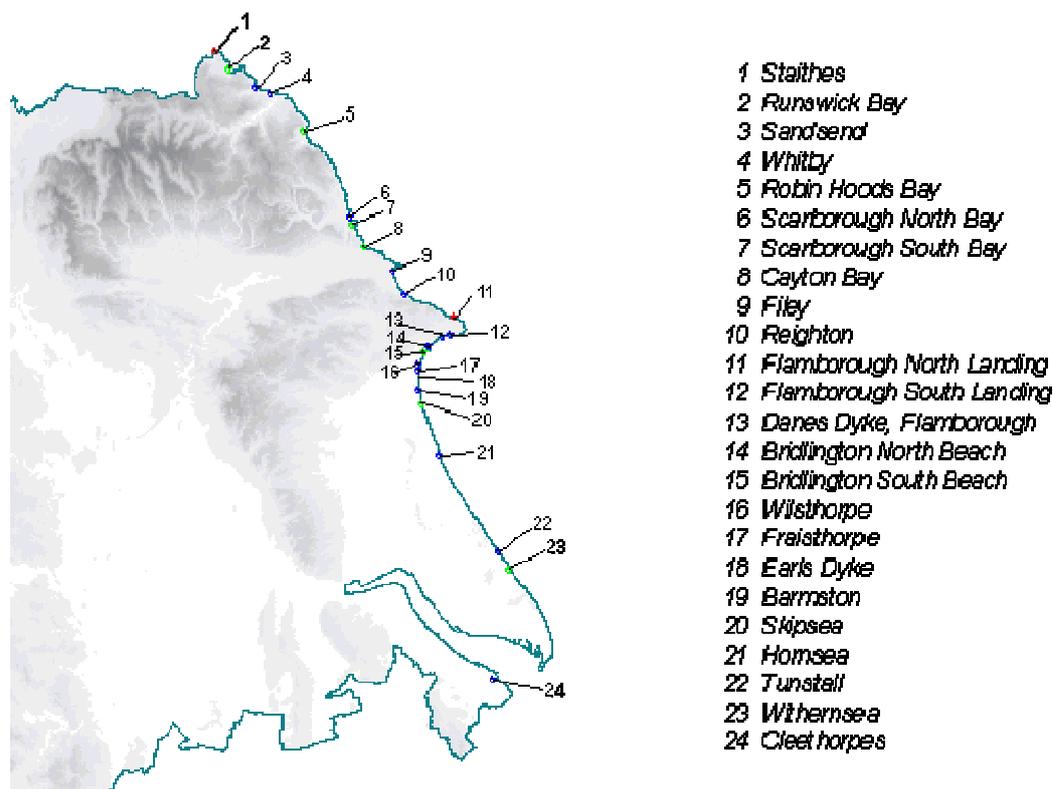
Source: *Environment Agency 2003*

In 1995 15.2% of estuary waters were classified as "poor" mainly because of low oxygen levels in parts of the tidal Ouse and Don. The situation has improved as a result of better treatment of waste water and industrial effluents in upstream catchments and these parts of

the estuary are now classified as “fair”. The poor oxygen levels in the tidal Ouse have, for a number of decades, acted as a barrier to migrating fish but salmon and sea trout are now returning to the Ouse catchment in increasing numbers.

However, as noted earlier, the EU considers that the Humber does not meet water quality standards required by the Urban Waste Water Treatment Directive, and should therefore be identified as an ‘area sensitive to eutrophication’; the UK Government oppose this view, but if it is upheld (by the European Court), then this will lead to substantially increased waste water treatment costs in the region.

Figure 6.3 Bathing Waters in Yorkshire and the Humber



Source Environment Agency 2003

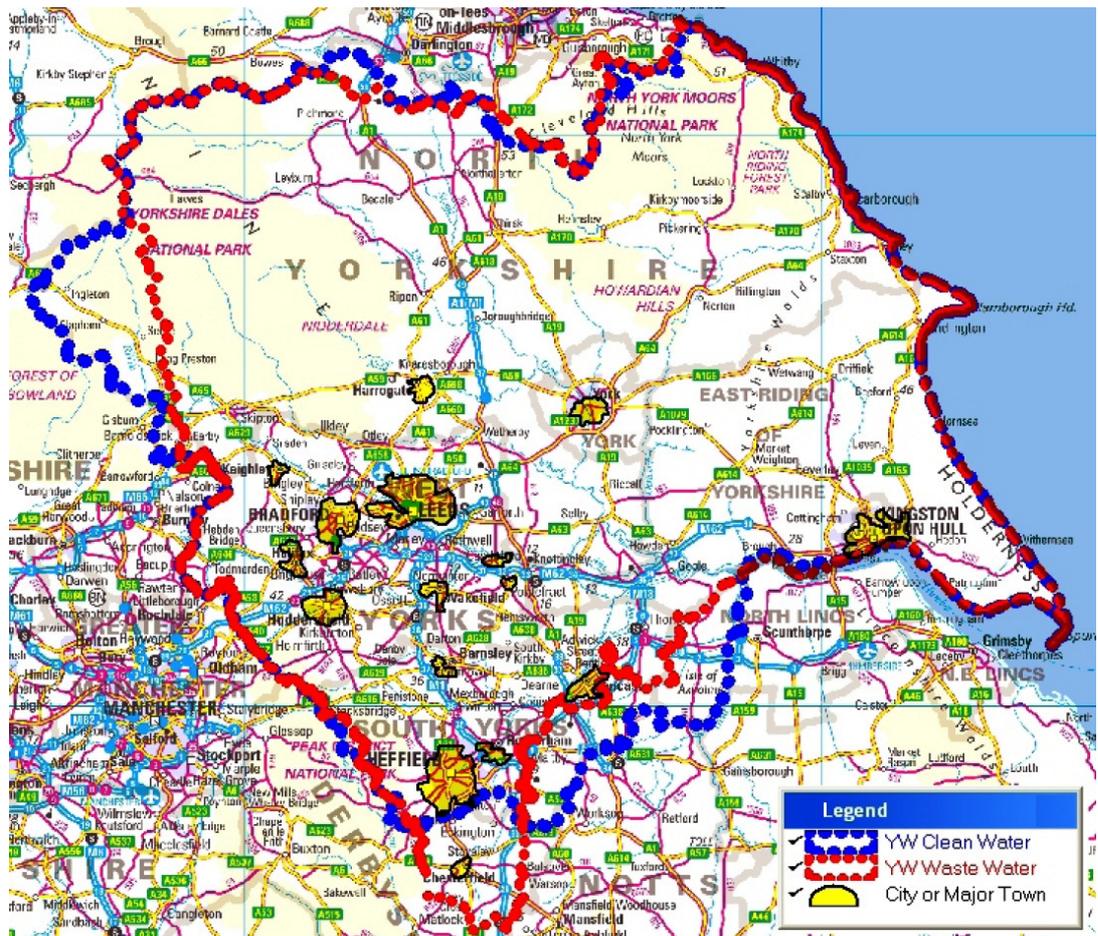
6.3.5 The Water Utilities

Yorkshire Water

As set out in Section 3, Yorkshire Water is the main water and waste water treatment service provider for most of the region. A map of the broad areas covered by the water and waste water treatment companies is included in Section 3, with a detailed map of the Yorkshire Water clean water and waste water treatment areas shown below. The operational boundaries between water companies are defined by water supply areas and sewerage catchment zones, which are not entirely contiguous. As such, there are instances close to the operational boundaries where one company is responsible for water supply and another ‘neighbouring’ company is responsible for waste water treatment.

Yorkshire Water provides water and waste water treatment services to most of the region (i.e. almost all of North Yorkshire, North Humber Bank, West Yorkshire and most of South Yorkshire). The area covered by Yorkshire Water is shown in Figure 6.4 below.

Figure 6.4 Yorkshire Water Service Area – Clean Water and Waste Water Treatment



Source Yorkshire Water Services

Following significant investment in a new 'water grid' in recent years, the region's water resources can be redistributed according to need. The grid (illustrated conceptually in Figure 6.5) now results in Yorkshire Water relying on only three water resource zones for supply, with the 'grid' zone covering most of the region, especially in terms of demand for water. Yorkshire Water's water resource zones are shown in Figure 6.6.

No detailed maps of Waste Water Treatment Facilities were provided. However through discussions it is understood that major urban areas tend to have spare treatment capacity (particularly where there has been economic restructuring, such as the Lower Don Valley in Sheffield), but that the growth of smaller outlying towns and villages is where treatment capacity issues are most likely to arise.

Yorkshire Water Services (YWS) has published its Strategic Direction Statement, entitled 'Striking the Right Balance'. This sets out the vision for the next 25 years and seeks to balance 5 strategic objectives through 10 priorities.

YWS has set itself ten priorities to guide the delivery of services, research, development, innovation, and technological change. The ten priorities to guide YWS to 2035 are:

- Service – Ensuring there is never a need for water supply restrictions;
- Service – Delivering the very best drinking water quality;
- Service – Stopping our sewers flooding homes and businesses;
- Service – Providing a customer experience second to none;
- Environment – Reducing leakage;
- Environment – Mitigating our carbon footprint and adapting to climate change;
- Environment – Going beyond environmental compliance;
- Prices – Providing tailored services for customers;
- Prices – Providing the lowest possible prices; and
- Returns – Delivering attractive returns for investors and lenders over the long term.

To fulfil their aspirations YWS estimate that they will need to invest between £9bn and £11bn over the next 25 years.

To attract investment, either from investors or lenders, they will need to be able to generate a sustainable level of return and demonstrate that they are fulfilling wider corporate and social responsibilities.

Further Information:

Company Website	www.yorkshirewater.com
2005-2010 Monitoring Plan	www.yorkshirewater.com/?OBH=5345
Strategic Direction Statement	www.yorkshirewater.com/?OBH=5024

Contact Point:

Stephanie Walden is Yorkshire Water's planning manager, and is the primary contact for land-use planning matters.

Telephone: 01274 692916

Email: stephanie.walden@yorkshirewater.co.uk

6.3.6 United Utilities Water

United Utilities Water covers western parts of the Yorkshire Dales National Park (in Craven and Richmondshire Districts).

Further Information

Company Website	www.unitedutilities.com
2005-2010 Monitoring Plan	www.unitedutilities.com/?OBH=2061
Strategic Direction Statement	www.unitedutilities.com/?OBH=5678

Contact Point

6.3.7 Anglian Water

Anglian Water provides water supply and waste water services to the south Humber Bank comprising North East Lincolnshire, most of North Lincolnshire.

The Anglian Water service area also includes much of the East of England. The Anglian Water Strategic Direction Statement (SDS) shows a genuine attempt to reconcile proposed spatial growth aspirations with the likely impact on water resource, water demand and waste water treatment. This is the result of high-profile (and relatively long standing) growth pressures articulated initially through the Sustainable Communities Plan and developed through the East of England and East Midlands RSS processes. A combination of the scale of these growth pressures, the clear spatial articulation of the likely locations for this growth and the challenging water resource issues in the East of England and Ofwats PRO9 have led Anglian Water to take a very pro-active approach in terms of planning for growth. In particular, Anglian Water is keen to be engaged in the RSS Planning process so that it can help shape and steer growth to 'optional' locations. In other words perhaps, Anglian Water wants to help influence growth so that it occurs in areas with sufficient waste water treatment capacity- and so that growth doesn't occur in areas without capacity, and where (therefore) new (unplanned) expenditure would be necessary. Clearly this approach has beneficial implications beyond this study, as it helps to obviate structured inflation within both the regional and national economy. In every sense, then, the approach of Anglian Water can be seen to be entirely sustainable in its truest sense. This is an example of how utility providers can respond and engage when spatial planners present clear proposals for plan-led growth.

Further Information:

Company Website	www.anglianwater.com
2005-2010 Monitoring Plan	www.anglianwater.co.uk/index.php?contentid=396&sectionid=52&parentid=50
Strategic Direction Statement	www.anglianwater.co.uk/sds

Contact Point:
Mick Galey (Planning Liaison Manager)
Telephone: 01733 414607

6.3.8 Severn Trent Water

Covers east Sheffield, East Rotherham, south eastern parts of Doncaster district and Scunthorpe.

Further Information:
Company Website www.stwater.co.uk
2005-2010 Monitoring Plan www.stwater.co.uk/server.php?show=nav.5903
Strategic Direction Statement www.stwater.co.uk/server.php?show=ConWebDoc.3295

Contact Point:
Matthew Foster
Telephone: 0116 2343382
Gillian Bullimore
Telephone: 0121 722 4746

6.3.9 Northumbrian Water

The coverage of Northumbrian Water includes the northernmost parts of Scarborough (NY National Park), Hambleton and Richmondshire, refer to Figure 3.1 for boundary.

Further Information:
Company Website www.nwl.co.uk
2005-2010 Monitoring Plan www.nwl.co.uk/aboutInvesting.aspx
Strategic Direction Statement www.nwl.co.uk/nwlookingtothefuture.aspx

Contact Point:

6.3.10 Implications for Integrated Infrastructure

The adequacy of infrastructure for flood defence, drainage, water supply and waste water treatment will largely depend on a combination of factors, including: topography, flooding history; age and condition of the infrastructure concerned; relevant investment programmes; operational plans/management. Notwithstanding the findings of the RFRA, the RSS should avoid areas of high flood risk wherever possible. Where this is not possible, as will often be the case for other/wider sustainability reasons, the RSS will need to make it clear that

development will need to provide related infrastructure, and could/should also seek to identify the provision of extended washlands with the EA to 'offset' the risk of flooding in major urban areas. Unless the EA indicate otherwise, the RSS should also seek to avoid locating growth in/around the Sherwood Sandstone Aquifer.

In terms of water quality, the RPB will need to discuss growth options with water companies and identify capacity as appropriate, seeking to avoid locating growth in areas at capacity, and/or phasing development/growth in line with the outcomes of PRO9. In doing so, the RPB should have particular regard to the economic consequences of the implications of the various water-related directives, which could have an inflationary impact on the regions economy if development occurs in the wrong place at the wrong time.

6.4 Waste

6.4.1 Introduction

In 2003, the Yorkshire & the Humber region was identified as the worst performing region in the country in terms of a range of waste indicators. The YHA therefore developed a Regional Waste Strategy (RWS, 2003) with partners, which sets out the region's aims and objectives for waste. Several changes to legislation and policy have taken place, including:

- development of sub-regional and local authority waste strategies;
- increased drivers for LAs in relation to waste (i.e. LATS targets);
- significant increases in funding to LAs through WIP and WRAP, resulting in significant diversions of waste from landfill;
- creation of Recycling Action Yorkshire by Yorkshire Forward to focus on recycling market development (in particular glass, plastics, organics and green procurement);
- establishment of the Defra BREW programme with a focus on C&I waste diversion from landfill; and
- formation of new steering groups (e.g. Waste Recycling Advisory Group, BREW).

The region now ranks 5th in recycling rates, many necessary structures and funding are in place, and there is a much wider awareness of the issues that need to be addressed. Despite this progress, a major step change is still required to achieve the waste management targets set by government, and the management of waste in the region needs to be more sustainable. The RSS provides a framework to facilitate this change, including the provision of sites for new or expanded waste management infrastructure.

6.4.2 Regional Policy Context

Forecasting

The core role for RSS in terms of waste (and indeed land use planning) is to support the delivery of new waste facilities/infrastructure to facilitate the achievement of waste management targets for recycling and recovery, and to reduce the reliance on landfill. Facilities need to be provided in sufficient numbers, in appropriate locations and in short time period. A related issue is resource use, including construction and the use of aggregates. The RSS needs to address waste streams other than Municipal Solid Waste (domestic waste) which is the subject of the most clearly expressed government targets, and one of the smaller waste streams (by tonnage) arising in the Region.

It is hard not to over-state the difficulties of estimating waste arisings. The Companion Guide to PPS 10 indicates the need to recognise the uncertainty associated with forecasting and that forecasts should take into account the possible impacts of commercial and legislative drivers in waste production. It goes on to highlight that undue precision should be avoided and uncertainties should be reduced through annual monitoring. The difficulty in estimating waste arisings is compounded by the range of possible approaches,

methodologies, scenarios, econometric data and assumptions concerned, as well as the unreliability of past trend data.

Regional Spatial Strategy (RSS)

The RSS's waste policies;

- reflect key regional issues (e.g. the over provision/reliance on landfill); in line with PPS10 and aim to:
- integrate forecasting work in the overall RSS approach, and include the need to consider likely impact of major planned investments;
- provide detailed guidance, but allow "proper space" in the approach for local strategies/LDF work to consider contracts, details of technology choice, location, availability and phasing; and
- reflect the Core Approach of RSS (i.e. sequential approach to sustainable development, including waste hierarchy; numbers as guidelines, but no ceiling on "win-win" solutions).

However, a key issue underpinning the development of the RSS was the availability of waste management data. Significant work on this, together with forecasting future waste arisings, was carried out during 2005-2006.

RSS provides three waste management policies and a suite of tables as follows:

- **ENV12 Regional Waste Management Objectives:** This outlines the key messages for managing waste, sets out roles and stresses the importance of providing sufficient infrastructure to enable targets to be met. It also addresses the link issues of design and construction;
- **ENV 13 Provision of Waste Management & Treatment Facilities:** This supports the delivery of new waste facilities and infrastructure to facilitate the achievement of waste management targets for recycling and recovery and to reduce the reliance on landfill. It requires LDDs to provide for sufficient waste management capacity to handle the region's forecasted waste arisings (based on data provided in Annex C of Draft RSS, with provision for this to be later supplemented by the annual RTAB reports). The approach is essentially an extension of the core approach of RSS. It provides for the accommodation of maximum levels of provision at the bottom of the hierarchy (i.e. landfill), whilst seeking to maximize (i.e. not limit) the provision of options at the top of the hierarchy. This approach will be monitored by the RTAB;
- **ENV 14 Strategic Locational Criteria for Waste Management Facilities:** This gives the spatial dimension and guidance to the provision of facilities under Policy ENV 13; and
- **Tables 10.4 to 10.8 within the RSS set out the waste tonnages requiring management, limits to landfill provision, recycling and recovery targets.**

6.4.3 Local planning

In view of RSS, LDFs will need to address the issues set out in Policies ENV 12-14 and seek to address strategic mismatches in capacity. A range of different "components" of waste management infrastructure will be required to handle the waste tonnages set out in tables 10.4 to 10.8. These options will need to be considered within local strategies, and accommodated on sites allocated or identified by LDDs. While the RSS forecasts of waste "to be managed" need to be considered in light of current facility capacity, it is clear that all parts of the region have shortfalls in specific elements or types of facilities.

6.4.4 Implementation

Table 6.1 sets out the main bodies with responsibility for waste in the region, together with membership and main tasks.

Table 6.1 Bodies with Waste Roles in the Region

Body	Membership Example	Main Tasks
RIWMS Regional Integrated Waste Management Steering Group	YHA, RDA, EA, WMA, WPA, Community Sector, industry, GOYH	Overview and strategic review, development of RWS
RTAB Regional Technical Advisory Group	YHA, LPA, industry, EA, GOYH	Provision of waste data, EA liaison, development of Annual Waste Report
WRAG Waste Regions Action Group	GOYH, RDA, YHA, LA	Focal point for LA, two way dialogue, DEFRA's Waste Implementation Programme, lead on MSW input into the RWS
BREW Business Resource Efficiency & Waste	RDA, industry, Business Support Organisations.	Regional and BREW strategy and plan, task and finish group for C&I element of RWS
RPB Regional Planning Body	YHA, LA, NGOs etc	Development of RSS, conformity scrutiny of local strategies and major development proposals

6.5 Electricity Distribution

Four regional distribution networks cover the Yorkshire and Humber Region. These are the former Yorkshire Electricity area, the former Northern Electric area and the former NORWEB / MANWEB area, Central Networks East. The former Northern Electric and Yorkshire Electric networks are now both owned and managed by CE Electric UK (trading as NEDL and YEDL in the respective areas). Whilst the two networks are still considered separately in regulatory terms, they are managed on a common basis. Parts of the far west of the region in Craven and Richmondshire are covered by the former NORWEB / MANWEB network, where the electricity distribution network is owned by Electricity North West and managed by United Utilities. Parts of the south of the region are served by Central Networks East (part of E-On).

The network maps for the YEDL and NEDL service areas are enclosed with this report. This also allows the user to deduce those parts of the region that are covered by the Electricity North West and Central Networks East networks.

The information here is correct at Spring 2008. The trading names of the utility companies can and do change as ownership and management models change. However, the geographic scope of the different networks tends to remain constant throughout these changes.

The following electricity distribution networks serve the region:

- YEDL (owned and managed by CE Electric Ltd);
- NEDL (owned and managed by CE Electric Ltd);
- Electricity North West (managed by United Utilities);
- Central Networks East (part of E.ON).

6.5.1 YEDL and NEDL

YEDL (Yorkshire Electricity Distribution Limited) and NEDL (Northern Electric Distribution Limited) are both owned and operated by CE Electric UK. Whilst they are separate networks in regulatory and physical terms, they are generally managed at a strategic level in a common way.

In general terms, the YEDL network covers West and South Yorkshire, part of Craven, Selby, and East Riding. NEDL covers the remainder of the northern part of the region, including most of North Yorkshire. Detailed boundary maps for the YEDL and NEDL networks are shown on the network maps that accompany this report.

Long Term Development Statement

Summary versions of the Long Term Development Statements for the YEDL and NEDL network areas are published on CE Electric’s website. The LTDSs have been compiled by NEDL and YEDL to assist existing and future users of their networks in assessing opportunities available to them for making new or additional use of the network.

The aim of the long-term development statement is to:

- improve the availability of information about NEDL’s / YEDL’s distribution network;
- furnish developers with sufficient information to carry out initial assessments of network capability;
- inform users of our distribution network development proposals; and
- inform relevant people of the correct points of contact within NEDL/YEDL for specific enquiries.

It is advised that as part future phases of work, the more detailed complete version of the LTDS is purchased to give accurate details of the proposals for developing the network.

CE Electric is currently undertaking a review of its investment programme for 2010-15. In doing so, it is focusing on customer service and climate change (i.e. network resilience and charges relating to greater energy efficiency).

Distribution Network Architecture

The YEDL and NEDL Distribution Networks operate on the following general principles:

Table 6.2 Network Architecture of the Regional Distribution Network

System Type	Operating Voltage	Role in Network
NGET Systems	400KV or 275KV	Connects power stations to National Grid.
132kV	132 kV	Serves in a distribution role between the NGET system (at 400kV or 275kV) and the 33kV / 66kV EHV systems. In exceptional circumstances direct 132/11kV transformation may be justified.
Extra High Voltage (EHV)	66kV and 33kV	Serve in a distribution role between 132kV or NGET systems and the 11kV system. Historically, the 66kV system is overhead lines between urban areas and the 33kV systems are underground within urban areas.
High Voltage (HV)	11kV and 6.6kV systems	Distribution of electricity into and around local urban and rural areas. The 6.6kV system is limited, and is a legacy in older industrial areas, in particular waterside / dockside locations. The 6.6kV system will not be developed further and will be phased out.

Low Voltage (LV)	400V and 230V	The LV system connects the supply terminals of customers to the wider network.
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Source: *YEDL and NEDL Long Term Development Statements*

Maps of the 132kV, 66kV and 33kV systems for the YEDL and NEDL networks are enclosed with this report. YEDL alone operates some 15,000 sub-stations in the region, 37,000 km of underground cabling and 16,000 km of overhead cabling.

The extent of these different parts of the network provide an understanding of the scope of the ‘core’ elements of the network, although offer no commentary of capacity. The Long Term Development Statements (LTDS) produced by each DNO as part of the regulatory requirement do set out capacity and utilisation of the network, with forecasts for demand growth and investment, as agreed with the regulator.

In general terms a number of former industrial areas are highlighted through discussion as having spare distribution capacity, as a result of reduced industrial demand. Examples include Sheffield’s Lower Don Valley and former coal mines. In particular a substantial high voltage network serving the Selby complex of mine sites still exists.

Electricity Networks and Distributed Generation

The overall architecture of the electricity networks is geared-up to address the historic model of power being generated by a relatively small number of large power stations. These power stations are typically connected to the National Grid Electric Transmission (NGET) system, which then in turn supplies the DNO networks at a relatively small number of fixed points. For a number of reasons, this model is changing.

An increasing number of smaller-scale power generation schemes are being developed, typically falling into the renewables category, including wind turbines, combined heat and power schemes, waste to energy projects and others. Only the largest (usually offshore) wind farms generate enough electricity to justify connection to the NGET system. As a result the schemes are connected directly to the distribution networks, and are generically known as distributed generation (DG).

Distributed generation presents a number of technical challenges to the architecture of the distribution network, challenges which are being address by the industry and the regulator. Generally speaking, DG connections for large schemes can successfully be made into the distribution network, particularly at existing substations in the EHV system. Such connections may require some reinforcement of the network, and there will be costs associated in making the connection from the location of the power source to the appropriate point on the EHV network.

A useful web-based resource is available to test the viability of new electrical connections to distribution networks for wind farm (or other local generation) developments, and is available via www.gridconnection.co.uk . This uses the detailed information from the full LTDS documents to establish a robust estimate of costs.

Further Information:	
Company Website	www.ce-elctticuk.com
YEDL Long Term Development Statement	www.ce-electricuk.com/page/news/publications
NEDL Long Term Development Statement	www.ce-electricuk.com/page/news/publications

Contact Points:

Chris Allanson – Network

Telephone: 01977 605 937;

Email: chris.allanson@ce-electricuk.com**6.5.2 Electricity North West**

United Utilities operates and manages the electricity distribution network in the North West England area on behalf of Electricity North West. This includes a significant part of the north western part of the Yorkshire and Humber region, including:

- the Craven District north west of (but excluding) Gargrave; and
- far west parts of Richmondshire, roughly west of Garsdale Head.

These areas are principally rural.

Further Information:

Company Website (Network Owner) www.enwLtd.co.ukCompany Website (Network Operator) www.unitedutilities.com/?OBH=3798Long Term Development Statement www.unitedutilities.com/ltds
(only very basic summary without password)

Contact Point:

Mike J Kay – Engineering & Planning Director

Telephone: 01925 233030;

Email: mjay@iee.org**6.5.3 Central Networks East**

Central Networks East operates the electricity distribution network in the East Midlands area. This includes a very small part of the Yorkshire and Humber region in the following locations:

- in the Halfway and Mosborough area of Sheffield;
- part of Bawtry in Doncaster; and
- part of the Finningley area in Doncaster.

Further Information:

Company Website www.eon-uk.com/distributionLong Term Development Statement www.eon-uk.com/distribution/ltds.aspx

Contact Point:
 Keith Hodson - Connections Policy Engineer
 Telephone: 07812 963023;
 Email: keith.hodson@central-networks.co.uk

6.5.4 Implications for Integrated Infrastructure

CE Electric’s review of its investment programme 2010-2015 presents the region with an opportunity to identify areas for growth in the short term.

Looking at the longer term, there is scope to explore the extent of connecting infrastructure (i.e. 33 KV or 11 KV distributed generation) from areas with greatest renewable energy potential and the distributed generation network.

6.6 Gas Distribution

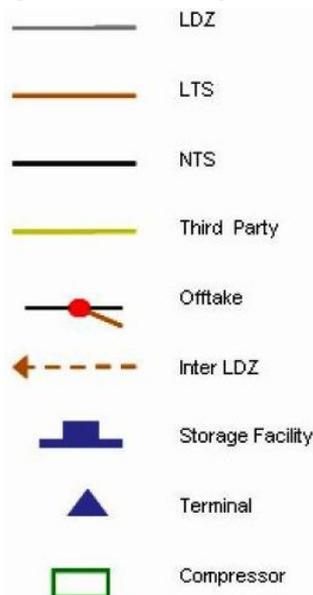
6.6.1 Introduction

There are two Gas Distribution Operators (DOs) in the region; Northern Gas Networks and National Grid Gas. There are four Local Distribution Zones; the North (NO) LDZ; the North East (NE) LDZ; the East Midlands (EM) LDZ; and the North West (NW) LDZ (see Figures 3.3 and 3.4 for map of networks). The East Midlands (EM) LDZ is part of the East of England Distribution Network, owned and operated by National Grid Gas. Part of the Craven and Richmondshire districts are in the North West LDZ, operated by National Grid Gas, although the coverage of the gas network in those locations is likely to be sparse. Northern Gas Networks operates the Northern Distribution Network, comprising the NO and NE LDZs.

In general terms, gas supply is not constrained in the region, as it benefits from a number of connections to the national High Pressure Transmission Network, as well as having an extensive and robust core network around the main urban areas. However, many rural areas have no gas supply.

Figures 6.7 to 6.12 below summarise the scope of the National Transmission Network in the region (although of limited interest to this study), together with the core components of the Local Transmission System (shown in brown) in the three LDZs that cover the region.

Figure 6.7 Key to Gas Network Maps



Summary of Abbreviations:

- LDZ – Local Distribution Zone (boundaries shown on maps)
- LTS – Local Transmission System
- NTS – National Transmission System

6.6.2 Northern Gas Networks

Northern Gas Networks covers the area shown in Figure 6.8

Figure 6.8 Operational Area for Northern Gas Networks

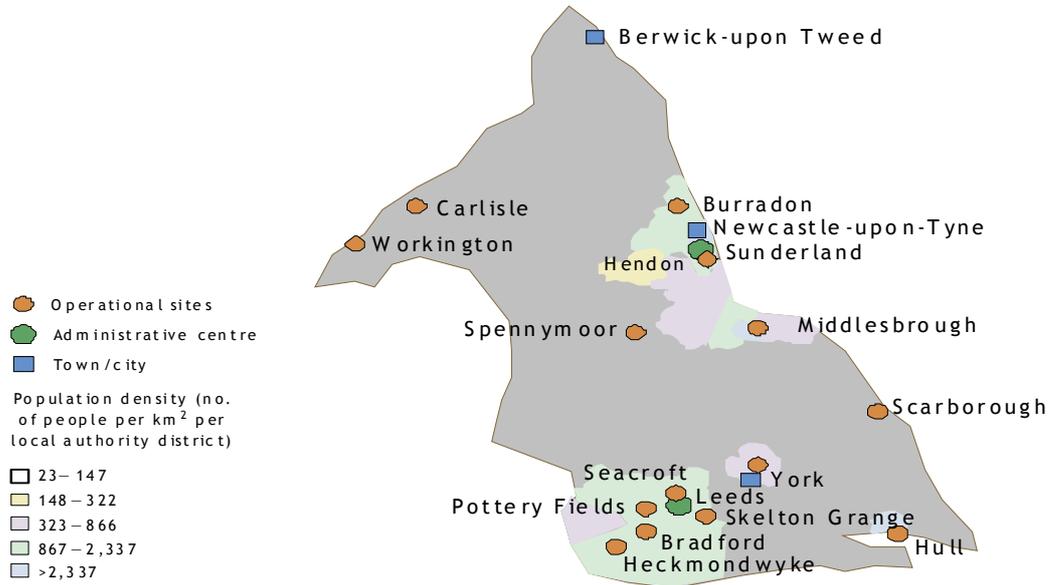
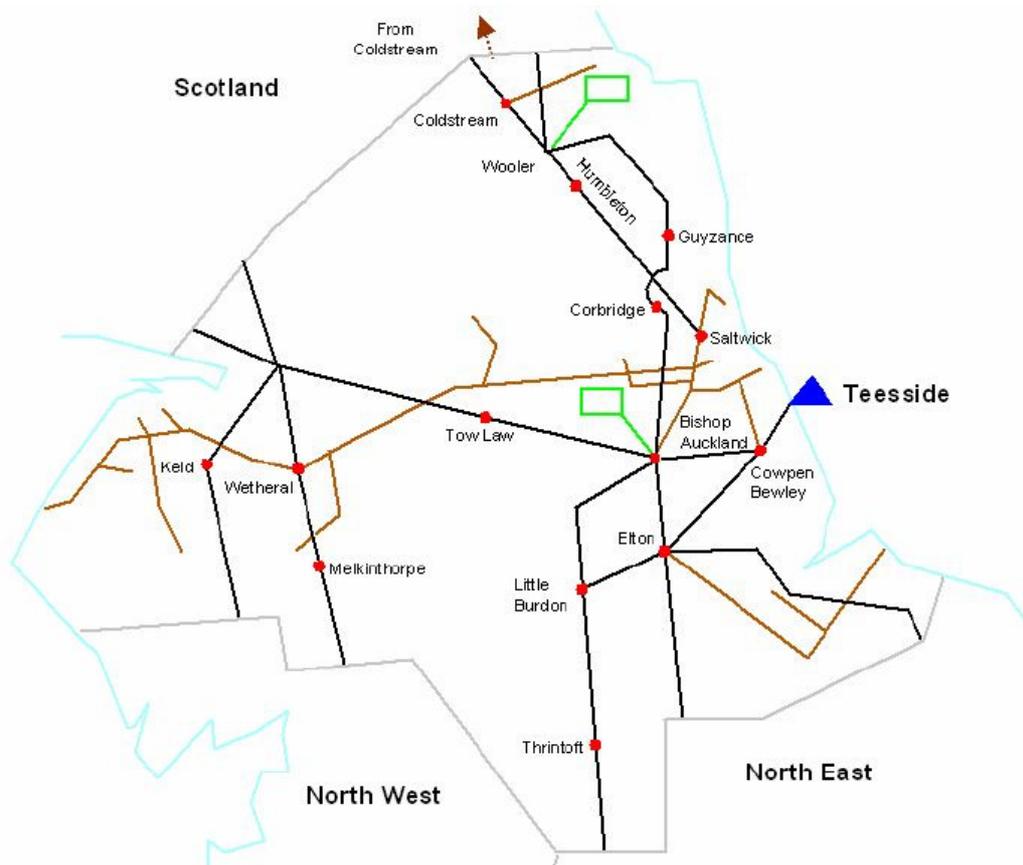
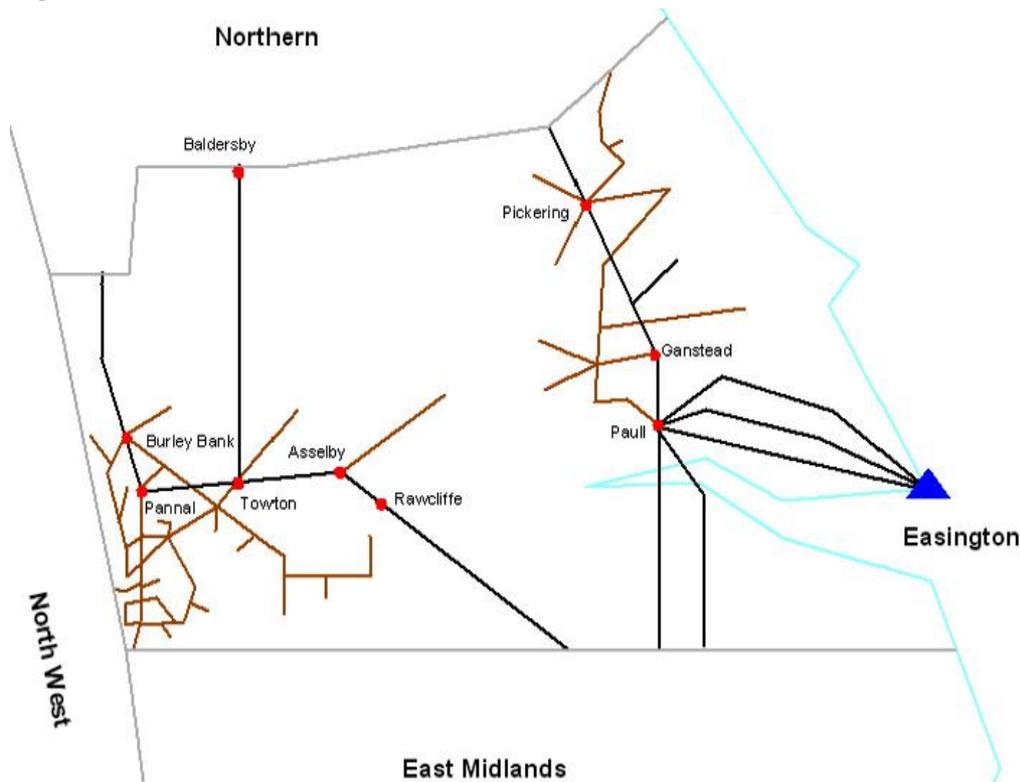


Figure 6.9 North LDZ Core Network



Source: Northern Gas Networks

Figure 6.10 North East LDZ Core Network



Source: Northern Gas Networks

Northern Gas Networks Long Term Development Statements

The NE LDZ forecasts suggests growth in demand across the whole forecast period of 7.15% but declining towards the end of the forecast, with the average growth 0.86% per annum.

The North LDZ forecast suggests a decline in demand over the first few years of the period with an increase in demand towards the end of the forecast period. Overall, the whole forecast period shows only marginal growth of 0.43%.

The models have been influenced by the recent demand patterns impacted by factors such as the warm weather, improved conservation and recent high fuel prices.

Peak demand is forecast to rise by 1.29% per annum over the period within North LDZ and 1.45% within North East. These figures are substantially reduced from the predictions made in 2006.

The trend and level of the 2007 peak forecasts have been heavily influenced by the 2006 throughput figures. The impact of high gas prices and general gas demand reductions has created industry debate on the appropriateness of peaks that are currently heavily linked to the forecast annual demand.

Investment

The LTDS is designed for transmission and storage of gas on the basis of satisfying the 1 in 20 peak-day, firm-only forecast demands. The system is developed, based on demand and supply forecasts, to ensure that this capability is maintained.

Major projects above £0.5m currently in the 2007 Plan are shown below:

Table 6.3: Major projects above £0.5m

LDZ	Project Name	Authorised / Unauthorised	Initial Start Date	Total Project Cost (£m)
NE	Pannal Offtake Upgrade	A	2006/7	1.8
NO	North Seaton Reinforcement	U	2008/9	1.9
NE	Paull Offtake Upgrade	U	2009/10	0.9
NE	New Tyersal Regulator	U	2008/9	2.8
NE	Whitehall Rd PRI Upgrade	U	2009/10	1.4
NE	East Bierley PRI Upgrade	U	2009/10	1.4
NO	Naisberry PRI Upgrade	U	2009/10	0.7
NE	Eggborough Reinforcement Rawcliffe to Chappel Haddlesley Pipeline	U	2010/11	23.1
NE	Eggborough Reinforcement Rawcliffe Upgrade	U	2010/11	2.4
NE	Eggborough Reinforcement Chappel Haddelsey Upgrade	U	2010/11	2.7
NO	Scremerston PRI Upgrade	U	2012/13	0.7
NE	Calder Valley Pipeline	U	2012/13	27.8
NO	Revalidate Lamesley Pipe Array	U	2012/14	1.2
NE	Catwick to Hornsea Pipeline	U	2016	3.1

The projects included in the table above are subject to the acceptance of a formal quotation. The Eggborough Reinforcement scheme has been kept in the plan due to the major impact this potential new load would have on the system.

Trends in Forecast Demand

During the next ten years annual gas demand is forecast to grow by only 0.41% in North LDZ and by 7.1% in North East. These figures are substantially reduced from the 2006 predictions.

Table 6.4 Northern LDZ - Forecast Annual Demand by Load Category by LDZ from 2007 Demand Statements. (TWh)

LDZ	Load Band	2008	2009	2010	2011	2012	2013	2014	2015	2016
NO	0-73 MWh	22.54	22.53	22.60	22.61	22.81	22.99	23.19	23.39	23.57
NO	73-732 MWh	3.05	3.09	3.12	3.14	3.15	3.17	3.19	3.21	3.24
NO	732-5860 MWh	2.69	2.68	2.69	2.69	2.69	2.69	2.70	2.70	2.71
NO	Firm 5860 MWh - 1465 GWh	5.59	5.59	5.59	5.60	5.60	5.61	5.63	5.63	5.64
NO	Interruptible < 1465 GWh	4.68	4.53	4.39	4.27	4.16	4.06	3.96	3.88	3.80

LDZ	Load Band	2008	2009	2010	2011	2012	2013	2014	2015	2016
NO	Very Large User	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62
NO	LDZ Shrinkage	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.23	0.23
NO	LDZ Demand	40.38	40.26	40.23	40.15	40.25	40.36	40.51	40.66	40.80

Table 6.5 North East LDZ - Forecast Annual Demand by Load Category by LDZ from 2007 Demand Statements. (TWh)

LDZ	Load Band	2008	2009	2010	2011	2012	2013	2014	2015	2016
NE	0-73 MWh	27.12	27.74	28.18	28.78	29.03	29.24	29.39	29.51	29.59
NE	73-732 MWh	4.33	4.39	4.39	4.40	4.40	4.41	4.47	4.52	4.58
NE	732-5860 MWh	2.92	2.90	2.89	2.82	2.80	2.78	2.77	2.75	2.74
NE	Firm 5860 MWh - 1465 GWh	3.77	3.73	3.68	3.53	3.48	3.43	3.39	3.36	3.33
NE	Interruptible < 1465 GWh	6.86	7.02	7.14	7.28	7.32	7.33	7.35	7.33	7.31
NE	Very Large User	3.18	3.18	3.19	3.18	3.18	3.18	3.19	3.18	3.18
NE	LDZ Shrinkage	0.30	0.31	0.31	0.31	0.32	0.32	0.32	0.32	0.32
NE	LDZ Demand	48.48	49.26	49.79	50.30	50.53	50.69	50.87	50.97	51.04

Further Information:

Company Website

www.northerngasnetworks.co.uk

Long Term Development Statement

www.northerngasnetworks.co.uk/cms/54.html

Contact Points:

Chris Gorman – Network Operations Director

Telephone: 0191 511 4501

Email: cgorman@northerngas.co.uk

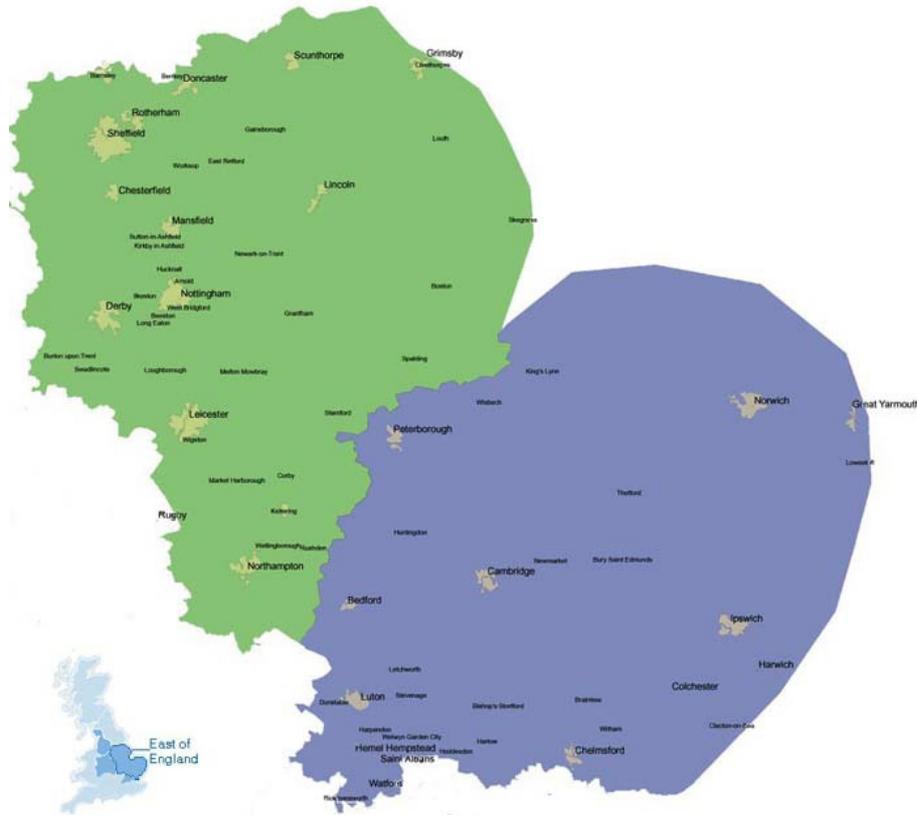
Tony Pearson – Network Planning Manager

Email: tpearson@northerngas.co.uk

6.6.3 National Grid Gas

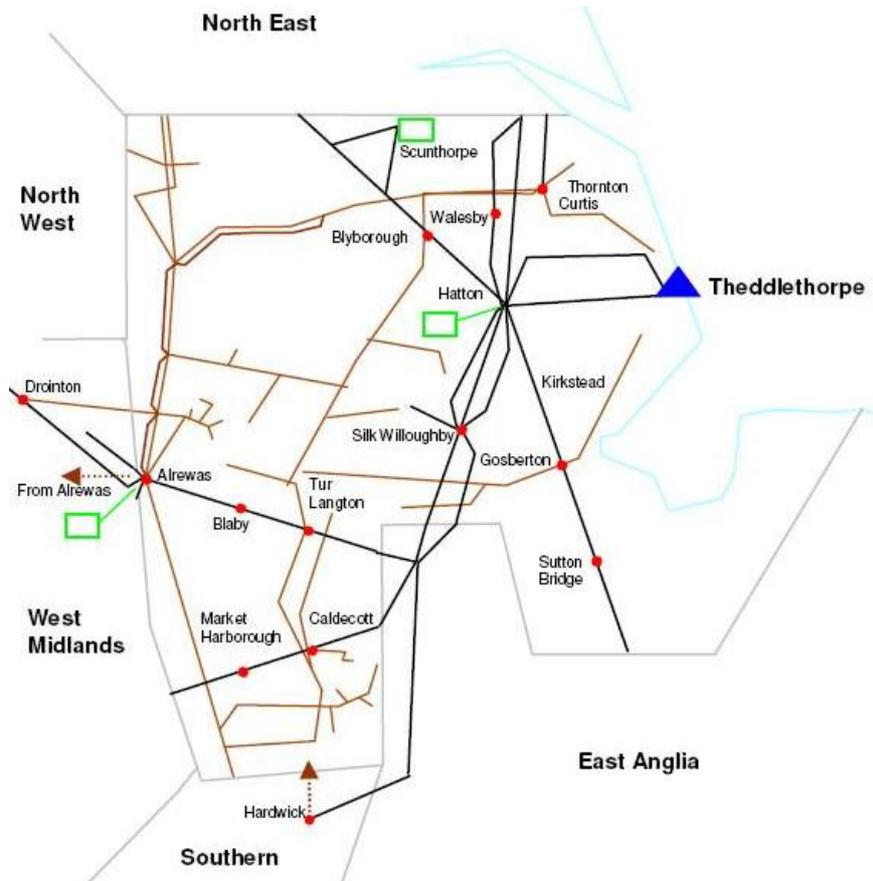
National Grid Gas retains distribution networks in a number of places, including the East Midlands area, which includes a significant part of South Yorkshire.

Figure 6.11 National Grid Gas – East Midlands LDZ



Source: National Grid Gas

Figure 6.12 East Midlands LDZ Core Network
North East



Source: National Grid Gas

Further Information	
.Company Website	www.nationalgrid.com/uk/Gas
Long Term Development Plan	www.nationalgrid.com/uk/Gas/TYS/LTDP

Contact Points

Jeremy Bending – Director, Network Strategy

Telephone: 01926 653309

Email: jeremy.bending@uk.ngrid.com

6.6.4 Implications for Integrated Infrastructure

The region benefits from a number of connections to the national High Pressure Transmission Network. Whilst there are in general no gas supply constraints in the region, many rural areas have no gas supply. This may limit the scope of such areas in terms of options for growth.

6.7 Telecommunications and Broadband

6.7.1 Introduction

There are three main fixed-line networks that provide telecommunications access to homes and businesses that operate in the region: Openreach (the main access network owned by BT, and the most extensive); Virgin Media (the cable television network); and Kingston Communications (in the Hull area). In addition, large commercial users may bypass these access networks to get direct access to other national networks.

6.7.2 Kingston Communications – Hull

Kingston Communications (KC) is a special case within the region and unique nationally, insofar as it never became part of the national Post Office Telecommunications network or subsequently BT. Instead the telephone network was retained by the Hull Corporation, and latterly Hull City Council prior to privatisation in the late 1990s. Now known as KCom Group, the company has diversified, but still owns and operates the local telephone network in the Hull area.

The KC telephone network has inevitably developed in a different way to the telephone network elsewhere. In the 1980s this meant that Hull residents and businesses benefitted from investment in modern technology that brought new features to the network many years ahead of similar investments elsewhere. The KC network was not subject to regulation when BT was privatised, and initially BT and others were prevented from entering Hull, giving KC a natural monopoly.

The telephone network in the Hull area is now open to full competition. However there is little commercial incentive for companies to make the significant investment needed to access this (relatively small) market. Furthermore, the local infrastructure is significantly different from that elsewhere and as such is 'non-standard' in a number of respects, reinforcing the perceived and actual barriers to entry for competing service providers.

The result is that except for large commercial customers there is little competition for the provision of telephony and broadband services in the area served by KC, with the implication that service availability, innovation and service development is being constrained.

6.7.3 Implications for Integrated Infrastructure

Telecommunications and broadband coverage in the urban areas is generally good, though some constraints exist in Hull. Coverage in the rural areas is much more variable, with poor level of service in the remoter areas. Options for growth will need to consider this broad picture.

6.8 Education

6.8.1 Introduction

Education services are provided and co-ordinated by the local education authorities (LEAs) in the region. These include North Yorkshire and one covering each unitary authority area in the region. Legacy Schools Organisation Plans (SOPs) are ideal tools for planners to understand school capacities and forecast numbers, and in their absence a number of LEAs continue to publish school planning data including forecasts of future deficits and surpluses of school places.

6.8.2 Implications for Integrated Infrastructure

The implications of education for integrated infrastructure remain those identified in Section 3.

6.9 Healthcare Services

6.9.1 Introduction

The structure of the National Health Service (NHS) in the region has been reformed in the last few years to better reflect the regional and local authority boundaries in the region.

The whole region is covered by a single Strategic Health Authority (SHA), in the form of the Yorkshire and the Humber Strategic Health Authority. The SHA has a role in the strategic supervision of the NHS trusts in the region.

There are 14 Primary Care Trusts (PCTs) in the region who are responsible for the procurement of health services on behalf of the population of various parts of the region, including hospital and GP services. The PCTs are now broadly aligned with local authority boundaries, and are shown on the map below:

Figure 6.13 Primary Care Trusts in Yorkshire and the Humber



Notes: All boundaries align with local authority boundaries; York and North Yorkshire are combined in a single PCT

In addition to the PCTs, the region also includes the Yorkshire Ambulance Service Trust, a number of Acute Trusts that run hospitals, and a number of mental health trusts providing health and social care services for people with mental health problems.

The region's main hospitals are important services, and help contribute to the functional role of the centres where they are located. The hospitals in Yorkshire and the Humber are mapped in the Regional GIS Study.

There is recognition that there is an important relationship between PCTs and spatial planning in terms of helping to plan service provision in the medium term. This includes ensuring that PCTs are aware of major development proposals and that spatial planners are

aware of circumstances where developer contributions should be sought for new provision if necessary – most commonly new community health facilities including GP facilities.

6.9.2 Implications for Integrated Infrastructure

The implications of healthcare facilities for integrated infrastructure in the region are those identified in Section 3.

6.10 Social and Care Services

Social and care services are administered by North Yorkshire County Council and the unitary authorities in other parts of the region.

6.11 Green Infrastructure

6.11.1 Current Situation

Current RSS Policy YH8 addresses green infrastructure. To help ensure that this policy informs growth options in the RSS Update 2009, the RPB has commissioned a regional Green Infrastructure Evidence Base Study. This will help identify strategic green infrastructure in the region (i.e. multifunctional areas and main strategic routes for trails and cycleways). Whilst this study should be referred to in the RSS Update 2009, it is worth reflecting on the implications of the Regional Green Infrastructure Evidence Base Study for integrated infrastructure, as in particular the emergent finding that a broad indication of the main Green Infrastructure corridors and wedges at a regional/sub-regional level is needed to inform growth options to maximise growth accordingly.

6.11.2 Future development of green infrastructure in the region

The issue of monitoring is a serious issue that the RPB and/or others must address if Green Infrastructure (GI) is to last as a genuine policy, rather than disappear like so many well-intentioned initiatives. However, it is considered that the Evidence Base study will provide a way forward for GI, and most probably focus on accessibility as providing the key “network” aspect to GI.

What is genuinely needed at a regional/sub-regional level is a broad indication of the main corridors/wedges of GI to help inform allocations for growth to maximize benefits accordingly.

A plan or diagram illustrating current “composite” components of GI is needed then, and also one of the “network” of green infrastructure at a strategic level (and possibly further broken down at a sub-area level). As such, the most significant parts of the GI network would be transparent and clear to all, and could greatly help in place-shaping, particularly at a sub-area level.

This could also help to inform the sub-area maps as part of the RSS 2009 Update. This in turn would greatly inform the allocations for growth in the RSS, and in particular help identify the broad areas where the strategic provision of green infrastructure should be seen as a priority (and even require specific interventions accordingly), although clearly much of the detail would need to be developed further at a local level.

In this respect, the region could do well to consider the Tees Valley Green Infrastructure Strategy (2005). In particular, map 5 provides a composite map of green infrastructure (i.e. all components), and map 8 provides a broad network of corridors where GI will be a priority consideration in terms of growth, so that investment and development provide for the “Housing offer” that is so central to the aims of the Northern Way aspirations.

6.11.3 Implications for Integrated Infrastructure

Whilst the issue of monitoring is a serious issue that the RPB and/or others must address if GI is to continue as a genuine policy for the RSS, the Evidence Base study is likely to address this issue as best it can. Hopefully this should also enable the RPB to address the illustration of GI by way of GIS in consultation with the city region and others.

As such, it would be helpful for the region to have a broad strategic map of GI, and to break this down into further sub-areas, ideally in the RSS, so that LPAs would be able to grasp the clear priorities for their area, and develop further work on GI accordingly. For this to happen, the RPB would do well to provide the following in the RSS:

- a composite map of GI similar to map 5 in the Tees Valley Green Infrastructure Strategy (2005), possibly as an adjunct to ENV15, to show where the region's GI is in total;
- a broad plan/diagram for strategic GI along the lines of map 8 in the same, showing a broad network of corridors where GI will be a priority consideration in terms of growth; and
- further plans or diagrams showing this strategic GI (i.e. see second bullet point above) at a sub-regional/area level (alongside other factors) to inform local planning.

Sub-area plans with strategic GI as outlined above would inform the allocations for growth in the RSS, and in particular help identify the broad areas where the strategic provision of green infrastructure should be seen as a priority (and even require specific interventions accordingly).

This would also allow much of the detail to be developed further at a local level. It would also allow green infrastructure to play its part in the suite of components that the RPB must take into account in determining locations and scale of growth, and also even attracting funding under Community Infrastructure Levy.

However, getting to that point in a short space of time will present challenges to the RPB.

6.12 Existing Coordination Mechanisms

6.12.1 Regional Utilities Group

Yorkshire Forward coordinates the Regional Utilities Group (RUG). It includes representation from CE Electric, Openreach, National Grid (electricity and gas transmission and gas distribution), Yorkshire Water, and Northern Gas Networks. English Partnerships and the Yorkshire and Humber Assembly also attend and support the RUG.

Yorkshire Forward facilitates meetings on a quarterly basis. Its purpose is to act as an informal forum for members to discuss strategic property, infrastructure, planning and development issues. As such, it helps to inform the utility providers' investment planning in the region, and provides an opportunity for them to glean and understand the implications of strategic planning (i.e. the RSS and the RES) on their operations.

The contact for details of the membership of the RUG is Dave Custance who is the current Chair of the group.

The RUG discussed the emergent findings from this scoping study at its meeting in June 2008. Views expressed included:

- difficulty in planning for eco-towns out of the blue;
- need to know what development will be like in 15-20 years (e.g. off-line/decentralised electricity supply or not);
- most utilities are at capacity already (i.e. very little space capacity);
- telecoms industry undergoing a major technological change/restructuring (i.e. more to fibre);
- knowledge on flood defences is good; knowledge on drainage is poor;
- drainage relies on topography; efficiency dependant on age of infrastructure; drainage history also important; and
- view that 'strategic' relates to 'broad means' (i.e. not just sites, schemes, local areas).

6.12.2 Regional Energy Forum

The Yorkshire and Humber Assembly as Regional Planning Body hosts the Yorkshire and Humber Regional Energy Forum. This collaborative forum ensures that a strategic approach to energy has been developed and implemented in the region as required by the Energy White Paper.

The forum is attended by a number of stakeholders at local and regional level and has representation from the major infrastructure and utility providers. Key responsibilities for the forum include producing the Regional Energy Infrastructure Strategy.

6.12.3 Highways Authorities and Utilities Committees

The Highway Authorities and Utilities Committee (HAUC(UK)) was established in 1986 by the constituent bodies of the local Highway Authorities and the Utilities to assist the Secretary of State in arriving at proposals for new street works legislation. HAUC(UK) played a significant role in the drawing up of the New Roads and Street Works Act 1991 (NRSWA), its subsidiary legislation and associated Codes of Practice.

The main aims of HAUC(UK) are:

- to advise the Secretary of State on issues relating to street works legislation;
- to provide guidance to practitioners; and
- to provide a forum for matters of mutual interest in relation to street works.

HAUC(UK) is currently working with the DfT on the implementation of the Traffic Management Act 2004 (TMA) and associated secondary legislation.

There are regional HAUCs, which help co-ordination at the regional level to minimise traffic disruption caused by utility works. Whilst this is the primary focus for the HAUCs, they may be a useful source of information and contacts for wider uses.

Details of the national HAUC are available here: www.hauc-uk.org.uk

Details of the regional HAUC are available here: www.yhauc.org.uk

6.12.4 Regional Resilience Team

Resilience is not considered explicitly in this study. The issue of strategically important infrastructure locations for matters of resilience (i.e. flood risk at key locations, susceptibility to terrorist attack) is a matter for the Regional Resilience Team within Government Office Yorkshire and Humber and individual infrastructure providers. There are also issues relating to climate change adaptation, which should be considered through other studies, including the Regional Climate Change Adaptation Study. Clearly planning by all partners should avoid the creation of new critical infrastructure in vulnerable, unprotected locations, and interventions may be needed in the future to improve the resilience of existing infrastructure. At one level, this may be a matter for regional planning in the future, informed by the Regional Resilience Team, infrastructure providers and climate change adaptation work. At another level, this is a matter for detailed planning and interventions at local level

6.13 Summary and Conclusions

This section of the report includes territorial maps and plans of areas of operation of the main utilities in the region and provides details of the main contacts, where available, and signposts the main providers of infrastructure through out the region and main data sources. Appendix A provides further information on who does what where.

The main findings arising from this section are:

- need to be clearer in RSS what development will be like in 15-20 years time;
- many utilities are at or close to capacity in the region already;

- the telecommunications industry is undergoing a major change due to the need to replace traditional copper cable with fibre in response to demand for higher data capacity;
- knowledge on flood risk in the region is generally good but poor on drainage, avoiding locating vulnerable networked infrastructure or facilities in floodplains needs to be considered;
- need to consider “strategic infrastructure” as that which applies to “broad areas”, not just specific sites, schemes and local areas;
- Anglian Water takes a very pro-active approach to planning for growth, and is actively seeking to steer growth to “optimal” locations in terms of waste water treatment capacity;
- adequacy of water management infrastructure in the region will depend on topography, flooding history, age/condition, funding/resources for new investment;
- need to discuss growth options with water companies to identify PRO9 issues, in particular potential for inflationary pressure;
- waste is unlikely to be a constraint on growth planning at a regional level;
- the review of investment programming by the utility operators for 2010-15 provides an opportunity to identify optimal areas for growth;
- there are no major gas or electricity constraints to urban areas, indeed there is some capacity resulting from industrial decline in areas where major industries have closed or scaled back, but gas supply is limited in rural areas;
- there are telecommunication and broadband constraints in Hull and rural areas; and
- the region needs a broad strategic map for green infrastructure, showing areas of constraint and opportunity.

7 Infrastructure and Regional Planning: Moving Forward

7.1 Introduction

This scoping study sets out how different types of infrastructure are currently planned for, with a particular emphasis on components of critical infrastructure which are most important to the delivery of a robust RSS. It is evident from the foregoing chapters that the different elements of critical infrastructure are planned in different ways, in accordance with different planning timescales, horizons and growth assumptions.

This section takes stock of the foregoing chapters and identifies what now needs to be done to ensure that regional and sub-area planning takes into account infrastructure. In particular, it sets out:

- a definition of regionally strategic infrastructure, including consideration of related issues;
- how spatial planners and infrastructure providers and others work together currently, and could work together more closely in the future;
- recommendations on what needs to be done for the RSS 2009 Update, incorporating a methodology for testing growth options to use now and in the longer term;

7.2 Context

The Housing Green Paper 2007 provides for better planning of housing growth and infrastructure, and PPS11 provides for evidence-based spatial planning. However, there seems to be a considerable disconnection between spatial planning and infrastructure provision, with infrastructure providers often using out-dated assumptions and planners themselves experiencing difficulties in engaging infrastructure providers and assessing infrastructure capacity constraints and opportunities in a clear and robust manner. This is a worry, given that infrastructure provision faces structural changes and pressures in the future, and yet proper spatial forward planning could help facilitate greater optimality in infrastructure provision.

In Yorkshire and the Humber, most types of infrastructure seem to be at or close to capacity. Whilst much is known about transport and flood defence infrastructure, and gas and electricity supply is well-established in urban areas, uncertainty relating to wastewater treatment capacity is a concern outside the main urban areas. This is because the RSS has a very strong urban focus for growth, and because the provision of extra treatment works in such areas could contribute to both unwanted inflation in the region's economy and yet paradoxically diminish the ability of the treatment network to handle wastewater.

There is a need then for the RPB to undertake extensive capacity building with infrastructure providers, and in particular the water companies in the region, especially at a time when the water industry is facing multiple challenges (climate change, WFD implementation, Urban Wastewater Treatment etc). In doing so, it could achieve a much more sustainable pattern of growth. The RSS Update 2009 provides a major opportunity for the RPB to begin this capacity building. But to do so, the RPB will need to be clearer as to the benefits of engagement to the utilities concerned, and the type of strategic infrastructure it is concerned with.

7.3 Defining Infrastructure of Strategic Importance to the RSS

7.3.1 Why Define Infrastructure of Strategic Importance to the RSS?

In order to provide for improved infrastructure planning, there is a need to define those elements of the region's infrastructure that are significant to the development of the RSS.

Other definitions and classifications are available to consider 'strategic infrastructure', but these definitions often relate to resilience and vulnerability, or asset management or maintenance regimes. These hierarchical definitions are of limited value for regional planning.

The various components of the region's infrastructure perform different and often concurrent roles of local, sub-area and regional significance. By way of example, in Yorkshire and the Humber, much of the main infrastructure is located within the city regions, such as the urban motorway networks, largest capacity electricity and gas distribution facilities, and local commuter rail facilities. Much of this infrastructure is of strategic importance to the RSS, but also play a very important role at city region and local level. In short, most of the region's infrastructure is multi-functional in terms of different geographic levels.

It is clear however that different elements and components of the region's infrastructure (or absence of it) are more likely than others to be of strategic relevance in terms of size, type and location.

The point can be illustrated through the indicative example of the capacity of a small waste water treatment plant in a currently predominantly semi-rural part of the region, compared to a large waste water treatment plant serving one of the region's major cities. Whilst superficially it may appear that the plant serving the major city is of greater regional significance, particularly given that city will be a focal point for jobs and housing growth in the future, the plant may have significant spare capacity (resulting from structural economic and population change). Conversely, the small plant in the semi-rural area may have very limited spare capacity, and this could be identified as an issue for the future if that area is being earmarked for modest growth (for instance through an urban extension). This problem could be addressed by ensuring development and infrastructure investment levels and timescales are reconciled. The point is that what is of most significance to the RSS in infrastructure terms will depend on how the characteristics of different types of infrastructure at different levels in different places relate to the various options for the RSS.

7.3.2 Establishing Strategic Importance

It is important to understand why different elements of infrastructure are important to the task in hand – i.e. what elements of infrastructure are important to the development of a robust RSS. Many parts of this same infrastructure will also be important to the delivery of local planning strategies too.

Generally, something will be of strategic importance if it relates to broad areas of more than just local or site specific importance. To be strategically important to the RSS, infrastructure would need to be an influencing factor on the development and implementation of spatial development policies. A series of questions therefore needs to be considered to help establish strategic importance.

The types of questions that will lead to an understanding if a given aspect of infrastructure is of strategic importance to the RSS will include:

- is the infrastructure investment / intervention⁶ of more than local or city-regional significance (i.e. raises cross-boundary issues)?
- would failure to deliver infrastructure investments / interventions impact on the delivery of the RSS strategy?
- are the timescales for delivery / phasing likely to mean that a clear RSS policy stance will facilitate delivery by improving certainty?
- is the scale of investment / intervention necessary to support the spatial aspiration unlikely to be delivered commercially in any event?

⁶ The intervention may take a number of forms, from simply setting out a firm planning position on a given matter to establish certainty to more pro-active public sector co-ordination role.

- is the scale of investment or planning horizon incommensurate with the likely scale of development (i.e. the investment will not be self-funding)?

Careful consideration needs to be given to separating achieving RSS outcomes from what is genuinely of strategic importance, because almost all infrastructure investment / intervention will contribute to achieving RSS outcomes in some way.

It is difficult to define what is infrastructure of regional significance *vis-à-vis* that of city-region / sub-area significance. In practice, the question of who takes forward work on infrastructure at what level will depend on the approach that is adopted to developing sub-area policy for the RSS, and for working with partners at sub-area level to inform the RSS more generally.

Given that the RSS has a sub-area dimension, it is recommended that infrastructure of significance at city region or sub area level is considered as strategically important to the RSS. It is also important for policy-makers to be clear that infrastructure that is not considered to be strategically important to the RSS could still be important for development and delivery of policy at local authority level and below.

Table 7.1 provides a starting point in developing an understanding of what is strategically important for the RSS and what is important for local policy. This is indicative only, and the fundamental questions above will take precedence in identifying those things that are strategically important to the RSS. It does not cover transport, flood defence or green infrastructure on account of other studies addressing those issues respectively.

Table 7.1 Route Map to Defining Strategically Important Infrastructure

Infrastructure Type	Specific Component	Conditions when considered 'strategically important to RSS'	Planning policy considerations of local significance only
Critical Infrastructure			
Water Management	Water resource	Where water aquifer depletion or reservoir capacity for water supply are identified as a barrier to growth (eg Sherwood Sandstone aquifer).	Not usually a matter of local significance
	Clean water treatment and supply	Where water quality or capacity issues that impact on delivery of the RSS have been identified.	Of local significance when relating to the detailed spatial planning of specific areas (i.e. at AAP level).
	Waste water treatment	Where proximity / capacity of major WWT facilities could impact on delivery of development in strategic areas of change.	Of local significance when relating to the detailed spatial planning of specific areas (i.e. at AAP level).
Electricity Supply	Renewable generation	Where distribution network issues are identified. In particular lack of transmission infrastructure to connect areas with renewable energy potential to the network	Issues relating to provision of on site renewables, or contribution to small scale local supply of renewables.

Infrastructure Type	Specific Component	Conditions when considered 'strategically important to RSS'	Planning policy considerations of local significance only
	Supply capacity	When changes are required to 132kV / 66kV / 33kV distribution network to deliver proposals.. RSS should be informed by an understanding of distribution capacity.	Issues relating to the detailed design and phasing of investments of specific area-based projects or at site level.
Gas Supply	Residential Gas Supply	Gas supply should not be strategically important to the RSS for residential outcomes, except where existing gas infrastructure capacity constraints could impair delivery of development in strategic areas of change.	Issues relating to the detailed design and phasing of investments of specific area-based projects or at site level.
	Employment related Gas Supply	Of strategic importance subject to the tests above.	Issues relating to the detailed design and phasing of investments of specific area-based projects or at site level.
Telecoms		When gaps in the network result in lead to slow and / or inconsistent coverage which impairs economic competitiveness of major settlements	
Social Infrastructure			
Healthcare		Could be strategic issues with hospitals that would be exposed through dialogue with NHS. However, there is scope for better integration, particularly at the regional and sub-area level in order to inform NHS investment and estate development strategies. Hospital provision reinforces service centre roles.	Provision of primary and acute healthcare likely to be an important matter for planning at LDF core strategy and AAP levels.
Education		In general, the provision of education facilities is not a barrier to the RSS strategy. However, there is scope for better integration of planning. In some strategic locations, improving the quality of education could be vital to their future development and change	Provision of education likely to be an important matter for planning at LDF core strategy and AAP levels.

Infrastructure Type	Specific Component	Conditions when considered 'strategically important to RSS'	Planning policy considerations of local significance only
Social and Care Services		These are planned for and delivered at sub-regional level and below.	Provision of education likely to be an important matter for planning at LDF core strategy and AAP levels.

7.4 Engaging with Partners

7.4.1 Introduction

Fundamental to both the short-term and longer-term success of integrating infrastructure and spatial and economic planning is meaningful engagement with infrastructure planners and others (e.g. city regions, LPAs).

7.4.2 Planning for Growth

The way that the major infrastructure and utility providers are controlled and regulated means that there are plans in place to address major network constraints, perhaps with the exception of transport networks. However, at the same time for regulatory and financial reasons, there are few locations where excess capacity is being provided unless there is clear evidence that future needs will arise – indeed 'speculative' development by the gas and electricity network operators is explicitly prohibited.

All the infrastructure providers generally have a detailed understanding of their own networks, the current demands and demand characteristics, and the capacity of the main constraining elements of the network. This is particularly true of the utility providers who have to report detailed information on the capacity and utilisation of, gas transmission offtakes, electricity sub-stations or waste water treatment works. However, questions remain about the extent to which the main infrastructure utility providers plan for the following:

- the most up-to-date population forecasts for the region;
- the necessary levels of housing growth (as defined by the NHPAU), given that these have yet to feed through into the RSS and LDFs;
- the impacts of the disproportionate growth in the number of households above and beyond population growth;
- the likely spatial distribution of population and housing growth; and
- the changing spatial patterns of employment in the region.

All the infrastructure providers, and indeed the regulators, make assumptions regarding these issues, but it is reasonable to suggest that there is significant gap between spatial planning and utility planning in terms of content and process. The reasons for this include: the way that the infrastructure and utility sectors are structured (including commercial confidentiality and competition); non-representation of some infrastructure providers on the Regional Planning Forum and other forums; the only (relatively) recent emergence of genuine regional spatial planning; the recent stalling of local plan-making; and the recent absence of genuine plan-led growth in most parts of the region; relative autonomy of infrastructure providers.

At a regional level, the infrastructure providers are planning for population growth, in accordance with national forecasts for growth, together with other assumptions such as those based on past trends. In areas where growth has been pro-actively planned in the recent past, such as the South East Growth Areas, dialogue with infrastructure providers

has been necessary. A good example of this is the Anglian Water Strategic Direction Statement which includes a section on plan-led growth along the main growth corridors and growth locations, demonstrating that understanding and responding to planned growth is in the commercial interests of providers and regulators.

Establishing the necessary level of dialogue between infrastructure providers and spatial planners is therefore at the heart of the recommendations for moving forward.

7.4.3 Infrastructure and the Current RSS Strategy

The current RSS strategy within Yorkshire and the Humber focuses new development on existing urban areas. In general terms, this strategy has had the advantage of utilising spare capacity in the main infrastructure networks that has been released in previous years as a result of:

- urban depopulation in the previous decades, which has created capacity in major urban waste water treatment works in particular, and together with demographic change, capacity in the primary and secondary schools;
- economic restructuring that has seen a decline in manufacturing facilities (and relocation out of central urban areas) with the commensurate release of significant electricity and gas distribution and capacity.

The combined result of these factors means that areas such as the Lower Don Valley in South Yorkshire have significant strategic capacity to accommodate future growth. Notwithstanding this, at a local level accessing this capacity could be costly on a scheme-by-scheme basis. Jobs growth in urban areas, particularly in urban centres in the context of economic restructuring, resulting in lower levels of employment in urban fringe and rural areas, has however had a marked impact on the capacity of transport networks.

The current RSS strategy therefore tends to lend itself to fitting in with general utility network upgrades, insofar as these are upgrades in capacity generally, which means an inevitable focus in existing urban areas.

7.4.4 Other Partners

In addition to the need to engage more with infrastructure providers, it is worth noting that the LPAs themselves often have a good understanding of infrastructure issues at a local level on account of the provisions within PPS12. The RPB could therefore use its existing forums and/or networks to glean “local” infrastructure issues by framing questions to LPAs accordingly.

It is also worth noting the emergence of the CRDPs at a sub-regional/sub-area level. Although the CRDPs tend to have no GIS capabilities, they are well-placed to ascertain from their constituent LPAs what infrastructure issues are relevant in a given area, and region and what growth options are most likely to apply.

7.4.5 Infrastructure and RSS Update 2009

The basis of the existing RSS strategy will be tested significantly, both in terms of its capacity to deliver higher levels of housing and also the new policy stance of PPS3. The inevitable result of this will be the need to identify locations that will be the focus of growth, which are likely to have far more specific implications for infrastructure provision, including utility network providers. In essence, the type of situation that Anglian Water and the East of England have dealt with, or which has started to be addressed in Greater London or the Thames Gateway, will need to be addressed in Yorkshire and the Humber.

This is not unique to Yorkshire and the Humber in the north, and similar issues are arising in addressing growth in other areas. The work undertaken by SURF⁷ for the Northern Way

⁷ *City Regions and Critical Infrastructure: Meeting growth targets sustainably, SURF for the Northern Way Sustainable Communities Team, July 2007.*

examined the challenges in the North West, in the Manchester City Region specifically, and is summarised in the case study in Section 4.

The SURF study exposed similar issues to this scoping study and other studies; that there is a lack of genuinely integrated planning, which becomes most apparent and most important when pro-actively planning for growth. That study also went on to provide a framework for action to overcome these barriers, and that framework provides the basis of the recommended next stages for integrated infrastructure planning following this scoping study. The discussions with stakeholders in Yorkshire and Humber confirm the issues faced in this region are broadly in common with those exposed in the Manchester City Region in the SURF study, particularly in institutional terms.

7.5 A Workstream for Integrated Infrastructure and the RSS Update 2009

7.5.1 Introduction

From the SURF analysis of the Manchester City-Region, it is possible to provide a 5-stage framework to consider and plan for infrastructure, comprising:

- understanding existing context;
- establishing existing framework;
- gap analysis;
- better integrated planning in the long term; and
- preparing for the future.

7.5.2 Stage 1 - Understanding the Existing Context

Table 7.2 outlines the aims, objectives and actions relating to Stage 1, much of which have been delivered by way of this study.

Table 7.2 Stage 1 -Understanding Existing Context

Aim/Objective: To gather relevant intelligence and data so that an assessment can be made of the current level of knowledge about the spatial distribution of assets, quantity, quality, use, accessibility and connectivity.		
Key Questions	Potential Evidence Base	Main Issues
What critical Infrastructure currently exists? And who provides it? What quantity & how is it distributed? What are the new pressures on critical infrastructure? What challenges do these new pressures pose for current capacity? What connectivity and cost issues are raised? How is network provision currently managed?	Privatised utilities Transport providers Environment Agency Local Authorities – strategic planners Regional Observatories Economic Regulators Developers	Critical Infrastructure capacity Critical Infrastructure quality Critical Infrastructure distribution Critical Infrastructure purpose Gaps in Critical Infrastructure Critical Infrastructure management style and provision

What are the growth targets of the Region / Sub Area / City Region in terms of housing, economy and population and what demands do these place on infrastructures?	Planning policies As above	An analysis of the City Region and the implications its raises for the provision of Critical Infrastructure.
Does capacity - quantity, quality and distribution - meet standards and growth targets?	As above	Comparison of flash points between capacities and growth targets expressed in strategies/ policies.

7.5.3 Stage 2 - Establishing the Existing Framework for Infrastructure

Development of the scoping study included dialogue with various infrastructure providers, and the RPB already engages in established forums such as the Regional Utilities Group. The next step is to ensure that development of growth options is informed by as much information from infrastructure providers as possible.

A series of one-to-one meetings, led by the regional planning body with the main infrastructure providers should happen as soon as possible. Table 7.3 should be used to establish main sectors of importance. These meetings should be used to:

- communicate to infrastructure providers the existence of the RSS 2009 Update and the associated timetable (already done);
- communicate details of the current ‘Call for Evidence’ and the component growth approaches (already done);
- verify the relevant components of this scoping study;
- build capacity for future collaborative working;
- understand the ‘baseline’ for the infrastructure, to include the nature of the current infrastructure, likely development plans, mechanisms for further upgrades, and the lead-in times associated with these; and
- establish the main infrastructure issues that are likely to have an impact on the development of growth options, including spatially-specific data where available to inform the GIS datasets.

The outcomes of these meetings should be documented to supplement the evidence base contained in this Scoping Study.

Table 7.3 Stage 2 - Establishing the Existing Framework for Infrastructure

Aim/Objective: To understand the extent to which strategic direction and implementation of Critical Infrastructure is currently joined up spatially (and also with other strategies delivering economic and social interventions). To what extent will these deliver the outcomes to be determined in the Action Plan (Stage 4)?		
Key Questions	Potential Evidence Base	Main Issues
What strategies currently reference Critical Infrastructure and what are they designed to achieve? What programme activity	Sustainable Development Strategy, Sustainable Communities Regional Economic	Identification of critical green infrastructure issues Spatial, temporal and thematic understanding of priorities

<p>and priorities exists which implement Critical Infrastructure? Who are the key stakeholders? Are their views and priorities regarding Critical infrastructure planning and investment consistent? Are all relevant stakeholders engaged?</p>	<p>Strategy, Regional Spatial Strategy, Regional Transport, waste? Flooding. Regional asset management plans for water and sewerage, electricity, and gas. City Region Development Programme Local Authority Strategies and emerging Local Development Frameworks</p>	<p>Identification of spatial distribution of opportunities related to future development (e.g. regional centre, regeneration areas, planned allocations for housing and industry) Identification of spatial distribution of need related to environmental improvement.</p>
<p>Where are the potential synergies and conflicts in strategic terms between critical infrastructure and planned interventions?</p>	<p>As above.</p>	<p>Identification of where the Critical Infrastructure agenda can be most rapidly progressed, and where further work is required to bring agendas together in a more joined up strategic manner.</p>

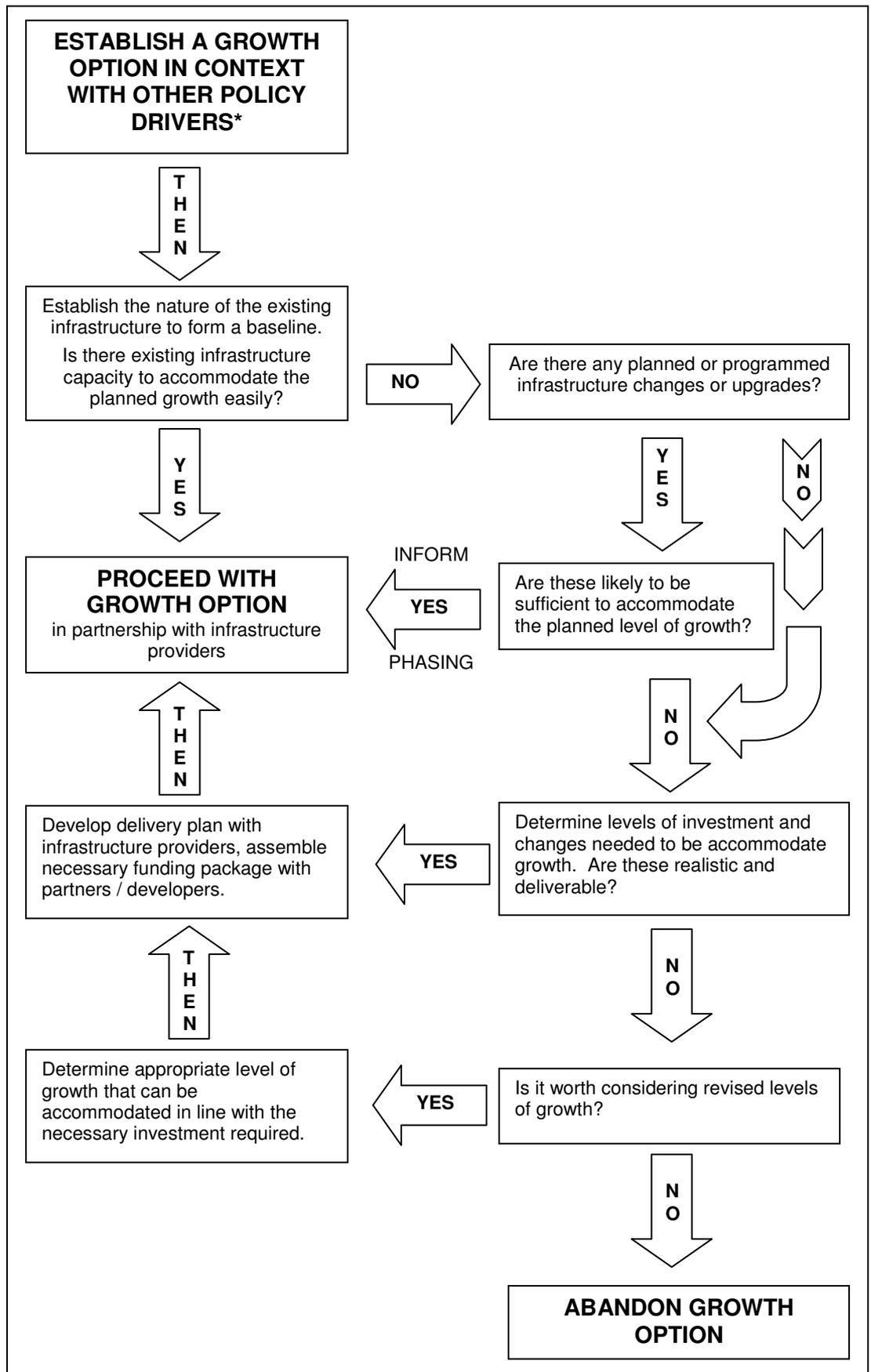
7.5.4 Stage 3 - Gap Analysis

It has been demonstrated that developing an understanding of what is strategically important infrastructure relates to the policy-making task in hand. It therefore follows that understanding strategic infrastructure at the sub-area level must be informed by an idea of where growth and change is being planned. This information can then be used to assess the impact, if any, on infrastructure capability and capacity on those proposals.

It is clear that it will be necessary for the RPB to take a lead in the short-term to inform the RSS 2009 Update, with input from sub-regional partners where possible. Ultimately, the spatial options that result from the RSS 2009 Update process should be tested with infrastructure providers to test robustness. Development of these options, as far as possible will be informed by this Scoping Study, the Phase Two work by the RPB set out above and other strands of work already underway.

Figure 7.1 provides a model for testing and integrating the viability of growth options in relation to infrastructure issues. In terms of the RSS 2009 Update it will be necessary for the RPB to run with this testing with the infrastructure providers on a one-to-one basis, although if capacity is available then it would be useful to bring the local knowledge and expertise of sub-regional partners to bear.

Figure 7.1 Integrating Growth Options with Infrastructure



*Note: * ideally growth options should be informed by a broad understanding of infrastructure capacity.*

Figure 7.1 presents an idealised approach, and it is not likely to be possible to do this in detail for the RSS 2009 Update. The one-to-one meetings with the infrastructure providers are therefore likely to focus on options testing on the basis of identifying and then testing a long-list of specific locations for possible growth and change, with a range on the scale of this growth. In each case, it will be necessary to establish for those locations:

- what is the existing infrastructure like;
- what the planned / committed improvements to the infrastructure in that location are;
- what the future infrastructure capacity will be;
- the ability to accommodate future growth;
- the timescales and costs associated with addressing shortfalls in capacity; and
- the potential need to revise growth plans in that location.

This is a simplified version of the process identified in Figure 7.1 and will help to ensure the RSS 2009 Update sets out robust options for growth. It seems likely issues of phasing growth will be an important output of this process.

Table 7.4 Stage 3 - Gap analysis

Aim/Objective: To understand where the opportunities are likely to arise for improved planning of and enhanced investment in Critical Infrastructure, spatially, temporally and in terms of quality and quantity.		
Key Questions	Potential Evidence Base	Main Issues
Where are resources currently under represented spatially?	Sub Regional Investment Plans Business Plans for relevant agencies and authorities (e.g. utilities, Environment Agency, local authorities)	Where is investment currently targeted? Where is investment planned for?
Given the economic plans for the City Regions, how do these need to be reflected in terms of Critical Infrastructure provision and planning?	City Region Development Programmes Emergent city region delivery plans	Potential future investment related to investment potential and opportunities for enhanced economic offer where development/investment is planned.
Are quantity and quality standards met or planned to be met?	As above – targets, milestones, quality standards.	The extent to which the Critical Infrastructure product is meeting needs.
Where are the mismatches between distribution/quality and different needs – growth aspirations? What opportunities exist to create these connections?	RES/RSS/CRDPs Ecological auditing of assets, linkages, barriers, opportunities. External targets for environmental performance and or change in networks	Correlating the Critical Infrastructure agenda with those related to economic growth, social cohesion and environmental quality. Opportunities identified for enhancing the existing network by decoupling, self sufficiency , demand management measures etc

7.5.5 Stage 4 - Better Integrated Planning in the Long Term

The North's city-regions are planning to accelerate economic growth, and the RSS in Yorkshire and the Humber needs to plan for significant housing growth, with the emphasis also likely to be on the city regions. Against this backdrop there is an emerging imperative to ensure that critical infrastructures of transport, energy, waste, water supply, sewerage and flooding support this ambition. This research and other evidence has shown how the current approach to matching critical infrastructure to growth aspirations is not well coordinated and in the longer term could lead to undermine the objective of creating sustainable communities and infrastructure. This is largely a result of:

- the profound disconnections between the processes and institutions of territorial and network planning;
- the existence of fundamental differences in the both the spatial scales and temporal dimensions of territorial and network planning; and
- the absence of a governance framework for systemically and more effectively integrating network and territorial planning.

No one body or sector is responsible for this – it is the product of the way infrastructure is regulated and delivered and the way that growth has been planned for in recent years, together with changing leadership models.

Nonetheless, stakeholders have indicated a clear requirement to move beyond the limitations of 'muddling through and making do' and a desire to develop a more systemic and longer term solution to more effectively enhancing coordination. Based on the findings of this scoping study, it became clear that an evolution of the SURF model to develop a more collective approach for the Northern Way was an appropriate one to develop for the Yorkshire and Humber region.

Whilst some issues make this intended approach difficult, and are embedded nationally, beyond the immediate influence of regional partners, there is much the RPB can do to help a collective approach in the region. This will ensure better planning all round, and there is clearly willingness on the part of all parties concerned to engage.

Table 7.5 Stage 4 - Better Integrated Planning in the Long Term

Aim/Objective: Based on the analysis and assessment in Stages 1-3, an initial prioritised plan can be developed establishing programme and policy interventions.		
Key Questions	Potential Evidence Base	Main Issues
<p>Where can Critical Infrastructure strategically contribute thematically and spatially, to decoupling resource use and economic growth?</p> <p>Where will actions have the highest impact?</p> <p>What opportunities are there for "quick wins"? (Windows of Opportunity)</p> <p>What opportunities are there to promote the development of exemplar projects?</p> <p>What best practice can be developed or imported?</p>	<p>Analysis into needs, opportunities, spatial distribution, quality variance and resourcing will all contribute to identifying :</p> <p>What is desirable/what is achievable</p> <p>Where investment is required and for what type and purpose. Where investment can have the maximum impact. Where investment can be used to develop an exemplar/model for best practice.</p> <p>Who the stakeholders are for individual actions/projects</p> <p>Strategic fit with other policies/strategies</p> <p>Consultation with key stakeholders to develop priorities and proposals</p> <p>Shaping investment planning of utilities and other infrastructure providers</p>	<p>Action Plan detailing:</p> <ul style="list-style-type: none"> - Priorities - Actions - Stakeholders - Resourcing - Outcomes and key milestones
<p>What supporting structures will be useful to see this action plan through to delivery? For example, Planning Guides, capacity building, demonstrators and pilots?</p>	<p>Review of existing structures.</p> <p>Good practice review- what has worked where?</p>	<p>Proposals for technical assistance to support the delivery and long term success of the action plan</p>
<p>How will the Plan be monitored, evaluated and reviewed?</p>	<p>Establishment of key targets and a Monitoring and Evaluation Framework for ongoing review.</p>	<p>Monitoring and Evaluation Framework, supported by milestones, targets and a baseline.</p>

7.5.6 Stage 5 - Preparing for the future

In addition, the RPB will need to address the longer term issues relating to infrastructure. Whilst these often relate to governance issues beyond its immediate control, it is important the RPB considers these.

Table 7.6 Stage 5 - Preparing for the Future

Aim/Objective: To establish ownership of the Critical Infrastructure agenda (Strategy and Action Plan) in terms of appropriate partnerships, fora, delivery vehicles or other structures and to identify where gaps exist that can be appropriately filled		
Key Questions	Potential Evidence Base	Main Issues
<p>What would the terms of reference be for any strategic partnership?</p> <p>What would the priorities of any strategic Partnership/Group be?</p>	<p>Development of proposals for a City Region Critical Infrastructure Planning Group/Partnership, if necessary, to own the process, act as advocate, monitor and evaluate progress.</p> <p>Develop organisational priorities relating to structure, communications, milestones, targets.</p>	<p>Strategic Group/partnership established (if appropriate), with terms of reference and membership.</p>
<p>What opportunities exist to identify a Critical Infrastructure Champion for the City Region?</p>	<p>Identify the best method for promoting the Critical Infrastructure message with a view to embedding messages in time within the City Region planning processes.</p>	<p>City Region Champion (individual or body) identified - greater influence gained within political structures.</p>
<p>How should any strategic Partnership/Group seek to integrate with other city regional/regional structures?</p> <p>What will its communications strategy be?</p>	<p>Analysis of Strategic Fit with other organisations and structures both within the City Region and beyond within the wider Region</p> <p>Communications Strategy, including Influencing Plan and Media Relations</p>	<p>Integration with the structures relevant for future planning of City regions and resource allocation.</p> <p>Increasing influence and public profile</p>

7.6 Action Plan Implications for RSS Update 2009

The RSS Update 2009 requires submission of the draft revised RSS to the Secretary of State by summer 2009. Clearly it will not be possible to achieve all five stages by the time the RPB agrees the final revised draft. However, the RPB should be able to achieve stages 2 and 3, and thereby inform growth options accordingly.

This presents no small challenge to the RPB however, as it will need to do the following (in order):

- undertake extensive capacity building with infrastructure providers (summer 2008);
- glean and understand the relevant infrastructure investment programmes, and identify locational pinch-points and opportunities (autumn 2008);
- meet, discuss and test options for growth with the infrastructure providers (autumn 2008); and
- identify and plot main infrastructure networks in a GIS format as far as reasonable practicable (autumn 2008).

By doing this, the RPB will be able to work towards a database for infrastructure. This may not be as comprehensive as other parts of the database, but there needs to be realism and maturity in recognising the RPB's starting point for this work.

To do this, it is recommended that the RPB makes initial contact with each of the infrastructure providers, informs them of the RSS Update 2009 process and its related needs in terms of infrastructure, and seeks to set up a series of meetings to address the issues identified above, and in particular address the issues identified at the end of section addressing Stage 3; Gap analysis.

Sub-regional/city region partners have a role to play in helping the RPB develop and test options for growth, and establish gaps in infrastructure accordingly. The need for this to be a collaborative approach cannot be stressed enough, given the pan-regional nature of most infrastructure, the related need for consistency, the poor GIS capability of the city regions, and the ability of the city regions to help by addressing sub-regional dimensions of the infrastructure providers' investment programmes.

Thereafter, the RPB will need to maintain relations with the infrastructure providers and provide input into their respective plans and programmes, seeking in particular to ensure the infrastructure providers are aware of spatial planning for growth and related issues.

7.7 Summary

In Yorkshire and the Humber, most infrastructure appears to be operating at or close to capacity at present, with good infrastructure provision in urban areas (i.e. the focus of growth in the RSS). However, there is clearly a considerable disconnection between strategic spatial planning and infrastructure provision, which is in the interests of neither the RPB nor the infrastructure providers.

To help address this, the RPB needs to identify strategic infrastructure relevant to RSS objectives (i.e. infrastructure relating to an area of more than just local or site-specific importance). It also needs to build better relations with providers and operators. Clearly the RSS Update 2009 provides an opportunity for it to do this, and in particular to establish pinch-points and spare capacity by testing growth options with providers. GIS coverage of the same may have to follow in due course.

In view of the foregoing, and the experience of the study team elsewhere, it is proposed that the RPB adopts a 5 stage framework of action broadly comprising the stages as outlined below. Whilst it is unlikely to be able to progress beyond stage 2 or 3 within the stringent timescale of the RSS Update 2009, the implementation of the actions identified would comprise a significant start in terms of better and more integrated planning for infrastructure.

Table 7.7 Action Plan

Stage	Short Term (2008/9)	Medium Term (preparing for SRS)	Longer Term
1	<p>This study delivers the majority of the necessary actions for Stage 1 at a regional level.</p> <p>Further study at the regional level should draw on the results of other studies. Sub-area partners to refine level of detail for their localities.</p>	<p>In the medium term the RPB should take ownership of the information in the scoping study and keep it up to date as necessary.</p>	<p>Baseline of infrastructure information maintained by RPB in partnership with sub-area partners.</p>

Stage	Short Term (2008/9)	Medium Term (preparing for SRS)	Longer Term
2	<p>This study partially addresses some of these actions. The RPB should continue to build on established links with utilities and agencies. Establishing better links with strategic service providers will also assist in building capacity ahead of the SRS.</p> <p>Sub-area partners to start considering how infrastructure issues relate to growth and change plans, and identify key sub-area contacts.</p>	<p>Sub-area partners should establish and build relationships with providers at the appropriate level, building on the existing regional links.</p> <p>Infrastructure providers engaged by sub-regional partners in identifying main issues at existing identified growth / change opportunity areas.</p>	N/A
3	<p>This should be identified through the RPB testing the options with service providers to ensure there are no major delivery issues for the RSS 2009 Update. Sub-area partners can augment capacity if available.</p>	<p>In the medium term the sub-area partners should lead on this in response to planned growth and change and building a detailed picture of barriers and opportunities with infrastructure providers. RPB will have a co-ordinating role concurrent with co-ordinating sub-area inputs to SRS.</p>	<p>Ongoing integrated joint working with infrastructure providers, with overall co-ordination by RPB.</p>
4	<p>In the short term this is likely to be limited by time and resources to the RPB identifying the major issues to be address by the SRS and infrastructure providers at a later stage – essentially setting the agenda for the medium term.</p>	<p>Established joint working at the sub-area level will mean infrastructure providers have a much clearer picture of growth and change policies, and within the possible scope be preparing their own investment and delivery plans in response to these. Similarly, sub-area policy-making will be informed by a robust understanding of infrastructure issues.</p>	<p>Ongoing integrated joint working with infrastructure providers, with overall co-ordination by RPB.</p>
5	<p>The RPB needs to consult on proposals to establish a framework for dialogue, based on protocols for joint working with the infrastructure providers. This is considered in more detail below. This will establish the basis for much of the medium term activity and beyond.</p>	<p>Focused on long-term planning aspirations wider policy propositions in relation to climate change, understanding changing future models of provision and technological changes will be well understood and</p>	<p>Review established models to ensure ongoing relevance and effectiveness.</p>

Appendix A

Infrastructure Overview

A1 Infrastructure Overview

Infrastructure Type	Structure Summary	Organisation Role	Organisation Name	Role and Remit of Organisation - interface with study	Main Legislation	Name of appropriate contact
TRANSPORT						
Highways	National network managed by Highways Agency - investment funding via TPI (targeted programme of improvements) - with central funding for 'strategic' network and RFA for transport for remainder. Local highway networks in Y&H managed by local Highway Authorities (UAs and NYCC). Investment via LTP process (sub £5million) and RFA for transport (£5million+).	Highways Agency	Highways Agency	Management of national highway network. Will be of very significant to study, especially in relation to motorways in West & South Yorkshire.	Transport Acts; Transport and Works Act; Local Government Finance; Government Capital, Commercial Revenue	Peter Godfrey
		Local Highway Authorities	NYCC and UAs in the region.	Management and operation of the local highways networks, including many highways of sub-regional significance. All are either local transport authorities or share role with PTAs / PTEs and are part of an LTP process, which has a line of conformity to the Regional Transport Strategy.		Various.
Rail	Passenger services franchised by DfT Rail on various terms, which set operator investment plans. PTEs are co-signatories to Northern franchise in Y&H. Some open access operators, licensed by Office of Rail Regulator (ORR). Rail network provided by Network Rail, quasi-public sector body. Regulation via 'control periods' with DfT and ORR involvement – this sets out the investment by Network Rail. Industry also informed by 'Regional Planning Assessments' (RPAs) (DfT led) of likely future demand, and this is operationally resolved by Route Utilisation Studies (Network Rail led) to understand delivery issues.	Network Operator	Network Rail	Technical decision-making on feasibility of schemes, route utilisation studies, infrastructure delivery.	Transport and Works Act; Railways and Transport Safety Act 2003; Railways Act 2005; White Paper – Delivering a Safer Railway – 2007.	Simon Leyshon
		National policy and strategy	DfT Rail Division	Sets investment plans via regulation and letting of franchises. Leads RPAs. Important to study.		Steffanie Whitfield
		Franchised Rail Operator	National Express	franchise operator - initial proposal of infrastructure investment areas		Adrian Caltieri / Andrew Markham
		Franchised Rail Operator	Trans-Pennine Express	franchise operator - initial proposal of infrastructure investment areas		Louise Ebbs
		Franchised Rail Operator	Cross Country Trains - owned by Arriva	franchise operator - initial proposal of infrastructure investment areas		Roger Cobbe
		Franchised Rail Operator	Northern	franchise operator - initial proposal of infrastructure investment areas		Pat Beijer
		Open Access Operator	Hull Trains	Operates long-distance services from Humber and Selby to London – unlikely to be of direct relevance.		

Infrastructure Type	Structure Summary	Organisation Role	Organisation Name	Role and Remit of Organisation - interface with study	Main Legislation	Name of appropriate contact
		Open Access Operator	Grand Central Railway	Operates limited long-distance services from Northallerton / Thirsk / York to London and Teesside / Tyneside. Unlikely to be of direct relevance.		
Bus	De-regulated in the region, but subject to possible change in future. Local authorities and PTEs 'buy-in' some additional services to supplement commercial networks, and also fund concessionary fare / multi-modal ticket schemes. Local authorities / PTEs also fund via LTP / RFA for transport capital investment in highways (bus lanes etc), bus stops and interchange facilities.	Bus operators	Main players: First Group Arriva Transdev	Unlikely to be of direct relevance. Role is a generally a market-led responsive one; capital expenditure is mainly on vehicles, with public sector (local authorities and PTEs) leading on other physical facilities.		
Light Rail	Schemes usually led by local authorities / PTEs, and necessary powers obtained by them. Funding can be via RFA for transport, but also PFI credits, packages of financing, including developer contributions. Usually operated on a concession basis.	Operator	Stagecoach Supertram	Concessionaire for South Yorkshire Supertram. Unlikely to be of significant relevance – need to understand proposals for extensions. SYPTE more relevant contact.		
Other Roles in Transport	Mainly mentioned above, but set out here for completeness.	Local transport authorities.	NYCC and Unitary Authorities – shared with PTAs in West & South Yorks.	Lead on LTP production and have roles in terms of promoting public transport schemes, concessionary fares, tendered bus services etc. Proposals and plans should have a line of conformity with the Regional Transport Strategy.		
		Passenger Transport Authority and Executive	Metro (West Yorkshire)	Has similar role to local transport authorities (including some shared) on the public transport side, but additional remit in terms of revenue raising and rail in particular. Some additional powers, with sub-regional co-ordination across UA boundaries.		David Hoggarth is the key lead officer for this study. Director General is Kieran Preston.
		Passenger Transport Authority and Executive	SYPTE (South Yorkshire)	Has similar role to local transport authorities (including some shared) on the public transport side, but additional remit in terms of revenue raising and rail in particular. Some additional powers, with sub-regional co-ordination across UA boundaries.		Keith Oates is the key officer for this study. Director General is Roy Wicks.
		Regional Planning Body	Yorkshire & Humber Assembly	Responsible for production and implementation of Regional Transport Strategy as part of the Regional Spatial Strategy.		Stewart Clewlow

Infrastructure Type	Structure Summary	Organisation Role	Organisation Name	Role and Remit of Organisation - interface with study	Main Legislation	Name of appropriate contact
		Industry grouping / lobbyist	Freight Transport Association	FTA represents the transport interests of 12,000 companies. FTA members operate over 200,000 lorries and around one million light vans; they consign over 90 per cent of the freight moved by rail; and they are responsible for over 70 per cent of UK visible exports by sea and air.		
		Port Operator	Association of British Ports	Own and operate 21 ports all around the UK. Plus have planning arm which deals with managing associated land within ports.		
ELECTRICITY						
Electricity - Distribution	<p>The high voltage transmission network ('national grid') connects the major power stations to the distribution network operators and the 'System Operator' is the company that runs this.</p> <p>There are 14 licensed distribution network operators (DNOs) each responsible for a distribution services area. The 14 DNOs are owned by seven different groups.</p> <p>There are also four independent network operators who own and run smaller networks embedded in the DNO networks. Domestic and most commercial consumers buy their electricity from suppliers who pay the DNOs for transporting their customers' electricity along their networks. Suppliers pass on these costs to consumers. Distribution costs account for about 20 per cent of electricity bills. DNOs are regulated on 5-year</p>	High voltage transmission network System Operator	National Grid Electricity Transmission	Distribution of power from the main large power stations to the DNOs and (sometimes) the independent network operators. Network runs at 275kV and up. Unlikely to be of relevance in this region.	Electricity Act 1989; Electricity Regulation Act 2006; Electricity Supply, Quality and Continuity Regulations, 2002; Energy Act 2004.	Chris Allanson – Network; Chris Newman – Network; Phil Jones – Commercial / Policy.
		Electricity Distribution Network Operator (DNO)	Yorkshire Electricity Distribution Ltd (YEDL) , part of CE Electric UK (itself part of MidAmerican Energy Holding Company)	The main company of interest for the study. The near-monopoly that owns and operates the main electricity infrastructure in the region. DNOs operate at up to 132kV. Increasing challenge for YEDL and others is adapting the network to cope with local generation - which by-passes the SO. The network architecture was geared to connecting the SO to end-users.		

Infrastructure Type	Structure Summary	Organisation Role	Organisation Name	Role and Remit of Organisation - interface with study	Main Legislation	Name of appropriate contact
	programme, based on a submissions to OFGEM of capital investment and operating cost plans. Regulation controls for DNOs operate on a 5-year basis and the current price control runs from 1 April 2005 to 31 March 2010.	Independent network operators	There are (currently) four of these companies, operating on a commercial and opportunistic basis to supply new development with electricity networks. They may obtain their supply from either the DNO or the SO.	Unlikely to be of direct relevance to the study, but role should be understood.		
Electricity - Generation	Power generation is largely deregulated. Large power stations are connected to DNOs via the SO. Smaller scale power generation connects direct to the DNOs.	Main large powers stations in the region	Scottish & Southern Energy: Ferrybridge and Keadby British Energy: Eggborough Drax Power: Drax	Of limited relevance, as part of the national picture in supply terms. Long term is considered as part of national strategy. Of possible indirect relevance (planning for new provision etc).		
		Other power generation sources	Various	Relevant insofar as this is a growing element of supply, and also creates increasing challenges for the DNO.		
GAS						
Gas Supply Resource	A national policy issue essentially managed through DBERR with Ofgem enabling delivery.			Not of direct relevance to the study.	Gas Safety Regulations 1998; Gas Act 1986; The Gas Regulations 2000.	
Gas Distribution	The national transmission system is a monopoly interest and is operated by National Grid Gas plc. This connects gas sources (terminals and offshore pipelines etc) to the gas distribution networks.	High Pressure Gas Transmission System Operator	National Grid Gas (NGG) plc - sole supplier to GDNs in heavily regulated sector.	Unlikely to be of direct relevance to the study - the high pressure network (referred to as the National Transmission System) is not considered to be a particular constraint.		

Infrastructure Type	Structure Summary	Organisation Role	Organisation Name	Role and Remit of Organisation - interface with study	Main Legislation	Name of appropriate contact
	<p>There are eight gas distribution networks (GDNs) currently owned by four companies, which each cover a separate geographical region of Britain. In addition there are a number of smaller networks owned and operated by Independent Gas Transporters (IGTs) - most but not all of these networks have been built to serve new housing. Two GDNs operate in Yorkshire & the Humber - National Grid Gas and Northern Gas Networks (the latter from around Wakefield northwards).</p> <p>Existing gas distribution networks are near-monopolies. GDNs and IGTs are regulated by Ofgem to protect consumers from potential abuse of monopoly power.</p> <p>The gas network regulatory periods are 5-years, with the next period starting in 2008 and running to 2013.</p>	Gas Distribution Network Operator	Northern Gas Networks - covers northern part of the region (Aprox Wakefield north)	Will be of direct relevance - will have an understanding of issues at the sub-regional and local level. Network is restricted to built-up areas only. Questions over need to provide gas to new residential development in terms of achieving carbon-neutral housing objectives.		Chris Gorman – Network Operations Director; Tony Pearson – Network Planning Manager
		Gas Distribution Network Operator	National Grid - covers southern part of the region (the Eastern Region DNO).	Will be of direct relevance - will have an understanding of issues at the sub-regional and local level. Network is restricted to built-up areas only. Questions over need to provide gas to new residential development in terms of achieving carbon-neutral housing objectives.		Jeremy Bending – Director, Network Strategy.
		Independent Gas Transporters	There are several of these companies, operating on a commercial and opportunistic basis to supply new development with gas networks.	Unlikely to be of direct relevance to the study, but role should be understood. This market is more buoyant than the comparable market for new electricity connections.		
TELECOMMUNICATIONS						
Telecommunications	<p>Now a competitive industry, with some legacy regulation (Ofcom) over near-monopoly 'local loop' network.</p> <p>Several network operators, although dominated by BT and Virgin Media, who also tend to supply virtually all 'final-stage' infrastructure.</p>	Main network operator	BT	Have the legacy national network with connections to most homes in the region - except Hull.		
		Main network operator	Virgin Media	Hold all cable TV franchises (through merger / acquisition) in the region, except Hull.		
		Main network operator	Kingston Communications	Legacy Hull area operator. Only area where might be specific issues - BT has been prevented from entering market, and for others the barriers to entry have been too great. This has lead to an increasingly poor network when judged against the networks elsewhere.		

Infrastructure Type	Structure Summary	Organisation Role	Organisation Name	Role and Remit of Organisation - interface with study	Main Legislation	Name of appropriate contact
		Others network operators	There are numerous other companies operating networks in main urban areas, usually selling capacity to other providers.	The presence of these other network operators, particularly in busy areas ensures a robust market for service providers.		
WATER						
Water Resource	There is no notable constraining 'water resource' issue in the region - assisted by investment in 'water grid' some years ago allowing distribution of water resource around the region.				Water Act 2003; Water Framework Directive; Water Resources Act 1991; Environment Act 1995; Environmental Permitting (EP) Regulations; Water Industry Act 1991.	
Clean Water Treatment and Supply, Sewerage Collection and Treatment Capacity	<p>Yorkshire Water is the natural monopoly supplier in the region, and is regulated by OFWAT. Regulation is in the form of 5 year regulatory periods. Next period runs from 2010 to 2015.</p> <p>YW plans for population growth based on information from a range of national and local sources - including, critically adopted development plans. The industry has an obligation to supply new development on allocated sites. Lack of adopted DPDs is now a very real challenge to pro-active supply of infrastructure, as Periodic Review submissions are based on this information.</p> <p>YW objects to applications on windfall sites on the basis of unavailability of infrastructure in increasing number of cases for this reason. In the case of such sites developer contributions are sought, but pro-active planning overcomes this barrier.</p>	Regional Water Company	Yorkshire Water - covers whole region.	<p>Water Distribution: adding capacity is relatively easy, but needs to be in association with plan-led growth approach, otherwise alignment with investment cycles breaks down.</p> <p>Sewerage Treatment: similar situation to that for water supply - relies on plan-led growth approach.</p>		Stephanie Walden is the main interface, and will be attending the Wakefield workshop.

Infrastructure Type	Structure Summary	Organisation Role	Organisation Name	Role and Remit of Organisation - interface with study	Main Legislation	Name of appropriate contact
	Operate in 5 year investment cycles but covered by a 25 year Strategic Direction Statement sds.yorkshirewater.com (2010 to 2035)	Regional Water Company	Anglian Water - covers whole region.	Water Distribution: adding capacity is relatively easy, but needs to be in association with plan-led growth approach, otherwise alignment with investment cycles breaks down. Sewerage Treatment: similar situation to that for water supply - relies on plan-led growth approach.		Mick Galey (Planning Liaison Manager)
		Regional Water Company	Severn Trent Water - covers whole region.	Water Distribution: adding capacity is relatively easy, but needs to be in association with plan-led growth approach, otherwise alignment with investment cycles breaks down. Sewerage Treatment: similar situation to that for water supply - relies on plan-led growth approach.		Matthew Foster
HEALTH SERVICES						
	Strategic body with responsibility for setting regional policy and strategy in healthcare provision.		Strategic Health Authority	Will be of relevance to study.		

Infrastructure Type	Structure Summary	Organisation Role	Organisation Name	Role and Remit of Organisation - interface with study	Main Legislation	Name of appropriate contact
	Healthcare 'purchasers', acquire healthcare provision from other healthcare trusts. PCTs are funded directly by the Department of Health, based on a complex formula that is population led.		Primary Care Trusts (x14) – align with UA boundaries, except single PCT covering York & North Yorkshire.	Will be of relevance to study.		
	Range of trusts providing a range of different services (such as hospitals etc), which are 'bought' by the PCTs.		Mental-Health Trusts (x4)			
			Care Trusts (x2)			
			NHS Trusts (x7)			
			Foundation Trusts (x8)			
MINERALS AND WASTE						
	<p>Minerals and Waste planning is undertaken at the regional and local level as part of the development planning process. Implementation is almost exclusively undertaken by the private sector on the basis of market economics. For municipal waste, there is an increasing emphasis on recycling and reduction in landfill. This is leading to a number of PFI led schemes for capital investment in new waste management facilities, including some Combined Heat Power schemes.</p> <p>Waste collection for business is a competitive market. Household waste collection is a district-level service.</p>	Regional Minerals and Waste Planning	Yorkshire & Humber Assembly	.	Environmental Permitting (EP) Regulations; Pollution Prevention and Control (PPC); Waste Management Licensing (WML) Regulations; Hazardous Waste Regulations; Waste Electrical and Electronic Equipment (WEEE) Directive; Agricultural Waste Regulations.	
		Minerals and Waste Planning Authorities	NYCC and UAs, with some voluntary joint working around the region, with joint DPDs.			

Infrastructure Type	Structure Summary	Organisation Role	Organisation Name	Role and Remit of Organisation - interface with study	Main Legislation	Name of appropriate contact
FLOOD RISK						
		Environment Agency is tasked with a range of duties as a government agency (sponsored by DEFRA). In this context the EA has a range of functions in relation to flood risk, including provision and maintenance of flood defences.	Environment Agency	Will be significant, and needs to be understood in some detail. This applies both in terms of dealing with flood risk as well as understanding the operation, management and provision of defence infrastructure.		
		British Waterways is a government-sponsored agency with duties over the management of inland waterways (canals, docks etc).	British Waterways	Unlikely to be significant as a barrier / issue for growth.		
GREEN INFRASTRUCTURE						
			Natural England		Forestry Act 1967; EIA Regulations; Habitat Regulations; Wildlife and Countryside Acts.	Chris Marshall - Geoff Lunn -
			English Heritage			

Infrastructure Type	Structure Summary	Organisation Role	Organisation Name	Role and Remit of Organisation - interface with study	Main Legislation	Name of appropriate contact
			Environment Agency			Phil Younge - regional strategy unit manager Phil Winn - Humber strategy manager - what does Humber estuary do for biodiversity - manager realignment - negotiate deals with land planning
			Forestry Commission - regional conservators			Vince Carter North Yorkshire - S yorkshire forest partnership - urban forestry strategy - reinventing areas - DIRECTOR - Richard ?
			National Trust - values of the land they own - Dales / Moors - significant land			Tony Burton - national YH regional director - worth?
			Groundwork - regional director - green infra - social inclusion - health - local skills - 11 GW trusts			YH contact
OTHER PUBLIC INFRASTRUCTURE						
Community Services	Social care, affordable housing.					

Infrastructure Type	Structure Summary	Organisation Role	Organisation Name	Role and Remit of Organisation - interface with study	Main Legislation	Name of appropriate contact
Emergency Services	Police, Fire and Ambulance provision					
Education Services	Full range – pre school, primary, secondary, further and higher education.					

Appendix B

Workshop Notes

B1 Blue Group – Discussion One

- Initial struggle to see how this project was different to transport prioritisation schemes already in place within the region – and that issues may just be related to timescales;
- Recognition within the group that the scale of growth proposed would allow more strategic thinking that just relying on headroom within existing infrastructure;
- Consideration of scale of problem in delivering infrastructure and the balance between local, sub-regional and regional issues. – When does it become critical?;
- Water and electricity infrastructure capacity not considered a problem in Scarborough (urban area); but if scale of growth within RSS means Scarborough Borough Council as a whole has to accommodate more, then areas such as Filey and lesser settlements may have to take some of growth and would then pose problems for capacity;
- A greater understanding is needed of the locations of choice for growth within the region. This dictates whether there is a ‘problem’ with infrastructural provision. In providing certainty then can assess whether there is enough existing capacity shortfall, or whether can ‘sweat assets’, or would need to provide additional;
- Hull – drainage key constraints within the LA, as is the Port – localised definition of ‘critical’ alters across region;
- ‘Critical’ should mean has affects beyond the immediate local area – but remember small schemes could still represent sub-regionally or regionally significant problems/constraints;
- Need a consistent approach to considering infrastructure and constraints across the region;
- Group discussed hospitals and their importance within the region. The instability and uncertainty across current PCTs in the region means they may require additional thinking in terms of infrastructure importance; and
- Schools deemed to be more of a local issue.

B2 Blue Group – Discussion Two – North Yorkshire

- Ensure that study considers and remembers rural nature of NY sub region – Rural-proofing!
- NY issues – Broadband connection issues and overall lack of coverage within the sub-region;
- Lack of critical mass within the region means that there are difficulties in attracting investment and making initial payments for infrastructure;
- CE Electric – most of the electricity provision and connections for new developments are undertaken through private agreements between the supplier and developers. Cost is the major issue. If there is a need for connection and supply it can be done at whatever magnitude, however there are obvious cost implications. Answer is never no.....but difficulty means additional expense;
- NY sub region must deliberate urban/rural split within its spatial planning - Hambleton versus Scarborough.
- CE Electric – Has a development plan which can be purchased, which tells you the current capacity of networks within the region, and also gives FUTURE projections of capacity requirements. This projection is determined on a trend basis, from historic data.

Changes in growth agenda, and overall ambitions may render these projections incorrect.

- CE Electric – where there is no need = no development of substations;
- CE Electric – large fear within development industry of paying, or being asked to pay initial upfront cost, which benefits ‘free-loaders’.
- Developments incur costs if there is any ‘headroom’ left over in provision to a development site – Possibility of claw-back from secondary developers.
- Large, off-shore wind turbine renewable energy generation will require a large land based connection point. Critical mass will allow this to be achieved.
- A small-scale turbine on side of house would also be able to be accommodated within existing capacity and network.
- However, development of turbines won each house within LA housing stock could not be accommodated.
- NOTE – CE Electric are **not** allowed to speculatively provide for connection points and network infrastructure. Regulator does not allow them to do this. Has potential to limit future funding mechanisms and innovative solutions to revenue and funding initiatives.

B3 Green Group – Discussion One

Q: Is highway capacity going to be a major part of this project?

A: While this is an absolutely key constraint, it is the subject of a separate piece of detailed scoping work. It will be looking at institutions and investment structures, rather than detailed/specific infra structure provision. This is because the arrangements for funding and delivery are extremely complex and always changing.

Statement from LCR: The real benefit of an integrated view on this issue is the ability to “reframe” how we look at the issue of infrastructure. At the moment each different technical discipline and each part of the strategic hierarchy see the issue slightly differently. It would be really helpful for a consistent view – it is not all about accommodating higher levels of growth, there are as equally important issues for communities in existing areas. On this basis, the move to use the “Infrastructure 2.0” concept is really important – i.e. a new way of looking at the issue without automatically looking for 19th/20th century responses to problems.

We need instead to look at the less capital intensive approaches and move to a more decentralised view. Some significant work has taken place on this in some foreign cities such as San Francisco.

Just because infrastructure/utility companies look at solutions in a certain way today is no reason that this approach should be used in the future.

A: How we deal with the infrastructure deficit in existing areas in the future is a key issue for this study. We need to look at the most appropriate scale/level for interventions. This is also a key part of this study.

However, it is also very true to say that there are issues which are undoubtedly dealt with at a larger scale – for example flood risk management, where decisions about a local matter will have implications and causes up and down stream of the actual problem.

This is not to say that these issues have important local dimensions, but there are matters that are more logically addressed at a local level – such as incorporating local energy solutions and management issues.

LCR: That argument is accepted, but this is always going to be a need to localise the understanding of all of these issues, otherwise local politicians will not be able to reflect the bigger picture in their decision making.

Leeds: These are not simple issues – flooding is a case in point. It is a wider issue to do with flooding and catchment areas, but it is local issue in terms of drainage design and capacity.

Leeds: This study is welcomed – it is necessary and long overdue. An important issue is retrofitting existing stock/areas as well as looking at the implications of the distribution of growth and transforming places.

The Lower Aire Valley is a good case in point. We are currently doing a lot of master planning and LDF work in this area to look at how we can accommodate growth. There are massive issue to do with infrastructure capacity and the problem of managing expectations and aiding understanding how all the issue interrelate.

It is true to say that long term issues such as public transport infrastructure are really significant. Dealing with the current issues and problems are difficult enough, let alone having ideas for future integrated solutions.

A: The Aire Valley is a good example. There some interesting big strategic issues about major new housing investment and transport, but there are also technical matters like odour problems currently being experienced because of the sewage treatment works. The big question is – are these housing numbers achievable – or will the infrastructure problems be an insurmountable problem?

Leeds: But if we are really serious about the transformational agenda, we must work out how to deal with such problems.

Scunthorpe: The current debate over growth points and Ecotowns brings this question into sharp focus – there are acute infrastructure problems.

Leeds: Yes, and this also proves the need to recognise that there will be a need for major support and investment to achieve these step changes. We cannot hope to succeed by just planning to tinker around the edges of the problem. Government needs to accept this.

Climate Change person: We also need to look at the wider context for the integration of issues – such as the backdrop of how we move to a low-carbon economy. We cannot go back to 19th/20th C solutions to these problems.

LCR: We actually need to look at sustainable infrastructure in its widest sense – the debate needs to include Climate Change – but this is only one issue amongst a suite of such issues. We need to think about “resource proofing” – will there be fuel/energy/funding available in the future as it is now? How do we design in low energy and self sufficiency? Some foreign cities are doing good work on this.

Also, there is the entire issue of long term finance – we should not delude ourselves about affordability long term, including upkeep/replacement. Financial sustainability is an important issue that is not normally looked at.

A: The area of infrastructure is actually one area that investors seem to regard as being safer in the long-term. However, how we design in robust climate change proofing is an issue that is proving a real focus for thinking.

The interplay between climate change and resource use planning is a key issue. Again, San Francisco is doing some great work on how to plan away from oil dependency.

We will also need to realise that there will be a spatial element to the impact of this issue – for example, parts of the region with a particularly energy reliant/heavy user base (such as the chemical industries on the Humber) may have to change/adapt more significantly than other areas of the Region.

NYCC – In all of these discussions we should try and not forget the rural dimension. Issues like accessibility need to be considered as well as the specific investment issues. For example, many small rural communities lack the critical mass to justify investment in infrastructure such as broadband.

The RSS does not support significant growth in small rural settlements, and this throws into question the simple government response of “developer contributions”.

A: The RSS answer would appear to be that we need to look at focusing on certain strategic locations (such as market towns) so as to achieve critical mass.

Therefore, the basic issue is that rural areas need to adopt different approaches to dealing with this problem.

Leeds: We need to think about how we can avoid the problems of 70s/80s regeneration, while acknowledging that there will be a funding gap.

Scunthorpe: We are already asking developers for a lot – affordable housing provision, green space, highways improvements etc. But there is pressure for developments in other areas – so we cannot ask for too much or they will just go elsewhere.

A: We need to look at what the SNR will be proposing about locally generated funding, as we know that central gov will not be able to provide all we need to address the infrastructure issue. There may be opportunity to look at local business tax supplements.

Q: There is a real difficulty in engaging with infrastructure providers at the early stage of strategy making and getting meaningful feedback. We really want to avoid the issue of proposing something in a location and then getting a fundamental objection very late in the day.

A: This is a key issue and it suggests that we need to work on planning for change in an integrated, non-silo way of thinking.

We must also recognise that certain utility providers have a statutory duty to look at statutory development plans and provide for/facilitate the growth. However, there is an in-built tension - as utility companies pay for these investments by putting up bills and raising finance, there is a regulator issue – they always strive to keep bills down.

How do we develop local intelligence bases?

B3.1 Summary

Key steps on this road are – identify what is important, agree the appropriate scale to deal with different issues and look at the requirements of climate change proofing

B4 Green Group – Discussion Two – Leeds City Region

The city region faces the largest step change in housing delivery. The Aire Valley will be “mission critical” component of the LCR, and there are likely to be infrastructure constraints.

There are top down and bottom up issues about how we present and disseminate intelligence.

B4.1 Utility (Gas) View

The main Leeds conurbation is reasonable secure for gas supply.

There may be problems with supplies centred in Leeds being distributed to other growth points/areas.

There are concerns that land used/earmarked for storage and distribution infrastructure may be lost to other forms of development.

Both gas and water suppliers need to have the most vital elements of their infrastructure protected.

Utility companies need to be aware of major planned growth areas, not just generic areas (i.e. by local authority) so they can plan to accommodate new housing/businesses.

There is a minimum 2 year lead in time to bring on line further capacity.

B4.2 Other views

Leeds centre may be restricted in growth because of problems with increasing the electricity supply – this further supports arguments for designing in low energy use and on-site CHP etc.

TB: So it is true to say that there is a real need to look at attempting to reduce the “strategic development footprint” impact on infrastructure. We cannot therefore look at energy/utility issues from a silo perspective.

There will be a complex organisational web of companies/bodies who will address these issues.

Environment Agency: Location must be regarded as the single most important factor that we need to discuss and it is all-important from a number of perspectives. We need to recognise that developments cannot tick all the boxes through on site design issues; we will need to involve wider actions such as demand management for private transport etc.

Long term thinking is needed to consider issues arising from the age/condition/design of the existing stock. We will need to amend the models of infrastructure needs. The retrofitting issue is really important – plans for upgrading existing homes etc can only ever expect to be successful on an ad-hoc basis.

Utility company: retrofitting is important, but because of the ad-hoc issue we still need to look to historic trends and patterns of consumption.

EA: This all still emphasises the need to get location right above other issues.

TB: On the locational issue, we need to think from a regional, city region and local perspective. For example – would it actually make it harder or easier to plan for focus change – such as by major growth points (say for 6,000 houses) as compared with more organic change?

The “Growth Points” debate depends very much on the level of detail again. If we have a clear idea of location we can plan ahead, but just saying “In Wakefield” does not really help us that much.

LCR: Remember that this debate is not just about new housing numbers – we need to consider where people work and take their leisure.

We also need to consider that some areas will be going for decentralised growth; other will be taking a more tightly focussed approach to say city centre development. In some areas connectivity is going to be more important than in others.

Leeds: It is the RSS debate about bringing together jobs and people or looking at connectivity issues.

Utility (gas): We tend to look at the totality of all forms of development that logically and clearly emerge from plans, but we cannot make decisions just on possible development in plans without more evidence about timescales etc.

Q: How much intelligence can be passed on to the planners on such issues as current capacity/weakness for energy supplies?

Utility: We tend to look at areas of tension then programme in upgrades. It is hard to name specific places/geographic areas, even where there are current problems on a constant basis.

Leeds CC: We need to also understand cross boundary issues and know if there are cross boundary limits to supply. This would be a key “added value” element of this study.

There could be water catchment issues, but PPS3 and the guidance on flood risk tend to contradict a little.

B5 Red Group – Discussion One

Simon Marvin (SURF)

Stuart Clewlow (Assembly)

John Ellis (Environment Agency)

Melanie Taylor (Leeds City Region)

Ian Preston (Environment Agency)

Lucy Bjork (RSPB)

Kate Wheeler (Natural England)

Jenny Haines (CPRE)

Harriet Fisher (Assembly)

Vince Carter (Forestry Commission)

VC – Opportunity to get involved with the new Homes and Communities Agency to get the green infrastructure (GI) agenda better considered and integrated. Difficult to engage with and influence development both at the strategy and site levels. Need to ensure that development is not just about a drive for numbers but that the environment is considered at the beginning.

LB – Historically, green infrastructure hasn't been valued, but the agenda is gaining momentum now and this needs to be maintained. We need to ensure that GI is understood at all stages and levels.

JE – Difficult to engage with the private sector e.g. utility providers who are key to planning decision making.

IP – Yes, this is critical – need to be able to make assumptions about what can be provided. All interested parties should be consulted.

MT – Local authorities need to be in a position to understand providers' motivations. Providers have issues of commercial interest and confidentiality, and local authorities need to understand how to communicate with them in the context of these issues and restrictions.

SC – Competition rules in transport and legislation limits what issues and with whom providers can address.

MT – Experience of providers being unable to attend meetings without bringing legal representation.

MT – In Leeds City Region, integration is all about enrichment. In looking at growth, the City Region never stepped back and looked at what the constraints are and what can actually be accommodated.

JH – Health infrastructure is also important. Local authorities are finding it difficult to engage with the health authorities. Perhaps it has traditionally been easier to engage with education services because the LEA was part of the local authority. However, health authorities and utility companies are not as used to working with local authorities.

SC – This does vary though, there were good discussions between local authority and the health authority in Kirklees

JE – It's probably an issue to do with administrative boundaries and the different spatial remits of the local and health authorities

KW – Role focuses on commenting on green space and community strategies at the moment to get GI embedded into local strategy. Traditionally, have tended to work more with similar organisations with shared agendas. However, are now trying to work more with the private sector, developers and English Partnerships. Started to talk to the private sector because of a lack of engagement. Started talking to them to explain Natural England's objectives and introduce the new organisation. Also, the organisation has a new remit for urban areas and the organisation recognises the need to engage with the development sector in relation to these areas. Want to show the sector how GI can be incorporated. Are involved in large projects with GI elements in South Yorkshire. It's about learning to communicate and work with developers – to understand their organisations, objectives and what they do, before approaching for discussions to show how Natural England can link into their work and help.

SC – Highways departments in local authorities and utilities companies have a good relationship on an operational level but not on a forward planning level

JH – The different set up and attitudes of the private sector e.g. their views on consultation, is a barrier – need to get a dialogue

CB – Yorkshire Water are better at engaging, they have an environmental advisory panel seeking customer views

SC – Yes, Yorkshire Water are fairly good because they have significant land holdings and land interests

IP – Yorkshire Water are more engaged compared to other water companies elsewhere in the country

JE – Have managed to engage with the Highways Agency. They attend regular regional meetings. But, need to get the right person (a large agency with different teams). Engagement did drop off slightly due to staff changes, but has picked up again now.

VC – The Quality Places Forum had potential to engage the private sector but only public sector colleagues spoke.

HF – The Quality Places Forum has improved since the first meeting and we now have good attendance and feedback from private sector attendees, although it is interesting to hear a different perspective on the meeting.

VC – Environmental organisations are getting better at developing a single message e.g. Regional Biodiversity Strategy, but not yet a completely united front

JE – We worked together on GI RSS Policy, but recognised that further work is needed e.g. mapping GI

LB – Difficult to map and understand GI because of the multi-functionality of uses

KW – Natural England are undertaking work to get an evidence base of GI, which will be a useful resource for the region. Also, there is a regional target for the accessibility of green space, which they are promoting for inclusion in all strategies and studies.

IP – GI is still a relatively new concept. Moving to the Single Regional Strategy and more of a plan-led approach to growth is critical and has potential to integrate issues more. Need to start bringing it all together for the new integrated Single Regional Strategy.

JH – It is a new concept, came out the RSS panel report only 18 months ago and organisations have been rapidly trying to see how it can be used.

MT – At the city region level, we need to build awareness of the utility companies of spatial patterns of growth. Our role is likely to be around encouraging proactive communication and giving companies information on where growth will be. There are forums and groups e.g. the Regional Utilities Group but they are fairly closed.

VC – Emphasise the importance of valuing GI. It is often seen as a constraint, but it should also be seen as an opportunity.

JE – Engagement with Yorkshire Waterways is difficult

B5.1 Summary of Issues Raised:

Coordination, forming and managing new relationships, providing information, active engagement, understanding the processes and business planning of companies, acting on different spatial scales, sending a joint message from groups with shared agendas.

B6 Red Group – Discussion Two – Humber

Simon Marvin (SURF)

John Ellis (Environment Agency)

Mike Ibbotson (Hull)

Jenny Haines (CPRE)

Harriet Fisher (Assembly)

Chris Barwell (North Lincolnshire)

James Durham (Hull)

B6.1 Humber South Bank (North Lincolnshire)

CB – Looking at growth of Scunthorpe urban area as a sub regional town and also the economic growth of the ports area. A major barrier to this growth is road and rail access (A160) to the ports. Also, there is the issue of GI, SSSI sites and RAMSAR sites.

JE – Issues of sea level rise, flood risk, coastal squeeze and biodiversity

CB – Humber strategy published last week, controversial because of its references to managed retreat/realignment

JE – The strategy looks to 2100 and was written mainly to comply with the Habitats Directive.

MI – Managed retreat is an ongoing policy in the sub area, it is not new

CB – There is the Lincolnshire Lakes (growth point bid) housing scheme, but it is in a flood risk zone-3 area. Have applied for growth point funding to help with the infrastructure provision for the scheme.

JE – Lincolnshire Lakes is in an area that won't be protected by the Environment Agency's flood measures. The area is also constrained physically because of the Humber and Trent rivers and the motorway. These physical constraints limit options for growth.

CB – Did look into an option for the Lakes scheme - as a flood alleviation option but the Environment Agency did not support this as an option.

JH – North Lincolnshire also has the issue of the main urban area being detached from the main industrial area (a 30 mile separation).

MI – Spare land at the Humber Ports (100 hectares) but area of flood risk, RAMSAR and Natura 2000 site.

JE – The ports are already used but could be busier – need transport improvements

MI – Transport improvements have been made e.g. to rail freight connections. Transport is a constraint but the local motorway network is relatively uncongested compared to networks elsewhere in the region and country.

CB – Trying to promote the ports as a global gateway that is close to airports and an area for investment. Main partners in this are APB and the Humber Economic Partnership.

CB – Principal towns in North Lincolnshire have issues relating to community infrastructure e.g. school capacity and open space provision

JH – Also, the South Bank has the issue of water provision (low water levels). Industries in the area are big users of water.

CB – Yes, North Lincolnshire Council recently met with Anglian Water. The water company said that they had earmarked the Elsham Aquifer for meeting demand arising from growth at Lincoln, Newark/Sherwood. So, the Council had to make them aware of their plans for Scunthorpe's growth too.

3 water companies in the Humber – Anglian, Severn Trent and Yorkshire

CB - Number of power stations in the area and new wind farms also. Proposals for a combined heat and power plant on the Humber bank. Also, proposals for biofuels. These proposals are connected to aspirations as a global gateway and are being brought forward as part of the LDF and a masterplan.

B6.2 North Bank (Hull)

MI – road transport blockage – the A63 (Castle Street). Also, issue of flood risk – Hull is below or at sea level with 95% of the urban area within flood zone 3.

JE – Hull will be protected by the Environment Agency. The EA has an agreement with planners on how to consider development proposals in Hull because of the city's unique circumstances. Flooding from drainage problems is the key issue, but flooding could also occur from tidal or river sources.

JD – At issues and options stage for core strategy, not enough space in the city to expand sufficiently - looking at the need for an urban extension (probably in East Riding) to accommodate RSS housing numbers.

JE – An SFRA has been completed for Hull.

MI – Another issue is that of sewerage and disposal

MI – As a city region there are places where development could occur but this needs careful consideration. Water is an issue, there are strict controls about the use of the aquifer.

JE – Use of the aquifer is dependent on what is being planned (scale) and where (distance from the aquifer). There is an agreed strategy for handling development in areas of different sensitivities.

JH – Coastal erosion – the fastest eroding coastline in Europe. The gas terminals along the coast are protected, but this has an impact on the coastline further down. Coastal settlements are relatively isolated and vulnerable to erosion, are they the right locations for growth in terms of accessibility

JH – Humber Bridge tolls. A piece of infrastructure that is seen as a constraint to economic growth.

B6.3 Summary of Issues

Environment Agency have an important role. Issues are being expressed as 'limits' to growth. National policy framework does restrict opportunities for growth. Natural England also have an important role in relation to designated sites.

CB – Look to RSS for ideas to resolve these issues (because of the chain of conformity).

MI – Also, look to studies and stakeholder groups to discuss issues. This probably occurs more at the local authority level than the sub regional level. There isn't a formal city region partnership yet but boards will be set up soon. The issues raised e.g. flood risk don't respect administrative boundaries, but work and solutions are constrained by boundaries and remits. Currently, collaboration across the sub region is voluntary, SNR might force it to happen.

JH – There is the issue of resource availability that impacts on capacity to work together.

CB – Also, political issues regarding competition between the North and South Banks.

B7 Yellow Group – Discussion One and Two

- Yorkshire Water has a land use planning department.
- Yorkshire Water is a statutory consultee on the LDF but no on planning applications.
- Yorkshire Water working in a tight regulatory framework.
- DWI and EA set the agenda for regulatory appliance.
- YW is funded for growth.
- It has been difficult as only one Core Strategy has been adopted, and need to know where the growth will occur in order to receive funding.
- For example, required to provide a figure for each and every catchment (i.e. sewage).
- Can not use for example Ryedale's housing target as set in RSS as need to know exactly where the growth will be.
- British Gas – difficult to forward plan.
- Just because a spatial strategy states 25 hectares is allocated for housing can not put investment upfront to extend the network although could state if there would be enough gas available.
- Yorkshire Water- A site has to be allocated in a development plan or already have planning permission.
- CE Electric – would like to know earlier so therefore have time to plan.
- Recently held a Planning Statutory Consultation event asking stakeholders what they development they were planning in the next 5 years so CE could forward plan.
- Yorkshire Forward – involvement in trying to help LA s identify the barriers to development and look at key issues surrounding infrastructure.
- SY PTE – should focus development where the network is strong. Need a pro-active approach in locating new development where we already have development.
- Public transport needs to be commercially viable.
- PTE is a non statutory consultee so only consulted late on – need to be involved in identifying sites at an early stage.
- Developer Contributions have their drawbacks as have to ask LA for some of it and at the bottom of the queue.
- Yorkshire Water would be very unlikely to object in regards to lack of water supply but sewage is an issue in regards to flooding.
- Looking to 2010, looking at proposed population figures. Now planning for investment till 2015.

-
- Regional figures are no help so they are not factored in, there is a need for more local information.
 - CE Electric – publish a Long Term Development Statement, which shows where all the cables and sub stations are located.
 - British Gas also produces Long Term Development Statements.
 - Physical boundaries include waterways, motorways, railways (which are a particular constraint). However there are solutions to everything as long as the money is there.

Appendix C

**Models for Funding
Infrastructure**

C1 Funding Infrastructure Through Planning

C1.1 The Current Approach

Funding infrastructure with developer contributions is an established principle, using the mechanisms offered through Section 106 of the Town & Country Planning Act 1990 and predecessor legislation.

The exact scope of Section 106 is continually subject to challenge and interpretation, but the general advice⁸ is that Section 106 should be used as a mechanism, in the context of a planning consent, to make development acceptable in planning terms, by (amongst other things) mitigating the impacts of the development.

A formulaic approach to Section 106 contributions has been developed in recent years, although the legality of this approach is subject to challenge. Nonetheless, the practice is now encouraged by Government and such formulaic approaches have been used to help fund strategic infrastructure projects – the most locally relevant example being the ‘Supertram Contributions’ scheme operated by Leeds City Council.

This approach requires a robust evidence base and a relatively strong commercial market. Nonetheless, in the case of Supertram Contributions in Leeds, the contribution has normally been subject to negotiation as part of the package of planning contributions (including affordable housing, open space etc), as well as abnormal site costs that might impact on viability.

C1.2 Evolution of the Approach

Nationally, there has also been a move towards a more structured approach to the formulaic application of Section 106, essentially as standard charging. Some years ago the Milton Keynes Partnership developed the Milton Keynes Development Tariff (aka the Roof Tax), which uses area-based tariffs to fund infrastructure. This is based on masterplans that are used to judge the scale of development proposed and the likely infrastructure. A straight forward guide to this is available here:

<http://www.miltonkeynespartnership.info/dfiles/DocumentLibrary/MKPTariffBrochure.pdf>.

Horley, City of London and Warrington have also development standard tariffs using the Section 106 process as a means of collection, and summary details are appended.

It is clear from all these examples that:

- there must be an obvious link between the development and the spend of the tariff;
- the tariff is just one source of the funding, and isn't being used to provide 100% of funding;
- that these approaches require detailed masterplanning together with a clear understanding of the likely infrastructure costs to ensure a robust level is set;
- the tariff needs to be considered either alongside or as an integrated element of other planning contribution ‘asks’ – most notably affordable housing; and
- that the largest proportion of the payment will be made following completion of the development.

The approach works most well in situations of plan-led growth, where there are few abnormal development costs which could undermine the overall commercial viability of development.

⁸ The Government's current policy on planning obligations is set out in Circular 5/05: Planning Contributions, CLG, July 2005.

C1.3 Examples of the Section 106 Tariff Approach

Examples taken from British Property Federation, Home Builders Federation, Major Developers Group and London First, submission to Government, December 2007, as set out in CLG's Community Infrastructure Levy document.

C1.3.1 Horley (Reigate and Banstead Borough Council)

A per-dwelling charge on all development within an urban extension of 2,600 units. The charge is set out in a Supplementary Planning Document (SPD), which states the infrastructure requirements for new developments in Horley based upon consultation with the county council and other service providers. The SPD lists the infrastructure that is required, gives a justification for the basis upon which it is being sought and explains how much developers will be expected to contribute towards the different categories of infrastructure. Contributions are sought for transport, education, fire and rescue, social services and community facilities. Obligations are secured through a model framework agreement, which addresses the issue of phased payments and the triggers for payment.

C1.3.2 City of London

A standard charging mechanism which uses standard formulae to calculate the level of contribution it seeks from developers for a variety of infrastructure requirements.

A series of identified areas, accompanied by specific plans, have been developed to assess where obligations will be required. Charges are on a residential unit and floor space basis. Differing thresholds apply depending on the type of development for which an obligation is sought. Contributions are sought for, amongst other things, education, CCTV, parking, health, and open space, as well as for the monitoring and enforcement of the scheme. Payment is usually required before the commencement of development although in some circumstances payments can be phased.

C1.3.3 Warrington Borough Council

A standard charging mechanism which seeks contributions on a per dwelling basis for residential development and square metre gross floor space for commercial development. The SPD indicates the type of development that should pay, the threshold (some obligations are only required for development of a certain size) and the amount sought.

Examples of contributions sought include education provision and health care facilities, public and community transport, cycling and pedestrian facilities, highway improvements, travel plans, amenity open space, sports facilities, and affordable housing.

Some obligations are calculated through the use of standard formulae, with the remainder negotiated on a case by case basis. Where the cumulative effects of development are identified, the council may pool contributions.

C1.4 The Community Infrastructure Levy

With a shift towards significant housing growth with a commensurate requirement for infrastructure investment, new models of securing funding have been examined by Government. This has included a number of studies⁹ and resulted in earlier proposals to introduce a 'Planning Gain Supplement' that would effectively tax the uplift in land value that results from the granting of planning consent. However, following Treasury consultation this approach was discontinued. What has emerged however is the concept of the Community Infrastructure Levy (CIL).

This is being progressed through the Planning Bill, currently before Parliament. However interim details are available in this guide:

<http://www.communities.gov.uk/documents/planningandbuilding/pdf/674479>.

⁹ Including Reforming Planning Obligations: A Consultation Paper, DTLR, 2001; and Contributing To Sustainable Communities: A New Approach to Planning Obligations, ODPM, 2003.

The exact scope of the CIL is still being determined, but the explanatory document makes the following points clear:

- that the levy should be used as one of a number of sources of funding for community infrastructure;
- that it's primary role will be for helping to deliver infrastructure to enable housing growth (although this will be more strategic in nature than the tariffs mentioned above);
- will need to be heavily evidence-based in terms of being set in relation to an identified list of deliverable infrastructure projects and be part of the 'plan-led' system;
- that CIL will sit alongside negotiated Section 106 agreements, that are still likely to be required to deliver affordable housing and other arrangements.

It is also still likely that the largest portion of the payment will be made following the completion of development.

C1.5 Conditions for a Tariff / Charge

Notwithstanding the future potential for Community Infrastructure Levy, it might be possible to go down a tariff route in the short-medium term. However, there are several probable conditions necessary for a formulaic tariff approach to work, including:

- a clearly defined area within which the tariff will apply;
- a masterplan setting out the scale of development proposed;
- a costed list of infrastructure (scope of 'infrastructure' clearly defined) required to enable that planned development; and
- all the above enshrined in planning policy, tested through consultation with stakeholders and developers.

It is crucial in adopting this approach that the viability of development is not undermined. This could be challenging in the context of complex brownfield development that could be subject to a range of unanticipated development costs.

C2 Emerging Models for Managing and Funding City Region Infrastructure

C2.1 Introduction to Development Planning and Infrastructure

As highlighted in Section 2 increasingly complex negotiations are creating bottlenecks in the delivery of infrastructure. The following demonstrate emerging options for facilitating delivery and overcoming the weaknesses in the system. The examples demonstrate both structural mechanisms and financial mechanisms for delivery.

C2.2 Multi-Area Agreements

The 2006, the Local Government White Paper proposed the introduction of Multi-Area Agreements (MAAs). The objective of MAAs would be to devolve power and pool funding streams to groups of local authorities that can demonstrate their ability to deliver on economic development objectives. This could see local authorities in, for example, Greater Manchester being given greater powers and resources to deliver key functions, such as public transport. Where appropriate, the Government could also build on the existing Local Area Agreement (LAAs) framework, by giving more powers over economic development to individual local authorities.

In theory, MAAs would reduce bureaucracy, improve coordination and transfer decision making for strategic investment to the appropriate geographic scale. In particular, MAAs are seen as a vehicle radically to improve cross-boundary working. However, many Whitehall departments are reluctant to pool major funding streams, and there have been questions raised as to how flexible such agreements really are. The Government must demonstrate the value of MAAs and LAAs, and its commitment to them, by detailing what funding streams and resources will be devolved through them.

C2.3 Economic Development Companies

C2.3.1 Economic Development Companies in general

Where practicable, Economic Development Companies (EDCs) should help simplify city economic development to potential customers through rationalisation and integration. Indeed the formation of EDCs represents an opportunity to simplify the current situation where local economic development operates in a rather crowded policy landscape.

The setting up of an EDC provides a good opportunity to re-think the nature, structure and quality of the local economic development ‘offer’ and give serious consideration to simplification and improving effectiveness. Fore example, ‘Creative Sheffield’ the CDC in Sheffield, was initially formed by integrating the functions of three existing ‘economic’ organisations in the city.

The integration of economic strategy, physical development and place making is likely to be one of the great strengths of the EDC.

Core activities for EDC could look something like this:

1. Strategic framework activity	Economic Masterplanning for the ‘economic footprint’ of the city.
2. Physical development	Delivery and coordination of key regeneration projects including: creating and developing advanced business infrastructure enhancing ‘attractiveness’ and the quality of public realm
3. Knowledge economy	Developing the knowledge Economy, including strengthening the city’s innovation infrastructure.
4. Business attraction and strategic marketing	Targeted investment marketing and business-winning including: smart inward investment strategic marketing
5. Destination development	Development of business and leisure tourism.
6. Others	Promotion of population growth.

C2.3.2 Economic Development Companies and infrastructure

Economic Development Companies, which in effect will be special purpose vehicles, are intended to ‘deliver transformational economic change across city regions’ in cities and urban areas by marshalling public and private sector resources and delivering regeneration investment.

Importantly, however, it is unclear whether EDCs will have the powers and financial resources required to deliver on this mission. Recently the Royal Institute of Chartered Surveyors argued EDCs will not have the desired effect without compulsory purchase (CPO) and land assembly powers, as well as the appropriate financial streams to underpin infrastructure investment and lever in private sector investment.

To some extent the current debate on EDCs reflects the experience of Urban Regeneration Companies (URCs) in recent years.

C2.4 Alternative Financing Mechanisms

C2.4.1 Supplementing Business Rates

One financing option for local infrastructure would be the introduction of a Supplementary Business Rate (SBR). This would allow local authorities to apply a geographically and temporally limited levy on business rates in order to fund specific infrastructure projects.

Supporters of an SBR have argued that it would provide a simple, clear, easily ring-fenced method of raising additional revenue to finance specific local or city-regional infrastructure projects. However, there are major political barriers to the introduction of an SBR. The Treasury, for example, is concerned about the impact that such a reform might have on the total tax burden.

Momentum has recently grown around the SBR concept. Business leaders in London have accepted the need for an SBR to finance a portion of the £10bn-plus Crossrail scheme, and are actively working with central government and the Mayor of London to fund the remainder of the project. The Lyons Inquiry recommended that local authorities gain a power to 'top-up' business rates and retain revenue locally. If implemented, this would create an important new revenue stream to underpin borrowing for major local infrastructure projects. There was an unenthusiastic response to the Lyons Inquiry's recommendation in the 2006 Budget. But if Ministers are serious about finding new methods of raising finance for infrastructure investment and giving local actors the flexibility necessary to make their own decisions, they need to give serious consideration to the introduction of an SBR.

C2.4.2 Tax Incentives Vehicles

Tax Increment Financing (TIF) would enable local authorities to finance infrastructure investment by borrowing against expected increases in tax revenue that would follow an infrastructure investment. There has been considerable support for this option from the private sector.

TIF has been successful in the US. Tax Increment Financing allows forward funding of infrastructure without additional business taxation, and it could give local authorities the power to deliver transport infrastructure without recourse to central government grants.

There are significant barriers to the introduction of TIF. The main issue is that, at present, British local authorities do not control a tax lever (e.g. business property rates) appropriate to underpin TIF. Another problem is that the mechanism would work when the economy is performing well, but it would not be as useful when the economy is weaker – and there are questions as to whether local authorities possess the skills to judge the viability of TIFs in relation to the economic cycle. Nevertheless, there is clear potential in TIF, and the model should be explored further – with a view to introducing TIF in one or more urban areas, in the first instance.

C2.4.3 Regeneration Investment Vehicles

Regeneration Investment Vehicles (RIVs) are shared equity agreements between public sector bodies and the private sector that typically see public sector agencies supplying land, and the private sector capital, in a 50/50 split.

Regeneration Investment Vehicles have a number of benefits. They have shown themselves to be effective facilitators of private-sector investment; they provide new revenue for infrastructure and site preparation; and they can create strong, long-term partnerships between the public and private sectors.

However, they also have their weaknesses. There is no local authority-level take-up to date because of legal and financial barriers, there are questions about local capacity to strike a deal due to the complexity of such agreements, and some variants would require legislation from the centre. Simplifying the regulatory framework, and enabling local authorities to use RIVs, could be a major step forward for urban infrastructure finance.

C2.4.4 Road Pricing

Road user charging is likely to be piloted outside London in the next few years. Local transport authorities, supported by start-up resources from the Transport innovation Fund, will manage the schemes. Any revenues generated by charging schemes will be ring-fenced to fund key local transport priorities.

There are a number of problems that need to be addressed, however, before road user charging becomes a useful tool for British cities seeking a new revenue stream to improve local infrastructure.

- First, cities want assurances that they'll be able to keep profits from charging schemes for at least 30-40 years, in order to fund investment in public transport. But the Government will only guarantee a ten-year period;
- Secondly, there are question marks over the impact that road pricing schemes will have on local economies, meaning that they may not be an appropriate method of financing infrastructure in all situations;
- Thirdly, public opposition to road pricing is strong; and
- Finally, cities fear 'first mover disadvantage'. Local leaders are unwilling to put their heads above the parapet for road charging projects – because they do not believe the pay-off is worth the political pain.

C2.4.5 Choosing Between Alternative Financial Mechanisms?

Introduction

How should decision makers select between these various financing options? Questions of effectiveness, speed, efficiency, sustainability and accountability all need to be considered, and trade-offs between these objectives may be necessary.

Flexibility	Who controls the finances? What conditions should be attached to the mechanism? Should funds be hypothecated?
Accountability	Is there a democratic basis for the use of the mechanism? Has there been adequate consultation over the scheme and mechanism? Who decides how the money is spent? Is the mechanism transparent and clear?
Budgeting	What is the impact on future/long-term budgets and revenue forecasts? What is the impact on other budget priorities?
Integration	Can funding be packaged with other revenue streams? Is the proposed mechanism flexible enough to be used across modes/types of investment?
Efficiency	To what extent should the public sector be financing the scheme under consideration? What should be the role of the private sector in financing the scheme? Does it deliver value for money for all concerned?

- If local authorities are not best placed to take forward investment, are we prepared to accept a stronger role for RDAs or CDCs despite their relative lack of accountability;

- Under what conditions and to what extent should the public sector be willing to fund infrastructure when private finance is not forthcoming; and
- What role, if any, should central government play in setting sub-national transport investment priorities?

The answers to these and other questions will vary considerably from place to place, depending on the specific circumstances and the needs of the local areas in question. It is likely that local conditions will shape the preferences of the actors concerned – meaning that one group of actors may value accountability more highly than another, for example.

Devolution to deliver infrastructure needs? - A way forward?

No clear route forward on infrastructure financing. Each of the options reviewed has its costs and benefits. It is unlikely that any one mechanism will be sufficient – either in terms of revenue generated or flexibility - to support the level of infrastructure investment required. A toolkit of different financing options will be required at local, sub-regional and regional levels in order to deliver appropriate transport infrastructure. This requires substantial devolution, with flexible national funding streams complemented by innovative local financial levers. In short, a culture change is needed in Whitehall – with a more flexible government system and local revenue raising powers as the new norm.

Cities need more autonomy to invest. Devolution is a critical step towards addressing the systemic weaknesses discussed above – the problems of centralisation, fragmentation, weak coordination and skills shortages. If these issues are not dealt with properly, they could continue to undermine the infrastructure development process, no matter what new financing mechanisms are introduced.

Devolution would give cities the financial and policy flexibility required to address local infrastructure needs. It would create a more responsive infrastructure financing system that would be able to deal with demand quickly by developing financing arrangements appropriate to local conditions – rather than having them handed down by Whitehall.

The level of financial fragmentation would be significantly reduced limiting the number of actors involved in the infrastructure development and regeneration process. A reduction in the number of public sector organisations and decision-points involved in infrastructure financing could lead to increased efficiency and faster delivery.

Strategic coordination would be improved by granting local actors and organisations the power and resources to lead the development process – rather than less responsive government departments or unelected regional quangos. The public sector needs to 'shorten governance chains. Local authority leaders and chief executives need to take ownership of development processes. Powerful local leaders could secure better deals for their areas, reduce delays and encourage investment. Local economic development skills could also be improved by building institutions with the power to attract top talent in the face of strong competition from the private sector.

The proposals for an Independent Planning Commission are not yet clear on what 'strategic infrastructure' means. In practice, many substantial infrastructure projects fall into a 'grey area' – neither wholly national nor wholly local in scale and impact.

Devolution needs to be to the appropriate spatial scale. In large conurbations, cross-boundary working has consistently been problematic – creating tensions between local authorities and causing delays in investment. There needs to be a broader, more coherent strategic approach to economic development that can join up the needs of the entire urbane economy and deliver growth. Multi-Area Agreements, focused on city-regions, provide one route forward.

In smaller, more compact economies, less radical forms of devolution and cross-boundary working might be more suitable.

Without giving local actors the financial powers to address infrastructure needs, and to experiment with financing solutions, the UK will continue to suffer from the urban infrastructure deficiencies identified over the course of the last three decades. Risk and experimentation are essential elements of local innovation.

C3 Warming Up the Region – Yorkshire and Humber Climate Change Impact Scoping Study

C3.1 Introduction

“Warming up the Region” was undertaken in 2002 as part of a series of sub-UK scoping studies completed with the support of the UK Climate Impacts Programme. The study was commissioned by Business in the Community on behalf of a consortium of organisations and funded by the Environment Agency, Yorkshire Forward, the Yorkshire and Humber Assembly and Government Office for Yorkshire and Humber. WS Atkins, Stockholm Environment Institute and the Met Office were appointed to undertake the study. The overall aim of the scoping study was to assess the potential impacts of climate change of the region.

C3.2 The Coastal Zone

C3.2.1 Impacts

The coastal area is likely to be at increased flood risks in the future without further investment in defences or retreat from the coast. Flood gates designed to protect Hull from flooding will require modifications to either their operational rules or design to provide protection over the next 50 years.

Extreme sea levels along the Yorkshire and Lincolnshire coast and within the Humber Estuary are expected to at least double in frequency over the next 50 years and may even increase up to seventeen fold over 80 years.

Rising sea levels have many other impacts on the coastal environment and on river water quality, for example:

- changing sea temperatures that will affect the type and quantity of fish stocks;
- a possible increase in the likelihood of algal growth in coastal waters; and
- more difficult maritime conditions affecting shipping.

C3.2.2 Opportunities

There are potential “wins” for the coastal zone, such as the development of new forms of tourism and recreation to take advantage of warmer climatic conditions. The main business opportunities relate to increasing the tourism potential of the coastal areas.

C3.2.3 Conclusions

The main impacts of climate change will be:

- Sea level rise at average rates of up to 9 mm per year;
- Increased risks of tidal flooding;
- Increased flood risks will affect many coastal industries;
- Increase coastal erosion and land sliding;
- Increase rates of coastal squeeze of important intertidal habitats; and
- Potential benefits of increased temperatures on the tourist industry that may help towards the regeneration of the coastal zone.

C3.3 Drainage, rivers and floodplains

C3.3.1 Impacts

The main impact of climate change is likely to be increased flood risks in terms of flood magnitude and (peak levels and volumes) and the frequency of flooding in winter months.

Maintaining defences

New and improved flood defence schemes will be required in some areas, while in those areas where reducing the risk of flooding through defences is not viable (economically or otherwise) it will be necessary to improve flood warning schemes and emergency response.

Urban drainage problems

Increased intensity of rainfall will lead to more urban flooding problems. This has implications for drainage in urban areas, where stormwater systems may require upgrading. Modern urban drainage systems are designed to store excess storm water in tanks, tunnels and ponds to ensure that large pulses of urban runoff are released at a controlled rate. Changes in the frequency of extreme rainfall events will mean that these in-built safety mechanisms will be used more often and become less effective leading to more flooding.

C3.3.2 Opportunities

Increased flood risk provides few direct opportunities with the exception of:

- Development of new flood proofing and flood protection products; and
- Specialist services to reduce the risks of supply chain or utility disruption due to flooding.

Climate change does however provide an added incentive to develop more sustainable drainage in urban and rural areas, change land use practices and to develop “win-win” situations that reduce flood risks and create new wetland habitats.

C3.3.3 Conclusions

In terms of fluvial flood risks the implications will be:

- Flooding events are likely to occur more frequently;
- Flood banks designed for infrequent use will be in use more often; and
- Urban drainage systems will not be able to cope with the increase intensity of winter rainfall events leading to more urban flooding and the disruption of urban transport systems.

The changing nature of flooding has important implications for the Environment Agency, local authorities, Yorkshire Forward, the RDA, nature conservation groups and anyone living and working in areas that are at risk.

C3.4 Water Resources**C3.4.1 Impacts**

The main impacts on water resources include:

- Overall groundwater levels will increase under the climate scenarios due to the increase in winter rainfall;
- Although the average situation will improve the increase variability of climate will mean that there will be increase risks of single drought years. Individual sources and water resource zones at risk and alternative emergency sources of water need to be identified as part of the water resource planning and drought contingency planning process;
- The demand for water will increase in warmer and drier months; and
- Some types of agriculture will have a considerable increase in demand during the summer.

C3.4.2 Opportunities

Opportunities should include:

- Improved water quality of some rivers;

- Changing chemical and physical river environments may provide opportunities for some conservation gain; and
- The development of real-time control technologies for industrial abstractions and discharges.

C3.5 Industry and Commerce

C3.5.1 Impacts

The impacts of climate change on industry and commerce are likely to be complex and interrelated. The perceptions of change and future climates may influence:

- Business location;
- industrial design and process efficiency;
- The design of buildings and building standards;
- The forms of products;
- Industrial relations;
- Elements of the general regional infrastructure; and
- Finance, investment priorities and insurance.

Changes in “normal climate” will have an effect on a whole range of infrastructure elements. The condition of roads, the stability of buildings, bridges, earth banks and dams and much else is a function of the climate in which they exist. Changes in design and the incidence of maintenance work was acknowledged as being affected.

Opportunities

There are no opportunities identified.

Conclusion

Forward planning to allow a precautionary attitude to some of the dis-benefits of climate change needs to be encouraged at the regional and local level. Local planning procedures in relation to industrial development need to have climate change implications at the forefront of procedures.

C3.6 Services

C3.6.1 Impacts

Tourism

There are continuous efforts to develop tourism in the Region and whilst there is a well-developed appreciation in the tourism industry that there must be a nurturing and constant development of tourism there is less awareness of the potential opportunities related to climate change.

Leisure and Sport Activities

Bodies running leisure activities have not really developed strategies related to the potential impacts of climate change but leisure activities are very dependant on the weather and have been heavily impacted in those years with unusual weather patterns.

Cultural Heritage

The anticipated change in the Region’s climate is likely to have a significant effect, both directly and indirectly, upon the heritage assets of the Region.

Construction of extensive flood defences to protect properties could for example destroy archaeological remains.

Increased rainfall will result in faster rates of erosion of the fabric of historic buildings of the Region. Apart from the damage that may be caused to buildings through flooding, the construction of flood defence works can have a major impact upon the character of historic settlements.

C3.6.2 Opportunities

There are a number of potential opportunities for the service sector:

- Environmental technology services are a growth sector and could be encouraged in the region;
- The development of specialist insurance and flood-proofing services;
- Developing partnerships: There is a key role for local authorities to promote coordinated policy responses to climate change impacts;
- The development of adaptive and flexible responses; and
- Awareness raising.

C3.7 Conclusion

The service sector is diverse and therefore so are the responses and opportunities in relation to potential climate change. The tourism sector probably has the most to gain from a change of climate, where as for the insurance sector there are considerable challenges. The sport and leisure industry faces a number of adverse spin-offs from climate change and it is important that the development of new and innovative facilities are planned with a change of climate in mind.

C3.8 Transport

C3.8.1 Impacts

The main impacts of climate change:

- Frequent flooding which will affect particular parts of the region's road and rail infrastructure due to the inability of drainage systems to cope with the intensity of water rainfall events;
- Increased risk of landslips along transport routes;
- General disruption of all transport operations (road, rail and air) resulting in economic losses; and
- A change in the transport use and the consequent effects on health.

C3.8.2 Opportunities

The impact of climate change on the Region's transport system has few opportunities other than ensuring that it is protected against flooding. Transport investments over the next 20-30 years should require all transport infrastructure developments to be climate change compliant.

Conclusions

Climate change impacts present the transport system with very real threats and opportunities. The threats are physical and have a direct bearing on the economic prosperity, competitiveness and quality of life of the Region. The consequence of higher car use is very worrying from a health, greenhouse gas, congestion and competitiveness point of view.