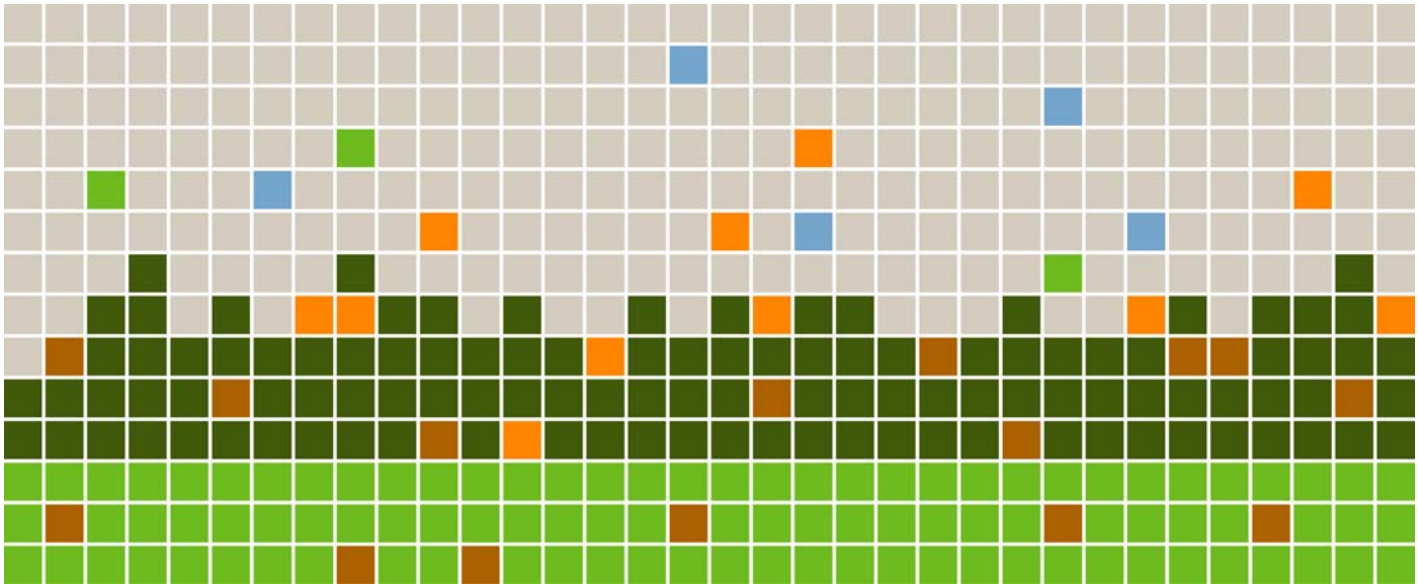

The Cambridgeshire Development Study

Final Report to:

Cambridgeshire County Council

Cambridge City Council

East Cambridgeshire District Council

Fenland District Council

Huntingdonshire District Council

South Cambridgeshire District Council

Cambridgeshire Horizons

July 2009

SQWconsulting WSP Pegasus Planning Group cambridge econometrics

QM

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Executive Summary

The Cambridgeshire Development Study has been undertaken by consultants WSP in association with Pegasus Planning, SQW Consulting and Cambridge Econometrics, to provide an evaluation of the potential spatial options for growth in Cambridgeshire and to identify areas of further work needed to guide the preparation of a preferred development strategy for the county.

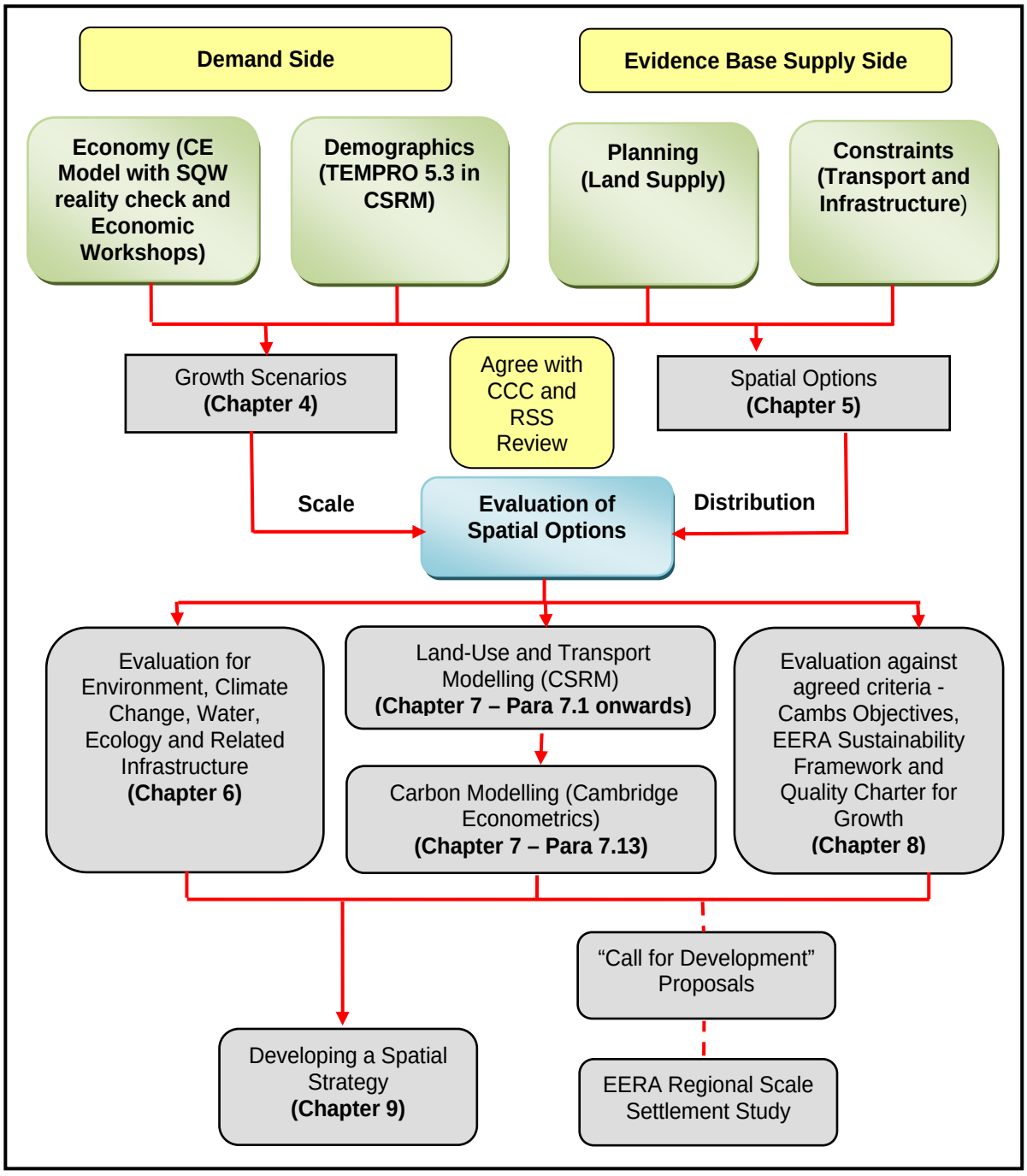
The Cambridgeshire Development Study requires evaluation and outputs to allow the Cambridgeshire RSS Review Study Group (senior officers of the Cambridgeshire local authorities and Cambridgeshire Horizons) and Cambridgeshire County Council (CCC) to formulate appropriate consultation responses to the East of England Regional Assembly (EERA) in the interests of recommending proposals for shaping sustainable growth in Cambridgeshire.

Delivery of the current strategy, embodied in the East of England Plan (and the earlier Structure Plan), is the top priority for Cambridgeshire, following Policy CSR1 and utilising the already identified housing supply with land available for up to 75,415 homes. The local authorities in Cambridgeshire are already putting into place a framework to implement this strategy, and Local Development Frameworks (LDF) are being prepared in each of the districts. However, delivery of the current strategy is likely to be challenging for the following reasons:

- The economic downturn reducing job growth and housing completions, at least in the near future;
- Land values reducing leading to challenges for delivery of necessary infrastructure related to new development;
- Enabling Cambridge East and significant allocated housing on the edge of Cambridge to move forward by finding a suitable site for the relocation of Marshall Cambridge Airport;
- Uncertainty of future infrastructure costs and the likely gap between infrastructure requirements and available funding with a gap identified of up to around £1bn to 2021[1];
- The need for an agreed transport solution for Cambridge and its surrounding area, such as through the Transport Innovation Fund (TIF) or similar levels of investment; and
- Additional requirements relating to adaptation and mitigating the impacts on climate change

The methodology for the study is set out below.

[1] Cambridgeshire Horizons LTDP



This study has used the Vision and Objectives developed by CCC and the RSS Study Group, and the Quality Charter for Growth to inform and shape the process of developing the growth scenarios and spatial options together with providing a guide to the evaluation of the options tested.

Compared to the range of 98,000 to 129,000 (2006 – 2031) in the EERA scenarios, the study set more realistic growth scenarios for testing in Cambridgeshire at 75,000, 90,000 and 110,000 new homes i.e. baseline, medium and higher growth scenarios. These were based on likely employment projections and taking account of the current economic downturn and reduction in rate of house building.

The following spatial options, which emerged from the findings of a background analysis, were assessed;

- baseline (current strategy included in all options);
- north of the County – market towns and other main settlements;

- urban extensions in the south – around Cambridge; and
- new settlements.

The testing for the growth scenarios against the spatial options is summarised below.

Growth Scenario	Baseline	Spatial Option		
		Market Town	Cambridge Expansion	New Settlements
75,415		Current Strategy Included in all options		
90,415	n/a			
110,415	n/a			

These spatial options were then used to test against the growth scenarios, within WSP's land-use model for the County, the Cambridge Sub-Regional Model (CSRM). Spatial housing pattern within the CSRM were based on Cambridgeshire County Council's (CCC) projection of strategic site developments and CCC's Research Group's revised estimates of the total development by Ward. The employment projections produced by Cambridge Econometrics, with a reality check by SQW, were also input into the CSRM to generate demand for commercial floorspace. Outputs from the CSRM were used to inform Carbon impacts. Evaluation was also carried out using the EERA Sustainability Objectives together with the Cambridgeshire Objectives.

The study has found that:

- There is already committed land for some 75,000 dwellings in Cambridgeshire which could last up to 20 years;
- Revised job growth projections suggest fewer than 2,000 new jobs will be created per annum up to 2030 compared to an assumption of 3,750 per annum in the current RSS to 2021[2];
- 69% of jobs growth is projected for Cambridge and South Cambridgeshire with 14% in Huntingdonshire, 14% in East Cambridgeshire and 3% in Fenland
- There is a shortfall of jobs between demand for employment from the housing numbers and job supply in the future. Spatially, the largest proportion of shortfalls are in East Cambridgeshire, Huntingdonshire and Fenland, while, March and Wisbech have the largest shortfall in employment amongst the market towns.
- Sufficient floorspace is available at present to support growth in all districts and employment types, with the exception of retail growth in East Cambridgeshire based on current employment growth forecasts;
- There is an imbalance for homes to jobs that will cause out-commuting from the majority of districts and in-commuting to Cambridge;
- The number of trips and commuting levels increases significantly in all options. There is a total of approximately 44,000 extra commuting trips across the County for the 2031 baseline relative to 2006 commuting trips. These trips increase for the medium and higher growth scenarios by about 5% and 11% for the Market Towns Spatial Option, 5% and 13% for the Cambridge Option, and 8% and 17% for the New Settlement Option, relative to the 2031 baseline;
- The average distance for work journeys, however, varies with the spatial options. Cambridge option with the medium growth scenario has the lowest total (and

[2] For comparison purposes only as considers different periods and modelling undertaken before and after the impacts of the economic downturn

average) trip km, although the addition of housing further from the City under the higher growth scenario results in an increase in trip km. Conversely, total trip km reduces between the medium growth scenario and the higher growth scenario for the Market Towns option. This is likely to be a result of a level of increased self-containment as the market towns increase in size (subject to attraction of jobs), however there is still significant commuting to Cambridge and its surrounding area.

- Non-work trips increase by approximately 153,000 across the County in the 2031 baseline relative to 2006 figures. These trips increase for the medium and higher growth scenarios by 4% and 9% for the Market Towns Spatial Option, 7% and 16% for the Cambridge Option and 8% and 19% in the New Settlement Option, relative to the 2031 baseline;
- Mode shares in Cambridgeshire are dominated by car travel in the baseline and all growth scenarios, with no notable differences between the spatial options. It should be noted that this is based on current travel behaviour and known and planned transport measures only. Therefore, for significant changes in travel behaviour, a step change in appropriate transport provision and techniques will be required in any scenario to achieve a sustainable outcome;
- Transport CO_2 emissions increase, relative to 2006 figures, by 20% for the 2031 baseline, 25% and 33% for the Market Towns, 23% and 26% for the Cambridge centred growth and 29% and 40% for the New Settlement Option in the medium and higher case options respectively;
- The Market Town options present challenges in terms of flood risk and ecology;
- The Cambridge Based option could lead to water stress; and
- The New Settlement options present significant challenges for ecology, flood risk and wastewater treatment;
- Infrastructure challenges for public and community facilities, such as schools, result from all the spatial options, albeit the Cambridge and Market Town based growth already start from an existing base whereas the new settlement options require a start from new; and
- Congestion and high carbon emissions emerge as major risks in the infrastructure assessment.

Considering testing up to 2031 the study found the following key challenges:

- Delivery of the current strategy in terms of the provision of suitable infrastructure, implementing appropriate transport solutions and achieving economic growth targets;
- There are a number of risks relating to flooding and other water based issues that could affect the future pattern of development;
- potential of a further new settlement to attract employment opportunities and be supported by adequate transportation and social infrastructure;
- the difficulty of diverting growth and economic prospects from the south to the north and the market towns enabling market towns to become more self contained;
- limited capacity and pressure on services where growth pressures are greatest around Cambridge;
- impact upon the integrity and purposes of the Cambridge green belt;
- ability of Cambridge city centre to accommodate further bus and car movements; and
- availability of sufficient funding to improve infrastructure to support growth.

- significant changes to travel behaviour to the use of non-car modes are dependent upon provision of suitable high quality public transport and other sustainable transport infrastructure, which will be a huge challenge to deliver in all options.

In summary, the study finds that all further options pose additional environmental, infrastructure and job creation challenges, especially at the higher levels of growth. These challenges will be more significant for the new settlement options. Evaluation of the options, based on these findings, against the EERA Sustainability Objectives, the Cambridgeshire Objectives and the Quality Charter for Growth Guidelines, favours 90,000 homes as a deliverable maximum to the year 2031, for planning purposes, delivered through the existing supply of 75,000 homes within the current strategy and a balanced approach for further expansion as follows:

- Regeneration in selected market town locations as sustainable extensions where a change towards non-car travel can be achieved;
- Focus on making best use of existing infrastructure for sustainable transport links with possible selective growth along such corridors; and
- Cambridge, incorporating a further review of the green belt boundary, subject to an agreed transport solution to cater for such growth and addressing the physical capacity issues.

This approach would be dependent upon where growth would be justifiable and deliverable and where capacity is shown to be available. With an achievable maximum of 90,000 homes this would be an extra 15,000 over the supply following the current strategy. Further work would need to be done to identify the priorities, distribution and pattern for this additional housing based on the spatial framework set out above. The evaluation of the study's findings leaves the new settlements option extremely challenging and not necessary under these levels of growth.

If further housing is to be delivered at Cambridge, an assessment of the extent and purposes of the green belt will be required and appropriate exceptional circumstances identified to warrant any possible change to the existing boundary, however at this stage a green belt review is not considered necessary as significant new housing is already identified in Cambridge for the next 15-20 years. If there are limited opportunities to achieve further housing growth at Cambridge, the policy emphasis will need to be placed upon the market towns and locations best placed to maximise the benefits arising from existing and other deliverable infrastructure commitments.

The key element to the delivery of sustainable growth beyond the current strategy will be identifying the crucial interventions that allow sustainable travel behaviours and identifying the sources of public and private funding to deliver such growth. An appropriate balance of homes to jobs in locations for growth across the County is crucial to seeking to encourage sustainable commuting patterns. With this in mind, homes will need to be located where in close proximity to successful employment locations and facilities and services within cycling and walking distance as well as being placed close to high quality public transport. The land-use modelling supports this as key to encouraging sustainable commuting patterns through the findings on the distances travelled for commuting journeys to work

Whilst this study and the findings in this report are based on current travel habits and the best known projections of future changes, there are likely to be changes in technology in the period to 2031 and beyond which will influence behaviours. Any strategy for growth therefore should aim at reducing carbon impacts based on the latest emerging guidance and legislation whilst embracing initiatives for smarter travel and appropriate use of technology.

1 Introduction

1.1 BACKGROUND

1.1.1 A project team of WSP together with SQW, Pegasus and Cambridge Econometrics have undertaken The Cambridgeshire Development Study.

1.1.2 The Cambridgeshire Development Study provides evaluation and outputs to allow the Cambridgeshire RSS Review Study Group (senior officers of the Cambridgeshire local authorities and Cambridgeshire Horizons) and Cambridgeshire County Council (CCC) to formulate appropriate consultation responses to the East of England Regional Assembly (EERA) in the interests of recommending proposals for shaping sustainable growth in Cambridgeshire.

1.1.3 This final report sets out the findings of the study by the project team. Key findings from this report were presented to the Joint Cambridgeshire Regional Spatial Strategy Review Panel (CRESSP) meeting held on 7th April 2009.

1.1.4 The study provides an evaluation of the potential spatial options for growth in Cambridgeshire rather than a specific conclusion and therefore sets out opportunities and constraints related to the delivery of such growth. The study also identifies areas of further work needed to provide detailed clarification and guidance to determining a preferred spatial strategy for the County.

1.2 PURPOSE OF STUDY

1.2.1 The study's aims and objectives are as follows:

- *An appraisal of the evidence and assessment and identification of those aspects which are most relevant to Cambridgeshire and which should be used to inform the preparation of a realistic range of spatial planning options to 2031 and beyond;*
- *Make a technical assessment of how well the existing strategy is working and whether it can be rolled forward to 2031. Other spatial approaches will need to be identified, tested and assessed;*
- *Consider how the strategic options relate to the EERA growth scenarios and what might be needed to close the gap (infrastructure, employment changes etc);*
- *Consider the "Call for Development Proposals" submitted to EERA and the Regional Scale Settlement Study;* and
- *Undertake an evaluation of the strategic planning options, including Land-use Modelling and consideration of carbon impacts.*

1.2.2 This Final Report covers the following areas:

- **Chapter 2: Development Strategy** – covering the current spatial picture, progress with and future challenges for delivering the current strategy;
- **Chapter 3: Process** – the methodology for the work undertaken for the study;
- **Chapter 4: Growth Scenarios** – review of the EERA growth scenarios and presentation and rationale for more robust growth scenarios for Cambridgeshire;
- **Chapter 5: Spatial Options** – the Vision and Objectives for Cambridgeshire and developing the spatial options for testing and the reasoning behind the options;
- **Chapter 6: Evaluation** –**Environment, Climate Change, Water, Ecology and Related Infrastructure** considers the constraints in Cambridgeshire;

- **Chapter 7: Evaluation** – **Transport, Economy and Carbon Impacts** considers the balance of homes to jobs and prospects for employment growth to support housing and the broad strategic findings from the land-use model and associated analysis and testing of the spatial options. It also covers the carbon aspects for the employment and housing numbers together with the transport related trends;
- **Chapter 8: Evaluation – Summary Tables** outlines the evaluation using the EERA Sustainability Objectives and Cambridgeshire Objectives and the key advantages and disadvantages covering sustainability, feasibility and deliverability and the infrastructure requirements related to the spatial options. It also covers the relationship to the Call for Developer proposals and Regional Scale Settlement Study;
- **Chapter 9: Developing a Spatial Strategy** – how the key elements of the evaluation and testing lead into developing a possible spatial strategy and outlines the challenges for spatial strategies for Cambridgeshire;
- **Chapter 10: Summary and Conclusions** – summary of findings and recommendations of any next steps.

1.2.3 It should be noted that Chapters 2 and 3 largely consist of sections from the Interim Report but are included for consistency and context to this Final Report.

1.2.4 For the purposes of this study the term “growth scenario” is used to describe the amount of increase in housing numbers and employment and “spatial option” describes the distribution and pattern across the County of the proposed growth.

2 Cambridgeshire Development Strategy

2.1 INTRODUCTION

2.1.1 The Cambridgeshire and Peterborough Structure Plan (2003) has largely been superseded by the East of England Plan (May 2008), with the exception of thirteen saved policies as listed below:

- P2/3 Strategic Employment Locations
- P2/5 Distribution, Warehousing and Manufacture
- P4/4 Water-based Recreation
- P6/1 Development-related Provision
- P7/10 Location of new Sand and Gravel Workings
- P8/10 Transport Investment Priorities
- P9/2b Review of Green Belt Boundaries
- P9/2c Location and Phasing of Development Land to be released from the Green Belt
- P9/5 Economic Regeneration of Chatteris
- P9/8 Infrastructure Provision
- P9/9 Cambridge Sub-Region – Transport Strategy
- P10/3 Market Towns – Peterborough and North Cambridgeshire
- P10/5 Peterborough – Hampton

2.1.2 The District Local Plans will be superseded by the Local Development Frameworks (LDFs), under the Planning and Compulsory Purchase Act 2004, and will consist of Development Plan Documents prepared by Local Planning Authorities to guide development. It should be noted that this Study has taken into account the policies of the LDFs when developing the baseline case.

2.1.3 The East of England Plan does set out housing and employment totals for the County and Districts within Cambridgeshire but it does not contain an overall vision or strategy for Cambridgeshire as a whole. However, for the Cambridge Sub-Region[3] it carries forward the aim of the Cambridge and Peterborough Structure Plan (2003) and RPG6 (the previous Regional Spatial Strategy(RSS)): "*to provide for a sustainable pattern of development to accommodate necessary growth in the sub-region, with a better balance between employment and housing focused on Cambridge and the surrounding area"*. The Cambridge Sub-Region's strategy is set out in the East of England Plan and is designed to:

- Secure the necessary infrastructure to continue to develop the Cambridge Sub-Region as a centre of excellence and world leader in higher education and research, fostering dynamism, prosperity and further expansion of the knowledge-based economy spreading outwards from Cambridge; and

[3] *"The Cambridge sub-region comprises Cambridge and the surrounding area as far as and including the market towns of Chatteris, Ely, Haverhill, Huntingdon, Newmarket, Royston, St Neots, St Ives and Saffron Walden." (The East of England Plan, May 2008)*

- Protect and enhance the historic character of Cambridge together with the character and setting of the market towns and other settlements and the important environmental qualities of the surrounding area.

2.1.4 As a centre for world-class research and development with significant sectors and businesses clusters including ICT, life sciences and environmental technologies, the Cambridge Sub-Region is recognised as key to the economy of the region. The East of England Plan identifies it as a growth area, i.e. *"an area where the most significant development and regeneration challenges in the region are concentrated, and provides a framework for helping to prioritise investment in infrastructure and, where necessary, for establishing strengthened delivery arrangements".* To meet the region's development policies, new development will have to be concentrated within the Cambridge area. The East of England Plan has set out the minimum targets, presented below, for Cambridgeshire.

2.1.5 A net growth of 75,400 jobs for the period 2001 to 2021 has been set as an indicative target for Cambridgeshire (Policy E1: Job Growth). Allocation of sites is based on the desire to minimise commuting and promote more sustainable communities, maximise public transport use, minimise adverse impacts to environment, and wildlife sites of international importance and the ability to provide appropriate skills and education (Policy E2).

2.1.6 As part of the minimum regional housing target of 508,000 between 2001 and 2021, for the East of England, (Policy H1), minimum targets have been set for Cambridgeshire as shown in Table 2.1.

District/Area	Minimum Dwelling Provision, 2001 to 2021		
	Minimum to build	Already built	Still to build
	April 2001 to March 2021	April 2001 to March 2006	April 2006 to March 2021
Cambridge	19,000	*2,300*	16,700
East Cambridgeshire	8,600	*3,240*	5,360
Fenland	11,000	*3,340*	7,660
Huntingdonshire	11,200	*2,890*	8,310
South Cambridgeshire	23,500	*3,520*	19,980

Table 2.1: Dwelling Provision Minimum Targets for Cambridgeshire as Specified by the East of England Plan (May 2008)

2.1.7 A specific strategy for the Cambridge Sub-Region is set out in Policy CSR1 of the RSS which makes provision for development in a specific order of preference as follows:

- in the built up area of Cambridge;
- on the periphery of Cambridge on land released from the Green Belt (set out in the 2003 Structure Plan and relevant local development plan documents);
- at Northstowe new settlement; and
- at market towns and key service centres.

2.1.8 Other Policies are also included for the management of employment development in the Cambridge area (CSR2), setting out the purposes of the Cambridge Green Belt (CSR3) and indicating a transport strategy based on high quality public transport systems, encouragement of cycling and walking and reducing the need to travel, while recognising the strategic position of Cambridge on east-west and north-south routes (CSR4).

2.1.9 Policies CSR1 to CSR4 are included in full in Appendix A. The Cambridge Sub-Region transport strategy, set out in Saved Policy P9/9 of the Cambridgeshire and Peterborough Structure Plan, is focused on improving and providing high quality public transport services along key transport corridors, demand management measures, provision of more walking and cycling facilities, highway improvement schemes and infrastructure improvements for the disabled.

2.1.10 Saved Policy P2/3 of the Cambridgeshire and Peterborough Structure Plan (2003), superseded by the East of England Plan, identifies the County's strategic employment locations on the basis of their ability to provide a major role in the employment strategy as follows:

- land at Alconbury Airfield;
- the new settlement at Longstanton / Oakington (Northstowe);
- March Trading Park;
- the south-west approach to Wisbech;
- land on the edge of Cambridge to be released from the Green Belt (in accordance with Policy P9/2c) at locations close to Addenbrooke's Hospital between Madingley Road and Huntingdon Road and at Cambridge Airport; and
- land at Chatteris.

2.1.11 The consultation Draft PPS4 Planning for Prosperous Economies[4] could affect allocations for economic development in the future. Firstly, if such sites are not used for the allocated economic use then alternatives should be actively considered, including housing. Secondly, parts of former guidance that provided for selectively managing employment types to help foster high technology and related industries have not (so far) been included in the latest draft. This omission could increase employment, housing and commuting pressures, particularly in the southern part of the County around Cambridge.

2.1.12 To provide further context the spatial picture of each of the districts is included below.

District	Description
Cambridge	Cambridge City covers an area of about 4070ha and is surrounded by a tight Green Belt. It lies about 60 miles northeast of London and had a population of about 120,000 in 2007. Cambridge is an internationally renowned historic university city, acknowledged internationally as a leader and centre of higher education, research, high technology industry, science clusters and related service sector industries. It attracts over 4.1 million visitors a year. In 2007, employment was estimated to be 99,700 (Cambridge Econometrics) with 22,000 jobs in education, 12,500 in health and social care,12,000 in professional services (Rand D, Technical Consultancy, Legal Firms and Financial Services) and 9,700 in Retailing. A small manufacturing sector exists with less than 4000 jobs. The city has a strong and dynamic economy due to its flourishing high-tech industry, biotechnology, health services and several specialist services. It is recognised as a key economic driver in the East of England with the largest retail and service sector in the sub-region, and, in 2006, was rated the 9th most prosperous city in the UK. 114,000 jobs are based within the City boundary and only 45% are taken up by its residents. Only 1.4% of its population is unemployed. Although salaries in the high technology sector are relatively high, housing

[4] Draft PPS4 Planning for Prosperous Economies May 2009 DCLG

District	Description
	affordability issues exist particularly for key workers and those on lower incomes. Cambridge City is well located strategically and is bounded by the A14/M11 and the A11. It has good rail links with London, Stansted Airport and the whole eastern region. With over 50% of its workers commuting from neighbouring authorities, the city suffers from traffic congestion on its radial routes and the centre. The city has 1579 listed properties, 5 scheduled ancient monuments and 11 historic parks and gardens. 10 conservation areas covering 18% of its area are designated within the City. The city also contains 15 County Wildlife Sites. Both Cambridge City and South Cambridgeshire District Councils have applied to the Electoral Commission for modifications to their boundaries. If approved, this will mean that some housing currently in South Cambridgeshire would move into the City and vice versa. For this study, it is important to note that Cambridge Airport, part of Cambridge East, would transfer into the Cambridge City district from South Cambridgeshire.
Huntingdonshire	The district encompasses an area of 350 sq miles and is predominantly rural in character with just 6% of urban land. Its population in 2007 was estimated to be 168,000 people and about 50% of them live in its four market towns of Huntingdon, St Neots, St Ives and Ramsey. Huntingdon is its administrative centre, the primary shopping centre and is well connected with the strategic road network and the East Coast Mainline Railway. St Neots, however, has the district's largest population and has its own rail station and direct access to the A1. Ramsey, whilst in Huntingdonshire, also closely aligns itself with the characteristics of Fenland. Its economy is mainly based around business services, manufacturing (12,000 jobs) and a strong public sector base. It is strong and relatively diverse and growth sectors include hi-tech manufacturing, environmental sciences, clean and bio-tech. Jobs in education and health care amount to around 15,000 each; public administration and defence account for more than 8000 jobs (County HQ for Fire and Police and major defence establishments). Professional Services employ a further 7,500 workers in some high profile businesses such as Huntingdon Life Sciences. Other sectors in excess of 5,000 jobs include retail and construction. Incomes are above the national average, but pockets of deprivation exist, particularly in Huntingdon North Ward and Eynesbury Ward. It's anticipated that its continued growth will generate additional demands on its physical and social infrastructure, adequate and timely provision of which is a key challenge The A1 offers the district access to the north-south and the A14 provides strategic east-west links and access to Europe via the East Coast ports. Airport access is remote with Stansted, Luton and Birmingham being the closest passenger airports. Bus services operate more frequently within and between the market towns and only 17 (out of 100) other villages have an hourly (or better) bus service. The district contains sites of international importance for biodiversity like the Ouse Washes, Woodwalton Fen and Portholme Meadow. It has 25 Sites of Special Scientific Interest, 4 Woodland Trust Sites and over 125 County Wildlife Sites. Within the District there are 2568 listed buildings,91 scheduled ancient monuments and 58 conservation areas.
Fenland	The district has a total population of approximately 91,800 (estimated in 2007), 71% of which is located in its four market towns of Wisbech, March, Whittlesey and Chatteris.

District	Description
	Wisbech is the largest town in the district and is a trading centre for a wide rural area with an inland port, the only port in Cambridgeshire. Its position on the A47 and renowned built heritage makes the town a stopping point for tourist traffic heading to the North Norfolk Coast. March and Whittlesey provide a range of high order services although proximity to Peterborough has led to a decline in the Whittlesey's service role. Chatteris, the most modest of the towns, in terms of services, has benefited from Cambridge's economic growth. Fenland's average household size is 2.34 according to the 2001 census. This has however fallen in recent years, and, combined with migration, has led to substantial population and housing growth in the district focused in Chatteris and March along with the villages of Doddington, Wimblington and Manea, all located in the corridor of the Cambridge Sub-Region.. Land values and house prices are buoyant due to the growth of Cambridge and Peterborough making the surrounding villages popular for commuters. The district's ratio of house prices to income is high compared to the region's and it is anticipated that housing demand and price will continue to increase with the continued growth of the Cambridge Sub-Region as well as King's Lynn. Fenland employment figures suggest some 41,200 jobs in 2007 which account for 60% of residents from within the district. It has a low wage economy, with the biggest employment sector being wholesale and retail trade (some 4,200 jobs), and manufacturing (some 7,000 jobs). Public services employment accounts for a fifth of the jobs. The district still offers many direct and indirect jobs in food processing, specialist engineering, packaging, transport and business services from its agri-food sector which used to be the backbone of its economy (each sector employing some 3,000 jobs each). The A47 links the district to Norfolk and Peterborough, the A141 and A142 to Cambridge via the A14/M11, and the A1101 to Lincolnshire. Bus services are concentrated on these corridors and in market towns, and are limited in the rural areas. The Birmingham-Peterborough-Stansted Airport Rail Line runs through and connects the district. It contains many walking and cycling routes including, among others, three routes on the National Cycle Network (NCN1, 11 and 63). Its four market towns have a strong historic character. The district has 756 listed buildings, 20 scheduled ancient monuments 10 conservation areas and 31 County Wildlife Sites. Its landscape comprises typically wide-open views across fields with important environmental assets including migratory and threatened bird habitats, the Nene and Ouse – two areas of international wildlife importance. Biodiversity levels are however low in the district. Much of its land level is between 1m below and 1m above OD.
East Cambs.	The district is located in the north-east of Cambridgeshire and encompasses an area of 655km^2. It's predominantly rural and has a population of 81,100 as estimated in 2007. 45% of this population resides in its 3 market towns i.e. Ely, Soham and Littleport. Experiences housing growth pressure as a result of Cambridge's economic success. It's one of the fastest growing districts in England in terms of population, but this and housing growth have outpaced its economic growth. This, combined with poor public transport services, has resulted in the district having one of the highest levels of out-commuting by car in the East of England. Local infrastructure and services are strained by the district's rapidly growing population. The district's economy is relatively strong with employment estimated to be

District	Description
	34,800 in 2007 and unemployment is only about 1%. Major sectors include business services, manufacturing, wholesale, haulage and agriculture, all employing between 3,000 and 4,000 jobs. There are large concentrations of industrial and commercial operations in Ely, Littleport, Sutton and Snailwell. However, skills and wages are generally low, and business formation rates are lower than the regional average. This, combined with the fact that house prices are relatively high, has created affordability problems. Generally the district appears affluent, but there are areas of deprivation particularly in the north and the remote rural areas. The northern part of the district is mainly low-lying (much of it being below sea-level) intensively farmed fenland. This area contains the three market towns and has been the focus of housing growth. It contains the majority of industry and manufacturing. Incomes are lower and deprivation is more marked here than in the south of the district. Ely, the district's main shopping, employment and commercial centre, has good rail connections to London, the North and the rest of East Anglia and is connected to Cambridge via the A10. The southern part of the district is mainly elevated chalk and heath land. It lies closer to Cambridge and benefits from rail links on the Ipswich to Cambridge Line. It also contains some suburbs of Newmarket and a small part of the Cambridge Green Belt. It contains 3 internationally important wildlife sites at Ouse Washes, Wicken Fen and Chippenham, 19 Sites of Special Scientific Interest and 81 County Wildlife Sites all important for biodiversity. In addition within the District there are 1135 listed buildings, 75 scheduled ancient monuments and 58 conservation areas.
South Cambs.	In 2007, employment in South Cambridgeshire was estimated to be 78,100 with a population of 136,900. The district has experienced relatively high job growth in recent years – faster than Cambridge City. Manufacturing is a very important sector with around 13,000 jobs in 2007, but the largest sector is professional services, with around 13,500 jobs. This includes many Research and Development companies and institutes, specialising in biotechnology and materials science. Health and social work is significant with a number of hospitals in the district, providing over 7,500 jobs. Education provides in the order of 7,000 jobs while sectors employing 4,000 or more people include retailing, wholesaling, leisure and personal services. The district has a number of prestigious science and business parks. These include the Cambridge Science Park in Milton, the Babraham Research Campus, Granta Park, The Sanger Centre at Hinxton, the Melbourn Science Park and the Cambridge Research Park at Landbeach. South Cambridgeshire is a predominantly rural district comprising over 100 villages surrounding Cambridge City. It has a number of market towns located on adjacent district borders. There a number of large villages in South Cambridgeshire with significant populations, including Sawston, Shelfords and Histon and Impington. These act as local centres. South Cambridgeshire surrounds Cambridge City and therefore there is a strong relationship between the two in terms of services, facilities and employment. The Cambridge Green Belt surrounding Cambridge is within South Cambridgeshire. Due to its proximity to Cambridge, the district has experienced considerable economic and housing demand growth. It does, however, have affordability issues as house prices in the district have risen to 8.7 times the average annual

District	Description
	salary. The district has 102 County Wildlife Sites and there are approximately 3,000 listed buildings and 25 Sites of Special Scientific Interest. there are 3036 listed buildings, 131 scheduled ancient monuments and 84 conservation areas. The current strategy for growth in Cambridgeshire already continues to place significant housing and employment on the edge of Cambridge as well as in the new settlement at Northstowe. The district is well located strategically with direct rail access to London and Stansted and road access via the A14/M11. As referred to under 'Cambridge City' above, it is likely that the boundaries with Cambridge City will be re-aligned within 2 to 3 years resulting in a transfer of housing and employment to Cambridge City and vice versa.

Table 2.2: : Cambridgeshire Spatial Picture

2.2 DELIVERY OF THE CURRENT STRATEGY

2.2.1 The current strategy as set out above is included in Policy CSR1 of the RSS. Policy H1 of the East of England plan sets out the minimum targets for housing completions in Cambridgeshire.

2.2.2 The local authorities in Cambridgeshire are already putting into place a framework to implement the strategy embodied in the East of England Plan (and the earlier Structure Plan). Local Development Frameworks (LDF) are being prepared and the relevant evidence base across each district provides information on housing completions since 2001 and trajectories outlining the level of completions anticipated in the period to 2026. Information contained within the annual monitoring reports has been used to inform Table 2.3.

Local Authority	Completions 2001 – 2006 *	Housing Trajectory 2006 – 2026
Cambridge City	2,329	17,172
East Cambridgeshire	3,191	7,272**
Fenland	3,348	11,176
Huntingdonshire	2,933	12,302
South Cambridgeshire	3,579	27,493***
Cambridgeshire	15,380	75,415

Table 2.3: : Progress in Implementing Policy H1 of the EEP

* *Housing Development in Cambridgeshire 2001 – 2008, Strategic Planning Research and Monitoring, Cambridgeshire County Council*

** *The estimated supply / capacity is to 2025*

*** *The Annual Monitoring Report indicates 25,752 completions in the period 2001-2023. SCDC notes that capacity at Northstowe and Cambridge East will increase the total supply in existing DPDs to 31,072 from 2001. This is the basis for the South Cambridgeshire supply (31,072 – 3,579 = 27,493).*

2.2.3 The progress in implementing Policy H1 of the EEP is shown in Figure 2.1 below.

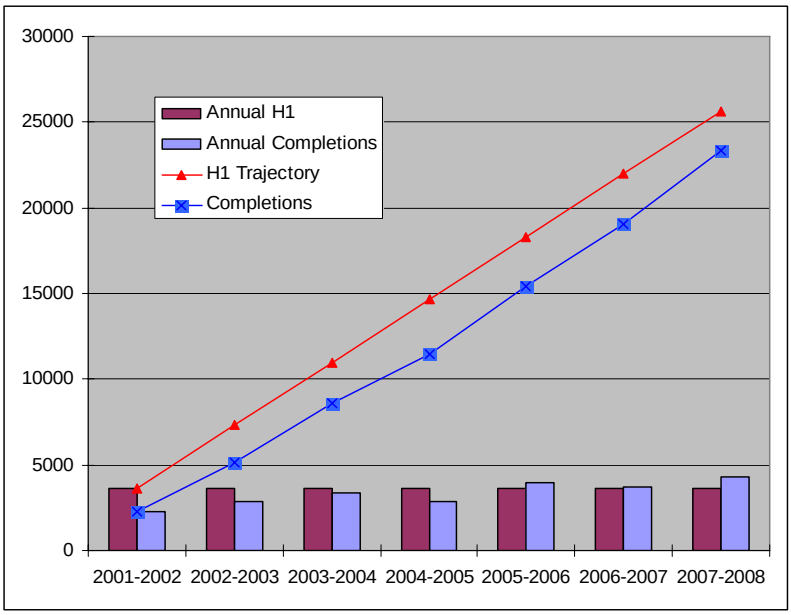


Figure 2.1 Progress with Implementing Policy H1 of the EEP

2.2.4 Figure 2.1 shows that progress has been slightly below that of the targets in the EEP. It should also be noted that as a result of the impact of the current economic downturn, the actual completions in the period from 2008 through to perhaps 2010/11 will be significantly reduced below the EEP Policy H1 targets.

2.2.5 However, Cambridgeshire has already made significant progress in increasing the rate of delivery of housing in the County, as shown below in Figure 2.2.

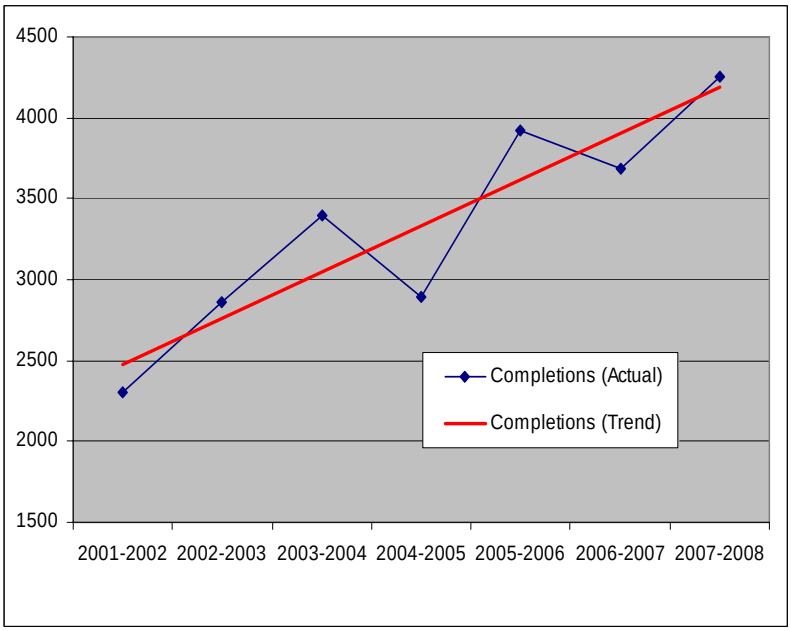


Figure 2.2 Housing Completions in Cambridgeshire

2.2.6 The current plans seek to reduce the longer distance commuting to Cambridge through selected growth around Cambridge and within Northstowe together with key towns and centres that can support growth in a sustainable manner.

2.2.7 The delivery of the current strategy is likely to be challenging for the following reasons:

- The economic downturn reducing job growth and housing completions, at least in the near future;

- Land values reducing leading to challenges for delivery of necessary infrastructure related to new development;
- Enabling Cambridge East and significant allocated housing on the edge of Cambridge to move forward by finding a suitable site for the relocation of Marshall Cambridge Airport;
- Uncertainty of future infrastructure costs and the likely gap between infrastructure requirements and available funding with a gap identified of up to around £1bn to 2021[5];
- The need for an agreed transport solution for Cambridge and its surrounding area, such as through the Transport Innovation Fund (TIF); and
- Additional requirements relating to the reducing the impacts on climate change

2.2.8 It is noted that the Cambridge economy is likely to remain strong when compared to the rest of the County. Cambridge Airport and Northstowe are fundamental to the delivery of the existing strategy and to providing the starting point and vital building blocks for any future strategy. However, at this stage no definite site has been identified for the relocation of Cambridge Airport, a fundamental prerequisite to achieving the planned urban extension here by 2031.

2.2.9 However, the delivery of the current strategy is the top priority for Cambridgeshire following Policy CSR1 and utilising the already identified housing supply with land available for up to 75,415 homes, as identified above in Table 2.3.

2.2.10 It should be noted, however, that the Sub-National Review and future merger of the RSS and Regional Economic Strategy (RES) seeks a greater emphasis on an evidence base and sub-regional delivery of employment and this will be operative from 2010. There may be challenges in situations where sites straddle Local Authority boundaries.

2.3 DEVELOPING A FUTURE STRATEGY

2.3.1 Cambridgeshire County Council together with the RSS Study Group has developed a Spatial Planning Vision for the County and this is set out below. By 2031 Cambridgeshire will be:

- **In relation to its people:**

  a County offering attractive homes, jobs and a high quality of life in a range of distinctive urban and rural communities with opportunities for all residents and workers to achieve their maximum potential;

- **In relation to the economy:**

  acknowledged as a world leader in knowledge based business and research, yet more diverse in its economy both in the Cambridge Sub Region and across the north and east of the County, including the expansion of appropriate-scale manufacturing and low carbon technologies;

- **In relation to transport and accessibility:**

  served by frequent high quality public transport within and between Cambridge and the market towns, with a closer relationship of homes to jobs and services, access to high quality routes for cycling and walking and good links to the countryside;

[5] Cambridgeshire Horizons LTDP

- **In relation to sustainability:**

  an exemplar of low carbon living, efficient use of resources, sustainable development and green infrastructure, founded on the retention of Cambridge as a compact city and the expansion of market towns with closely linked village communities;

- **In relation to the environment:**

  outstanding in the conservation and enhancement of its urban, rural and historic environment including a vibrant university city, attractive market towns, spacious fen landscapes, river valleys and an overall high degree of biodiversity;

- **In relation to climate change:**

  well prepared for the impact of climate change and highly adapted to its effects, especially in the extensive low lying areas of the County.

2.3.2 In addition, Cambridgeshire County Council together with the RSS Study Group has also developed RSS Review Objectives and these are set out below in Table 2.4. These objectives together with the vision are an essential starting point to developing any strategy for future growth in the County.

Delivery Plan for a realistic rate of growth that can be adequately supported by future investment in transport and other necessary infrastructure to be provided by developer contributions and other identifiable resources. Transport investment will be focussed on facilitating sustainable modes of travel or improving essential access in growth areas to make optimum use of the resources likely to be available.
Quality of Development Ensure that all development can be provided to a high quality with a distinct sense of place, respecting and learning from the traditional character of Cambridgeshire, including the historic environment and a logical, coherent settlement structure, and incorporating the principles of sustainable development including[6]: ▪ mixed uses and types of home ▪ appropriate densities to facilitate closer community life ▪ high quality, distinctive design ▪ safe walking and cycling ▪ good public transport access ▪ reduced opportunities for crime ▪ new habitats and landscapes ▪ encouragement of healthy lifestyles ▪ encouragement of social and community interaction
Housing Delivery Provide for a level and quality of housing growth to allow for the economic prospects and aspirations of the County and each local area. Ensure the provision of a high proportion of affordable homes, including social housing and housing for key workers related to identifiable needs.
Climate Change Ensure that the overriding need to meet the challenge of climate change is recognised by: ▪ only accepting growth that is designed and constructed to take account of the current and predicted future effects of climate change ▪ only accepting growth which can demonstrate a neutral or at least minimum adverse

[6] Also including the future of the Cambridge Green Belt as studies progress.

impact on climate change by achieving the highest possible standards in reducing CO_2 emissions (to be assessed individually on each development or cumulatively in association with related developments.) Factors to be taken into account include: ▪ sustainable location ▪ access to public transport ▪ ease of walking and cycling ▪ energy efficiency in buildings and renewable and low carbon energy sources ▪ efficiency in water use ▪ avoidance of flood risk and promotion of natural sustainable drainage systems ▪ avoidance of waste and promotion of sustainable waste management ▪ overall minimising the use of resources
Economic Growth New development will be encouraged that supports the growth of a sustainable low carbon economy in Cambridgeshire and strengthens its high technology and knowledge based clusters in locations that improve the alignment between homes and jobs. Sustainable economic regeneration and urban renaissance will be encouraged especially in northern Cambridgeshire, the rural areas and the urban centres of market towns. Economic prosperity will be promoted throughout the County.
Travel Planning – Smarter Travel Sustainable transport will be developed as a key component of overall sustainable development. All growth and infrastructure investment is to be planned to minimise the need for unnecessary travel and, where travel and mobility is beneficial or essential, the use of public transport or cycling and walking is to be given priority. Home working, remote working and IT developments that cut down on the need to travel are to be facilitated.
Quality of Community Life All new developments will have to enable and allocate land for a high quality of community life including access to work opportunities, community facilities, safe walkable streets and a network of open spaces and green infrastructure. Cultural diversity, recreation and the arts are to be encouraged. Priority will be given to regeneration and renewal in disadvantaged or declining communities. Community involvement will be essential to the design and implementation of all new communities and major developments.
Local Environmental Quality To improve and conserve the environment of Cambridgeshire in relation to: ▪ townscapes, buildings and heritage ▪ landscape and water resources (including the Cam, the Great Ouse and Nene and associated Washes) ▪ habitats and species (biodiversity ▪ public access to and enjoyment of the County's environmental assets in urban and rural areas (green infrastructure) ▪ minimising waste and pollution.
Scale and Location of Development Dependent on outcome of studies

Table 2.4. RSS Review Objectives

2.3.3 The “Cambridgeshire Quality Charter for Growth” sets out some core principles of the level of quality to be expected in new developments in the Cambridge sub-region. The principles are organised around four themes, namely:

- **Community**

Building a sense of community by providing a greater choice of housing along with active participation of people in the way their neighbourhoods are run.

- **Connectivity**

Locating new developments where they can benefit from high connectivity to jobs and services, and upgrading infrastructure to match the pace of development.

- **Climate**

Tackling climate change through imaginative landscaping that treats ‘water as a friend not an enemy’ and though an innovative approach to energy, transport and waste.

- **Character**

Creating places of character with distinctive neighbourhoods and a public realm that encourages people to walk and cycle.

2.3.4 This study has used CCC and the RSS Study Group’s vision and objectives, together with Cambridgeshire Horizons’ principles set out in the Quality Charter for Growth, to inform and shape the process of developing the growth scenarios and spatial options together with providing a guide to the evaluation of the options tested.

2.3.5 The Vision provides a reference point to the process of evidencing the emerging spatial themes and the development of the spatial options and a suitable growth strategy for Cambridgeshire.

2.3.6 The Cambridgeshire Objectives and the Quality Charter for Growth principles have been used in developing the evaluation criteria and are a reference point for comparing the spatial options when considering the key advantages and disadvantages.

3 Process and Methodology

KEY MESSAGES

- Separate workstreams covering independent views on demand and supply side implications for future growth
- Employment projections based on both past trends and performance and also policy-based using the dwellings required by Policy H1 of the East of England Plan to provide economic realism
- Economic Workshops have shaped the view on future economy and allowed adjustments and clarification on the employment projections
- Land supply identifies where current strategy will take the County and identifies implications for future growth and the likely gap when considering EERA growth scenarios
- The infrastructure supply looks at existing/planned measures that would have implications for the pattern for growth
- Themes emerging from the workstreams have been used to inform the growth scenarios and spatial options and testing
- Evaluation has been carried out using criteria stemming from the EERA sustainability framework and objectives together with the Cambridgeshire Objectives
- Modelling has been undertaken using the Cambridge Sub-Regional Model (CSRM) to consider the land-use implications and commuting patterns
- Carbon modelling has been undertaken using Cambridge Econometrics analysis of household and industry emissions, CSRM analysis of transport emissions, and reference to the DfT Carbon Pathways report.

3.1 METHODOLOGY

3.1.1 The process has been driven by a focus separately on the demand and supply sides influencing future growth in Cambridgeshire to provide three separate workstream papers and evidence base for:

- Economy;
- Land; and
- Infrastructure.

3.1.2 The demand side has provided consideration of how the economy of Cambridgeshire might change in the period to 2031, focusing particularly on issues relating to employment. It also provides an understanding of the differences in prospects for economic growth across the County, both sectorally and spatially. It also brings a market perspective and a reality check in helping to define and test spatial options.

3.1.3 The supply side has considered the evidence base for housing and employment land supply and the implications for future growth insofar as supply may influence where further growth could occur. In addition, consideration has been given to infrastructure that is already in place together with infrastructure that might be in place in the future, as well as any constraints, and what role this might play in developing the patterns of growth.

3.1.4 Taking the three workstreams and the emerging thoughts on spatial options to evaluate, this has resulted in the following main methods:

- Evaluation using criteria developed from EERA sustainability framework and CCC Objectives;
- Land-use modelling and assessment of census data; and
- Carbon Modelling considers the population and economic activity as well as employment types together with transport related impacts.

3.1.5 The testing criteria have been developed to take account of the EERA sustainability framework together with local Cambridgeshire objectives and indicators already available through each monitoring carried out by the District Councils and other frameworks and plans developed by Cambridgeshire Horizons.

3.1.6 Each of the spatial strategies will be tested against these criteria and will be largely based on the key advantages and disadvantages in qualitative form together with a limited range of quantitative indicators, largely based on the outcomes of the modelling and assessment by the project team. A key aspect of the testing will be deliverability, feasibility and sustainability.

3.1.7 Further detail on each part of the process is set out in detail below.

3.2 EMPLOYMENT PROJECTIONS

3.2.1 A key part of providing the demand side view on prospects for economic growth has stemmed from using the Cambridge Econometrics (CE) model to give employment projections together with gathering informed views from “Economic Workshops” on the future shape of the economy in Cambridgeshire.

3.2.2 The CE model has produced a set of baseline employment projections based on past trends and performance, which through economic workshops as part of this study and input by SQW, has allowed verification, analysis and data cleaning. However, it was also considered appropriate to provide an alternative set of projections based on Policy H1 of the East of England Plan for dwellings (and linked population) assumptions. The rationale for this is set out below.

3.2.3 The County Council commissioned SQW, to provide an initial assessment of the appropriateness of the EERA growth scenarios (and in particular growth scenarios 1, 3, 4 and 5: see Chapter 4) as they relate to Cambridgeshire. It concluded that delivery of such higher growth, by 2031, would be very uncertain and this is further considered in Appendix D on the Validation of the EERA Growth Scenarios. The further deterioration in the economic prospects and discussions during this study’s initial two economic workshops recently have given further reinforcement to that conclusion. The third economic workshop for key stakeholders and members of CReSSP re-emphasised the importance of testing growth scenarios that are based on realistic employment projections. This is further described below.

3.2.4 The trend based baseline projections provided by the CE model, unlike the work of Oxford Economics (which has been used by EERA), takes into account at least the earlier indications of the current economic downturn.

3.2.5 Guided by economic and stakeholder workshop discussions, held to canvass opinion as the study progresses, and reflecting known defects in official data, the project team has made a small number of adjustments to the outputs from the CE model. With these incorporated, CE’s projections can provide the basis for a scenario which has greater realism in respect of economic prospects up to 2031.

3.2.6 The CE model is, however, trend-based rather than policy-based, and we considered that the study would carry more conviction if a second set of projections was generated based on the population projections that derive from the Policy H1 dwelling requirements. The reasons for this are that:

- it allows us to draw comparisons between the trend-based and policy-based forecasts;
- if they were to differ significantly then we would have two scenarios to use as the basis for testing options; and
- if the differences were relatively minor then we would have confidence as to the soundness of testing options for the delivery of the H1 policy.

3.2.7 Our work to look at spatial options and their implications would thereby focus upon one or two scenarios that are rooted in a far greater degree of economic realism than the scenarios currently provided by EERA. The EERA scenarios would then be considered through a commentary on their implications cast in the context of a detailed consideration of what we regard as a realistic set of projections.

3.3 LAND AND INFRASTRUCTURE SUPPLY

3.3.1 In contrast to the likely levels of demand for employment, consideration was given to the future supply of land and infrastructure together with likely constraints, such as capacity of existing infrastructure now and in the future and environmental aspects.

3.3.2 This land supply workstream reviews the current supply of housing and also employment land in Cambridgeshire. It considers where the current strategy will take the County together with the implications for the amount of “new” land to be identified to address the growth scenarios put forward for testing by EERA. The local planning authorities in Cambridgeshire are committed to implementing the spatial strategy established in the East of England Plan published by the Secretary of State for Communities and Local Government on 12 May 2008 and the approved and/or emerging development plan documents provide the framework to deliver the required new housing in the period to 2021/2026. The purpose of the land supply workstream is to identify the scale of the “gap” between the growth scenarios to be tested and the scale of existing commitments regarding housing development. It also sets out what would happen if the strategy continued on this current pattern of growth in terms of land supply.

3.3.3 The purpose of the infrastructure supply paper is to provide an outline of the infrastructure related supply side of future growth in Cambridgeshire. It covers areas including transport, flood risk, water resources, environment and other infrastructure. It is based on available evidence set out in the Cambridgeshire Development Study Tender Documents.

3.3.4 The process in determining the findings is based on an assessment of the evidence base and identifies infrastructure, location and capacity related and environmental based supply issues, possible constraints and planned interventions that would have implications for growth.

3.4 BRINGING THE WORKSTREAMS TOGETHER

3.4.1 Each of the workstreams has presented independent findings within separate papers and summarised the potential implications for spatial options.

3.4.2 In order to seek to achieve the most sustainable pattern of development, particularly the spatial relationship between homes and jobs, the project team considers that the formulation of an appropriate spatial strategy for Cambridgeshire must be based upon realistic economic growth prospects, the capacity of existing/planned infrastructure and the availability of funding to enable the construction of new infrastructure to support higher rates of growth in the period to 2031 and beyond. This is consistent with the Government's own advice on the importance of deliverability in development plans and strategies.

3.4.3 With this in mind, the implications resulting from the three workstreams have been used to inform the options to be tested for spatial strategies.

3.5 TESTING

3.5.1 The County's Cambridge Sub-Regional Model (CSRM) has been used to then provide an assessment of the following:

- Balance of homes to jobs;
- Consideration of spatial patterns of working age population and distribution of employment based on the CE projections;
- Analysis of trip generation, commuting patterns and mode share; and
- Outputs to feed into the transport related carbon emissions.

3.5.2 Furthermore, Cambridge Econometrics have undertaken assessment of carbon impacts relating to economic activity and type together with changes in population.

3.5.3 These are described further below.

3.6 USE OF CAMBRIDGE SUB-REGIONAL MODEL

3.6.1 This work has made use of the Cambridge Sub-Regional Model which has been developed by WSP Group on behalf of CCC for the Cambridgeshire Congestion TIF bid.

3.6.2 The model includes spatial relationships between employment, commercial floorspace, dwellings, employed residents and general population, and models trip-making for all modes and trip purposes.

3.6.3 The project has produced trip-making information based on Land Use model runs (but without conducting full transport model runs which would require more detailed consideration of travel options). The relationships in the model for 2001 and 2006 have been used extensively in the processing of employment, dwellings and floorspace data for the project.

3.6.4 However, the study of trip patterns has been limited due to the large disparity between employment and dwellings forecasts. Trip-making information from the model has been used to consider the likely trip generation effects of future scenarios and the significance in terms of trip kilometres and carbon dioxide emissions.

3.6.5 The model requires estimates of the following exogenous inputs and constraints:

- dwellings
- commercial floor-space
- changes in those jobs supported by the national economy (i.e. basic or exogenous employment), and
- numbers of economically inactive households, student households, and economically inactive persons in communal establishments.

3.6.6 Detailed locations and timing of dwellings and floor-space developments are input to the model, while study area wide totals are used for other inputs and the model determines the precise distribution and location of jobs and households.

3.6.7 The model method, for the purpose of this study, is outlined in the flow chart given in Figure 3.1 below.

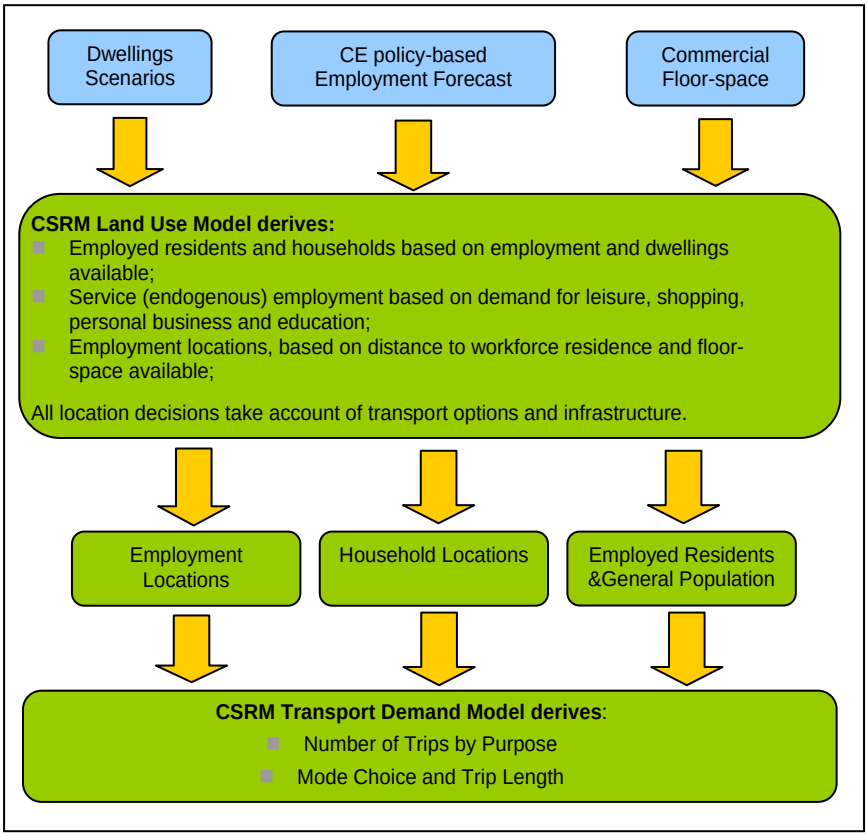


Figure 3.1: Application of Land Use and Transport Demand Modelling

3.7 CARBON MODELLING METHOD

3.7.1 The carbon modelling has assessed the carbon emissions associated with each scenario and strategy and has taken account of:

- the scale and composition of economic activity in the county;
- the scale and composition of transport activity in the county; and
- underlying trends in energy use.

3.7.2 The approach to CO_2 modelling has used CSRM information on trip making and modes to estimate the rise in CO_2 based on the pattern of land development, extrapolating from 2006 trip-making across both work and leisure trips and considering the full range of transport modes. Anticipated improvements in vehicle emissions have also been factored into the forecasts. This approach separates out the aspects of CO_2 emissions which are sensitive to land use policy from those which are subject to external trends or policy influences.

3.7.3 The general approach has used levels of economic activity to demand for different types of fuel (e.g. gas, electricity, etc), and from demand for different fuels to emissions of CO_2 associated with the consumption of each fuel. In doing so it has taken into account that different industries vary in the fuel mix used to meet their energy needs and that because of the technologies they use the emissions associated with the burning of gas in one sector can be different to that elsewhere.

3.7.4 The data on energy use in the county published by BERR and that on energy use published by Defra has been used. The data together enable separate estimates to be constructed for CO_2 emissions from the use of fuels by a small number of aggregated fuel users. The fuels identified are coal, manufactured fuels, petroleum products, natural gas, electricity and renewable waste while the source of activities are limited to Industry & commercial, domestic, road transport and rail.

3.7.5 In projecting the future carbon emissions in the county we have utilised the more detailed sectoral data available on the energy and emissions characteristics of activity in the East of England provided by the REEIO model[7], together with underlying trends in energy efficiency (at a sectoral level), trends in switching between fuels (e.g. trend towards electricity and away from other fuels). In this way, the projections for, say, CO_2 emissions by the industrial & commercial sector have taken account of whether the future economic growth is likely to be stronger in, say, retailing rather than professional services, or pharmaceuticals rather than food processing.

3.7.6 In terms of carbon emissions specifically for transport reference has also been made to the DfT Carbon Pathways report and then likely emissions have been calculated using the outputs of the CSRM model and known CO_2 emissions for future vehicle kilometres.

3.8 EVALUATION OF KEY ADVANTAGES AND DISADVANTAGES

3.8.1 Using the Cambridgeshire RSS Review Objectives, the EERA Sustainable Development Objectives and the principles set out in the Quality Charter for Growth the following criteria have been developed, as shown in Table 3.1 to undertake the evaluation as part of the study. Against these criteria a qualitative review summarising the key advantages and disadvantages together with showing quantitative indicators and comparative scoring has been undertaken.

3.8.2 The scoring criteria used for the evaluation is as follows:

- - - - very strongly negative
- - - strongly negative
- - negative
- o neutral
- + positive
- + + strongly positive

+ + + very strongly positive.

[7] The REEIO model has been developed by Cambridge Econometrics for SCPnet, a consortium of regional bodies, including EEDA, led by the Environment Agency. EEDA have a version of the REEIO software for the East of England. CE used a version of the software in a study for EEDA looking at the resource use and CO2 implications of alternative patterns for regional economic growth as part of the evidence base to support the recent Regional Economic Strategy.

EERA Sustainable Development Objectives	RSS Review Objectives for Cambridgeshire	Criteria
	Delivery	Resources for and ability to provide infrastructure
		Impact on Infrastructure Deficit
		Capacity of existing infrastructure
		Maintaining the overall vision
		Land type
Reduce greenhouse gas emissions	**Climate Change**	Carbon Footprint
Deliver low carbon building to support continued economic growth		Renewable Energy Generation
Use resources more efficiently, minimising waste and increasing rates of reuse and recycling		Waste arisings and recycling
Move towards sustainable consumption and production		Access to public transport (HQPT)
Separate economic growth from increases in resource use, especially in terms of energy and water		Water cycle impacts and water use
Adapt to the impacts of climate change		Impact on flood risk
		Anticipating climate change
Protect and enhance the Region's natural and historic environmental assets	**Environment**	Impact on Designations
		Habitat loss
Create, conserve and enhance distinctive local environments		Loss of Agricultural land
		Biodiversity value
		Relationship to existing landform
		Impacts on landscape/water/townscape
Reduce levels of poverty and exclusion Provide decent and affordable homes for all Promote sustainable lifestyles Achieve health and income equality	**Quality of Development**	CABE Design for Life issues
		Diversity of housing need
		Community deprivation indicator studies
		Community Health and Health Impacts
To promote wellbeing through community cohesion and social capital Provide effective social infrastructure and services	**Quality of Community Life**	Economic (job) potential
		Ease of establishing accountable, democratic community governance
		Access to shops and services
		Capacity of existing local community infrastructure
Meet the needs of the changing regional demographic	**Housing Delivery**	Land values
		Ease of Development
		Ability to deliver affordable housing
		Land allocations and availability
Harness the region's economic strengths specifically in science and R&D Improve the skills base through increased learning opportunities	**Economic Growth**	Employment land availability
		Relationship to existing "engines" of growth
		Accessibility
		Access to labour markets
		Skills Development
Minimise transport growth whilst capturing the economic benefits of international	**Travel Planning**	Reduce need to travel
		Public Transport Capacity
		Promotion of sustainable modes
		Impacts on existing and future travel behaviours

Table 3.1: Evaluation Criteria

4 Growth Scenarios

KEY MESSAGES

- Levels of growth resulting from the EERA Scenarios up to 2031 are not realistic given the current economic downturn and the time it will take to return to prior growth levels
- Depending on the level of growth (using growth scenarios 1,3,4 and 5) and annual growth rates, the housing land supply already available would last between 14/15 years and 19/20 years (and at this timescale this would be only some 2-3 years from reaching 2031)
- Trend-based projections indicate 47,300 new jobs by 2031
- Policy-based projections show 38,600 new jobs by 2031
- The policy-based projections for employment show a greater share of growth towards Cambridge and South Cambridgeshire than trend based
- Employment growth rates will be slower than previously experienced
- Projections show that job growth in Cambridgeshire will rise at a similar rate to the rest of the region; in the past Cambridgeshire has been higher
- Only modest growth is expected for Fenland, East Cambridgeshire and Huntingdonshire from the projections.
- In terms of the growth scenarios to 2031 for testing in this study these would be:
  - Baseline = **75,415** (essentially committed supply);
  - Reduction on continuation of H1 Policy = **90,415** (committed supply of 75,415 plus 15,000) and following continuation of EERA Growth Scenario 1 with a reduction based on an allowance for the current downturn; and
  - Increased level of growth = **110,415** (committed supply of 75,415 plus 35,000) and similar to EERA Growth Scenario 3 NHPAU Lower.

4.1 INTRODUCTION

4.1.1 A key aspect of the study is consideration of the rates of growth to be tested and how these impact on the delivery of any spatial strategy across Cambridgeshire.

4.1.2 In their review of the RSS, EERA issued guidance on housing and employment growth, considering the region's development needs from 2021 to 2031, in the form of three baseline forecasts and six growth scenarios. The EERA baseline forecasts and growth scenarios were determined by Oxford Economics (OE) using their East of England Forecasting Model. The baseline cases are:

- Unconstrained Baseline;
- Baseline: Low Migration; and
- Baseline: Higher Household Formation.

4.1.3 Four of the growth scenarios are dwellings-led, based on either the RSS or National Housing and Planning Advice Unit (NHPAU) housing supply options, and two are based on the achievement of the Regional Economic Strategy (RES) GVA growth targets. The six scenarios and annual dwelling targets indicated for Cambridgeshire are summarised in Table 4.1 below.

Scenario	Annual dwellings target
Scenario 1 RSS H1 Policy with 2006-2021 residual annual housing targets continued to 2031	3,920
Scenario 2 RSS H1 Policy with 2001-2021 annual targets continued to 2031.	3,810
Scenario 3 the lower end of the NHPAU range	4,310
Scenario 4 the upper end of the NHPAU range	5,230
Scenario 5 GVA growth at RES targets, unconstrained	4,820
Scenario 6 GVA growth at RES targets, constrained by RSS housing targets	3,930

Table 4.1: EERA's Cambridgeshire Scenarios and Targets

4.1.4 As set out above the RSS Review includes six growth scenarios, but EERA have requested that Cambridgeshire County Council provides advice on whether four of the initial growth scenarios can be achieved. These four scenarios are as follows:

- Scenario 1 RSS H1 Policy with 2006-2021 residual annual housing targets continued to 2031;
- Scenario 3 the lower end of the NHPAU range;
- Scenario 4 the upper end of the NHPAU range; and
- Scenario 5 GVA growth at RES targets, unconstrained.

4.1.5 However, it is important to consider the validity of these growth scenarios before deciding upon the most appropriate growth levels to test.

4.2 EVALUATION OF EERA GROWTH SCENARIOS FOR CAMBRIDGESHIRE

4.2.1 Table 4.2 shows the comparison between anticipated supply/capacity in 2006 (see Chapter 2) with the forecasts contained within EERA's growth scenarios 1, 3, 4 and 5. It can be seen that in all cases the scenarios considerably exceed the 75,415 capacity of the existing land supply.

4.2.2 The achievement of an increase in housing above the current RSS rates in the context of the national economic predicament is not realistic. At the upper end the strategy for 2031 would have to provide for 54,000 new homes which is equivalent to building another City the size of Cambridge. Even at the lower end, capacity for some 22,500 more homes would need to be created.

Supply at 2006 (a)	EERA Growth Scenario 2006 – 31 (b)	Difference Between supply and scenario (c) = (b) – (a) Total ***Average***	***Annual***	Duration of Supply (Years) (d) = (a) ÷ (b)
75,415	1 = 97,900 (3916)	22,485	899	19.26
75,415	3 = 107,275 (4291)	31,860	1274	17.58
75,415	4 = 129,350 (5174)	53,935	2,157	14.58
75,415	5 = 119,575 (4783)	44,160	1,766	15.77

Table 4.2: : Comparison between Anticipated Supply and EERA's Growth Scenarios for Cambs. 2006 – 2031
Figures in brackets are annual average rates

4.2.3 The housing land supply in March 2006 would, based upon the average annual rates of growth suggested by EERA's scenarios, last for between 14.58 and 19.26 years. Therefore, if Scenario 1 forms the policy basis of the EEP Review, the existing land supply would extend from 1 April 2006–31 March 2025. However, if Scenario 4 forms the basis of the EEP Review, the existing supply would last until towards the end of 2020.

4.2.4 Further detail on land supply is contained in Appendix B.

Employment Land Supply

4.2.5 On 31st March 2008, there were 883.79ha (net) of employment land commitments for B1, B2 and B8 uses (including planning permissions and allocations) across Cambridgeshire. The vast majority of these employment commitments were located in Huntingdonshire (502.60ha) and to a lesser extent in Fenland (143.77ha) and South Cambridgeshire (135.12) respectively. There were relatively fewer employment commitments in East Cambridgeshire (108.84ha) and Cambridge City (39.06ha).

4.2.6 These figures demonstrate that there is a far from uniform situation regarding net employment commitments throughout the county and whilst upon first glance it might appear that the vast majority of commitments are located in the north and west of the County, it should be borne in mind that Alconbury Airfield (65,000 sq metres) accounts for a significant proportion of the overall figure and therefore somewhat distorts the overall position for Huntingdonshire.

4.2.7 When the use type is taken into consideration, it becomes clear that the proportion of B1 versus B8 type uses varies across the county. In Fenland and Huntingdonshire, the majority of commitments are in the B8 sector, whilst in Cambridge and South Cambridgeshire, the balance is reversed, with the vast majority of requirements within B1 use. The use type has implications for employment commitments as B1 uses tend to be more labour intensive, whilst B8 uses are, by their nature, land intensive and will not generate the same density of jobs.

4.2.8 Further detail on employment land supply within the county is illustrated by the figures in Appendix C.

4.2.9 However, there are some underlying trends on the actual availability as evidenced in the Employment Land Reviews across the County. For example, commitments in the City disguise the real scale of recent loss of employment land of around 50 hectares between 1998 and 2006.[8]

Validity of EERA Growth Scenarios

4.2.10 The validity and appropriateness of all the EERA scenarios as a basis for developing strategic options for the County has been assessed by SQW, on behalf of Cambridgeshire County Council. The SQW review report is attached at Appendix D.

4.2.11 In their assessment, SQW found that:

- The OE model overstates population and employment growth in the period 2001 to 2007, which could lead to a possible overstatement in future years and affect the link between those living and working in each area;
- Modelled job growth outstrips the increase in employed residents by at least 30,000 in each case by 2031, creating significant net in-commuting i.e. 30,000 net in-commuting trips in 2031 compared to 7,000 net-out-commuting in 2001, as recorded by the 2001 Census;
- A significant level of net immigration to Cambridgeshire from outside the region is modelled in all scenarios from 5,000 to 8,200 per annum;
- The building rates in all but three scenarios would pose a considerable challenge, significantly the baselines. Scenarios 1, 2 and 6 building rates are relatively close to that of 2006/2007 of 3,640 and on this basis considered reasonable;
- Due to the current recession, SQW anticipate that housing building rates will be significantly reduced for at least two years. As a consequence, even if building rates

[8] Cambridge and South Cambridgeshire Employment Land Review July 2008

return to 2007/2008 figures, achievement of those scenarios with rates significantly higher than the current RSS rates is highly uncertain; and

- The OE model suggests a growth in jobs for the near future (2009 to 2011) which is unlikely, taking into account the current and intensifying recession, and there is a divergence between the OE model output and the Annual Population Survey's (APS) estimates of the county's workplace population, raising concern about the realism of the employment forecasts generated by the model.

Economy

4.2.12 This subsection provides a summary of the main preliminary findings of the processes set out in Chapter 3.

4.2.13 As explained earlier Cambridge Econometrics have provided both policy-led and trend[9] based employment projections for Cambridgeshire. Appendix E explains in detail, the two sets of employment projections. The projections are summarised and compared in Table 4.3 by main industry sector and in Table 4.4 by district.

4.2.14 Table 4.4 shows clearly that job growth forecasts in financial and business services outstrip increases expected in all other sectors of the economy, (37,000 – 38, 100 between 2007 and 2031). This wide ranging sector includes computing services, R&D, accountancy and many support services, including employment agencies, security and packing. Consequently, some workers classified as 'business services' may in practice be working at the premises of firms in agriculture, transport, retailing or manufacturing.

4.2.15 Other industry sectors forecast to experience a significant increase in jobs include 'other services', (9,000 – 14,100 over the entire period) distribution, and hotels & catering (6,900 – 8,200). 'Other services' includes the bulk of public sector jobs such as education, police, fire, defence and health & social work. More modest job growth is forecast in construction (1,200 – 2,000) and in transport & communication (1,000 – 1,200). Very little change in employment is anticipated in quarrying and the utilities/energy sector. Two sectors are expected to undergo a continuing loss of employment: agriculture, (down by 2,400) and manufacturing, with a reduction of over 14,000 jobs between 2007 and 2031).

[9] Trend projections are informed by an analysis of past relative performance at a local level, but they are driven by the forecasts from Cambridge Econometrics' Regional Economic Prospects model. Hence even under the "trend" projection, there should be no assumption that in absolute terms future performance will be a straight line extrapolation of past growth

Main industry sector	2007	2031 'trend'	2031 RSS policy-led	2007-2031 'trend' (% p.a.)	2007-2031 RSS policy (% p.a.)
Agriculture	8.9	6.5	6.5	-2.4 (-1.1%)	-2.4 (-1.1%)
Mining, quarrying etc	0.1	0.1	0.1	0 (0%)	0 (0%)
Manufacturing	39.8	25.8	25.8	-14.0 (-1.5%)	-14.0 (-1.5%)
Utilities	0.5	0.6	0.6	0.1 (0.8%)	0.1 (0.8%)
Construction	22.7	24.6	23.9	2.0 (0.3%)	1.2 (0.2%)
Distribution, hotels & catering	63.7	71.9	70.7	8.2 (0.5%)	6.9 (0.5%)
Transport & communications	14	15.2	15	1.2 (0.4%)	1.0 (0.3%)
Financial & business services	74.6	112.7	111.6	38.1 (2.1%)	37.0 (2.1%)
Other services, (education, health, leisure etc)	115	129.1	124	14.1 (0.5%)	9.0 (0.3%)
Total	339.4	386.7	378	47.3 (0.6%)	38.6 (0.5%)

Source: Cambridge Econometrics, CCC Research Group Note: All figures rounded independently

Table 4.3: Comparison, by main industry sector, of two sets of employment projections 2007 to 2031 ('000)

Date; element	Cambridge City	East Cambs	Fenland	Hunts	South Cambs	Cambs County
2007	99.7	34.8	41.2	85.5	78.1	339.4
2031 RSS policy-led	121.1	37.6	40.3	83.5	95.6	378
2031 trend projection	117.1	41.4	42.7	92.2	93.3	386.7
2007-2031 policy-led employment change	21.4	2.7	-0.9	-1.9	17.4	38.6
2007-2031 trend employment change	17.4	6.5	2.5	6.7	15.2	47.3
Share of Cambs employment growth policy-led %	55.4%	7%	-2.3%	-4.9%	45.1%	100%
Share of Cambs employment growth trend %	36.8%	13.7%	3.2%	14.2%	32.1%	100%

Source: Cambridge Econometrics; CCC Research Group Note: All figures rounded independently

Table 4.4: Comparison, by district, of two sets of employment projections 2007 to 2031 ('000)

4.2.16 The forecasts differ in two main ways. Firstly the forecasts differ in terms of the overall number of jobs available up to 2031. The policy-led forecast involves a lower rate of population growth than the trend-based one and therefore this has an implication on employment growth. The total employment growth between 2007 and 2031 amounts to 38,600 under the policy-led forecast as compared with 47,300 generated by the trend projection.

4.2.17 The second difference relates to the spatial distribution of employment. The RSS policy-led forecast results in a significantly higher share of the County's housing and population growth occurring in Cambridge City and South Cambridgeshire than the trend projection. The reason for this stems from the policy related projections putting more population and hence likely employment in the southern part of the County.

4.2.18 The policy-led forecast not only suggests that East Cambridgeshire, Fenland and Huntingdonshire will account for lower shares of the county's housing growth than in the recent past, it also assumes these districts attract lower rates of new dwelling construction than have been achieved in the period 2001-2008. As some jobs are related to the construction industry and are also needed to serve new housing areas, the consequence is that additional employment growth is concentrated on Cambridge City and South Cambridgeshire as a result of current policy.

4.2.19 The comparison of the policy-led and trend projections for employment growth across each district is also illustrated in Figure 3.2.

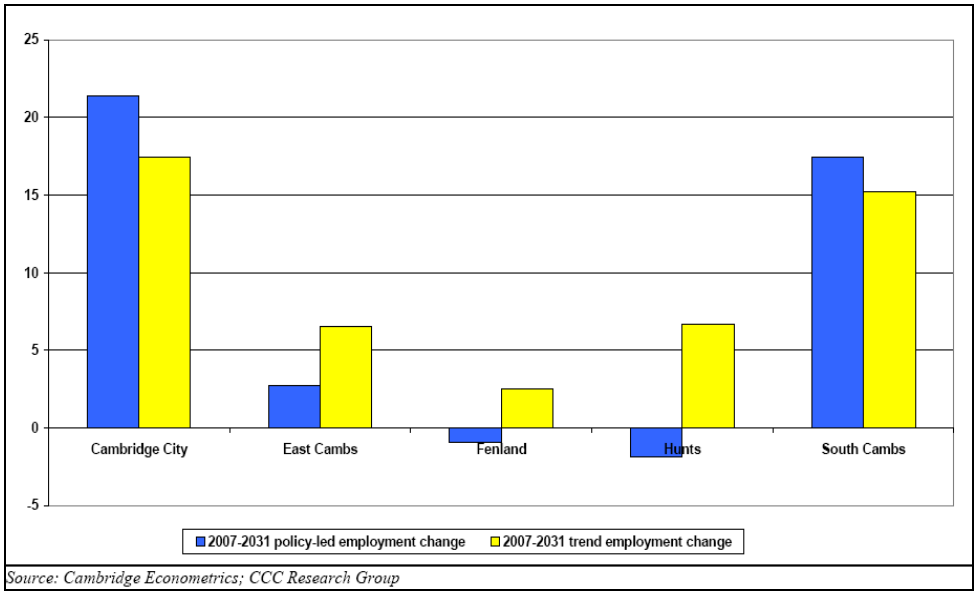


Figure 3.2: Comparison of two sets of projections for employment growth by district ('000)

4.2.20 The main issues arising from the two sets of projections are as follows:

- The overall rate of increase in employment in the County is likely to be very much slower than has occurred in the recent past and an overall reduction in employment is now expected in the period 2008 to 2010 before any growth resumes;
- Under the trend-based projections CE expect employment to increase at a very similar rate to the region as a whole. Whereas in the past the County has accounted for an increasing share of the region's total employment, the projection shows a constant share (12% of all);
- Four main industry sectors are projected to account for the bulk of new job growth – professional services (including R&D), computing services, health and social work and other business services (including employment agencies, packaging, cleaning etc);
- Manufacturing and agriculture-related jobs appear set to decline under both the projection scenarios;
- Under both projection scenarios hotels & retailing and retailing sectors are expected to experience growth. Under the trend-based projection education and construction jobs are expected to experience growth;
- Cambridge City and South Cambridgeshire are the main areas for future employment growth, particularly as their share of new house building increases; and
- Under the trend based projections modest growth is expected in East Cambridgeshire and Huntingdonshire with very little in Fenland. However the policy-led projections show employment to decline over the period 2007-2031 in Fenland

and Huntingdonshire as the additional jobs primarily linked to population increase are insufficient to counteract the number of jobs likely to be lost in manufacturing and agriculture.

4.2.21 It should also be noted that the Cambridge Econometrics forecasts presented in this Study were undertaken prior to the full extent of the economic downturn being recognised (and also being available for informing the modelling). More up to date forecasts would result in a less positive picture for the future and likely employment projections. With this in mind the findings presented within this report represent a robust case for considering future growth in Cambridgeshire.

4.3 MORE REALISTIC GROWTH SCENARIOS

4.3.1 Noting therefore that the EERA Growth Scenarios are not considered realistic in the context of the severe economic downturn, this study has considered more robust/plausible growth scenarios for testing purposes. It is worth noting that this view has also been provided by the neighbouring authorities to Cambridgeshire and furthermore higher levels of growth are not supported by these authorities.

4.3.2 As set out above the committed land supply allows for 75,415 dwellings to be built across the County. As this is already within the system it is considered that this should be used for testing for baseline purposes, and may be viewed as a realistic bottom growth figure to 2031 given the state of the national economic position. Therefore the base case would focus on the existing committed supply of 75,415 dwellings by 2031 only and delivering the current strategy in terms of spatial distribution.

4.3.3 Based on the assessment of employment projections and the downturn in housing completions over the next two to three years it is anticipated that the continuation of EERA Growth Scenario 1 to give 97,900 dwellings by 2031 may not be achieved. Therefore accounting for a stark reduction in housing completions over the next two to three years and then time for a recovery back to rates prior to 2008 it is estimated that a reduction to around 90,000 homes to 2031 would occur. For testing purposes 15,000 homes were added to the committed supply of 75,415 to give 90,415 homes.

4.3.4 Using views on reduced housing trajectory, based on current economic downturn and conditions, provides the following assessment of the housing requirement for the base case over the period 2006-2031.

- Completions:
    - 2006-08 = 7,944
    - 2008-10 = 5,200
    - 2010-12 = 4,000
    - 2012-14 = 6,000
    - 2014–2021 (3,861 x 7) = 27,027
- Total Projected 2006–2021 = 50,220
- Completions achieved 2001-06 = 15,380
- Assumed Total 2001-2021 = 65,600
- Shortfall when compared with the East of England Plan 2001-2021 (73,300 – 65,600) = 7,700

4.3.5 This has been interpreted for the CSRM and is described in section 7.2.

4.3.6 The County Council's Strategic Planning Research and Monitoring team has produced a document entitled 'Housing Development in Cambridgeshire 2001-2008'.

That shows that there were 15,380 completions in Cambridgeshire in the period 2001-2006. Therefore, in order to address Policy H1 of the East of England Plan, it follows that a minimum of 57,920 completions should arise in Cambridgeshire in the period 2006-2021 (73,300 – 15,380). That residual figure equates to an average of 3,861 completions per year. That is the figure that we have used in the above calculation in respect of the period 2014-2021.

4.3.7 When considering a "downturn" scenario, it can be calculated that this approach leads to a shortfall of some 7,700 dwellings when compared with the current strategy established at Policy H1 of the East of England Plan. We would suggest that this is the appropriate figure to use in any analysis as it demonstrates the extent to which our more realistic assessment will vary from the present policy which requires, as a minimum, 73,300 completions in Cambridgeshire in the period 2001-2021.

4.3.8 The housing provision for the period 2021-2031 should take forward the rate established in the East of England Plan. In order fully to address this point, we have assumed that the rate of completions in the period 2021-2031 will arise at the residual rate calculated above, namely 3,861 completions per year. Thus, on that basis, 38,610 completions would be assumed to arise in the period 2021-2031.

4.3.9 In the light of the above analysis, it can be calculated that the requirement arising in the period 2006-2031 is 50,220 (for the period 2006-2021) + 38,610 (3,861 x 10), namely 88,830 dwellings. This is 9,070 dwellings less than the outcome of EERA's Growth Scenario 1 which anticipates 97,900 completions in Cambridgeshire in the period 2006-2031.

4.3.10 On balance it is considered that a reduction of between 7,000 and 8,000 is appropriate to allow for a reduction in delivery of Scenario 1 and on this basis a scenario for 90,415 homes by 2031 is being tested.

4.3.11 However, in order to give some higher levels of growth for testing purposes consideration has been given to a suitable additional level of growth. In order for some consistency with the EERA Growth Scenarios a higher level of growth similar to the Growth Scenario 3 NHPAU Lower has been chosen of 110,415 and for testing purposes this is 35,000 extra homes above the committed supply of 75,415.

4.3.12 In terms of the growth scenarios to 2031 these would be:

- Baseline = **75,415** (essentially committed supply);
- Reduction on continuation of H1 Policy = **90,415** (committed supply of 75,415 plus 15,000) and following continuation of EERA Growth Scenario 1 with a reduction based on an allowance for the current downturn; and
- Increased level of growth = **110,415** (committed supply of 75,415 plus 35,000) and similar to EERA Growth Scenario 3 NHPAU Lower.

4.4 GROWTH SCENARIO DEFINITIONS

4.4.1 The growth scenarios to 2031 for testing are defined as follows:

- Base = **baseline** using the existing supply of 75,415 homes;
- Main = **medium growth** of 90,415 homes; and
- High = **higher growth** of 110,415 homes.

4.4.2 For the purposes of the land-use modelling only the terms Base, Main and High have been used.

4.4.3 Whilst we have tested the higher levels of growth, as indicated in the “higher growth” scenario above, it is considered that delivery of an extra 35,000 homes above the committed supply of 75,415 homes by 2031 will not in reality be deliverable or feasible.

5 Spatial Options

KEY MESSAGES

- The spatial themes emerging from the findings of the study point towards exploring the following distribution of growth:
  - North of the County – primarily focusing on the Market Towns to provide towns where people can live, work and spend time;
  - Cambridge Based Strategy– around Cambridge and including Northstowe due to its connections and proximity to Cambridge;
  - New settlements – considering those that may be possible and have a closer relationship to Cambridge as well as those considered more distinct; or
  - Combination of the above.
- The options for assessment and testing provide a direct comparison and are as follows:
  - Market Town Strategy;
  - Cambridge Based Strategy; and
  - New Settlement Strategy.
- The current housing and employment land supply reflects the present spatial strategy and the existing commitments are concentrated primarily at the main settlements; and
- Any robust revision and extension to the existing strategy of concentrating growth at the main settlements across the County will need to reflect realistic economic prospects.

5.1 INTRODUCTION

5.1.1 The approach to tackling the spatial options to be tested as part of the study has focused on emerging spatial themes developing from the findings and implications coming out of the individual workstreams, included as Appendices to this report.

5.2 DEVELOPING SPATIAL OPTIONS

5.2.1 The key implications coming out of individual workstreams that have shaped the spatial options to be tested are outlined below.

Economy

5.2.2 The economy workstream has looked at projections based on past performance and trends and policy and has split the County into three functional economies:

- The Fens – Fenland plus the northern area of East Cambs. (Littleport northwards) and the North East part of Huntingdonshire (Ramsey etc);
- The Ouse Valley – a substantial part of Huntingdonshire; and
- The Cambridge Area – Cambridge plus South Cambs, plus the central and south part of East Cambs.

5.2.3 The implications of the economic and employment projections on each of these areas are as follows.

The Fens

5.2.4 On the baseline projections the prospects for employment growth do not look positive. Therefore the options from an economic perspective are:

a) to plan for modest absolute economic growth, which would be slower than the rest of the County, and make provision for housing growth in this context; or
b) to take a pro-active approach to:

- Focus spatially on March and Wisbech, recognising critical thresholds (population of 25,000 to 30,000 to provide self-sustaining containment within these towns);
- Put real economic development effort into agribusiness;
- Focus on “clean tech” bio-renewable sectors;
- Address skills issues amongst the local workforce;
- Seek to link to high order settlements such as King’s Lynn and Peterborough; and/or
- Exploit an existing public transport corridor (Cambridge – Ely – March – Peterborough).

The Ouse Valley

5.2.5 The main implication of the projections in the Huntingdonshire area, especially around the Ouse Valley towns, is the potential for increased out-commuting unless there is a greater effort to encourage more self-containment, such that:

- The sustainable employment footprint is enlarged to maximise use of the existing quality public transport links – i.e. north to Peterborough, south to London, east to Cambridge and west into Bedfordshire;
- The area provides a supporting role for Cambridge (back office functions and higher value manufacturing);
- Possibly attracting significant employment, such as Marshall Aerospace, to the area;
- Development of rail and CGB related employment sites occurs;
- Improve the amenity of the market towns as places to earn and spend, as well as live;
- Ensure that substantial employment occurs on suitable large scale sites
- Alconbury is a significant strategic site in the area and its future potential needs to be resolved; and
- There is the retention and expansion of public sector jobs (prison, defence and police for example).

Cambridge Area

5.2.6 The implications of projections on the Cambridge area are as follows:

- Impetus from the high tech cluster should continue although it will need to be nurtured in the face of international competition;
- Further growth from the public sector is unlikely;
- Achievement of job targets and the current state of the economy and its impact on developers regarding s106 agreement restrictions may reduce speculative building. Cambridge has significant strengths, but these are implemented within a restricted Use Class Order range. Therefore this may warrant some relaxation of planning policies to kick start new investment, such as towards HQ offices and business services, however these changes should not be significant and still maintain an element of selective growth approach, albeit the City Council has not made any

policy decisions towards changing its stance towards selective management of the economy and there may be future issues through PPS 4 as highlighted in Chapter 2;

- Quality employment sites with good transport links are essential, especially the A14/CGB corridor;
- Congestion in and around Cambridge could undermine job growth;
- The implied levels of employment growth in the forecasts would be very challenging for housing and infrastructure provision; and
- In order to match the needs of the economy, housing policy will require more focus on quality provision for internationally mobile knowledge workers as well as providing affordable housing for key workers.

5.2.7 The implication of the employment projections is that there may be a case for proactive policy in economic development being strengthened further, particularly for the Fens and the Ouse Valley.

Land Supply

5.2.8 The following spatial challenges and implications arise when land supply is related to the potential growth scenarios:

- There will be a lack of extra land capacity at some point after 2021 within and close to Cambridge unless a major green belt review is undertaken and this could happen much earlier if Cambridge East is delayed beyond 2021;
- If capacity is not available in Cambridge, there will be a need to examine other land at centres close to Cambridge and/ or along existing corridors (such as large villages or new settlements);
- The Employment Land Reviews show the true availability of employment land is reduced in Cambridge and densification of development in Cambridge is particularly challenging;
- The Employment Land Reviews also show that Districts are not short of employment land. However, large proportions of this land are not necessarily in sustainable locations as they are distant from main urban areas and housing. As noted Draft PPS4 may have implications for such sites in the future and therefore seeking land closer to main settlements;
- Accommodation of significant growth related to sustainable economic prospects may need an additional new settlement in the Cambridge area;
- The possibility of market towns playing a more significant role would provide further capacity depending upon growth scenarios and ability to attract future job growth;
- The amount and distribution of housing and employment land commitments effectively predetermine the spatial delivery of new development for a number of years, and at least to 2021, and probably for some time beyond that;
- Nevertheless, considerable additional development land will be required by 2031;
- The current employment land supply reflects the present spatial strategy and the existing commitments are concentrated primarily at the main settlements; and
- Any robust revision and extension to the existing strategy of concentrating growth at the main settlements across the County will need to reflect realistic economic prospects.

Infrastructure Supply

5.2.9 The implications for growth strategies arising from infrastructure supply and constraints are:

- Retaining quality of Cambridge and impact on Green Belt with additional growth;
- Flood Risk in Market Towns that reduces developable areas, however further work may demonstrate feasible technical solutions taking account of policy constraints on development on land at risk of flooding;
- Viable new settlement locations are limited as many parts of the County are in Flood Zones and subject to transport and environmental constraints;
- A critical mass would be needed to create self-sustaining market towns that reduce out-commuting, which if successful could alleviate transport pressures along existing networks, albeit this may not be successful based on current patterns of commuting;
- Significant congestion in Cambridge and the surrounding area and serious capacity issues for historic Cambridge to accommodate growth in terms of physical space for new infrastructure and public transport as well as provision of suitable facilities and services are serious impediments to future growth. The new station at Chesterton and improvements to the existing railway station will assist, but will only make a marginal improvement. In addition, within Cambridge public transport may not be the only solution due to constrained roadspace and sharing with other modes, such as cycles. Therefore a range of other techniques such as smarter travel choices and travel planning will be needed;
- However, Transport Innovation Fund (TIF) measures, including a significant package of sustainable transport proposals and demand management, are being considered only to address the current RSS strategy. A significant step change in sustainable transport measures is likely to be needed to cater for any further additional growth, but there is no evidence as yet that this can be achieved. For either the RSS or any further growth there is still no agreed transport solution for Cambridge and as such this presents significant challenges for Cambridge centred growth;
- Many main road corridors in the County have reached or are over capacity, such as the A10, A14, A505, A47, A428 (western end) which will inhibit growth options. The implications of this and of the difficulty of securing investment for future highway improvements should be given careful consideration. Sustainable growth will need to avoid reliance on road based corridors but there is a lack of significant high quality public transport on some corridors, such as the A47, A142, A141, A505, A14 (east). However, some corridors have rail lines programmed for upgrade and some market towns are located on existing railway stations (Ely, Huntingdon, St Neots, March) as well as CGB and other proposed high quality public transport may create opportunities for growth. CGB also has the opportunity to work both ways allowing travel towards Cambridge as well as from Cambridge towards Northstowe, St Ives and Huntingdon;
- Overall there needs to be appropriate use of transport corridors (only those with attractive and high quality public transport) to maximise sustainable travel patterns and to take advantage of existing infrastructure and/or proposed public transport infrastructure. The reliance on corridors could still create increased commuting distances whether by public transport or car and does not reduce the need to travel;
- A multi-centre approach to new development may lead to dispersed travel patterns and a lack of focus in coordinating infrastructure and facilities; and
- Transport schemes proposed for market towns through transport strategies and other major schemes (such as Ely Southern Relief Road, A605 Kings Dyke and the A428 “missing link” between A1 and Caxton – subject to funding) would facilitate some growth in the market towns.

5.2.10 Further detail on infrastructure supply is contained in Appendix F.

5.3 SYNTHESIS

5.3.1 A key aspect of this study has been to focus on economic drivers as the basis for developing future spatial strategies and options. An important conclusion to be derived from the technical work is the expectation that the distribution of employment growth in Cambridgeshire will be far from uniform. The most marked increase in job opportunities will be seen in South Cambridgeshire and Cambridge whilst economic growth in Fenland, Huntingdonshire and East Cambridgeshire will be lower. The implication is that there will be a further shift in economic gravity towards the south of the County. Whilst policy interventions may seek to direct further employment generating opportunities to northern parts of Cambridgeshire as well as the market towns, the economic projections clearly suggest that most economic growth will be focused upon Cambridge.

5.3.2 A key policy objective of the Cambridgeshire planning authorities is that the review of the East of England Plan (EEP), in whatever form, should not have a detrimental impact upon the implementation/delivery of the spatial strategy already established in the EEP (and previously through the Structure Plan). Even within this strategy, there are limited funds available to provide significant new infrastructure despite the substantial investments now taking place or already programmed. It would be counterproductive if a marked increase in annual house building rates were to be incorporated in the review of the East of England Plan in a manner which would dilute or divert funding already assumed to arise to deliver necessary strategic infrastructure.

5.3.3 It is noted that paragraph 13.10 of the EEP states that the focus in the early years in the Cambridge sub-region will be on delivery. In the longer term, the Cambridge Sub-Region will continue to develop as a centre of excellence in higher education/research, fostering the dynamism, prosperity and further expansion of the knowledge based economy. A key consideration, however, is the extent to which that dynamism can be spread outwards from Cambridge in a realistic and sustainable manner.

5.3.4 Paragraph 13.11 of the EEP recognises that the Cambridge Sub-Region has one of the most remarkable concentrations of high technology and research clusters in the UK. These should be fostered in the national interest and to promote further growth of the local and regional economy and we would expect this to be achieved in a sustainable manner. Policy CSR2 of the EEP states that employment land in and close to Cambridge should be reserved for development "*which can demonstrate a clear need to be located in the area to serve local requirements or contribute to the continuing success of the sub-region as a centre of high technology and research.*" Given uncertainties now inherent in the projection of future economic growth prospects, the review of the EEP may need to give consideration to the basis for the restrictive approach established at Policy CSR2 of the EEP, which suggests that the existing Selective Management Policy for the CSR should be reviewed to avoid an overreliance on those particular employment sectors. At this stage this has not been fully considered as part of this study.

5.3.5 Cambridge has the potential to become a centre for a wide range of service provision, in both the public and private sectors, and a review of the concepts underpinning Policy CSR2 may be required to enable a balanced range of job growth to arise in the Cambridge area and to assist in the sustainable expansion of planned new communities. This is further emphasised by PPS4, which provides draft guidance that could impact on allocations for economic development. If such sites continue to represent no realistic prospect of being used for the allocated economic use then alternative uses should be actively considered, including housing. This could present challenges for selectively managing employment types, which could in turn have consequences for housing pressures, particularly in the southern part of the County.

5.3.6 The development of a spatial strategy for Cambridgeshire in the period to 2031 and beyond should take into account the impact of the Cambridgeshire Guided Busway. The Busway will provide an effective public transport corridor, initially linking St Ives to Cambridge. The Busway should significantly improve access to major employment locations in and at the edge of Cambridge. It will enhance economic growth prospects arising in the Huntingdon to Cambridge corridor and provide congestion relief and sustainable travel. The enhanced strategic significance of that corridor will be augmented by improvements to the A14 which will significantly improve access to Cambridge and the movement of through traffic to Felixstowe and the rest of the UK.

5.3.7 The further growth of Addenbrooke's Hospital into an important bio-medical campus, incorporating the relocation of Papworth Hospital, will equally have an impact upon the economic geography of Cambridge and its surrounding area. A further component of the revised economic geography of the area will be the development of Northstowe, located on the route of the Busway. Northstowe therefore could provide a complementary employment site for Cambridge, provided jobs can be attracted to this location.

5.4 EMERGING SPATIAL THEMES

5.4.1 Therefore following the implications coming out of the three workstreams summarised in the interim report and set out above, four themes have emerged for testing:

- North of the County – primarily focusing on the Market Towns to provide towns where people can live, work and spend time;
- Urban Extension in the south around Cambridge and including Northstowe due to its connections and proximity to Cambridge;
- New settlements – considering those that may be possible and have a closer relationship to Cambridge as well as those considered more distinct; or
- Combination of the above.

5.4.2 On the basis that employment projections predict growth mainly in the south and that it is considered that there is a role for the market towns the main themes to address and test are growth in the market towns and around Cambridge. It is considered that, as with Northstowe, there may also be a role for further new settlements. These form the basis of testing and evaluation. It should be noted that ultimately it is likely to be a combination of all or some of these themes.

5.4.3 For the purposes of testing and to provide a distinct comparison the study has focused individually on these themes. However, it should be noted that as part of the study the combination approach would not be tested at this stage as the key is to determine and evaluate between the main separate themes for spatial strategies and use these outputs to inform the development of any preferred approach.

5.4.4 These themes have been set into options for testing as follows:

- Current strategy and distribution (baseline);
- Market towns and key centres strategy; and
- New settlement strategy.

5.4.5 The options are described in greater detail below. It should be noted that in all the options tested, housing has been allocated to various wards that follow the spatial distribution, but do not necessarily represent definitive development proposals or provide specific locations within any wards. In other words, the spatial options are not specific locations but instead give an indication of the likely strategic pattern of where growth could be located. The modelling work requires ward level inputs and therefore the spatial options have been undertaken in this way.

5.5 CURRENT STRATEGY (BASELINE)

5.5.1 The baseline case would focus on the existing committed supply of 75,415 dwellings by 2031 and delivering the current strategy in terms of spatial distribution.

5.5.2 The baseline includes the strategic sites currently being progressed under the existing strategy to 2021. This includes the group of sites to the north-west, south and east of Cambridge itself, Northstowe, Northbridge (Huntingdon) and Loves Farm (St Neots). These are main sites being progressed, however, there are a range of other sites proposed for delivery up to 2021

5.5.3 These sites are shown in Figure 5.1 below.

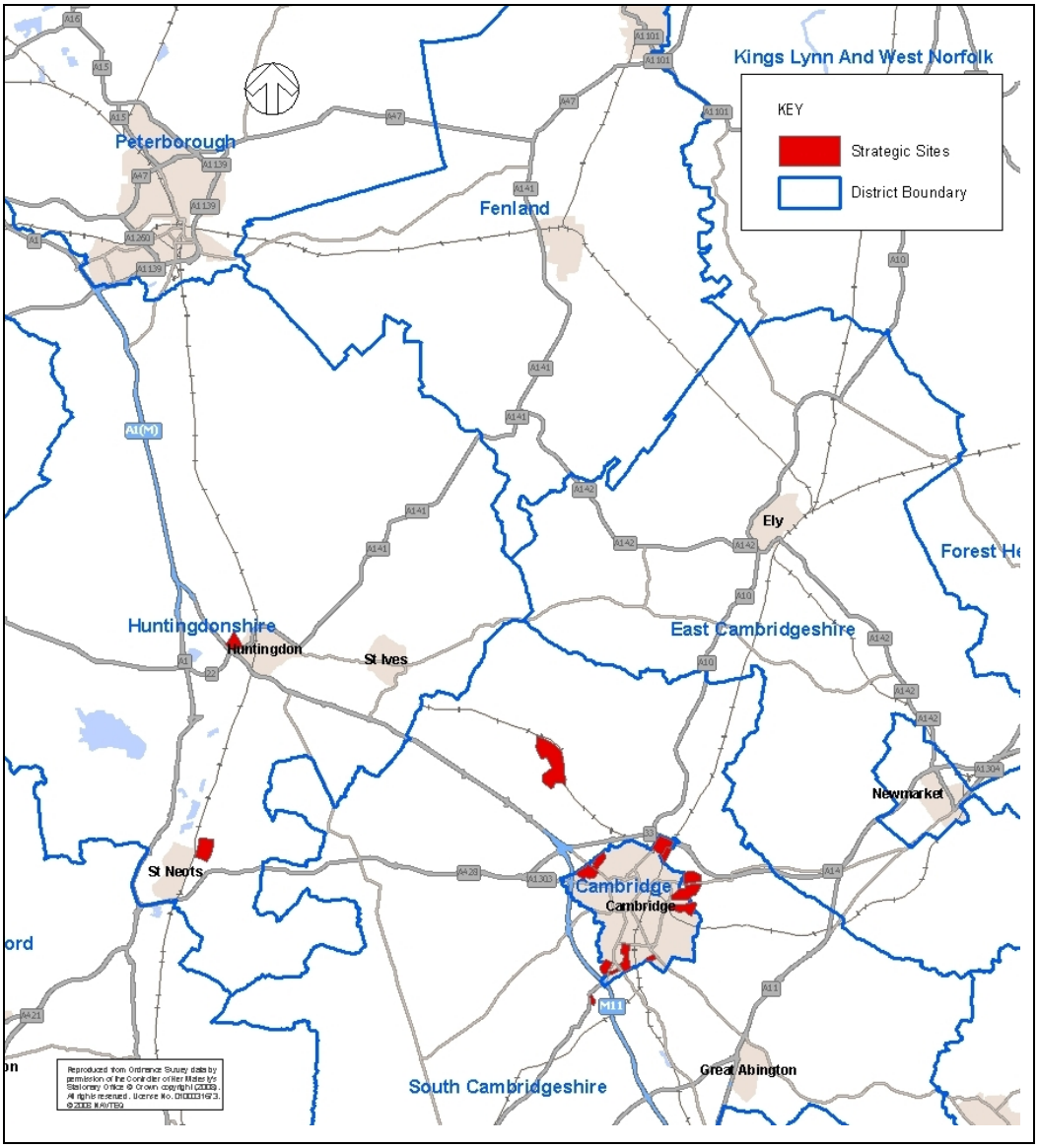


Figure 5.1: Strategic Sites under the Existing Strategy

5.6 MARKET TOWNS AND OTHER LOCAL CENTRES STRATEGY

5.6.1 The Market Town Option primarily focuses on growth in the market towns north of the County to provide towns where people can live work and spend time.

5.6.2 The medium growth scenario would seek to direct approximately 3,000 homes to each of the towns of Ely, Huntingdon, St Neots, March and Wisbech, giving a total of 15,000 homes to be added to the committed supply.

5.6.3 In addition to the above, a further 20,000 dwellings would be directed to the market towns for the higher growth scenario. In these circumstances, the spread of existing settlements would need to be greater than that for the main case and therefore includes other local centres as well as the market towns.

District	Ward	Market Towns Main Case Scenario	Market Towns High Case Scenario
East Cambs	Ely North	3,000	3,750
	Ely West		750
	Soham North		750
	Soham South		750
	Sutton		500
Fenland	March West	2,000	3,000
	March East	1,000	2,000
	March North		1,000
	Wisbech Peckover	3,000	4,500
	Wisbech Roman Bank		750
	Wisbech Waterlees		750
	Whittlesey St Andrews		500
Huntingdonshire	Huntingdon West	1,000	1,750
	Huntingdon North	1,000	1,500
	Gransden and The Offords (St Neots East)	3,000	3,500
	Alconbury & The Stukeleys	1,000	2,000
	St Ives East		1,500
	St Ives West		500
	Godmanchester		1,000
	Ramsey		750
	Brampton		1,000
	Yaxley and Farcet		500
South Cambs	Melbourn		1,000
	Sawston		1,000
Total		**15,000**	**35,000**

Table5.1: Market Towns Scenarios Housing Distribution (wards are indicative locations)

5.6.4 The distribution of the dwellings has been based on consideration of the known aspirations for growth within the districts at market towns together with the assessment of settlements that represent other local centres in terms of facilities and services. Housing distribution among the market towns by ward is summarised in Table5.1 below for the main and high case growth scenarios. This distribution is also illustrated in Figure 5.2 at the back of this report.

5.7 URBAN EXTENSIONS AROUND CAMBRIDGE

5.7.1 This focuses on urban extension in the south around Cambridge and including Northstowe due to its connections and proximity to Cambridge.

5.7.2 The Cambridge medium growth scenario requires 15,000 homes to be added to the projected committed supply while the higher levels of growth require a further 20,000 dwellings to be added to the main case.

5.7.3 The growth has been distributed on the basis of extending and increasing the levels of the existing planned growth around Cambridge. The wards in the table are indicative to approximate locations where additional growth would be located.

5.7.4 The level of growth for the two scenarios would be distributed as shown in Table5.2 below and Figure 5.3 at the end of the report.

District	Ward	Cambridge Main Case Scenario	Cambridge High Case Scenario
South Cambs	Sawston	2,000	2,000
	The Shelfords and Stapleford	3,000	3,000
	Teversham	2,000	2,000
	Fulbourn	5,000	5,000
	The Wilbrahams		500
	Longstanton (Northstowe)		12,500
	Girton		1,500
	Histon and Impington		1,500
	Waterbeach		1,000
	Melbourn		1,000
Cambridge City	Trumpington (West of Trumpington Rd[10] and adjoining wards)	3,000	3,000
	Cambridge Castle and adjoining wards		2,000
Total		**15,000**	**35,000**

Table5.2: Cambridge Scenarios Housing Distribution (wards are indicative locations)

5.8 NEW SETTLEMENTS

5.8.1 Growth in this strategy is focused on possible locations for new settlements and considers those that have a closer relationship to Cambridge as well as those considered more distinct.

5.8.2 The New Settlements medium growth scenario requires the identification of 15,000 dwellings above the projected supply, while the higher growth scenario requires 20,000 dwellings above the medium growth levels. The dwellings distribution for the two new settlements growth scenarios is as shown in Table5.3 below, and is also illustrated by Figure 5.4 at the end of the report.

District	Ward	New Settlements Main Case	New Settlements High Case
South Cambs	Waterbeach	12,000	12,000
	Cambourne	3,000	3,000
	The Abingtons		10,000
Huntingdonshire	Alconbury and The Stukeleys		10,000
Total		**15,000**	**35,000**

Table5.3: New Settlement Scenarios Housing Distribution (wards are indicative locations)

[10] It should be noted that West of Trumpington Road was strongly rejected through the 2003 Structure Plan process for Green Belt impacts

5.8.3 It should be noted that the land at Waterbeach may be needed for the relocation of the Marshall business to enable Cambridge East to come forward.

5.9 CHALLENGES

5.9.1 In summary, most potential options beyond the current strategy will pose major challenges whether for land supply, infrastructure provision and constraints or delivering economic growth in certain parts of the County, and based on the evidence from the study, these are set out below:

- Significant additional expansion to Cambridge (where economy is stronger) would impact on the integrity of the Green Belt and the concept of Cambridge as a "compact city" and there are significant issues with the capacity of Cambridge Centre to cater for such growth and without deliverable solutions for transport and land supply Cambridge centred growth will be difficult to achieve;
- Cambridge centred growth would also require a fundamental step change in traffic management and travel behaviour;
- The market towns are weak in sectors giving rise to job growth and would need major economic and public transport interventions for sustainable expansion;
- New settlements and/or corridor developments may not attract new jobs, would have significant infrastructure implications and may not be sustainable; and
- The prospects for future infrastructure investment are not considered positive, albeit considerable investment is already being seen in the A14 corridor.

5.9.2 These challenges are explored further in the following chapters covering the evaluation.

6 Evaluation – Environment, Climate Change, Water, Ecology and Related Infrastructure

KEY MESSAGES

- Flood risk and ecological impact is a potential issue for Market Town expansion and needs to be given further consideration
- Water resources need to be managed carefully for higher levels of growth in all options and consideration needs to be given to ensuring new development includes significant measures to reduce water consumption
- The new settlement option presents the most significant challenges for water resources and infrastructure for both this and waste water disposal
- All options present challenges for responding and adapting to climate change, but particularly the higher growth levels
- Concentration of growth on existing settlements and existing communities, such as those with greater level of services, facilities and job potential will make best use of existing infrastructure and may deliver a more sustainable growth strategy
- On current indications the provision of future infrastructure to facilitate growth is likely to be limited, other than in one or two key places
- A key issue for all options and particularly for higher growth levels is the limited physical capacity of existing infrastructure, historic centres and service pressures which present significant challenges.

6.1 INTRODUCTION

6.1.1 This chapter covers the evaluation of the spatial options based on consideration of infrastructure and environmental implications and constraints. It summarises the main findings of the infrastructure supply workstream. The chapter also advises on the potential constraints within the water cycle infrastructure implications which could restrict the proposed long-term growth scenarios and development options for the period 2021-31, as indicated by a study by Halcrow Group Limited on behalf of Cambridgeshire Horizons.

6.1.2 The following sections of this chapter will therefore highlight whether water related issues, ecology and other environmental matters have the potential to restrict the ability to deliver the proposed development scenarios. It should be noted, however, that this would need to be subject to further detailed investigation and separate studies.

6.1.3 Figures 6.1 and 6.2 at the end of the report show the key constraints and the three options in relation to these constraints, respectively, providing an overview of the implications for accommodating future growth within the County.

6.2 FLOOD RISK

6.2.1 The aim of this section is to collate the available information on flood risk from all sources of flooding, to establish a view on areas where development might be at risk of flooding to areas of lower flood risk probability.

6.2.2 This section does not aim to provide information for applying the Exception Test (PPS25). That test requires detailed information on frequency, depth, velocity and speed of onset of flooding, usually obtained from detailed 3-dimensional modelling of the proposed development site. This type of investigation is not appropriate for the regional scale of this screening study. Should the Exception Test be required at a later stage in the planning process, and the district authorities commissioning a Stage 2 Strategic Flood Risk Assessments for the sites of interest in order to provide the information required.

6.2.3 The methods used within this study to assess the risk of flooding from each source (river, tidal, groundwater, overland, sewer, and artificial sources) are summarised below. Due to the strategic nature of this study and the lack of detailed development site locations, it is not feasible to investigate the existing locations of sewer flooding or to speculate the locations of sewer flooding in the period 2021-31.

River and Tidal Flooding

6.2.4 Information on fluvial and tidal flood extents has been taken from the Environment Agency Flood Maps and the Strategic Flood Risk Assessments where available. Environment Agency Flood Zone Maps classify land into the four flood zones listed in Table 6.1. The Environment Agency Flood Zones are shown on Figure 6.3, at the end of the report.

Flood Zone	Description
1 – Low Probability	■ Less than 0.1% annual probability of river or sea flooding. ■ All uses of land are appropriate.
2 – Medium Probability	■ Between 0.1% and 1% annual probability of river flooding, or between 0.5% and 1% probability of sea flooding. ■ Water-compatible, less vulnerable and more vulnerable uses of land and essential infrastructure are appropriate. ■ Highly vulnerable land uses are only appropriate if the Exception Test is passed.
3a – High Probability	■ Greater than 1% annual probability of river flooding, or greater than 0.5% probability of sea flooding. ■ Water-compatible and less vulnerable land uses are appropriate. ■ More vulnerable land uses and essential infrastructure are appropriate only if the Exception Test is passed. ■ Highly vulnerable land uses should not be permitted.
3b – Functional Flooding	■ Greater than 5% annual probability of river flooding, or designed to flood in the 0.1% event, or any other probability agreed between the LPA and Environment Agency. ■ Water-compatible land uses are appropriate, subject to design conditions. ■ Essential infrastructure is appropriate only if the Exception Test is passed. ■ Highly vulnerable, more vulnerable and less vulnerable land uses should not be permitted.

Table 6.1: PP25 Flood Zone definitions and compatible land use vulnerability. Please refer to PPS25 for further information

6.2.5 As precise locations of the spatial options are not known at this stage, it is not possible to identify whether the proposed development lies within the fluvial or tidal floodplain. Instead, the potential constraint to development at each location was assessed as follows:

- Low – The land surrounding the existing development is almost entirely in the Environment Agency's Flood Zone 1.
- Medium – Approximately 50% of the land surrounding the existing development is in the Environment Agency's Flood Zone 2 or 3.
- High – The land surrounding the existing development is almost entirely in the Environment Agency's Flood Zone 2 or 3.

6.2.6 Therefore the flood risk classifications provide a relative indication of the degree of flood risk and do not imply that development could not be allocated in these settlements. The development option most likely to be affected by fluvial flood risk is the development of the Market Town option. Further investigation would be required to determine whether there is sufficient land availability in Flood Zone 1 to accommodate future development.

Groundwater Flooding

6.2.7 Groundwater flooding occurs when water levels in underlying permeable rocks (aquifers) rise above the surface ground levels. In contrast to fluvial flooding, the risks and mechanisms associated with groundwater flooding are poorly reported and understood. Until national groundwater flood risk maps are produced (a recommendation of the Government's Making Space for Water programme), a number of other data sources must be used to infer groundwater flood risk.

6.2.8 To estimate the potential risk of groundwater flooding, the bedrock and superficial geology maps have been used to indicate the location of aquifers. The fluctuation of groundwater levels and the Environment Agency records of groundwater flooding incidents have been used to estimate the potential risk of groundwater flooding for future developments (see Figure 6.4, at the end of the report). Generally this risk of ground water flooding is highest for the Cambridge Expansion or New Settlement Scenarios. This is not considered likely to pose a constraint to the development of these scenarios, however, further investigation of this risk is recommended if these options are progressed, to inform the future allocation of development sites in these locations.

Overland Flooding

6.2.9 Overland flooding occurs when the rate of rainfall exceeds the rate of infiltration into the soil, and water flows overland to the river. This is particularly a risk at the base of steep slopes where water flowing downhill can rapidly coalesce. There is no standard methodology for assessing risk of flooding from overland sources. In this study, the following methodology was therefore adopted:

- The potential rate of infiltration was inferred from the bedrock and surface geology maps. Impermeable geology was inferred to have a low infiltration rate while permeable geology was inferred to have a high infiltration rate; and
- The steepness of local topography was calculated using topographic data.

6.2.10 This methodology is subjective according to choice of slope risk, and dependent on the extent of area considered in the vicinity of each potential development location. The methodology therefore aims to be conservative and to highlight potential risks (see table in Appendix G) for further investigation once development site outlines are known.

Artificial Sources of Flooding

6.2.11 The river networks in Cambridgeshire have been heavily modified to improve drainage and flood risk, resulting in water levels in rivers being higher than the natural ground level. Therefore, many of the fluvial sources of flood risk could be considered 'artificial'. These sources of flooding are included in the fluvial flood risk section.

6.2.12 The low topography of Cambridgeshire means that there are few reservoirs in the study area. The largest artificial structure is Grafham Water, located between the villages of Grafham and Perry in Huntingdonshire District. The risk of flooding from any other smaller scale reservoirs was identified by reviewing Ordnance Survey mapping in the vicinity of the development locations.

Summary

6.2.13 Based upon the information available this assessment has not identified any major land availability constraints that would prevent development of any of the proposed scenarios. There are no absolute flood risk constraints identified at this stage that would limit the ability to develop any of the housing scenarios proposed.

6.2.14 The greatest risk of flooding is of fluvial flooding to the Market Towns, or from groundwater sources in the Cambridge Expansion or New Settlement Options, but this is subject to further detailed work such as through the Strategic Flood Risk Assessment work for Fenland and East Cambridgeshire.

6.2.15 Once development site locations or boundaries are proposed, a more detailed investigation of the risk of flooding from all sources and potential mitigation measures should be undertaken to inform the allocation of future development sites. This will be needed to identify the availability of land with a low risk of flooding for all wards.

6.2.16 This is summarised in the table at Appendix G.

6.3 WATER USE

6.3.1 This section incorporates data from the Cambridge Water Company and Anglian Water Services draft Water Resources Management Plans (dWRMP), relevant Environment Agency Catchment Abstraction Management Strategies (CAMS), draft River Basin Management Plans (dRBMP) and data supplied by the water companies.

6.3.2 The purpose of this section of the report is to identify the most sustainable growth location in terms of water resource availability considering the growth scenarios in the RSS review. This is based on a high level analysis of the available water resources in and around the growth areas and the proposed RSS review growth scenarios.

6.3.3 Within the study area, water is supplied by Anglian Water Services and Cambridge Water Company. The area served by each company is shown in Figure 6.5, at the end of the report.

Water Resources

6.3.4 The East of England is one of the driest regions of the UK and the water resource availability in the region merits a 'serious' water stress classification from the Environment Agency for both Cambridge Water and Anglian Water. The availability of water resources as indicated by the relevant Catchment Abstraction Management Strategies is shown in Figure 6.6, at the end of the report. This shows that there are no new water resources available in the area or that the water recourses are already over licensed or over abstracted. It is therefore expected that the water resource to supply future development will need to be supplied by using the headroom in the existing abstraction licences.

6.3.5 The potential development of an additional 35,000 homes within Cambridgeshire (the Higher Growth Scenario) is in alignment with Anglian Water's 25 year growth projection for the wider region. Anglian Water dWRMP includes the consideration of the planned development in the Milton Keynes South Midlands region. Therefore Anglian Water has stated that it could supply the High or Main Case for the Market Town scenario which is predominantly in its area of supply

6.3.6 In the short to medium term, Anglian Water has stated that water resources are available to accommodate the growth. Its Ruthamford water resource zones will become focus (subject to Ofwat funding) of major demand management campaigns such as enhanced metering (a policy currently successfully trialled in the Ipswich area) and increased water efficiency measures.

6.3.7 Anglian Water's dWRMP has identified potential medium to long-term options such as extending its existing water treatment works or recommissioning other water treatment works. In the long term Anglian Water is looking at the potential of developing a regional solution, such as a winter storage reservoir taking water from the River Trent. Further consideration should be given to the associated carbon cost of supporting additional development using water resources imported from the River Trent. Anglian Water is required by Ofwat to consider carbon costs within its business planning process.

6.3.8 Cambridge Water Company has stated in its dWRMP that it has planned for the supply of 2,000 new dwellings per year (averaged from 2010 to 2035), meaning that Cambridge Water Company would be able to accommodate the development of the medium growth scenario (15,000 additional homes, or an annual completion of 1,500 homes). However the final WRMP is expected to include provision for an annual completion rate of 2,500 homes with a consumption of 125 litres per head per day, as required by the proposed changes to the building regulations.

6.3.9 Until further information is available it should be assumed that Cambridge Water could not sustain a rate of development above 2,500 new dwellings per year without causing a deficit in its supply and demand balance. Therefore it would not be feasible to supply the High Case Cambridge Expansion option if these homes were entirely located within Cambridge Water's area of supply. Anglian Water's supply boundary is in close proximity to the east of Cambridge, however, and therefore it may be possible to supply the High Case for the Cambridge Expansion option using a combination of Cambridge Water and Anglian Water supplies. It is therefore recommended that when the final WRMP is available and development site boundaries are proposed, the potential to supply the High Case is reconsidered.

6.3.10 The New Settlements scenario is split across the Anglian Water and Cambridge Water Supply areas, thus current information shows that there is sufficient water resource available to develop the New Settlements High Case option.

Water Efficiency

6.3.11 The current policies and guidance are proposing water efficiency measures to be undertaken so that there is a reduction in water demand[11]. Cambridgeshire Horizons is researching a more ambitious goal of "water neutrality" for new development stemming from guidance from DEFRA.[12] If this approach is agreed for the growth agenda across Cambridgeshire, water resources will need to be assessed in greater detail to identify viable measures. Further detailed assessment will also be required in due course to take into account future sustainability reductions and any new information regarding potential climate change impacts.

6.3.12 Cambridge Water's dWRMP does not include any dependency on water efficiency savings in the existing properties, as it has a duty to plan for a worst case scenario in order to ensure security of adequate water supply during drought conditions.

6.3.13 Government requires all homes constructed after 2016 to be built to CSH Level 6 which requires a per capita consumption of 80 litres per person per day. If delivery of CSH Level 6 homes proves successful, this would offer a significant water resource saving compared to the 125 litres assumed by Cambridge Water. When the final WRMP is available further assessment is recommended to determine whether this saving would allow the High Case Green Belt scenario to be supplied.

6.3.14 The Environment Agency commissioned a study to look at water efficiency entitled, 'The Impact of Housing and Water Efficiency Policies on Water Supplies to the East of England'. This study should be referenced in future work when considering water efficiency.

[11] Water Efficiency in New Buildings, a joint Defra and Communities and Local Government policy statement
[12] Cambridgeshire Horizons Water Cycle Strategy Phase 1 by Halcrow

Groundwater Protection Zones

6.3.15 The Environment Agency defines Source Protection Zones (SPZs) for groundwater sources which are used for public drinking water supply. These zones (see Figure 6.7 at the end of the report) show the risk of contamination to water supplies from any activities that might cause pollution. The closer the activity the greater the risk. The maps show three main zones (inner, outer and total catchment).

6.3.16 There are a large number of abstractions south east of Cambridge which reflects the reliance upon the chalk aquifer for the public water supply. This is relevant to the development of all three scenarios. This issue does not necessarily pose a constraint to development provided that pollution prevention measures are provided. Sustainable drainage systems are also likely to be required to mitigate any loss of aquifer recharge area due to the increase in impermeable surfaces associated with development.

Water Supply

6.3.17 The short term challenges are in developing the local infrastructure to support growth and new development, which is dependent on Ofwat approving the water companies Final Business Plan.

6.3.18 Detailed consideration of the water supply network requirements is beyond the high level strategic assessment for this study, however in order to supply the new settlement option, major new strategic water supply infrastructure will be required. It is likely that this would be less sustainable than supplying developments in and around existing settlements which is more likely to require local reinforcement, however more detailed investigation would be required to confirm this.

Summary

6.3.19 Based upon the current information, there is sufficient water resource available to support the medium growth scenario for all spatial options (Market Town, Cambridge Green Belt and New Settlement options). There is also sufficient water resource for the High Case Market Town and New Settlement options, however, further investigation is required to confirm whether there is sufficient water resource to supply the High Case Cambridge Expansion option. The successful implementation of CSH Level 6 may offer a solution to allow development of the High Case Cambridge Expansion option, however further investigation is required to confirm this. It should be noted that current regulatory requirements mean that Cambridge Water cannot rely upon the successful implementation of CSH Level 6 as it has a duty to plan for a worst case scenario and ensure adequate water resources can be supplied in time of drought. This means that a regulatory change may be required to enable this scenario to be progressed.

6.3.20 In the long term, there is potential for additional water resources to be obtained by Anglian Water by transfer from the River Trent. Consideration should be made of the pumping and sustainability costs of this option to support future development.

6.4 WASTE-WATER AND WATER QUALITY

6.4.1 To assess the capacity of wastewater treatment works to accommodate additional development, the headroom within the effluent discharge consent has been reviewed. This consent is set by the Environment Agency to protect water quality in the receiving watercourse. Where the headroom in the discharge consent is insufficient to accommodate the levels of development proposed, the impacts of revising the discharge consent have been considered.

6.4.2 The remaining treatment capacity at each treatment works has not been considered in detail unless there are known constraints to extending the works. This is because Anglian Water is required to provide any additional treatment capacity in order to maintain the treatment standards required to comply with its discharge consents, therefore this is not considered to pose an ultimate constraint to future development. Wastewater treatment infrastructure constraints can typically be overcome given sufficient time and/or investment. Development timescales and timely provision of development location information to water companies are the key issues that will affect whether required wastewater infrastructure/asset upgrades pose any constraint to growth.

6.4.3 The assessment for water quality has considered whether the proposed levels of development has the potential to;

- exceed the environmental capacity of the receiving watercourse;
- restrict the ability to meet the requirements of Water Framework Directive; and
- introduce the need for a standard of treatment above the levels currently achievable by the best available technology.

Water Quality

6.4.4 The major water quality constraints are associated with the new settlements which will either require the construction of a new wastewater treatment works or the provision of a strategic sewer to an existing major treatment works.

6.4.5 The construction of a new treatment works at Alconbury or the Abingtons appears significantly challenging, as this would require a standard of treatment above the levels currently achievable by the best available treatment technology. The wastewater from Alconbury could be treated at Huntingdon WwTW, however there are no major treatment works in the vicinity of the Abingdons which could accommodate this load. Therefore water quality poses a serious constraint to the development of a potential new settlement at Abingdon, unless a long term commitment is made to the pump the wastewater to an alternative area where capacity is available. Sustainability of this solution in terms of carbon cost would need to be considered.

6.4.6 In order to accommodate additional development at Northstowe above what is currently planned (including the strategic reserve), further expansion of the wastewater treatment works and land drainage mitigation would be required. The upgrade of the existing treatment works is likely to require a standard of treatment above the levels currently achievable by the best available technology and therefore the water quality is an environmental constraint to this further expansion of Northstowe. To resolve this issue, the wastewater would need to be treated at an alternative location where the watercourse has the environmental capacity to accommodate additional treated wastewater effluent.

6.4.7 There are a number of treatment works in the study area where a revised discharge consent will be required and where the effluent is discharged to a minor watercourse. Further investigation is required to determine whether this could restrict the ability to meet the Water Framework directive and these development locations have been classified as a medium risk to water quality.

6.4.8 Anglian Water has taken the option of using a catchment wide solution to comply with the Habitat Directive and achieve the river phosphate target adjacent to the Ouse Washes. Therefore an increase in the consented flow at any WwTW upstream of the Ouse Washes within a particular area of influence will trigger an Appropriate Assessment. This will require modelling of the area of influence to assess impact on the Ouse Washes, which is beyond the scope of this study. The reduction in phosphate load within the watercourse, if required, does not necessarily need to be achieved by changing all of the discharge consents within the catchment of the Ouse Washes, providing that phosphate concentration in the river adjacent to the Ouse Washes does not increase. Based upon the current information the development of the Market Town Scenario has the greatest potential to increase the nutrient levels within the Ouse Washes, however insufficient information is available to determine whether this would be a constraint to the development of this scenario.

6.4.9 In order to understand the long term effects of future development upon the Ouse Washes, wider consideration is required of the total development planned in River Ouse catchment such as at Milton Keynes and in Bedfordshire. This will require modelling of water quality which is beyond the responsibly of Cambridgeshire County Council and should therefore be considered by EERA during the review of the East of England Plan.

Water Quantity

6.4.10 The Swavesey Internal Drainage Board (IDB) is already concerned over the Northstowe development owing to the potentially detrimental impact of additional flows from the wastewater treatment works upon flood risk in Swavesey Drain. The IDB is therefore highly likely to have ongoing concerns regarding any additional development draining to this catchment, such as would be caused by any increased flows from wastewater treatment works. Therefore there are likely to be significant constraints to any additional development draining to this watercourse without mitigation, and this would require further investigation and demonstrable solutions to overcome these issues.

6.4.11 Once additional detail is available regarding preferred development locations and site boundaries in Cambridgeshire, consideration should be made of how the increase in flows could affect the morphology of the watercourses.

Wastewater Treatment

6.4.12 The majority of the treatment works in the area will require expansion to accommodate the levels of development proposed. The locations where this will pose the greatest difficulties are within the wards of Waterbeach, Teversham and Soham. These difficulties can be overcome and should not pose a constraint to development in these locations. The Wastewater Treatment Works (WwTW) in the locations of potential development sites are shown in Figure 6.8 at the end of the report. It is likely that the flows from Waterbeach and Teversham could be treated at Cambridge WwTW and expansion would be required at Soham WwTW.

6.4.13 It is noted that moving the sewerage works at Cambridge Northern Fringe has now been discounted by the local authorities because of the lack of viability and because of the need to retain the sidings for rail transport uses.

6.4.14 Any improvements to the water services infrastructure needs to be programmed into a water company's capital programme, which runs in five year Asset Management Plan (AMP) cycles. We are currently in the AMP4 period (2005-2010) and water companies are in the process of preparing for its next submission to Ofwat, to determine its allowable capital expenditure for AMP5 (2010-2015). The period 2021-31 will be covered by AMP7 and AMP8. This funding cycle and its associated constraints can have implications for the phasing of development, and it is important that water companies are involved in the planning process to ensure that infrastructure can be provided in time.

Sewer Capacity

6.4.15 It is likely that all new developments will require a strategic sewer connection direct to the wastewater treatment works. Therefore the new developments should be located reasonably close to the treatment works to minimise the length of strategic sewer required.

Summary

6.4.16 Water quality poses a possible serious environmental capacity constraint to the development of a potential new town at the Abingtons or a significant extension of Northstowe. To overcome this constraint will require the construction of major strategic sewers to allow the wastewater to be treated in an area that can accommodate the large volumes of wastewater. The constraints of serving potential new towns at Alconbury or Waterbeach could be overcome, however this would still rely on treating the wastewater at locations away from the New Settlements, such as at Huntingdon or Cambridge. Therefore the development of the New Settlement option would require commitment to long term energy intensive pumping systems. Further work will be required to determine these limitations.

6.4.17 Further investigation is required to determine whether the additional development could restrict the ability to meet the Water Framework Directive, particularly in locations where wastewater treatment works discharge into small watercourses. There are difficulties which need to be overcome to support additional development at Soham, however, wastewater treatment capacity or water quality should not restrict the development of the Market Town or Cambridge Expansion Options.

6.5 ECOLOGY –SITES OF INTERNATIONAL IMPORTANCE

6.5.1 This section reviews the potential ecological impacts of future development scenarios upon the designated wetland sites. . The designated sites are shown on Figure 6.9, at the end of the report.

6.5.2 The European Habitats Directive, which is intended to protect important, rare and endangered plants, wildlife and natural habitats, was adopted by the European Commission in 1992. The Directive applies the 'precautionary principle' and was incorporated into UK law under the Conservation (Natural Habitats) Regulations 1994 which required the UK Government to designate Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). These are known as Natura 2000 sites, most of which are designated as Sites of Special Scientific Interest (SSSIs). SACs support rare, endangered or vulnerable habitats and species of plants and animals (other than birds) whereas SPAs support significant numbers of wild birds and their habitats.

6.5.3 In accordance with the Conservation (Natural Habitats, &c.) Regulations 1994, any development deemed likely to have a significant effect requires an Appropriate Assessment in order to determine whether it will have an adverse impact on the integrity of the European site. Authorisation for the development to proceed can only be granted once it has been properly ascertained that it will not adversely affect the integrity of the site (subject to considerations of overriding public interest). The assessment should include the need to proceed with a plan or project using the best available information.

6.5.4 Initial screening and assessment of a Natura 2000 site must commence as early in the development process as possible to ensure sufficient time is available to identify likely significant effects and to confirm the need for an Appropriate Assessment.

Market Towns

6.5.5 The development of the Market Towns is considered a higher risk in terms of potential negative ecological impacts on designated wetland sites. This is due to the following:

- The development areas surrounding Huntingdon and Alconbury are upstream of the Ouse Washes, an internationally designated site (Ramsar, SPA and SAC), and a Site of Special Scientific Interest (SSSI). There are six wastewater treatment works in the area surrounding

these developments and management of the Ouse Washes is currently under review as it is too wet in Spring and Summer as a result of impeded seasonal drainage (caused by siltation in the Hundred Foot Drain and other complex issues). Therefore additional flow through the Ouse Washes from wastewater treatment works is not desirable without suitable mitigation;

- Four development areas are directly adjacent to watercourses upstream of Portholme Meadow, an internationally designated site (SAC) and a SSSI. A further two development areas are adjacent to the designated site. The proximity of all six development areas to the designated site increases the risk of potential impacts from any pollution. In addition, the developments could potentially affect the hydrology of the area, which in turn could negatively impact Portholme Meadow SAC. The increase in flows from the three wastewater treatment works upstream of Portholme Meadow present potential risks in terms of water quality;
- Development at Sutton is just over 1.5km east of the upstream end of the Ouse Washes; the area's proximity to the designated site increases the risk of potential impacts from any pollution associated with surface water drainage;
- Development at Whittlesey is 1.4km south of the Nene Washes which is an internationally designated site (Ramsar and SAC), and a SSSI. Issues of concern relating to water quality already exist due to the wastewater treatment works upstream of the designated sites;
- The potential development at Ramsey is approximately 6.5km east and upstream of Woodwalton Fen, which is an internationally designated site (Ramsar and SAC), and a SSSI and NNR. There are risks of impact from pollution on the designated site from the upstream development area. However, Woodwalton Fen is part of the Great Fen Project Area, which aims to create a 3,700ha wetland area between Huntingdon and Peterborough. This will be achieved by converting the arable land that currently exists between Woodwalton Fen and Holme Fen into fenland, thereby connecting these two designated sites. This project may have an important role in the management of flood water, which could be channelled from the development area into the newly-created wetland; and
- The proposed development area south of Peterborough is just south east of Orton Pit, an internationally designated site (SAC) and SSSI. 25% of this site consists of inland water bodies. The development area is also north-west of Holme Fen, a nationally designated site (NNR) and SSSI. The development could potentially affect the hydrology of the area, which in turn could negatively impact both designated sites.

6.5.6 Several development areas are upstream of, or adjacent to, SSSIs with wetland features, increasing potential impacts from any pollution incidents. These include:

- The development at St Neots which is upstream of St Neots Common SSSI and Little Paxton Pits SSSI;
- The development at Gamlingay is adjacent to Waresley Wood SSSI;
- Three of the development areas around Huntingdon are upstream of Portholme Meadow SSSI/SAC; a further two development areas are in close proximity to the designated site, increasing the risk of potential impacts from any pollution;
- Grafham Water and Brampton Woods SSSIs are west of two proposed development areas to the south west of Huntingdon. Changes to the area's hydrology could negatively impact both sites;
- The development area at Ely is just upstream from Ely Pits and Meadow SSSI, also including Roswell Pits SSSI;
- The development area south of Cambridge at Little Shelford is just south east of Dernford Fen SSSI;
- The development area south of Cambridge at Melbourn is south west of Fowlmere Watercress Beds SSSI; and

- The development area at Soham is upstream of Ely Pits and Meadows SSSI, therefore there are potential risks of impact on the designated site from pollution. The development area is north east of the Cam Washes SSSI and Wicken Fen, an internationally designated site (Ramsar and SAC), and a SSSI. The area apparently does not overlap the catchment of New River, which runs through Wicken Fen; however this cannot be stated for certain, as currently the extent of the development area is not clearly defined. The Wicken Fen Vision is a long term project to expand the wetland area between the existing Wicken Fen and Anglesey Abbey to the south towards Cambridge. This project may have an important role in the management of flood water, which could be channelled from the development area into the newly-created wetland.

6.5.7 Development area causing the least negative impact is at March as there are no designated sites identified downstream. However, the above views are subject to much further detail analysis and are at this stage potential issues that are highlighted as risks to be managed.

Cambridge Expansion Strategy

6.5.8 The expansion of Cambridge is considered medium risk in terms of potential negative ecological impacts on designated wetland sites. This is due to the following:

- Five of the ten development areas are directly adjacent to watercourses upstream of the Cam Washes SSSI; therefore there are potential impacts from any pollution associated with surface drainage. The sites are relatively close to the designated site, thereby increasing the risk of negative impacts from any pollution. The SSSI is designated for wet grassland and breeding waters, and includes washlands which flood in the winter, i.e. floodplain habitats are inextricably linked with hydrological conditions in the river. At least eight proposed wastewater treatment works are upstream of the SSSI, consequently there are potential risks associated with water quality (and flows) downstream at the Cam Washes;
- It is worth noting that Wicken Fen, an internationally designated site (Ramsar and SAC), is adjacent to the Cam Washes SSSI. However, any risk is likely to be small since Wicken Fen is hydrologically upstream of the Cam; and
- One development area is upstream of Wilbraham Fens SSSI and may present pollution and hydrological risks similar to those described above for the Cam Washes.

6.5.9 Several development areas are upstream of, or adjacent to, SSSIs with wetland features, increasing potential impacts from any pollution incidents. These include:

- Two development areas east of Cambridge (Teversham and Great Wilbraham) are adjacent to Fulbourn Fen and Wilbraham Fen;
- Two development areas south of Cambridge at Little Shelford and Sawston are adjacent to Dernford Fen SSSI and relatively close to Whittlesford and Thriplow Hummocky Fields and Thriplow Peat Holes SSSIs; and
- The development area south of Cambridge at Melbourn is south west of Fowlmere Watercress Beds SSSI.

6.5.10 Development areas causing the least ecological negative impact:

- Histon (just north of Cambridge); and
- Melbourn (south west of Cambridge). Although this development area is south west of Fowlmere Watercress Beds SSSI, it is the only development area within this scenario that is not adjacent to a watercourse. Therefore, in terms of the Water Cycle Strategy, it has the least potential for negative impacts.

6.5.11 The above views are subject to much further detail analysis and are at this stage potential issues that are highlighted as risks to be managed.

New Settlements

6.5.12 The development of new settlements is considered a medium risk in terms of potential negative ecological impacts on designated wetland sites. This is due to the following:

- Two of the proposed spatial options for new settlements are adjacent to watercourses that are upstream of the Cam Washes SSSI and adjacent to Wicken Fen (Ramsar and SAC). Therefore there are potential impacts from any pollution associated with surface drainage. The sites are relatively close to the designated site, thereby increasing the risk of negative impacts from any pollution;
- The SSSI is designated for wet grassland and breeding waters, and includes wash lands which flood in the winter, i.e. floodplain habitats inextricably linked with hydrological conditions in the river. At least eight proposed WwTWs are upstream of the SSSI, consequently there are potential risks associated with water quality (and flows) downstream at the Cam Washes;
- It is worth noting that Wicken Fen, an internationally designated site (Ramsar and SAC), is adjacent to the Cam Washes SSSI. However, any risk is likely to be small since Wicken Fen is hydrologically upstream of the Cam;
- One of the areas considered through the spatial options for the new settlements is directly adjacent to a watercourse that is upstream of the Ouse Washes. There is also a WwTW adjacent to this development. The development area is also upstream of several SSSI sites with wetland features; and
- The spatial option for the new settlement east of Sawston is on the bank of a watercourse opposite Alder Carr SSSI.

6.5.13 However, the above views are subject to much further detailed analysis and are at this stage potential issues that are highlighted as risks to be managed.

Summary

6.5.14 Comparison of scenarios has not taken into account any potential future mitigation measures that may be implemented. The expansion of the Market Towns option is considered to have the highest risk of ecological impacts to the designated wetland sites without mitigation measures. The expansion of Cambridge and New Settlement options are considered to have a medium risk of ecological impact without mitigation measures. This is however subject to further detailed analysis.

6.5.15 The table contained in Appendix G summarises the evaluation of all the options against:

- Flood Risk;
- Water Resources;
- Wastewater Treatment;
- Water Quality;
- Sewer Capacity; and
- Ecology.

6.6 CLIMATE CHANGE, ENVIRONMENT AND LANDSCAPE

Climate Change

6.6.1 Climate change will impact on habitats and species and there is a need to protect existing sites and features to avoid severance and fragmentation as well as preventing reductions loss of existing species and habitats . With this in mind there is a need to improve access to nature and integrate biodiversity into development, as currently there are deficiencies in the level of accessibility to green infrastructure for the Cambridge Sub-Region and other parts of the county and green infrastructure provides mitigation benefits for climate change.

6.6.2 The RSS recognises the importance of climate change and meeting obligations on carbon emissions in taking forward sustainable development. This is reflected in policies ENG1&2 and WAT1-4.

6.6.3 Since the RSS the UK has passed the Climate Change Act, which sets out the greenhouse gas reduction goals within a new national framework. IN Cambridgeshire the County Council published a Climate Change and Environment Strategy in 2008, which sets out a vision for Cambridgeshire in 2021 and this sits alongside climate change targets for the Local Area Agreement for Cambridgeshire.

6.6.4 The introduction of zero carbon standards for new homes and schools from 2016 and other public sector buildings from 2018 and all new buildings from 2019 will help limit Co2 emissions. However, this will not address emissions from the existing built environment and furthermore the delivery of zero carbon has many challenges, including residual emissions from the new buildings after the built fabric and other on-site measures have been incorporated.

6.6.5 Delivery of low carbon homes and for all buildings is necessary to work towards meeting climate change targets across all spatial options. However, progress is being made on this, but transport, and particularly existing travel habits, will be more challenging to alter and more detail is discussed on this in the next chapter.

6.6.6 The increases in traffic from commuting associated with the growth within the spatial options will adversely impact on existing Air Quality Management Areas (AQMA). Furthermore there may be a need for additional AQMA designations from the generation of additional traffic from new development.

6.6.7 Finally, given that the Climate Change Act targets will apply to all types of greenhouse gases and greater understanding of the impact of growth on other gases is required.

Energy

6.6.8 The European Commission has proposed a UK target to achieve 15% of the UK's energy from renewable by 2020. The EERA report "Placing Renewables in the East of England" published in 2008 estimated that the level of renewable electricity output from Cambridgeshire as 25.4% of onshore generation.

6.6.9 Whilst, the County is doing relatively well in the production of renewable energy there is a step change required from heat and for transport fuel, which is particularly challenging

In order to tackle the rising carbon emissions in the medium to longer term there is a need for a strategic approach to lower carbon energy infrastructure, such as renewables, decentralised energy provision, combined heat and power and opportunities for energy from waste. A step change is required to meet targets. This would give rise to additional costs in terms of build to meet sustainable construction methods and strain on s106 resources as well.

6.6.17 The current strategy will require significant upgrades to electricity supply as set out in Appendix F.

Biodiversity

6.6.10 Key issues to tackle under all spatial options include:

- Inclusion of measures to allow adaptation and species to move within the landscape and therefore a landscape scale approach to biodiversity conservation;
- Protection of existing sites and features of biodiversity value;
- Mitigating human impacts on sites;
- Seeking to avoid habitat loss and fragmentation through severance of wildlife corridors by built infrastructure and new development needs to seek to buffer existing habitat, extend and link fragmented landscape features;
- Seek opportunities to help meet biodiversity action plan targets;

- Maintaining water quality and quantity;
- Improving access to nature in urban areas and urban fringes;
- Integrating biodiversity into development; and
- Long term management of sites and obtaining funding for such management.

Landscape

6.6.11 There are no nationally protected landscapes within Cambridgeshire, however there are a wide range of landscape character areas which have been indentified at the national level as set out in policy ENV2 Landscape Conservation of the RSS. At the local level the Cambridgeshire Landscape Guidelines produced in 1995 identified six distinct landscape character areas.

6.6.12 In terms of the new settlement option there is the potential for significant impacts on landscape due to existing local topography and character.

Green Belt

6.6.13 There could be potential significant impacts on the Cambridge Green Belt for any further growth in the future with the green belt as currently drawn, and questions exist over whether this can be consistent with maintaining the green belt purposes of preserving the character of the city, maintaining and enhancing its setting and preventing surrounding communities from coalescing with the city and each other. However, it may be the case that a future review of Green Belt could identify minor changes to the Green Belt which could have a relatively limited impact, although strategic growth would present significant challenges. Furthermore, protection and enhancement of the wider historic environment is required, whether in Cambridge or the market towns.

Historic Environment

6.6.14 In general terms, both Cambridge and Ely include archaeological remains and built environments of exceptional importance. The historic market towns have retained high quality archaeological remains and buildings which are nationally and locally distinctive. Most of Cambridgeshire's villages have ancient origins reflected in their current forms and built environment. Cambridgeshire's landscape also contains many boundaries and features of ancient origins. The division across all districts for all types of historic asset, but not necessarily quality, is as follows:

- Cambridge 9%;
- East Cambridgeshire 18%;
- Fenland 11%;
- Huntingdonshire 27%; and
- South Cambridgeshire 35%.

6.6.15 Overall there is a wide spread across the County of features relating to the wider historic environment. With this in mind there is a need to ensure that prior to delivery of any new development through the spatial options that there is understanding of the historic environment and its relationship to development and the impacts that can occur. Whilst this does not prevent delivery of any of the spatial options it clearly means that consideration needs to be given to protecting and enhancing the wider historic environment.

Agricultural land

6.6.16 Provision of land for new development is likely to impact on high grade agricultural land especially in the Fens.

Waste

6.6.17 It is estimated that with the current development growth strategy there will be an increase of 28% in waste arising (noting need to make provision for waste from London) and this could become a further constraint under additional growth scenarios.

Green Infrastructure

6.6.18 The Green Infrastructure Strategy for the Cambridge Sub-Region was published in 2006. A review is currently underway.

6.6.19 Currently the main green corridors are the waterways, such as the Ouse Valley and Washes, River Cam. They also include significant archaeological remains, such as Devil's Dyke and Fleam Dyke.

6.6.20 .Both the Strategic Open Space Study and the Green Infrastructure Strategy for the Cambridge Sub Region highlighted existing deficiencies in the level of accessible green infrastructure within the County. The Strategy which is currently under review proposed three main elements namely Green Corridors, Major New Greenspaces and Six Landscape Projects.

6.6.21 Green infrastructure will need to play an increasing role in any of the spatial options for the mitigation it can provide for climate change, such as flood relief, carbon reductions, thermal cooling and biodiversity. Sustainable access to and through green infrastructure will be important for low carbon economies and congestion mitigation within the County for all the spatial options

Infrastructure Implications

6.6.22 The implications for growth on other infrastructure are shown in Table 6.2 below. The implications for transport infrastructure are covered in the next Chapter. Further work will be required to identify the likely cost of this infrastructure and how it is to be funded.

Option	Growth Scenario	Likely Infrastructure Requirements (not including Transport)
Market Towns Strategy	Baseline - 75,415	Expansion of existing facilities and additional facilities where required, noting the scale of development related contributions and the infrastructure required to deliver the current strategy
	Medium - 90,415	Measures required to tackle flood risk Expansion of wasterwater treatment facilities and measures to mitigate impacts on water based ecology Expansion of schools may be difficult and therefore building of new schools (particularly primary with approx 1 new school per 1,000 dwellings and 1 secondary school per 3,000 to 4,000 dwellings) and incremental growth below these thresholds presents difficulties for accommodating education requirements and therefore easier to provide larger sustainable urban extensions where new schools can be part of masterplan Expansion of community facilities and governance structures Increased physical space required within town and city centres to accommodate growth and regeneration of the urban fabric Integration with the countryside and green infrastructure to promote access to the Countryside Expanded and new waste and recycling facilities Renewable energy provision (Fenland already offers opportunities) Upgrading and expansion of all existing utilities *All of the above starting from an existing base*
	Higher - 110,415	

Option	Growth Scenario	Likely Infrastructure Requirements (not including Transport)
Cambridge Based Strategy	Baseline - 75,415	**Cambridge** Land required for relocation of Marshall Aerospace businesses Physical capacity issues for services and retail in the City Centre
	Medium - 90,415 Higher – 110,415	**Northstowe** New wastewater treatment and measures to tackle flood risk and water quality Increased size of governance structures Increased size of community facilities Further retail floorspace required Further schools to be built Expansion of existing utilities **Cambridge** Further physical space needed to accommodate growth in services, retail and facilities Measures to reduce possible impacts of water stress Expansion of wastewater treatment facilities Significant ecological and landscape provision as well as open space to mitigate and seek to preserve setting and quality Expansion of education facilities is easier to deliver with larger scale sustainable urban extensions than scattered dispersed change Recycling sites and transfer stations to accommodate Access to the Countryside measures Upgrading and expansion of existing utilities
New Settlement Strategy	Baseline – 75,415	*See Northstowe above*
	Medium – 90,415 Higher - 110,415	**Waterbeach and Cambourne (Medium growth)** **Alconbury and Abingtons (Higher growth)** Existing services only those associated with a village No existing starting point for any major development so significant costs and resources required to deliver infrastructure Drainage measures and flood risk mitigation required for expansion New wastewater treatment and measures to tackle water quality New governance structures New community facilities Retail floorspace required Significant schools to be built (approx 1 primary per 1,000 dwellings and 1 secondary per 3,000-4,000 dwellings) Extensive ecological and landscape mitigation required Protection of groundwater supplies Completely new utilities provision

Table 6.2 Likely Infrastructure Requirements (excluding Transport)

7 Evaluation – Transport, Economy and Carbon Impacts

KEY MESSAGES

- Testing has been carried out using the Cambridge Sub-Regional Model (CSRM) to consider the balance of dwellings to employment demand
- All options show an imbalance between the projected employment growth and the level of housing numbers following the growth scenarios (although the degree of imbalance varies with the input assumptions that are made)
- Commuting trips to Cambridge and South Cambridgeshire increase significantly in the baseline of the committed supply of dwellings
- Growth of dwellings in the market towns and Cambridge, whilst it will increase the number of trips, could result in reduced average journey distances
- Under any growth strategy, significant congestion is likely to occur without major infrastructure investment and increased levels of demand management, particularly in and around Cambridge
- The increase in commuting trips is highest for the new settlement option
- In all options, the increase in work trips TO Cambridge (i.e. demand for employment in Cambridge) is significant.
- Relationships with neighbouring authorities are likely to strengthen, particularly for commuting patterns in relation to Bury St Edmunds, Peterborough, Kings Lynn and the Bedford to Milton Keynes corridor.
- Carbon impacts show that in all options transport related CO_2 is likely to increase even taking account of possible improvements in vehicle efficiency and emissions, and therefore significant steps to change travel behaviour and mode of transport will be required in any scenario.
- Carbon Impacts for housing and employment have been determined by modelling work by Cambridge Econometrics and this shows that increases in population and growth in economic activity will have associated increases in carbon impacts and whilst the increases take into account possible policy interventions steps should be considered to mitigate these impacts

7.1 INTRODUCTION

7.1.1 This chapter considers the evaluation of the spatial options with a focus on the employment and dwellings balance, the transport patterns arising from the Cambridge Sub-Regional Model (CSRM) and the analysis of commuting patterns and consideration of the carbon impacts.

7.2 BACKGROUND TO CAMBRIDGE DEVELOPMENT STUDY WORK

7.2.1 For the Cambridgeshire Development Study, employment projections were derived from Cambridge Econometrics policy-based forecasts. The analysis of the growth in these forecasts, applied to 2001 Census employment in the County, implied a total of 32,000 extra jobs (labour demand) from 2006 to 2031, or a 12% increase.

7.2.2 However, the baseline dwellings scenario projected 75,000 extra dwellings, an increase of 30% over 2006.

7.2.3 As part of the Cambridgeshire Development Study (CDS) patterns of commuting within, from and to the County were analysed to estimate the growth in people working within the County which would be associated with these extra dwellings. This was termed 'Demand for Employment', a term selected deliberately to emphasise that this quantity is a demand created by the addition of dwellings in the County. The quantity differs from 'Labour Supply' in that it represents the net demand after in-commuting to the County has been added in, and out-commuters have been accounted for. N.B. The County Council Labour Supply projections to 2031 (which assume activity rates will not rise after 2016) have therefore not been used for this exercise, but these are discussed below in 7.5.

7.2.4 In the CDS report, the analysis assumes a modest 5% growth in in-commuting over the period 2001-2031, and out-commuting as a fixed proportion of the working population. This equates to a 30% rise in net out-commuting, from 7,300 to 9,500.

7.2.5 The demand for employment was then further modified using DfT's TEMPRO 5.4 data to modify the assumptions on the number of adults per household.

7.2.6 However, it has been highlighted that these assumptions may be incomplete in that:

- The number of workers per household is a better representation of the demand for employment than simply household size or adults per household, as it represents shifts in labour participation.
- The population of the county is projected to age significantly, and this effect in particular needs to be taken into account when considering the labour supply within the county.

7.2.7 This note then considers these further issues and their potential impact on the conclusions of the report.

7.3 ANALYSIS OF DEMAND FOR EMPLOYMENT

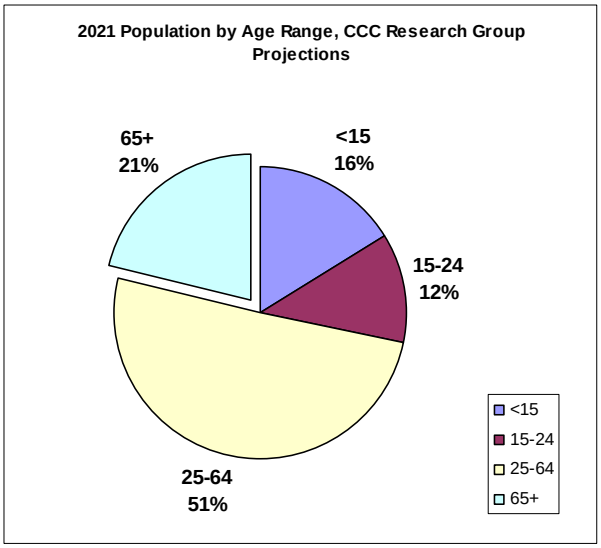
Changes in age structure: CCC vs TEMPRO

7.3.1 In applying DfT TEMPRO projections, the analysis for the study has implicitly used TEMPRO's assumptions for the age structure of the population, which are taken from Office for National Statistics projections. Separate work has been carried out by CCC Research Group considering the characteristics of the local population in more detail (CCC Research Group , 2007)[13].

7.3.2 The figure below compares the TEMPRO v5.4 and CCC projections of the County age structure in 2021. Though the age ranges used differ slightly, it can be seen that the broad age structure is very similar: the proportion of the population above 65 is approximately 20%, and the proportion in the working age range can be seen to be between 50% and 60% in each case.

7.3.3 Figure 7.1a shows the TEMPRO figures for 2031 (N.B. alternative County age structure projections for 2031 are available but they have not been used for this exercise). This shows that the proportion of 64+ increases to from 19% to 22% in the intervening years, suggesting that the trend of ageing continues through time.

[13] Cambridgeshire County Council Research Group 2007-based ward age-group forecasts, http://www.cambridgeshire.gov.uk/community/population/forecasts/Populationforecasts.htm



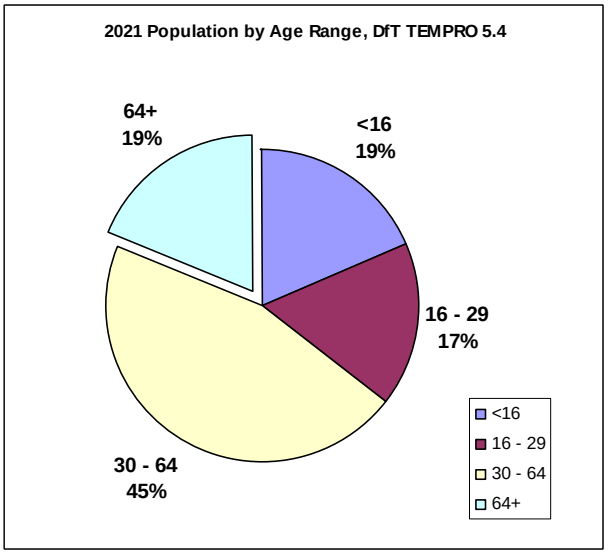


Figure 7.1a 2021 Age Structure of County Residents, CCC Research Group and TEMPRO 5.4

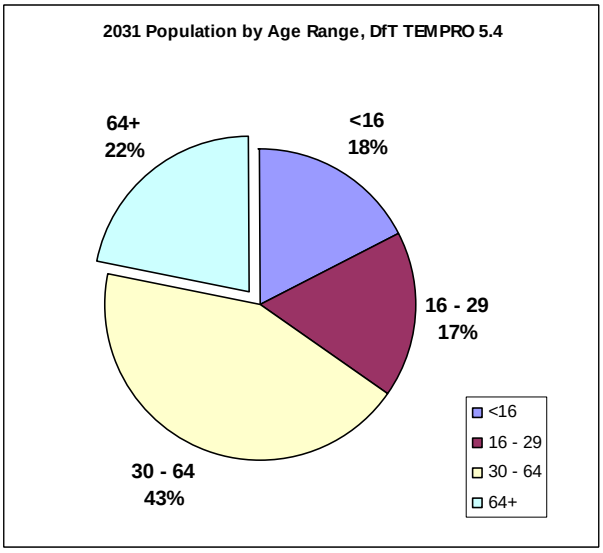


Figure 7.1b 2031 Age Structure of County Residents, TEMPRO 5.4

7.3.4 In terms of Figure 7.1b it can therefore be concluded that the TEMPRO assumptions on age structure are broadly in line with what CCC analysis would suggest.

Proportion in Employment, by Age Range

7.3.5 In the context of the CDS analysis, it may be important to consider to what extent the ageing population (above the current retirement age) will be seeking work. In TEMPRO, it is assumed that none of the NO over 65s are part of the labour market. However, TEMPRO does project an increase in the proportion of 15-64 year olds who are seeking work from 72% to 81%.

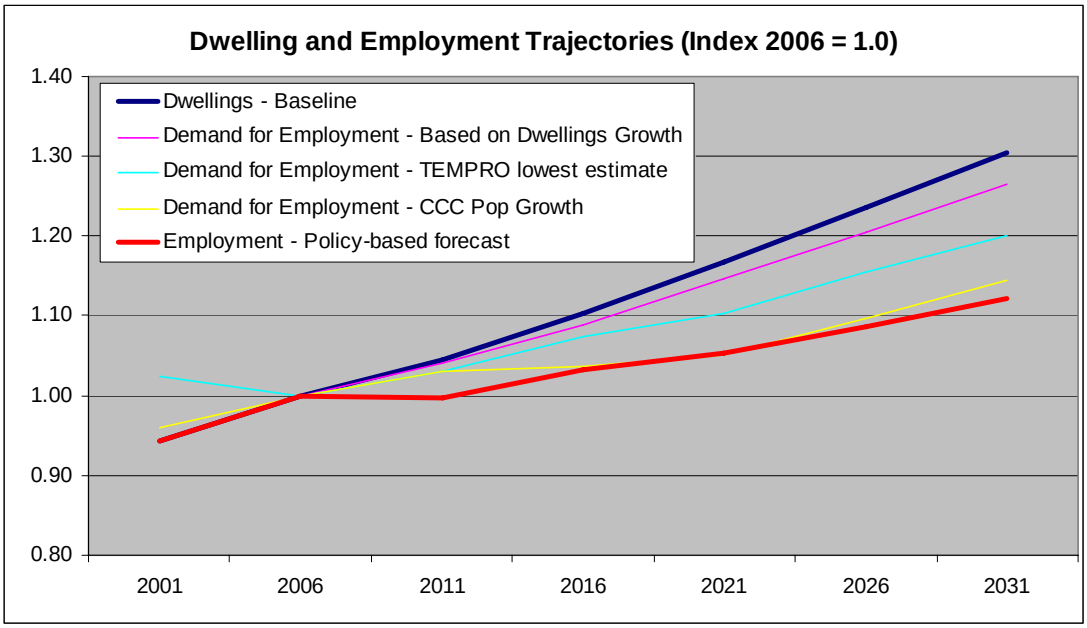


Figure 7.1c Growth in Dwellings and Employment, compared with Demand for Employment

7.3.6 Figure 7.1c above compares the growth rates of Baseline Dwellings (Dark Blue line) and Employment (CE Policy Projections, Red line) with the expected rise in demand for employment, with varying assumptions as follows:

- **Based on Dwellings Growth (pink line):** Assuming current numbers of jobs sought per dwelling, but shift in-commuting vs out-commuting as discussed above.
- **'Low' TEMPRO estimate (light blue line):** Assuming a decrease in workers per household as projected by TEMPRO. The TEMPRO assumption includes an allowance for household size decrease over the period, but also assumes an increased rate of employment amongst the working age population.
- **CCC Working Population (yellow line):** Increase in demand for employment based on TEMPRO household size, and with the working age population calculated based on proportions aged 15-64 in published CCC figures.

7.3.7 It can be seen that the gap between employment growth and demand for employment is lowest when using the CCC age projection alone. The gap between the jobs created (2006-2031) and increase in demand for employment varies from 40,000 (dwellings based) down to 6,000.

7.3.8 This analysis is necessarily approximate, but does suggest that the amount of labour supply in the County (and hence demand for employment) varies based on input assumptions regarding age and employment participation. However, a number of key questions will need to be addressed to achieve greater certainty in this respect:

- The EERA employment forecasts undertaken by Oxford Economic's have been reviewed, with new baseline, recession and 'faster recovery' scenarios;
- The CCC Research Group based projections assume that none of those aged 65+ seek employment. This may not be a correct assumption: retirement ages are expected to increase in future;
- A relatively simplistic assumption regarding the balance of in-commuting and out-commuting has been made, with a general increase in out-commuting, decreasing the employment required in the County; and

- The CE employment projections include 12% growth to 2006, whereas dwellings grow by only 6% in this period. This suggests that a further review of changes in the 2001-2006 period may be required.

7.3.9 The above points are raised within the study to make a clear reference to the effects of the County's population characteristics on growth in dwellings and demand for employment.

7.3.10 However, for the purposes of modelling work within this study the TEMPRO forecasts have been used, and the TEMPRO age structures structures are broadly in line with CCC.

7.4 MODEL INPUTS

7.4.1 In order to take the growth scenarios and spatial options and input them into the CSRM significant work was undertaken to establish suitably detailed model inputs. The details of the CSRM inputs and how these were determined are set out below.

Dwellings

7.4.2 In developing the dwellings options, the project team consulted with CCC and the affected Districts to consider the likely delivery rates for new dwellings in the period from 2008 to 2021, and determine how these would be affected by the economic slowdown.

7.4.3 Based on these discussions, the following assumptions were made in the Baseline case:

- Due to the current economic recession and hence downturn in new building starts, confirmed from a survey of local authorities in autumn 2008, all districts will have build rates well below the RSS Policy H1 targets during the period 2008 to 2011;
- During the next two years (2011-2013) Huntingdonshire, East Cambridgeshire and Fenland are able to reach their Policy H1 minimum targets, considering that these are lower than those achieved in the period 2001 to 2008. South Cambridgeshire is also expected to recover (largely due to building in Northstowe commencing). However, it is thought that the Cambridge building rate may remain below the H1 targets during this period; and
- Between 2013 and 2021, all districts will achieve the Policy H1 targets.

7.4.4 The Baseline scenario then allows for growth to continue to achieve the overall baseline target of 75,415 extra dwellings by 2031. Despite the assumed slowdown in delivery, the target can be achieved without exceeding the H1 build rate target of approximately 3,900 dwellings per annum.

7.4.5 To produce a build profile over time which realistically balances the build rates through the period, it has therefore been assumed that delivery of dwellings would rise more slowly to 2021, peaking at 3,450 in 2026-2031.

7.4.6 The precise spatial patterns were then derived using the following information:

- CCC projections of Strategic Site developments across Cambridgeshire, detailing projected build rates and total capacity to 2024 for all strategic sites (See Table below); and
- CCC Research Group's revised estimates of the total development by Ward (incorporating Strategic Sites and individual developments across the county).

7.4.7 The two datasets were compared and found to be in line in terms of Strategic sites, with the exception of Northstowe for which CCC Research Group projected a lower total to 2021 (5,700 compared with 7,000 dwellings). In this case, the Research Group total was used as an input assumption, and the remaining development assumed to take place post-2021. In all cases, the Strategic site developments post-2021 were used to indicate development potential of the sites but were not used as a hard and fast constraint.

7.4.8 This information was then used to derive the expected spatial development patterns through time within the baseline totals by district explained above. The following rules were applied:

- Where the Baseline district development to a specific year was BELOW the CCC allocations, the CCC build rate in the period for each Ward was scaled down to the Baseline total; and
- Where the Baseline target to a specific year was ABOVE the CCC allocations, the total build was scaled up using the CCC spatial pattern up to that date.

7.4.9 This approach preserves both the CCC spatial development pattern and the relative timing of developments within each District, so that developments are brought forward in a manner in keeping with District and County priorities. The resulting annual growth rates are shown in Table 7.1 below and the trends illustrated by Figure 7.1d for all the growth scenarios. The table compares the outturn total build to 2031 with the housing trajectories from Table 2.3 which demonstrates the overall build rate remains within accepted bounds. It should be noted that in all districts the build to 2031 exceeds the number of sites identified in County figures provided for this study, and the build in Fenland to 2021 exceeds identified sites to that date.

	2006-2008	2008-2011	2011-2016	2016-2021	2021-2026	2026-2031	Total 2006-2031	Housing Trajectory 2006-
Cambridge	596	226	526	1,004	1,029	1,073	**20,027**	17,172
East Cambs	721	173	207	276	285	297	**7,289**	7,272
Hunts	847	309	457	417	414	433	**11,227**	12,302
South Cambs	702	226	1,193	1,148	1,176	1,227	**25,807**	27,493
Fenland	1107	226	401	386	396	413	**10,870**	11,176
Total	**3,972**	**1,160**	**2,785**	**3,231**	**3,300**	**3,443**	**75,220**	**75,415**

Table 7.1 Baseline Annual Growth Rates by District

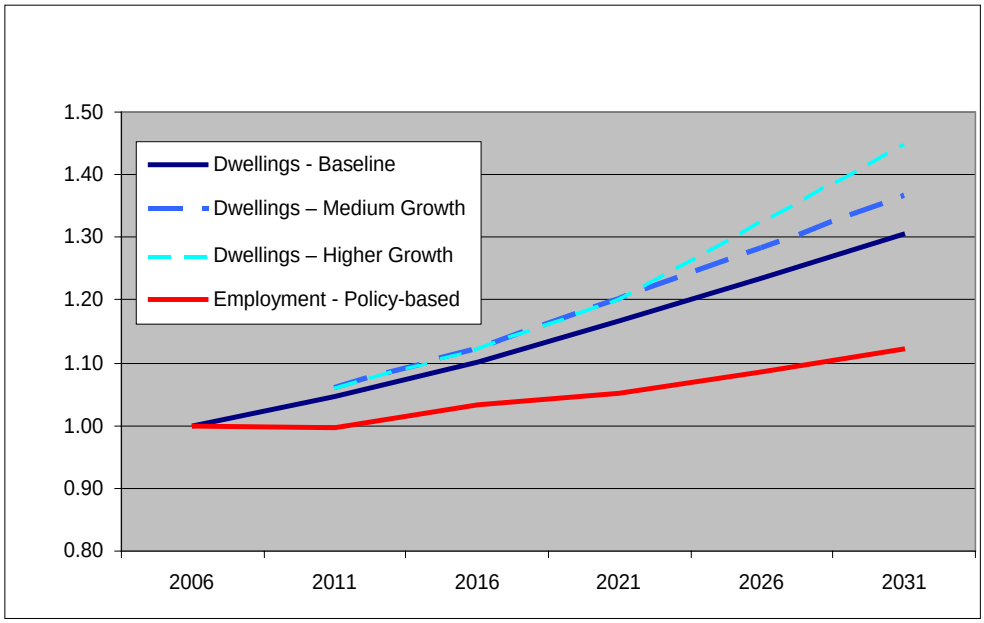


Figure 7.1d: Dwelling and Employment Trajectories (Index 2006 = 1.0)

Employment Data

7.4.10 Cambridge Econometrics provided growth forecasts by detailed employment type for each District. The employment types were matched by Standard Industrial Classification against the CSRM model's 9 employment types.

7.4.11 The method of calculation of employment levels used by Cambridge Econometrics (CE) considers employment in a different manner to the 2001 Census reporting of workplace employment. The main differences being that:

- Census figures only include the first job occupied by each employed person (excluding multiple jobs);
- CE's figures include work generated within the District but where the work is not specifically carried out there (e.g. employment agencies, supply teachers); and
- CE's figures include those over 74, voluntary work and others not necessarily counted as employed on the Census form.

7.4.12 Given that the aim of the study is to consider spatial work patterns, the study has used the absolute employment figures from the Census which have firmly established spatial patterns. The relationship of employment to commercial floorspace and dwellings and links to the skill sets of the population, have been considered as part of the CSRM model development.

7.4.13 The employment forecasts used to consider future trip making and pressure for jobs have therefore been based on 2001 Census employment, with growth applied based on the Cambridge Econometrics policy based forecasts. The resultant employment trend is illustrated in Figure 7.1. The percentage growth within each district and employment type is preserved, although the absolute change in employment is 32,000 as opposed to 41,000 in the input CE figures.

7.4.14 This approach makes the explicit assumption that the rate of change in 'first job' employment is identical to the rate of change in wider employment as considered by Cambridge Econometrics' figures.

Commercial Floorspace

7.4.15 Commercial floorspace data was obtained from Cambridgeshire County Council based on existing floorspace allocations and known planning applications.

7.4.16 Data received from CCC was categorised by Use Class which have been matched to employment types in the CSRM model development as shown in Table 7.2 below. Changes in commercial floorspace were entered across Industrial, Warehouse, Retail, Office and "Miscellaneous" categories.

Use Class	Class Description	Floorspace Type	Corresponding Model Employment Type
B1	Business general	Office	Finance and Business Services
B1a	Offices (excluding		
B1b*	R&D , studios,		
A3	Finance an professional		
B1c	Light Industry	Industrial Floorspace	Manufacturing and Utilities
B2	General Industry		
B8	Storage and Distribution	Warehousing	Transport, Storage and
RTC**	Retail Floorspace	Retail Floorspace	Retail, Catering and Repairs
RTD**	Retail Floorspace		
RTU**	Retail Floorspace		
A2	Shops		
SuiG	Shops and services		
A4	Restaurants and cafes		
A5	Takeaway		
C1	Hotels etc		
C2	Residential Institutions	Miscellaneous and Leisure	Other/Miscellaneous (includes Health)
D1	Non-Resi Institutions		
D2	Cinemas etc		

Table 7.2 - Correspondence of Use Types and Model Employment and Floorspace Types

** Use Class B1b was initially assigned to Industrial usage, but in future developments there are a series of large R&D and laboratory developments, which have been assumed to be more akin to Office usage.*

*** Source: CCC Retail Floorspace codes RTC – Retail Convenience Floorspace, RTD – Retail Durable Floorspace and RTU – Retail unknown (where it is not identified in planning application).*

Demographics

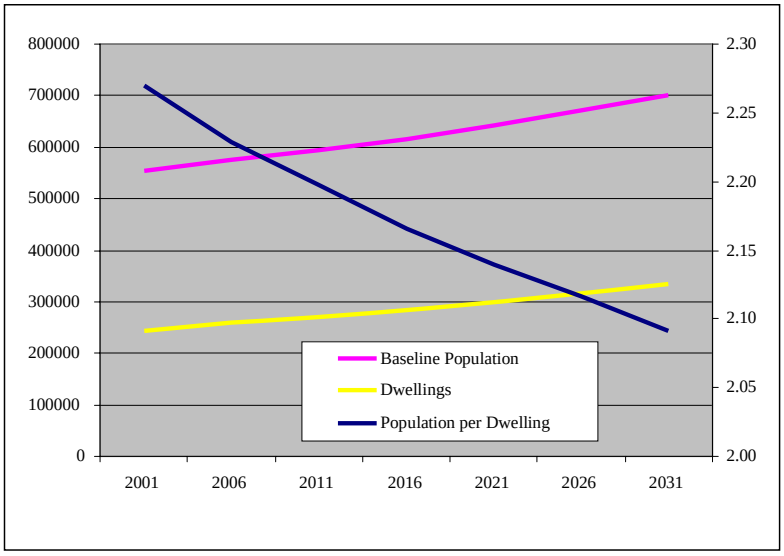
7.4.17 Default assumptions from Department for Transport's TEMPRO planning software were used to provide the model with assumptions on changes in student numbers, numbers of non-employed households (both unemployed and retired), and proportions of households according to car ownership, numbers of adults, and adults seeking employment.

7.4.18 The future population for the baseline was based on projected growth in dwellings, 2001 Census household sizes and TEMPRO trajectories. Shifts in household size by district were estimated[14] from TEMPRO v5.4 and applied to 2001 household size figures, projecting population per dwelling by district as shown in Table 7.1 below.

	2001	2006	2011	2016	2021	2026	2031
Cambridge	2.45	2.42	2.38	2.34	2.30	2.28	2.24
East Cambs	2.36	2.31	2.28	2.25	2.23	2.21	2.19
Hunts	2.39	2.36	2.34	2.31	2.29	2.27	2.25
South Cambs	2.39	2.36	2.30	2.25	2.20	2.17	2.13
Fenland	2.27	2.23	2.20	2.17	2.14	2.12	2.09

Table 7.1: Projected Population per Dwelling, TEMPRO 5.4.

[14] Change in household size has been based on adults in household, from TEMPRO



Note: 2001 rates have been calculated from 2001 Census Data.

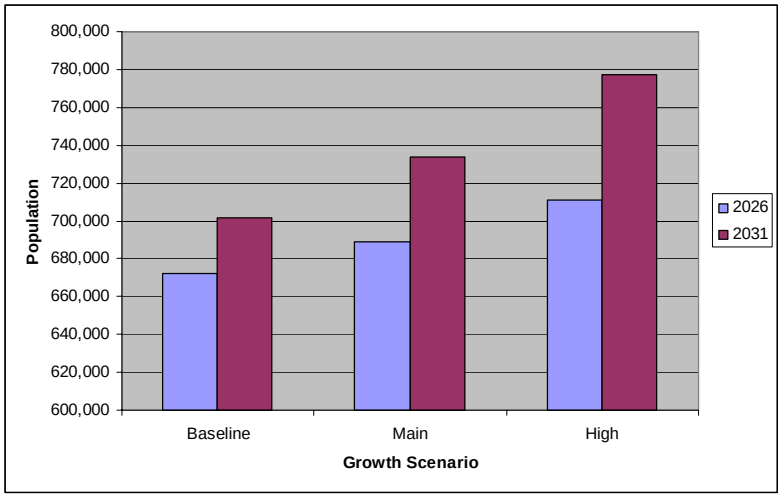


Figure 7.2: Cambridgeshire's Projected Population per Dwelling, Dwellings and Population

7.4.19 The population per dwelling together with dwelling numbers were then used to obtain the total population. The County's projected dwellings, population per dwelling and the resulting population growth are illustrated on Figure 7.2 below.

7.4.20 For the purposes of taking forward the various growth scenarios the population was then estimated for the medium and higher growth scenarios and the comparison of these to the baseline are also shown in Figure 7.2.

Constraints (Transport / Infrastructure)

7.4.21 CSRM includes an integrated model of highway, public transport, walk and cycle networks, and as such has its own internal representation of transport constraints. This incorporates the County's SATURN model. However, it should be noted that, due to time constraints, it was not possible to consider detailed congestion responses or transport changes above the CCC base assumptions as part of this work. However, the findings indicate likely requirements for transport infrastructure.

7.4.22 It should also be noted that the CSRM does not fully extend to cover all of Fenland and therefore appropriate use of Census data and application of characteristics from similar parts of Huntingdonshire and East Cambs have been used to provide outputs for Fenland.

7.5 LABOUR SUPPLY AND DEMAND FOR EMPLOYMENT

7.5.1 The dwellings scenarios project future housing growth of between 30% (Baseline), 37% (Main Case-Medium Growth) and 45% (High Case-Higher Growth) for the County as a whole. It has been shown in the previous section that demographic trends will mean that population and hence labour supply rise at a lower rate. However, it should be noted that labour demand rises much more slowly: the policy-based employment projection projects employment growth of only 12%, or 32,000 jobs.

7.5.2 The forecast of 32,000 extra jobs is the best indication available given current information. However, it should be noted that other forecasters may make more positive assumptions regarding the economy. Nevertheless, the analysis by Cambridge Econometrics shows that the creation of jobs to match housing supply is an issue which may require addressing.

7.5.3 This comparison immediately indicates a gap between labour supply and demand in the future, which is characterised by a rising household population potentially seeking employment in a labour market which is growing slowly. To make clear that in this case dwellings growth is the driver of any gap created, the term 'demand for employment' is used to refer to the amount of employment required in the region under the given housing scenario. The demand for employment in each area is defined as the number of jobs which are required in that area, to keep up with household growth across the whole region.

7.5.4 However, a straightforward forecast of resident labour supply, linked to the County Council's population forecasts and hence the delivery of the current strategy through Policy H1 is included for contrast. The County Council's projections have been used to inform the Cambridge Econometrics "policy-constrained" employment projections model run, described in Chapter 4 above. The County Council have also produced labour supply forecasts using ONS national forecasts of economic activity rates, scaled to Cambridgeshire districts using Census 2001. It should be noted that activity rates are held constant after 2016, but if they rise then labour supply would also increase and the labour supply would increase for both those in work and those seeking work. The County Council labour supply projections are shown below.

District	Labour Supply 2001	Labour Supply 2007	Labour Supply 2031	Change 01/07	Change 07/31
Cambridge City	52.6	56	73.5	3.4	17.5
East Cambs	37.4	41.4	41.4	4.0	0.0
Hunts	93.8	97.1	93.2	3.3	-3.9
South Cambs	71.2	76.5	98.8	5.3	22.3
Fenland	39.7	43.9	47.6	4.2	3.7
County	**294.7**	**314.8**	**354.5**	**20.2**	**39.6**

Source: Cambridgeshire County Council Research Group

7.5.5 The spatial distribution assumed for these projections is East of England dwelling targets up to 2021 and for between 2021 and 2031 a continuation of these annual new build rates at a district level with the exception of Cambridge City and South Cambridgeshire. Within Cambridge City it is assumed that the city fills to an assume theoretical maximum and then new building is switched into South Cambridgeshire in addition to the RSS development rate.

7.5.6 It should be noted that this labour supply is not the same as demand for employment as there are no assumptions about gross in and out commuting at a district or County level. However, the CSRM and the testing in the study considers the demand for employment as shown below.

7.5.7 The critical point to note is that the change in labour supply of 39,600 between 2007 and 2031 is close to the Cambridge Econometrics forecast of additional jobs at 32,000 compared to the approach taken below.

7.5.8 The following paragraphs expand on our analysis of the impact of this gap, where it is most critical, and the relationship to different employment types.

7.5.9 The extent of the gap was first considered using 2001 Census Journey to Work data to determine the possible demand for employment in each part of the County. This analysis assumed that the 2001 travel to work patterns would persist, and that the number of jobs per household would remain constant. This assumption results in a 'demand for employment' in each part of the county in 2031, based on the forecast dwellings. Table 7.2 illustrates this and highlights the gap in the Baseline case. Table Table 7.3 shows the Census 2001 trip patterns which have been assumed in this analysis.

7.5.10 This method projects a significant shortfall against the CE projections (though see comments below regarding the absolute size of the difference), of up to 70,000 across the entire County.

	2001 Employment (Census)	2031 Employment Forecast	2031 Baseline Demand for Employment	Shortfall	%age Shortfall
Cambridge City	75	94	115	-20	-18%
East Cambs	24	27	33	-7	-21%
Huntingdonshire	67	67	84	-17	-20%
South Cambs	63	76	90	-14	-15%
Fenland	32	31	42	-11	-27%
Total	**261**	**295**	**364**	**-69**	**-19%**
Wisbech	11.6	11.2	15.0	-3.8	-25%
March	7.6	7.4	10.3	-2.9	-29%
Ely	7.5	8.1	10.1	-1.9	-19%
St Neots	10.4	10.4	12.5	-2.1	-17%
Huntingdon	16.8	16.8	20.6	-3.8	-19%
St Ives	6.8	6.8	8.4	-1.6	-19%

Table 7.2: 2031 Demand for Employment (based on 2001 Census Journey to Work and Baseline Dwellings I 2031, Compared to Policy Based Employment Forecast. Figures in thousands.

7.5.11 Spatially, this indicates the largest proportional shortfalls in East Cambridgeshire, Huntingdonshire and Fenland, which have the most pessimistic employment forecasts. This suggests that the dwellings assigned in the Baseline scenario may, in respect of this employment forecast, place too many dwellings in these districts.

7.5.12 Amongst the market towns, March and Wisbech have the largest shortfall in employment. This arises because these towns provide a large proportion of the employment both within Fenland and from surrounding areas (see Table 7.3), and hence a greater increase in employment focused on these towns is required to maintain the status quo.

7.5.13 Given that only a single central case employment scenario is considered, the gap increases in the main and high case scenarios.

Factors Influencing Level of Employment Demand and Shortfall

7.5.14 It should be noted that this approach assumes that the proportion of out-commuting remains fixed and that in-commuting increases by a modest amount (5% has been assumed, though this represents a drop relative to existing in-commuting).

7.5.15 Using this methodology, the extra demand for employment in Cambridgeshire would be estimated as approximately 76,000 from 2006 to 2031 in the Baseline case. However, as household size is projected to continue to fall, it is reasonable to expect a further drop in the demand for employment as households contain on average less adults. The current DfT TEMPRO (v5.4) forecasts incorporated in CSRM project a 9% decrease in household size, which would imply 69,000 jobs required. It is also possible that the rate of economic activity amongst the adult population may alter. Currently this is assumed to remain constant at approximately 53%. However, the ageing population and other socio-economic shifts are likely to cause a decrease in the proportion of economically active adults per household. TEMPRO predicts a 7% drop in the number of workers per household in Cambridgeshire from 2006 to 2031. This would reduce the demand for employment still further to just over 64,000. However there is possible double-counting alongside the assumption regarding household size, so this is a low estimate.

7.5.16 Clearly, this total remains well in excess of the 32,000 extra jobs forecast in the policy scenario and the 39,600 projected by the County Council modelling. Though it is possible demographic and socio-economic trends could be more extreme than those assumed in TEMPRO, it appears unlikely that the shift will be sufficient to alter such a large gap.

7.5.17 It is possible that the balance of in-commuting and out-commuting to and from the County could alter. For instance, a fall in in-commuters or rise in out-commuting would decrease the number of jobs within the County required to support a given number of dwellings. However, there are potential sustainability issues with this.

		PLACE OF WORK													
		Cambridge	East Cambs	Fenland	Hunts	South Cambs	Outside Cambs		Wisbech	March	Ely	St Neots	Hunt'n	St Ives	P'boro
RESIDENCE	Cambridge	71%	1%	0%	1%	16%	10%		0%	0%	0%	0%	0%	0%	0%
	East Cambs	17%	50%	1%	2%	11%	19%		0%	0%	15%	0%	1%	0%	1%
	Fenland	2%	2%	63%	6%	2%	25%		21%	17%	1%	0%	2%	1%	14%
	Hunts	5%	1%	1%	65%	6%	22%		0%	0%	0%	10%	16%	7%	5%
	South Cambs	30%	1%	0%	3%	50%	16%		0%	0%	0%	0%	1%	0%	0%
	Outside Cambs	26%	8%	15%	24%	27%	0%		8%	2%	2%	4%	5%	1%	n/a
	Total	**25%**	**8%**	**10%**	**22%**	**20%**	**16%**		**4%**	**2%**	**2%**	**3%**	**5%**	**2%**	**3%**
	Wisbech	1%	1%	75%	1%	0%	22%		65%	4%	0%	0%	1%	0%	6%
	March	3%	2%	72%	4%	2%	16%		4%	56%	1%	0%	1%	0%	8%
	Ely	18%	56%	1%	2%	10%	14%		0%	0%	45%	0%	1%	0%	1%
	St Neots	4%	0%	0%	64%	5%	26%		0%	0%	0%	47%	6%	1%	1%
	Huntingdon	5%	0%	1%	75%	5%	14%		0%	0%	0%	2%	49%	3%	2%
	St Ives	11%	1%	1%	67%	10%	10%		0%	0%	0%	1%	12%	36%	2%

Table 7.3 Distribution of Journey to Work Trips from Each District and Market Town Origin (from 2001 Census)

Source: ONS, 2001 Census. Percentages represent the percentage of commuting trips from the origin district/town (rows) which travel to employment in the corresponding work district/town (columns)

7.6 COMMERCIAL FLOORSPACE AVAILABILTY

7.6.1 Commercial floorspace projections were received from CCC based on current allocations and planning applications, as well as consideration of the findings of the Employment Land Reviews across the County. Using baseline analysis conducted for the CSRM, it was possible to compare this projection of floorspace available to the employment forecasts for Industrial, Warehousing/Transport, Office, Retail and Other jobs (the category of other includes both leisure facilities and health, based on Census Standard Industrial Classifications).

7.6.2 A comparison has been carried out to test the sufficiency of the commercial floorspace available, in terms of its ability to support the policy employment growth. The comparison shows the amount of employment that the floorspace could potentially accommodate, at 2001 accommodation levels calculated for CSRM. These levels show the square metres per employee in each District and for each employment type based on 2001 Census Employment and Valuation Office Agency (VOA) reports of taxable floorspace.

7.6.3 Figure 7.3 illustrates this comparison for each District. The blue bars show the amount of employment forecast in the policy forecasts, and the red bars show the employment which could be supported by the available development area (at 2001 occupancy rates). This illustrates that sufficient floorspace is available at present to support growth in all disticts and employment types, with the exception of retail growth in East Cambridgeshire. However should employment forecasts rise, more space would be required. Pressure for floorspace is most likely to arise in Cambridge (Retail), East Cambs (Retail and Misc/Health[15] and South Cambridgeshire (Retail).

7.6.4 Note that this is a comparison against forecast employment, and does not consider whether the floorspace available is in line with the growth in dwellings forecast. The comparison here and the consideration of Demand for Employment suggest that the two are not fully aligned.

[15] NB Misc/Health includes all Leisure employment including sports clubs, swimming pools, and cinemas.

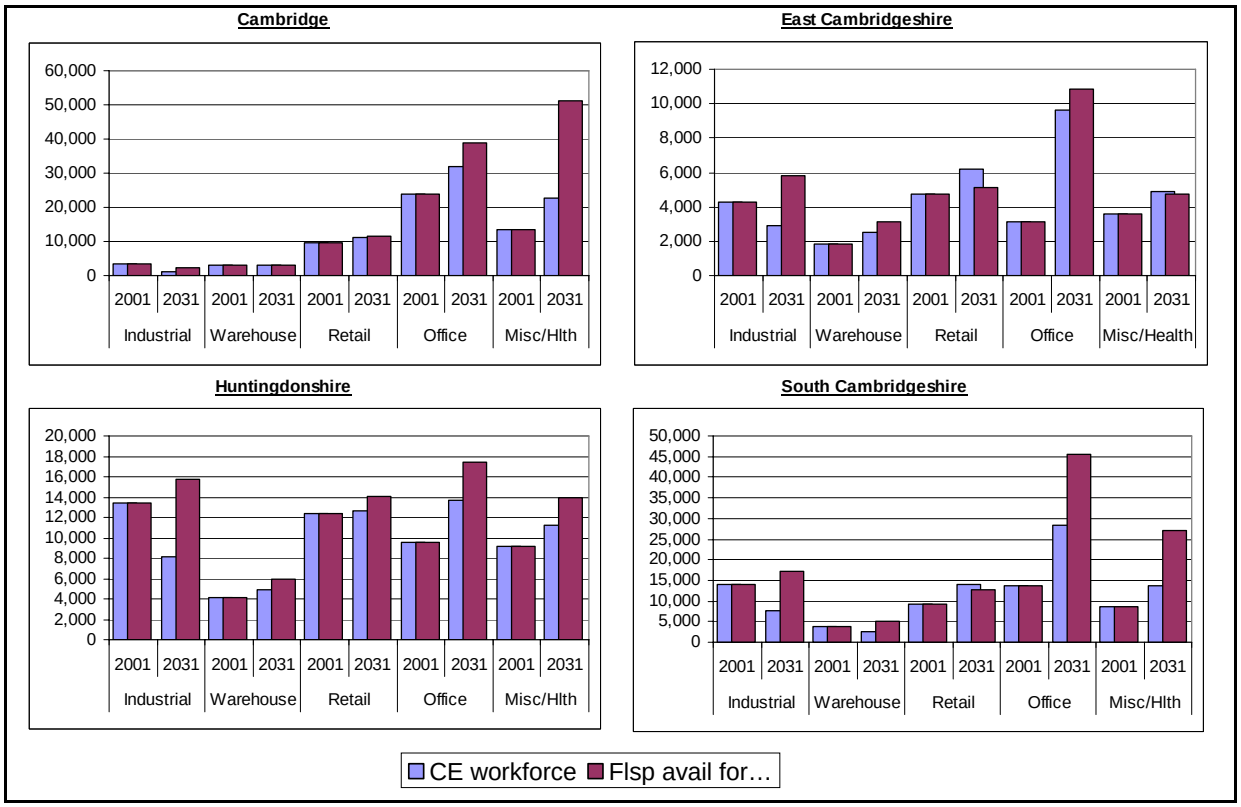


Figure 7.3: Comparison of Employment Forecast with Workspace Available (NB 2001 Employment). Note Fenland is not included as not within CSRM.

7.7 BALANCE OF EMPLOYMENT TO DWELLINGS

7.7.1 A key aspect of considering sustainability, and particularly commuting patterns, relates to the provision of employment to match the amount of working age population arising from the proposed housing numbers. Therefore, there needs to be an optimum level of balance between the dwellings / working population of an area and the number of jobs in its vicinity. Figure 7.4 below illustrates the balance between dwellings and employment for the 2031 Baseline Scenario.

7.7.2 CE forecasts and CSRM outcomes show that with continuation of the current strategy (see Figure 7.4), South Cambridgeshire is broadly evenly balanced, while Cambridge has a greater amount of employment compared to dwelling numbers. Fenland, East Cambridgeshire and Huntingdonshire show significant imbalance of dwellings over employment, which may lead to commuting towards Cambridge.

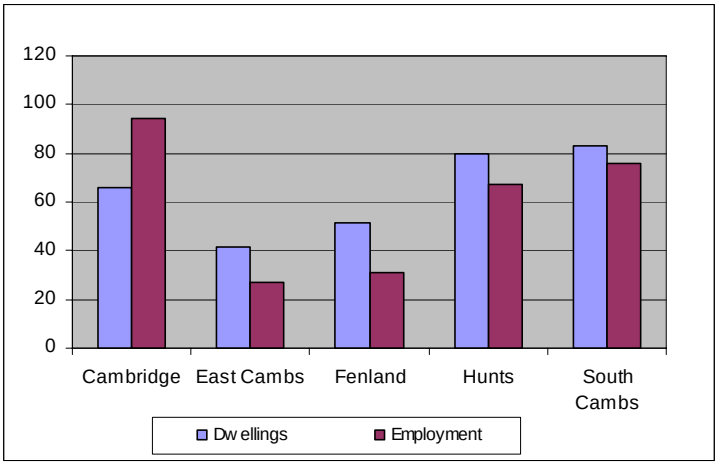


Figure 7.4: Balance of Dwellings to CE Employment Forecasts ('000s): Current Strategy (Baseline) 2031

7.7.3 The distribution of employment opportunities plays a very important role in determining the way people travel to work in terms of distances to commute and modes used and this consequently determines the need for transport infrastructure. People living close to their areas of work are more likely to travel by sustainable means like walking, cycling or use buses as their main mode of travel. Of course, many jobs are peripatetic and not fixed to a particular location.

7.7.4 The distribution of Cambridgeshire's working population (resident employed) by ward has been estimated based on the number of dwellings in the different wards for the different options, and is illustrated in Figure 7.5 alongside the distribution of jobs for the 2031 Baseline Scenario/ Current Strategy. The colour scale is the same for both population and jobs to allow comparison of the two parameters, providing an indication of their spatial balance and commuting within the county.

7.7.5 Figure 7.5 clearly indicates a spatial mismatch between employment and working population within the county. At district level, East Cambridgeshire and Fenland appear to have the least correlation in distribution of the two parameters, while Cambridge City appears to have a closer correlation which is not surprising considering that it has got more jobs than dwellings and/or working population, hence the large extent of commuting into Cambridge and its surrounding area.

7.7.6 In the 2031 Baseline, only 3 out of 39 wards in East Cambridgeshire have more than 2,000 jobs each yet 36 of the wards have more than 2,000 working people each. This indicates that a relatively significant proportion of East Cambridgeshire's working population would have to travel to work outside of the district. This is true also for Fenland. While Huntingdonshire and South Cambridgeshire are the most closely balanced there are areas which have higher population densities not balanced by the lower employment opportunities in these areas which would result in significant out-commuting. On the other hand, such areas as Cambridge and Huntingdon have more jobs than working residents and this would make them more attractive to in-commuters. The extent of in-commuting and out-commuting in the County will be discussed in more detail in later sections.

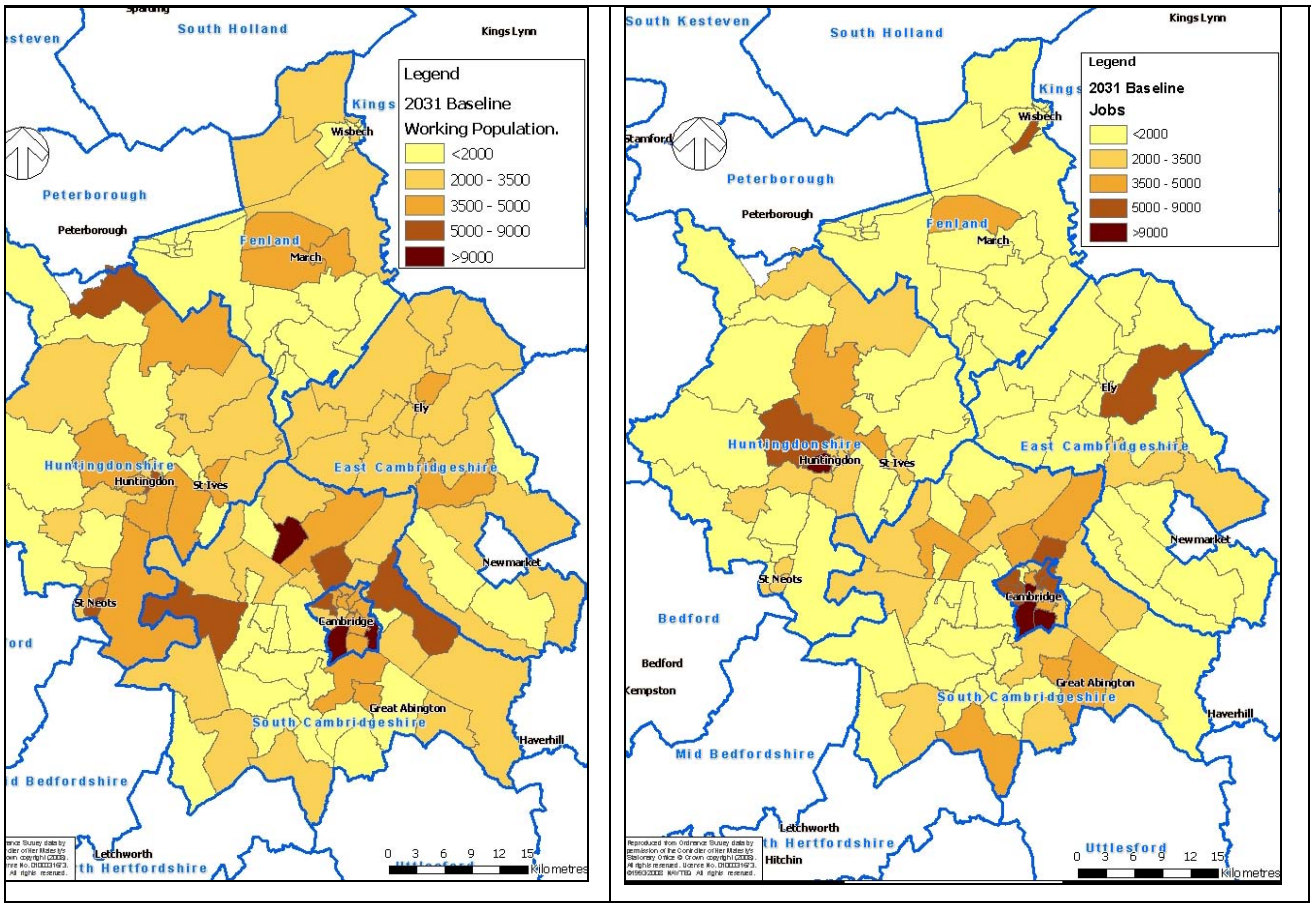


Figure 7.5: Cambridgeshire's Working Population and Jobs Distribution at Ward Level: 2031 Baseline

7.7.7 Table 7.6 below shows the ratio of jobs to dwellings for all options and Figure 7.6 illustrates the balance between employment and dwellings for the Market Towns, Cambridge and New Settlement strategic options. Generally, the strategies show similar relationships to the baseline situation, the imbalance between dwellings and employment being higher in the main case options and increasing further in the high case options. A closer balance between dwellings and employment is provided when Cambridge is taken together with its surrounding area (within South Cambridgeshire).

Location	Baseline	Market Towns Strategy		Cambridge Strategy		New Settlements	
		Main Case	High Case	Main Case	High Case	Main Case	High Case
Cambridge	1.43	1.43	1.42	1.37	1.33	1.43	1.43
East Cambs	0.65	0.61	0.57	0.65	0.65	0.66	0.66
Fenland	0.60	0.54	0.49	0.60	0.60	0.60	0.61
Hunts	0.84	0.78	0.72	0.84	0.84	0.85	0.84
South Cambs	0.92	0.91	0.89	0.80	0.68	0.75	0.71
Ely	0.68	0.61	0.55	0.68	0.68	0.68	0.68
St Neots	0.78	0.68	0.66	0.78	0.78	0.78	0.78
Huntingdon	1.59	1.30	1.12	1.60	1.59	1.59	1.59
St Ives	0.91	0.76	0.60	0.91	0.90	0.91	0.91

Table 7.6: Jobs to Dwellings Ratios

7.7.8 Within East Cambs, Fenland and Huntingdonshire it can be seen that with the market town options the jobs to dwelling ratios decrease from the baseline as there are increasing numbers of homes versus only a small increase in jobs showing that imbalance grows. By placing more dwellings in and around Cambridge and also within South Cambridgeshire the ratio of jobs to dwellings reduces as more employed residents are available locally to take up the available jobs and a greater balance is achieved between employment and dwellings.

7.7.9 In the market towns themselves additional housing in the market town options serves to reduce the ratio of jobs to dwellings and increase the imbalance and oversupply of housing versus available jobs.

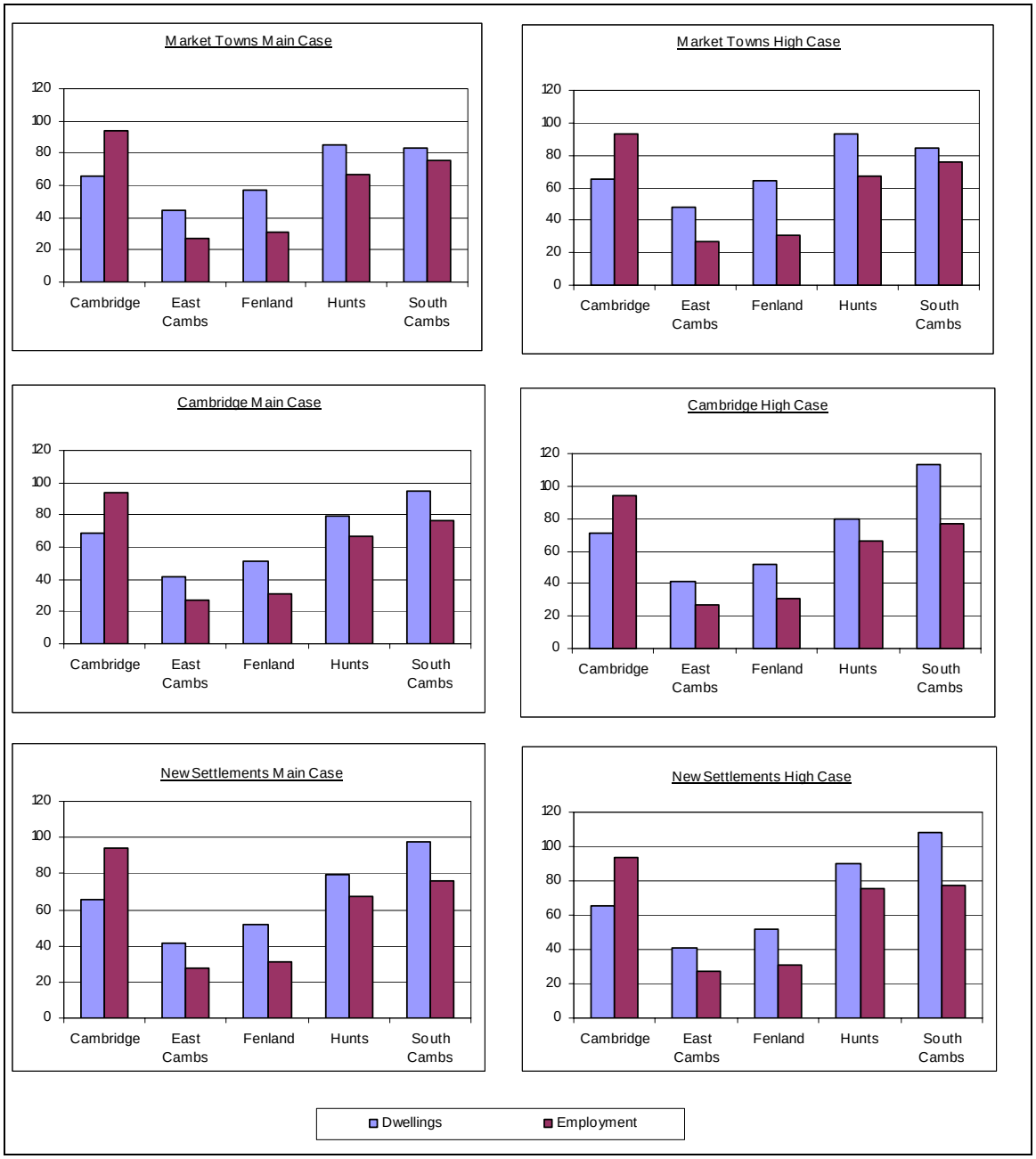


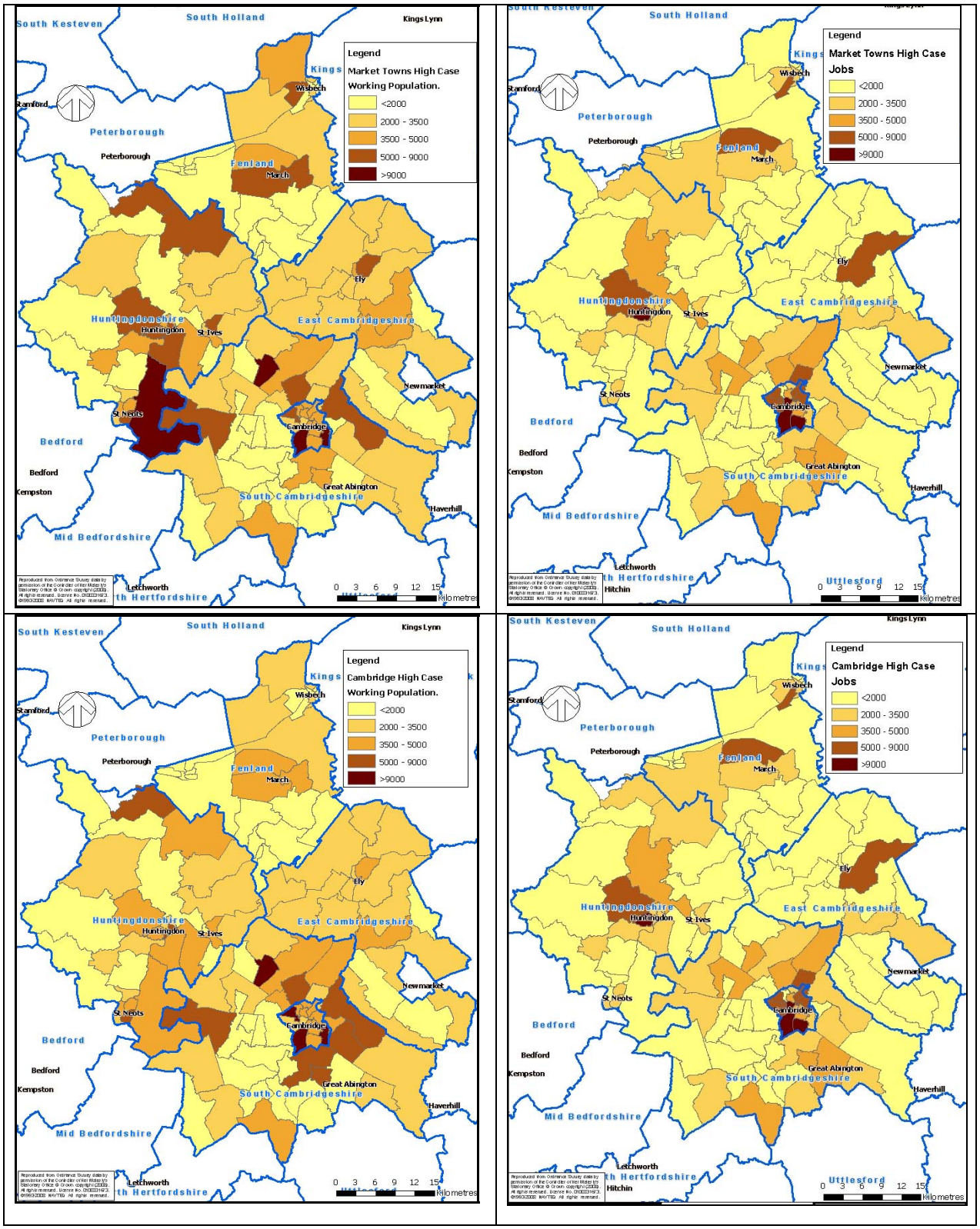
Figure 7.6: Balance of Dwellings to Employment ('000s), 2031

7.7.10 Although the levels of dwellings (and therefore population) and employment are forecast to grow by the same amount relative to the baseline in corresponding growth scenarios of the different options, the distribution of this growth does vary within the county and districts. Figure 7.7 illustrates the distribution of population and jobs within the county for the Market Towns, Cambridge and New Settlements High Case Options at ward level.

7.7.11 On the whole, the distribution of employment within the County for the growth scenarios is not significantly different from that of the baseline case discussed above. As in the baseline case, about 55% - 60% of all the jobs in the county are located in the southern part of the County, in Cambridge and South Cambridgeshire, while East Cambridgeshire and Fenland combined account for only 20% - 25%. Huntingdonshire alone accounts for 20% - 23%. There is, however, a slight increase in Fenland's share of employment, of about 5%, in the Market Towns Options, while the Cambridge and New Settlements options continue to concentrate employment in Cambridge and South Cambridgeshire. Huntingdonshire and East Cambridgeshire's employment shares remain relatively unchanged at 21%-23% and 9% respectively in all the options assessed. There is also improvement in employment distribution within Fenland in the Market and Cambridge Case options as Figure 7.7 illustrates.

7.7.12 The following figures showing more detailed dwellings and employment are included at the end of the report:

- Figure 7.8 – 2031 Baseline;
- Figure 7.9 – 2031 Market Towns Medium Growth;
- Figure 7.10 – 2031 Market Towns Higher Growth;
- Figure 7.11 – 2031 Cambridge Medium Growth;
- Figure 7.12 – 2031 Cambridge Higher Growth;
- Figure 7.13 – 2031 New Settlement Medium Growth; and
- Figure 7.14 – 2031 New Settlement Higher Growth.


South Kesteven
South Holland
Kings Lynn
Legend
Market Towns High Case
Working Population.
<2000
2000 - 3500
3500 - 5000
5000 - 9000
>9000
Stamford
Wisbech
Peterborough
Fenland
March
Ely
Huntingdonshire
Huntingdon
St Ives
East Cambridgeshire
Newmarket
St Neots
Cambridge
Bedford
Great Abington
South Cambridgeshire
Haverhill
Mid Bedfordshire
Letchworth
Hitchin
Uttlesford
0 3 6 9 12 15
Kilometres
Legend
Market Towns High Case
Jobs
<2000
2000 - 3500
3500 - 5000
5000 - 9000
>9000
Legend
Cambridge High Case
Working Population.
<2000
2000 - 3500
3500 - 5000
5000 - 9000
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Legend
Cambridge High Case
Jobs
<2000
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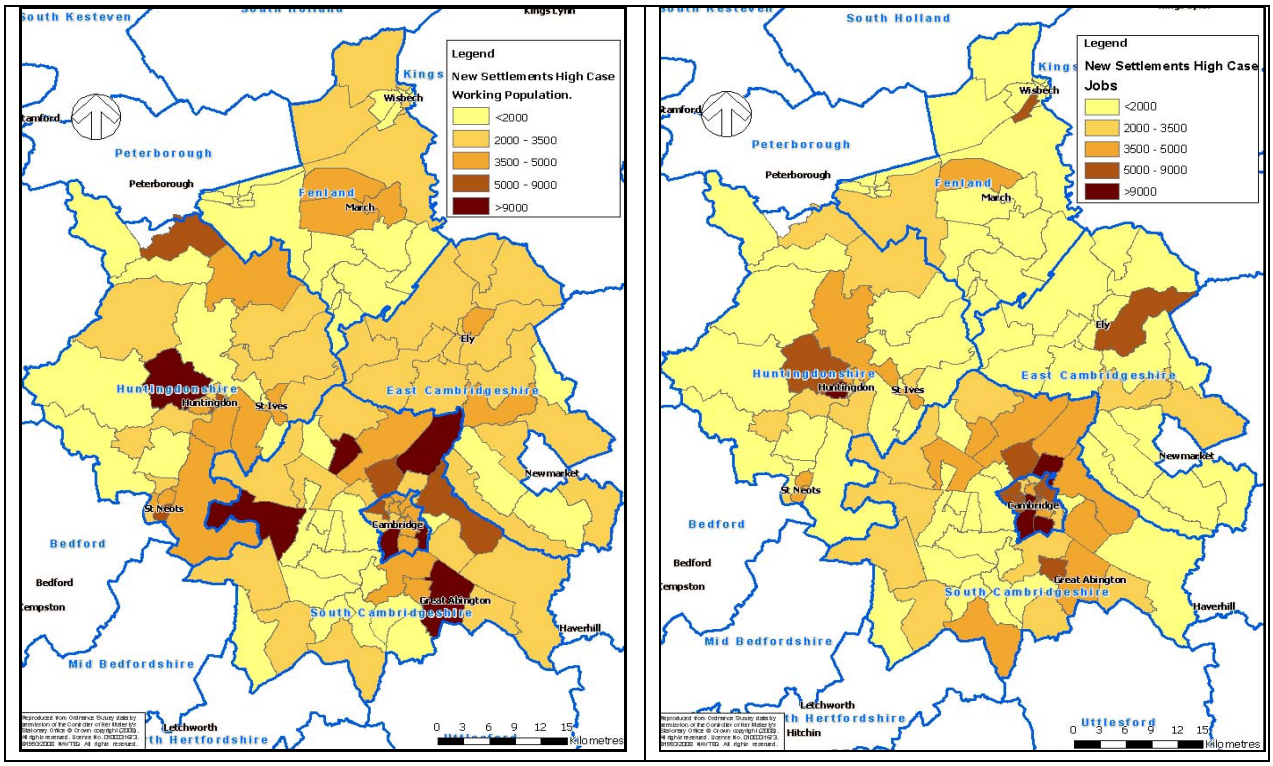


Figure 7.7: Cambridgeshire's Working Population and Jobs Distribution at Ward Level, 2031.

7.8 ANALYSIS OF TRIP GENERATION

7.8.1 The growth in dwellings across the County will have trip generation impacts for all trip purposes and modes. This section of the report considers the number of additional trips which would be generated from each District, and from the main market towns under the Baseline and additional growth scenarios and spatial options.

7.8.2 The patterns were first considered using CSRM to model commuter flows based on projected dwellings and employment. This served to highlight the imbalance of employment and dwellings above. The model results suggested that the lack of employment would lead to:

- A radical drop in in-commuting and/or rise in out-commuting to maintain a balance of employment opportunities for residents, combined with:
- A drop in household size and rise in empty dwellings.

7.8.3 The detailed model results for future commuting are therefore not referenced here, as without a match in employment and dwellings these do not inform as to future trip patterns. An alternative approach has therefore been developed whereby the CSRM 2006 data on trips by trip purpose are used to project forward future trip origins and destinations. This has been achieved by:

- Establishing the number of trips per head of population in 2006 from CSRM by purpose[16];
- Projecting the population of each District and Market Town in 2031, based on the 7 dwellings options and with forecast decline in household size[17]; and
- Using 2006 trips per head to calculate the total trips originating/terminating in each area.

7.8.4 The trips quoted in the report are daily flows.

[16] CSRM does not cover trips to/from Fenland, Wisbech or March in detail and therefore 2001 Census Journey to Work data has been used for these areas.
[17] Household size figures taken from DfT TEMPRO 5.4

HOME-BASED WORK TRIPS

7.8.5 Table 7.4 shows the rise in dwellings in each scenario for comparison.

	Baseline (2006-2031)	Baseline %age Growth	Market Towns 2031(Additional to Baseline)		Cambridge 2031(Additional to Baseline)		New Settlements 2031(Additional to Baseline)	
			Main Case	High Case	Main Case	High Case	Main Case	High Case
Cambridge	20,027	44%	-	-	+3000	+5000	-	-
East Cambs	7,289	21%	+3,000	+6,500	-	-	-	-
Fenland	10,870	27%	+6,000	+12,500	-	-	-	-
Hunts	11,227	16%	+6,000	+14,000	-	-	-	+10,000
South Cambs	25,807	45%	-	+2,000	+12000	+30,000	+15,000	+25,000
Total	**75,220**	**31%**	**+15,000**	**+35,000**	**+15000**	**+35,000**	**+15,000**	**+35,000**
Wisbech	2,883	29%	+3,000	+6,000	-	-	-	-
March	3,011	33%	+3,000	+6,000	-	-	-	-
Ely	3,301	44%	+3,000	+4,500	-	-	-	-
St Neots	2,975	20%	+3,000	+3,500	-	-	-	-
Huntingdon	4,096	26%	+3,000	+6,250	-	-	-	-
St Ives	515	7%	-	+2,000	-	-	-	-

Table 7.4 Summary of Dwellings Growth from 2006, comparing Baseline to Growth Options

7.8.6 Table 7.5 and Table 7.6 below show the change in the number of commuting trips originating in each district/market town (i.e. outgoing trips by County residents) and terminating (i.e. incoming trips by workers, resident in the County or beyond). Table 7.7 and Table 7.11 show the percentage change, relative to 2006 commuting trips.

	Baseline (Additional to 2006)	Market Towns (Additional to Baseline)		Cambridge (Additional to Baseline)		New Settlements (Additional to Baseline)	
		Main Case	High Case	Main Case	High Case	Main Case	High Case
Cambridge	**12.4**			+2.3	+3.8		
East Cambs	**4.0**	+2.2	+4.8				
Fenland	**5.0**	+3.7	+7.6				
Hunts	**6.3**	+4.9	+11.4				+9.8
South Cambs	**16.4**		+1.7	+10.0	+25.1	+16.3	+27.1
Total	**44.1**	**+10.8**	**+25.5**	**+12.3**	**+28.8**	**+16.3**	**+36.9**
Wisbech	**1.3**	+1.7	+3.4				
March	**1.5**	+1.9	+3.7				
Ely	**2.2**	+2.3	+3.5				
St Neots	**1.7**	+2.2	+2.6				
Huntingdon	**2.7**	+2.5	+5.1				
St Ives	**0.1**		+1.6				

Table 7.5 2031 Commuting Trips by Origin (Residence End) in '000 trips, based on 2006 CSRM Trips, scaled by population at Origin

Note: Trips from Outside Cambridgeshire not included; changes in trips may be expected should in-commuting rise or fall.

7.8.7 For the Baseline, there are a total of approximately 44,000 extra trips across the County, with the largest rises in origins corresponding to the areas with the most dwellings (though the percentage growth is suppressed due to assumed decrease in household size). On this basis, Cambridge, South Cambridgeshire and East Cambs have the largest rise in trip origins due to the large proportional rise in dwellings.

	Baseline (Additional to 2006)	Market Towns (Additional to Baseline)		Cambridge (Additional to Baseline)		New Settlements (Additional to Baseline	
		Main Case	High Case	Main Case	High Case	Main Case	High Case
Cambridge	**15.0**	+0.7	+2.0	+4.7	+10.5	+5.8	+10.3
East Cambs	**2.6**	+1.2	+2.7	+0.2	+0.4	+0.2	+0.4
Fenland	**3.4**	+2.5	+5.2		+0.1	+0.1	+0.2
Hunts	**5.5**	+3.5	+8.1	+0.5	+1.1	+0.6	+9.1
South Cambs	**10.7**	+0.6	+2.1	+5.1	+12.4	+9.6	+16.8
Outside Cambs	**6.9**	+2.3	+5.3	+1.8	+4.3		
Total	**44.1**	**+10.8**	**+25.5**	**+12.3**	**+28.8**	**+16.3**	**+36.8**
Wisbech	**1.1**	+0.8	+1.7			+0.01	+0.02
March	**0.9**	+0.6	+1.4			+0.02	+0.07
Ely	**0.8**	+0.4	+0.9		+0.1	+0.07	+0.15
St Neots	**1.4**	+1.0	+2.0			+0.06	+1.40
Huntingdon	**3.2**	+2.2	+4.5	+0.1	+0.3	+0.17	+2.30
St Ives	**0.9**	+0.6	+1.3		+0.1	+0.09	+1.00

Table 7.6 Commuting Trips by Destination (Work End) in '000 trips, based on 2006 CSRM Trips, scaled by population at Origin

7.8.8 The destination tables demonstrate the impact on commuting trips to each area under this scenario, showing the absolute and percentage growth in each area. This is illustrative of the growth in jobs required, though these figures represent trips to work per day rather than jobs.

	Baseline (Additional to 2006)	Market Towns (Additional to Baseline)		Cambridge (Additional to Baseline)		New Settlements (Additional to Baseline)	
		Main Case	High Case	Main Case	High Case	Main Case	High Case
Cambridge	**33%**			+5%	+8%		
East Cambs	**15%**	+7%	+16%				
Fenland	**19%**	+12%	+24%				
Hunts	**11%**	+8%	+18%				+15%
South Cambs	**31%**		+2%	+14%	+36%	+24%	+39%
Total	**20%**	**+4%**	**+10%**	**+5%**	**+11%**	**+6%**	**+14%**
Wisbech	**21%**	+23%	+45%				
March	**24%**	+25%	+48%				
Ely	**36%**	+28%	+42%				
St Neots	**15%**	+17%	+20%				
Huntingdon	**19%**	+15%	+30%				
St Ives	**2%**		+31%				

Table 7.7 Commuting Trips by Origin (Residence End) %age growth, based on 2006 CSRM Trips, scaled by population at Origin

7.8.9 As would be expected, Cambridge absorbs a significantly larger proportion of the jobs than other areas. The only other area which attracts more trips than origins is Huntingdon. This illustrates the current commuting patterns where Huntingdon and Cambridge attract a higher proportion of trips from across the County.

7.8.10 However, there is still significant increase in work trips to all areas of 16% to 19% in market towns, East Cambridgeshire and Fenland.

	Baseline (Additional to 2006)	Market Towns (Additional to Baseline)		Cambridge (Additional to Baseline)		New Settlements (Additional to Baseline)	
		Main Case	High Case	Main Case	High Case	Main Case	High Case
Cambridge	**29%**	+1%	+3%	+7%	+16%	+9%	+15%
East Cambs	**16%**	+6%	+14%	+1%	+2%	+1%	+2%
Fenland	**19%**	+12%	+24%		+1%	+1%	+1%
Hunts	**13%**	+7%	+17%	+1%	+2%	+1%	+19%
South Cambs	**28%**	+1%	+4%	+10%	+25%	+20%	+34%
Outside Cambs	**20%**	+6%	+13%	+4%	+10%		
Total	**22%**	**+4%**	**+10%**	**+5%**	**+12%**	**+7%**	**+15%**
Wisbech	**19%**	+12%	+25%			+0.1%	+0.3%
March	**19%**	+11%	+25%			+0.4%	+1.2%
Ely	**16%**	+7%	+16%		+2%	+1.2%	+2.6%
St Neots	**19%**	+11%	+23%			+0.7%	+16.0%
Huntingdon	**19%**	+11%	+22%	+1%	+2%	+0.8%	+11.5%
St Ives	**19%**	+11%	+23%		+2%	+1.6%	+17.7%

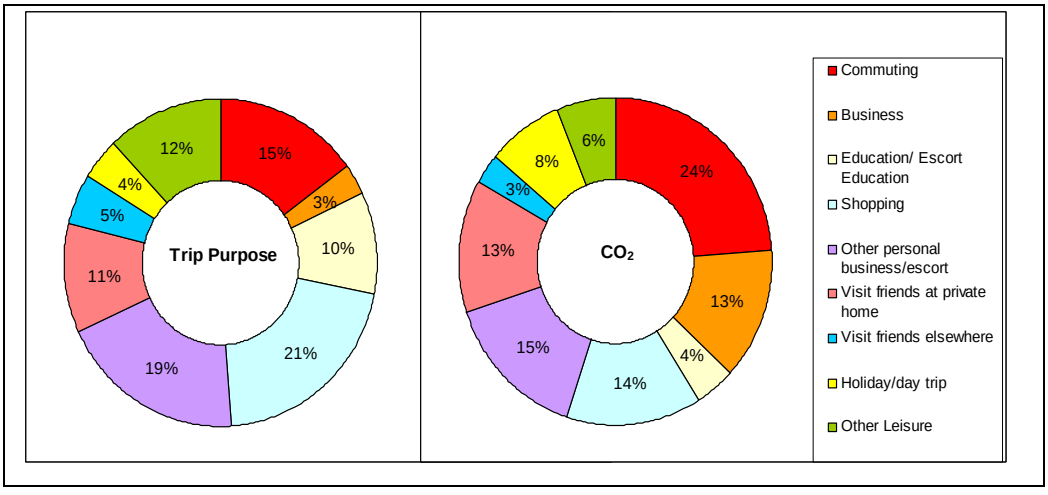
Table 7.8 Commuting Trips by Destination (Work End) %age growth, based on 2006 CSRM Trips, scaled by population growth at Origin

Note: Growth in in-commuting to the County is NOT included.

7.8.11 In terms of the new settlement options the results show that these are likely to give rise to the greatest increase in commuting trips and therefore the relationship of the location of any new settlements to high order settlements (such as Cambridge, Huntingdon and Peterborough) plays a crucial role in trip distances and sustainability aspects if non-car modes can be delivered.

Balance of In-Commuting and Out-Commuting

7.8.12 The DfT's National Travel Survey (NTS) 2006 indicates that commuting accounts for 15% of all people's trips, being the second most popular travel purpose after shopping which accounts for 21%. Figure 7.15 below shows the proportions of trips by purpose from the 2006 NTS. Furthermore, the DfT's Carbon Pathways Analysis (CPA) 2008 indicates that commuting accounts for 24%, the greatest percentage, of CO_2 emissions from all passenger transport modes in Great Britain (2002/2006 average). The CO_2 share by trip purpose from the 2008 CPA is also shown in Figure 7.14. Commuting trips hence play a significant role, not only in influencing transport infrastructure and related services but also in the control of green house gas and its effects. This section hence analyses Cambridgeshire's commuting trips in greater detail.



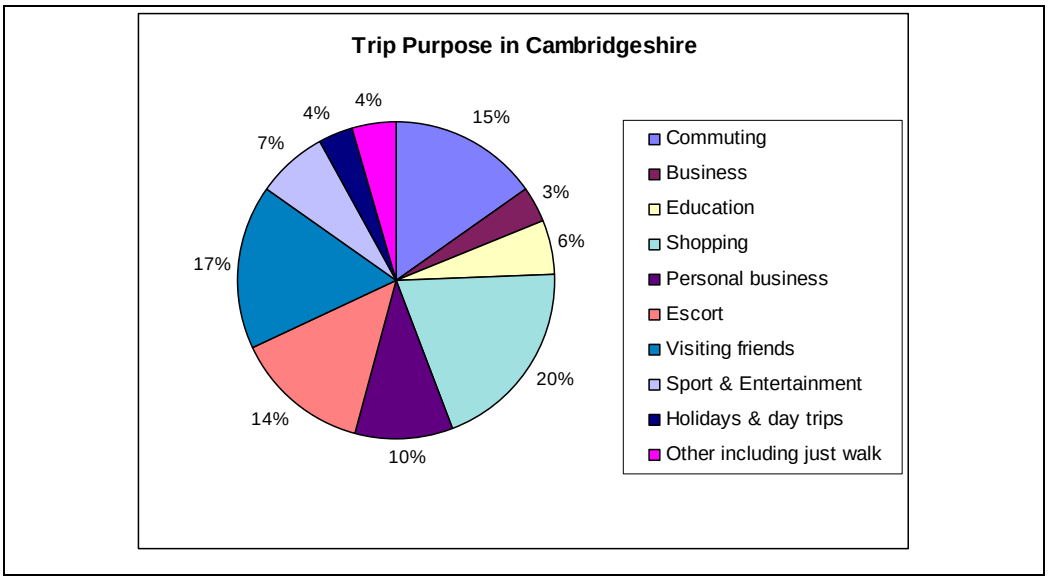


Figure 7.15: Proportion of Trips and CO_2 Emissions by Trip Purpose (Source: DfT's National Travel Survey (NTS) 2006 & Carbon Pathways Analysis (CPA) 2008) and Trip Purpose Calculated for Cambridgeshire (Source WSP)

7.8.13 The level of in and out-commuting to Cambridgeshire would also depend on factors in external areas outside the jurisdiction of Cambridgeshire authorities and therefore could not be estimated to a satisfactory degree of accuracy. This section therefore mainly discusses commuting patterns within Cambridgeshire. However, the outcome of the review of the RSS by authorities surrounding Cambridgeshire, and their implications for the latter are discussed below.

7.8.14 As mentioned earlier, location of employment opportunities in relation to housing is a key determinant of the commuting patterns of the population, in other words, the availability of local jobs in an area determines the level of self containment of trips within that area. The distribution of jobs and population within Cambridgeshire was illustrated above. It was revealed that while the County as a whole was imbalanced, East Cambridgeshire and Fenland were the least balanced districts with significantly less jobs than population in many of the district areas, while there were more jobs within the Cambridge and Huntingdon areas, in all options, compared to population densities in these areas.

7.8.15 Table 7.9 below shows the level of self containment of trips within the districts for the tested options.

		Market Towns		Cambridge Strategy		New Settlements	
	Baseline	Main Case	High Case	Main Case	High Case	Main Case	High Case
Cambridge	71%	71%	71%	72%	72%	71%	71%
East	50%	51%	52%	50%	50%	50%	50%
Fenland	63%	65%	66%	63%	63%	63%	63%
Hunts	66%	67%	68%	66%	66%	66%	68%
South Cambs	50%	50%	50%	52%	52%	51%	52%

Table 7.9: Level of Self Containment of Commuting Trips within Cambridgeshire Districts

7.8.16 Self containment is a key indicator of the level of sustainability and as the results show above for the baseline Cambridge performs the best followed by Huntingdonshire and again this results from the closer match in balancing homes to jobs. The analysis above, whilst the levels do not change considerably within the options tested, shows that without improving the employment prospects within the various districts to match any growth in housing the level of self containment will not improve.

7.8.17 However, it should be noted that Cambridge City is also characterised by significant in-commuting as it has got more jobs than population.

7.8.18 Another key aspect of self containment is the provision of wider services and facilities as well as employment. For example whilst Ely has seen considerable increases in housing growth and this has resulted in a greater level of vibrancy for those who live there without associated employment there is still significant out-commuting. Therefore for any market town or new settlement option a full range of successful facilities and employment is required to cater for all trip purposes, as shown in Figure 7.15.

7.8.19 It should also be noted that a dispersal of housing growth, rather than concentrations in areas with suitable levels of employment, facilities and services is likely to lead to greater levels of commuting and travel. The results of the option testing above demonstrate this, when comparing the strategic distribution of market towns and new settlements versus the findings of the Cambridge based expansion.

7.8.20 The commuting patterns within the county are shown in more detail in the following figures at the end of the report:

- Figure 7.16 – 2031 Baseline;
- Figure 7.17 – 2031 Market Town Strategy Medium Growth;
- Figure 7.18 – 2031 Market Town Strategy Higher Growth;
- Figure 7.19 – 2031 Cambridge Strategy Medium Growth;
- Figure 7.20 – 2031 Cambridge Strategy Higher Growth;
- Figure 7.21 – 2031 New Settlement Medium Growth; and
- Figure 7.22 – 2031 New Settlement Higher Growth.

Neighbouring Authorities

7.8.21 The EEP/RSS published in May 2008 sets out regional planning policy to 2021. The EERA is currently reviewing the RSS to roll it forward to provide for the period 2021 to 2031 in response to the Government's new targets of housing and economic growth. To inform its review of the RSS, the EERA requested advice from local planning authorities.

7.8.22 The EERA required the authorities to assess and advise on the feasibility of four scenarios including Growth Scenarios 1, 3, 4 and 5. Further detail on these growth scenarios is included in Chapter 5 of this study report.

7.8.23 Some key issues from reviews of the RSS by Cambridgeshire's neighbouring authorities and their implications for Cambridgeshire are summarised in Table 7.13 below.

Local Authority	Key Issues	Implications for Cambridgeshire
Peterborough City Council (PCC)	■ Policy H1 of the RSS requires Peterborough to provide an average of 1,420 dwellings per year from 2006 onwards. ■ Regarding the RSS review PCC proposes a scenario of about 30,000 dwellings (2007-2031) and this would meet Scenario 1 of the EERA scenarios i.e. annual building rate of 1,440 subject to policy intervention and considerable investment, but indications are that PCC will go for NHPAU lower. ■ The GVA scenario which implies a building rate of 650 doesn't take into account Peterborough's policy aspirations, is not considered sufficiently ambitious to PCC. ■ PCC would also consider increased employment needed and ARU educational facility considered essential. ■ Due to constraints to the East (flooding) & North (high pressure gas pipe) of the city, growth options are to be considered for the South, West and within existing city area and villages. ■ Review should consider further work especially with regard to the economic modelling.	Increased growth in employment in Peterborough would increase out-commuting from Cambridgeshire, particularly for Fenland and Huntingdonshire.
Hertfordshire County Council	■ The EEP requires Hertfordshire to deliver a minimum of 83,200 homes and an additional 68,000 jobs over the period 2001 to 2021. This existing RSS is preferred to alternative approaches in distributing development within Hertfordshire. ■ EERA's higher growth levels are not sustainable or deliverable ■ Higher growth is not feasible due to insufficient infrastructure, limited capacity of development industry, and cost, technical and environmental constraints.	Much of the growth focuses southwards so unlikely to alter current relationship and commuting patterns.
Norfolk County Council	■ EEP requires Norfolk to deliver 78,700 homes which is a huge challenge. ■ The EERA review requires tests for an additional 20,700 to 67,000 up to 2031 at annual average rates of between 4,150 and 6,160 (the average rate since 1993 has been 3,300). ■ Suggested extra growth would impact greatly on the environment and local communities and widen the infrastructure funding gap.	Growth in jobs at Kings Lynn would further reinforce the relationship to Wisbech.

Local Authority	Key Issues	Implications for Cambridgeshire
	▪ Limited capacity to deliver higher levels of housing growth up to 2031 beyond what is currently planned.	
Suffolk County Council	▪ Suffolk CC only supports provision of a maximum of 3,200 dwellings per year between 2007 and 2031 i.e. EERA's Scenario 1 subject to provision of necessary supporting infrastructure. ▪ Favours the greater Ipswich area and St Edmundsbury Borough for a major role in meeting future housing needs. ▪ No justification for new settlements in Suffolk during the review period. ▪ Suggests that higher rates of housing development should not be considered by EERA before it is satisfied that there would be sufficient future economic and employment growth to generate that demand.	Housing at Bury St Edmunds without supporting attractive jobs will increase the likelihood of commuting to Cambridge.
Essex County Council	▪ EERA's growth scenarios lack credibility as they do not have regard to current economic recession. ▪ Future growth for sub regions should primarily be driven by their spatial visions & strategic ambitions as these are based upon the characteristics & distinctiveness of the different areas and hence are robust unlike EERA's top-bottom approach. ▪ In considering growth in the region, EERA should take an approach based upon prospects for the delivery of jobs and infrastructure.	Unlikely to impact significantly on Cambridgeshire, although employment growth around Stansted would be likely to increase commuting southwards from the County.
Bedford Area Authorities	▪ Initial indications are that the pressure to accommodate significant additional growth will seriously undermine and put at risk the delivery of the hard won emergent LDF strategies for a step increase in existing policy commitments to 2021. ▪ The sub region is already likely to be contributing to Scenarios 1 and 2 to 2031. ▪ Existing growth proposals depend upon suitable infrastructure and funding ▪ Milton Keynes Long Term Growth Strategy	Likely to be a draw to residents of St Neots for employment in the Bedford to Milton Keynes corridor (noting also employment in St Neots is across the border).

Table 7.10: Neighbouring Authorities EEP RSS Review Implications Source: Section 4(4) Advice to EERA and outcome of discussions with neighbouring authorities

7.8.24 Essentially the assessment of the neighbouring authorities shows the following implications for Cambridgeshire:

- Growth in Peterborough, including employment, will increase the attractiveness for commuting from Fenland and Huntingdonshire with knock-on impacts for sustainable commuting along the A47, A605 and A1 corridors;
- The relationship between Kings Lynn and Wisbech is likely to strengthen;
- Growth at Bury St Edmunds is likely to result in increased commuting towards Cambridge if suitable and attractive employment is not forthcoming in St Edmundsbury; and
- Growth in employment in the Bedford to Milton Keynes corridor and the upgrading of the A421 to junction 13 of the M1 will make out-commuting more attractive from St Neots.

7.8.25 Furthermore, it should be noted when considering the appropriate scale of growth in Cambridgeshire, as explored in Chapter 4 the views of neighbouring authorities have been considered. As noted above the other neighbouring authorities have similar concerns about higher levels of growth.

7.9 NON-WORK TRIPS

7.9.1 Analysis has been undertaken considering non-work trips, including leisure, shopping, personal business, employer's business and education. Each of these trip purposes are considered separately within the model, however for simplicity they are presented together here.

7.9.2 Given that the rates of trip-making are assumed to be constant, the percentage growth in trip origins is as shown in Table 7.7 above for work trips. Tables 7.14 and 7.15 below show the total and percentage rise in non-work trips to each area. These are similar in percentage terms to work trips, as across wider areas the relative attractiveness of areas for work is similar to that for other activities. However, the absolute number of trips generated is much greater in each case, illustrating the importance of planning for non-work trips and related activities and therefore the provision of local facilities and services.

7.9.3 In terms of new settlements, unless such towns can successfully provide the necessary facilities and services, patterns similar to those set out above for commuting are likely to result.

	Baseline (Additional to 2006)	Market Towns (Additional to Baseline)		Cambridge (Additional to Baseline)		New Settlements (Additional to Baseline)	
	Baseline	**Market Towns**		**Cambridge**		**New Settlements**	
		Main Case	**High Case**	**Main Case**	**High Case**	**Main Case**	**High Case**
Cambridge	**56.2**	+1.0	+3.4	+15.1	+31.2	+21.7	+38.6
East Cambs	**10.3**	+4.8	+10.6	+0.9	+2.1	+0.8	+1.6
Hunts	**23.9**	+13.5	+31.9	+3.3	+8.2	+2.6	+39.5
South Cambs	**43.3**	+2.1	+7.9	+20.3	+49.3	+38.8	+68.0
Outside Cambs	**20.3**	+4.0	+10.2	+7.1	+17.1		
Total	**153.3**	+24.8	+62.7	+46.8	+108.1	+56.7	+127.9
Ely	**3.8**	+2.0	+4.3	+0.1	+0.3	+0.3	+0.7
St Neots	**7.0**	+5.0	+10.5	+0.1	+0.1	+0.3	+7.0
Huntingdon	**9.9**	+6.8	+14.3	+0.2	+0.5	+0.5	+7.1
St Ives	**5.6**	+3.7	+7.8	+0.2	+0.4	+0.6	+6.2

Table 7.11 Non-work Trips by Destination in '000 trips, based on 2006 CSRM Trips, scaled by population at Origin

	Baseline (Additional to 2006)	Market Towns (Additional to Baseline)		Cambridge (Additional to Baseline)		New Settlements (Additional to Baseline)	
	Baseline	**Market Towns**		**Cambridge**		**New Settlements**	
		Main Case	**High Case**	**Main Case**	**High Case**	**Main Case**	**High Case**
Cambridge	**31%**	+1%	+2%	+9%	+18%	+13%	+22%
East Cambs	**16%**	+8%	+17%	+1%	+3%	+1%	+2%
Hunts	**13%**	+8%	+18%	+2%	+5%	+1%	+25%
South Cambs	**28%**	+1%	+5%	+13%	+32%	+25%	+39%
Outside Cambs	**22%**	+4%	+11%	+8%	+18%		
Total	**23%**	+4%	+9%	+7%	+16%	+8%	+19%
Ely	**16%**	+8%	+18%	+0%	+1%	+1%	+1%
St Neots	**18%**	+13%	+27%	+0%	+0%	+0%	+20%
Huntingdon	**19%**	+13%	+27%	+0%	+1%	+1%	+20%
St Ives	**19%**	+12%	+26%	+1%	+1%	+1%	+18%

Table 7.12 Non-work Trips by Destination %age growth, based on 2006 CSRM Trips, scaled by population growth at Origin

Note: Fenland, March and Wisbech excluded as no data on trips available.
Growth in trips from outside the county is NOT included.

7.10 MODE SHARE

7.10.1 The prediction of the mode share for the baseline and delivery of the current strategy of 75,415 homes by 2031 is shown in Figure 7.23 below. This predicted mode share includes planned/committed transport measures only, as coded within the CSRM, such as CGB and the A14.

7.10.2 Without any improvements to the public transport infrastructure and service provision or changes to travel behaviour resulting from technology or smarter choices then all of the options will continue to result in a continuation of these mode shares.

7.10.3 However, it should be noted that providing housing growth on the edge of existing settlements, such as Cambridge and/or the Market Towns would increase the likelihood of being able to deliver improved sustainable travel modal share away from the private car. This is due to proximity to existing employment and services and the ability to take advantage of existing infrastructure, albeit with upgrading and expansion.

7.10.4 However, there may be physical capacity and/or amenity issues for delivering further measures for sustainable modes in Cambridge and the Market Towns in order to support increased growth. Further work would need to be done to demonstrate or otherwise whether this was the case.

7.10.5 Without significant investment in improving public transport,walking and cycling and increased demand management measures such as with CGB at Northstowe, it is more challenging to deliver reduced car use with the new settlement options.

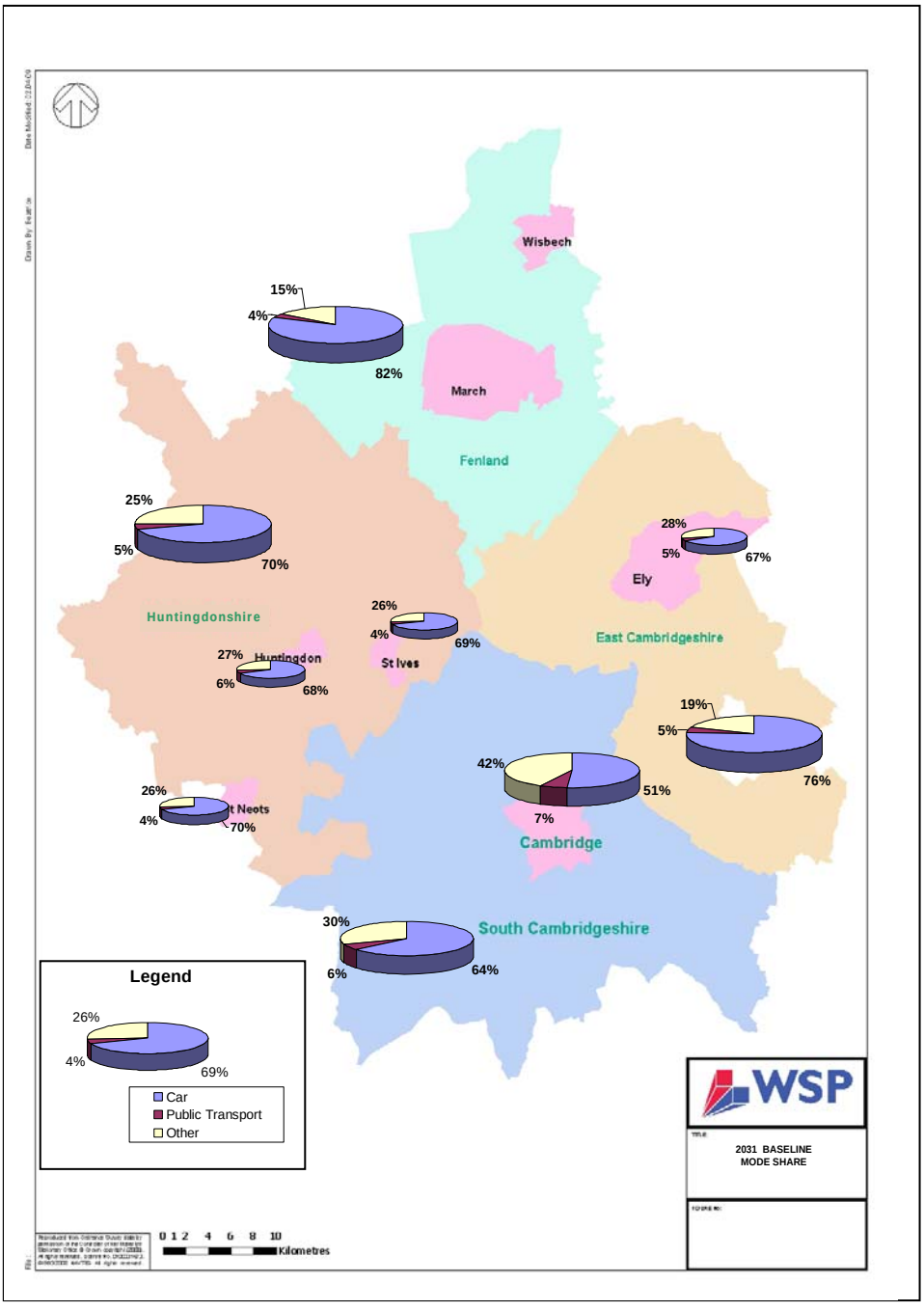


Figure 7.23: 2031 Current Strategy (Baseline) Mode Share

7.11 PRESSURES ON EXISTING TRANSPORT INFRASTRUCTURE

7.11.1 Congestion currently occurs within and around Cambridge, even without any future growth and any measures such as proposed within Transport Innovation Fund (TIF) only cater for current growth strategies. Even with development in place under the current strategy to 2021 there are likely to be congestion impacts in Cambridge with up to 32,500 extra inbound trips to Cambridge, 46% increase in total travel time in Cambridge and 23% in the wider area, and 16% increase in distance travelled in the wider area around Cambridge.[18]

[18] CCC TIF Outline Proposal for Funding Oct 2007

7.11.2 Market Towns have increasing traffic levels (2-3% growth each year) and wide catchment/influence areas in many cases leading to higher levels of car dependency, however many of the Market Towns are on existing railway stations (Ely, March, St Neots, Huntingdon, Whittlesey) with the CGB providing links from St Ives to Huntingdon and Cambridge stations, but others such as Wisbech, Ramsey and Chatteris are not.

7.11.3 Furthermore, congestion is increasing on trunk roads and principal routes between Cambridge and to and between other market towns and in many cases capacity has been exceeded.

7.11.4 In relation to the options tested the key findings are as follows. In the Market Town Option the following is likely to result:

- Increased commuting to Cambridge, with greater pressure on routes such as the A10 and A428;
- Increased commuting to Peterborough and Kings Lynn leading to increased congestion on routes such as the A47, A141 and A605; and
- If mode shares are to remain (or improve) for public transport then increased capacity will be required on rail and bus routes as well as Park & Ride and at railway stations.

7.11.5 For the Cambridge Expansion options the following issues may arise:

- Potential for greater levels cycling and walking but significant upgrades likely to be required;
- Physical capacity constraints in Cambridge for any transport mode including in some places for buses cycles and pedestrians;
- As this option includes expansion of Northstowe, CGB will require an increased service frequency and associated priority;
- Greater level of orbital trips around Cambridge;
- A deliverable increase in capacity for all public transport services and facilities will need to be identified,
- The need for enhanced demand management on roads in the City and surrounding Cambridge.

7.11.6 For the new settlement option there may be a range of pressures, including:

- Road congestion on the local road network surrounding the potential locations;
- Out-commuting for services, facilities and employment; and
- Higher car mode share (noting Cambourne levels of car use and out-commuting) without significant high quality public transport provision or upgrades.

7.11.7 It should be noted that tackling the productivity agenda and climate change through sustainable transport will be challenging without significant investment and increased demand management. Furthermore, existing travel patterns and commuting habits are not sustainable in the longer term (there is already significant out-commuting from market towns, such as Ely and even newer settlements such as Cambourne).

7.11.8 The Cambridgeshire Guided Busway (CGB) is anticipated to cater for 20,000 trips per day to accommodate Northstowe, but also has sufficient capacity to cater for further growth, although this needs to be further considered as part of any additional growth along this corridor. However, achieving modal shift on some of the transport corridors will be challenging when considering car use versus public transport, such as the A428 and A47.

7.11.9 A package of measures, including high quality public transport incorporating enhanced bus services, mass transit, interchange facilities, significant improvements to the walking and cycling network and (where congestion would otherwise be significant) increased levels of demand management.) It should also be noted that new road building, such as the A14 and A428 will make travel by car more attractive towards Cambridge promoting the need for measures in and around the City to tackle this, such as expanded Park & Ride and other packages of measures that are proposed through TIF. A key aspect will be the need to achieve a significant step change in public transport and other sustainable modes of travel as well as in the first instance seeking to reduce the need to travel, such as through smarter choices or exploiting new forms of technology.

7.11.10 A package of measures on the scale of those set out of those set out in the County's Transport Innovation Fund (TIF) would be necessary if a 10% reduction in traffic in traffic and a reduction in congestion were to be achieved in the Cambridge Area is essential to cope with the growth envisaged in the RSS. However, there is no certainty as to whether the TIF Package will go ahead as it is subject to the outcomes of the Transport Commission later this year.

7.11.11 The County have examined alternatives to the TIF proposals, but none have proved as effective. However, modelling carried out indicates that a package of measures including a significantly enhanced CPZ and much tighter parking controls in Cambridge would result only in a limited increase in traffic, thus restricting future congestion to some extent. Additional growth beyond the current strategy will require a further step change in sustainable transport using the principles set out in the County's Long Term Transport Strategy of improved choices and greater demand management other investment commensurate with the proposed levels of growth, however without an agreed solution or certainty over delivery such further additional growth in Cambridge will be difficult to justify.

7.11.12 Noting CGB above and other bus improvements feeding into Cambridge there will be significant issues for Cambridge to cater for increased numbers of buses and a limited physical capacity within the city centre in general to support current levels of growth, let alone further growth. This needs further investigation and without an agreed solution Cambridge centred growth will be difficult to achieve.

7.11.13 There is an estimated transport infrastructure deficit of around £2bn for the current strategy. The overall infrastructure deficit is in the region of 6.044billion within the Cambridgeshire (based upon Cambridgeshire Horizons latest estimate). The A14 improvements, CGB, Chesterton Station, Addenbrooke's Access Road and other planned measures only go part of the way to meeting the deficit. Therefore this points towards ensuring that residual problems arising from currently planned growth are addressed before further developments are implemented. As there is limited prospect of large scale transport investment, it will also be important that effective use is made of existing and planned infrastructure to accommodate growth. There are also growth pressures in relation to the affordability of infrastructure versus ability to achieve s106 contributions when considering the range of other competing draws on finance, such as affordable housing and meeting reduced carbon. This may also impact on the ability to deliver quality aspects as part of new development.

7.11.14 There are large costs associated with other required infrastructure, and not just transport, across the County and whilst preparation for the current growth strategy is underway any further cost will increase the requirements. These have been described in the previous chapter.

7.12 TRANSPORT INFRASTRUCTURE REQUIREMENTS

7.12.1 The options tested show growth beyond the existing supply and the infrastructure associated with it together with the resulting pressures described above. There are already pressures for delivering the current growth strategy, such as agreeing a transport solution for Cambridge and securing the required funding to facilitate sustainable development.

7.12.2 Each of the options have therefore been assessed against likely requirement for supporting infrastructure and this is summarised in Table 7.13 below.

Option	Growth Scenario	Likely Infrastructure Requirements
Market Towns Strategy	Baseline - 75,415	Delivery of LTP identified Transport Measures
	Medium - 90,415	Increased HQPT and sustainable transport within Market Towns Smarter travel choices – changing travel behaviour Public Transport Interchange Hubs at market towns and local centres for travel to Cambridge and HQPT improvements on key corridors, including: ■ A47 Peterborough to Fenland; ■ A428 St Neots to Cambridge (inc Cambourne) ■ Upgrade of railway lines north and south of Cambridge and ECML Use of technology – village homeworking hubs Expanded Park & Ride in Cambridge Increased physical capacity (bus and rail) for accessing Cambridge and market towns dependant upon deliverability Rural Park & Ride (might also be considered)
	Higher - 110,415	
Cambridge Based Strategy	Baseline - 75,415	Agreed Transport Solution for Cambridge, such as Transport Innovation Fund (TIF) Transport or other comparable solution of similar investment Tackling physical capacity of Cambridge for public transport Chesterton Interchange Cambridge Railway Station Upgrade Rural Park & Ride
	Medium - 90,415	TIF Plus (continuation and expansion of TIF package) or similar solution. However, with the Northstowe expansion increased frequency of CGB would be required together with addressing the capacity constraints in Cambridge.
	Higher - 110,415	
New Settlement Strategy	Baseline - 75,415	Only applies to delivery of Northstowe under current strategy, as already identified.
	Medium - 90,415	All new settlements would require same level of sustainable transport as Northstowe with Guided Busway or similar HQPT providing suitable connections to Cambridge – this is particularly challenging for those locations further from Cambridge. New settlement at Alconbury would require connection to ECML and HQPT sustainable transport connections and improvements to link to Peterborough and Huntingdon
	Higher - 110,415	

Table 7.13: Transport Infrastructure (HQPT = High Quality Public Transport)

7.12.3 The likely infrastructure requirements set out above will require further investigation outside of the remit of this study. In particular this will need to consider the possible limitations on space for physical infrastructure, costs and deliverability and these need to be determined prior to agreeing any future levels and locations for growth.

7.13 TRANSPORT CARBON IMPACTS

7.13.1 This section outlines the transport related carbon impacts using the CSRM and also refers to the DfT Carbon Pathways Report for reference and guidance.

7.13.2 It is noted that transport contributes 33% of the County's carbon emissions and is the main contributor to poor air quality. There is need to deliver a low carbon transport strategy within the County and any additional commuting along corridors would have an impact on Air Quality Management Areas.

7.13.3 The East of England Plan Policy SS1 which emphasises "living within environmental limits" states that spatial planning should seek to assist with meeting obligations on carbon emissions and adopt a precautionary approach to climate change. Adaption and climate proofing are also important and are also influenced by the location and scale of development.

7.13.4 The DfT's Carbon Pathways Analysis (CPA) indicates that commuting accounts for 24%, the greatest percentage, of CO_2 emissions from all passenger transport modes (see Section 7.6) in Great Britain. The CPA also shows that during 2002-2006, 57% of household car trips, in Great Britain, were under 5 miles and these accounted for under 20% of CO_2 emissions from cars, 37% of car trips were between 5 and 25 miles and these accounted for 43% and while only 7% of household trips were over 25miles, they account for 38% of the emissions.

7.13.5 This implies that for a significant reduction in emissions there has to be emphasis on reduction of long car trips, as these are responsible for the greatest percentage of emissions. However, the first two miles of any car trip produce more pollution and CO2 than the following miles. As trips under 2 miles may be substituted by walking, cycling, they also need to be targeted Taking into account the fact that most long car trips (over 25 miles) tend to be non-commuting trips, it is imperative that the spatial strategy takes into consideration trips of all purposes and caters for both short and long distance trips for effective reduction in carbon foot print and hence creation of communities that are environmentally sustainable. This also calls for a services/housing balance within the county. The impact of transport on CO_2 emissions in Cambridgeshire for the proposed development strategies is discussed in the sections that follow.

Approach to Transport Emissions Modelling

7.13.6 Sustainability is a critical aspect of planning policy, and the impact of developments on the climate amongst the most important measures of future sustainability.

7.13.7 Increasing dwellings numbers and population will inevitably lead to impacts on the total greenhouse gas emissions, both from Transport and other activities, both domestic and non-domestic.

7.13.8 In considering the transport carbon emissions impacts of the proposed development strategies, the most important consideration is the extent to which the number and spatial distribution of dwellings can affect the emissions. There are two ways in which spatial development decisions affect emissions:

- Mode Share: The proportion of trips to be made by car vs public transport, walk or cycle modes, influenced both by the transport provision and the demographic mix in a given area.

- Trip length: The typical length of trips, which is governed by the proximity of homes to the desired destinations for work, leisure, shopping and education.

7.13.9 The project has therefore analysed the emissions levels in 2006 vs 2031 taking account of the mode share and trip length characteristics of the development areas.

Assumptions in Transport Emissions Modelling

7.13.10 The methodology used takes advantage of the CSRM detailed modelling of trip purposes, trip lengths and mode share across the Cambridge Sub-Region in 2006. It has not been possible during the study to model the impacts of developments (or indeed planned transport schemes) on the mode share or trip patterns.

7.13.11 However, the results will indicate that focusing developments in areas where both trip lengths and car mode share are lower (typically urban areas) has definite benefits in terms of future carbon emissions.

7.13.12 In order to isolate the impact of the spatial strategy, the projections have initially considered current car emissions rates per km as fixed through time. It is well known and documented that these rates will fall as the national car fleet is replaced by more efficient models. An estimate is presented of the impact for comparison purposes.

7.13.13 The figures shown below include an assumed emissions for Fenland District. As CSRM does not model Fenland District in detail, we have assumed the Fenland emissions per dwelling are similar to East Cambridgeshire, and presented the Fenland results on this basis. This is necessarily a broad assumption, but allows the relative impact of locating dwellings in Fenland rather than Cambridge to be assessed.

7.13.14 In the Cambridge development scenario, a large proportion of the new dwellings are located in South Cambridgeshire, either on the Cambridge periphery or in Northstowe. It has been assumed that a large proportion of these dwellings (60%) will adopt travel characteristics (trip length and mode choice) similar to current Cambridge residents.

Future Transport Carbon Emissions

7.13.15 Figure 7.24 compares the Carbon Emissions by origin in 2006 with the various 2031 scenarios considered, whilst Table 7.14compares the growth in dwellings and carbon emissions.

	2006	2031	2031 - Market Towns		2031 – Cambridge		2031 – New Settlements	
		Baseline	Main Case	High Case	Main Case	High Case	Main Case	High Case
Carbon Emissions	-	20%	25%	33%	23%	26%	29%	40%
Dwellings Growth	-	31%	37%	45%	37%	45%	37%	45%
Emissions per Dwelling (Tonnes p.a.)	3.74	3.43	3.42	3.42	3.35	3.38	3.53	3.62

Table 7.14:Change in Carbon and Dwellings versus 2006 and Carbon Emissions per Dwelling (All Cambridgeshire, CO_2 from origins in county only), accounting for dwellings and population change only..

7.13.16 It can be seen that in all cases the carbon emissions grow more slowly than the dwellings, and the estimated emissions per dwelling falls compared with 2006. This reflects both the decline in household size and to some extent the fact that dwellings on the whole become more spatially concentrated, with high levels of development in Cambridge (+44% in the Baseline), and in urban extensions of market towns. Essentially, both trip lengths and the proportion of trips undertaken by car will decline.

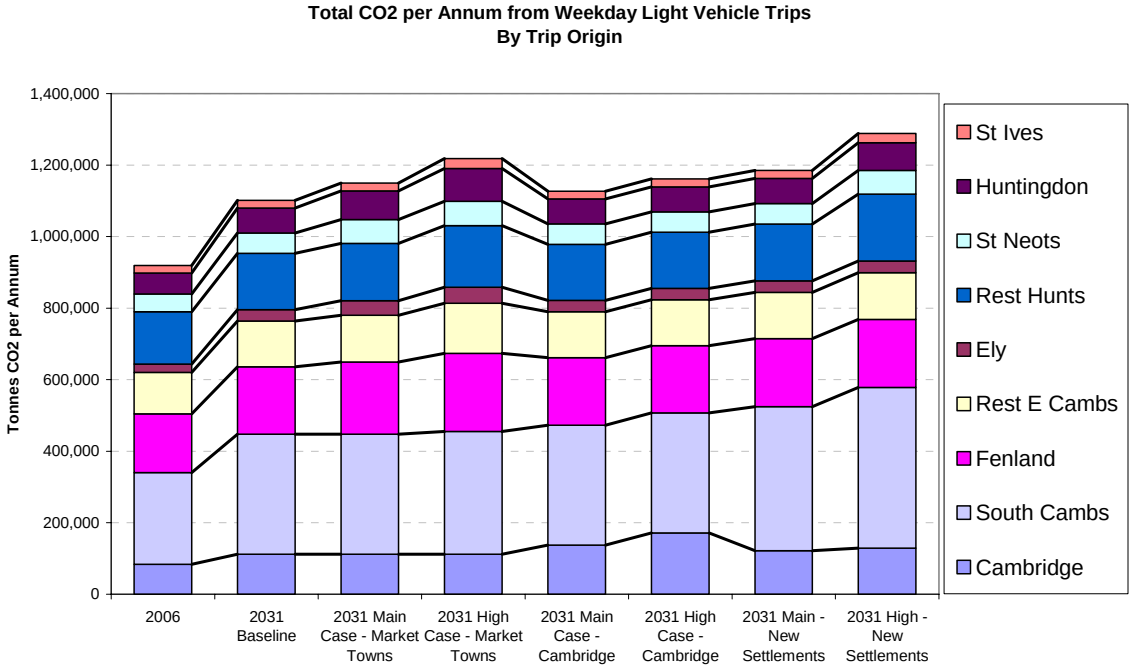


Figure 7.24 Total CO_2 per Annum from Weekday Light Vehicle Trips, By Origin

Source: WSP calculations from CSRM 2006 trip patterns, dwellings growth and Defra current average emissions

7.13.17 In terms of the new settlements, as a result of the greater number of transport trips and commuting patterns set out earlier in this chapter the CO_2 will be correspondingly higher than the Market Town and Cambridge options for both the medium and higher growth scenarios for the new settlement spatial options, as shown above.

7.13.18 The main differences between an approach that focuses growth in Cambridge and its surrounding area and a Market Town option are shown below in Figure 7.25.

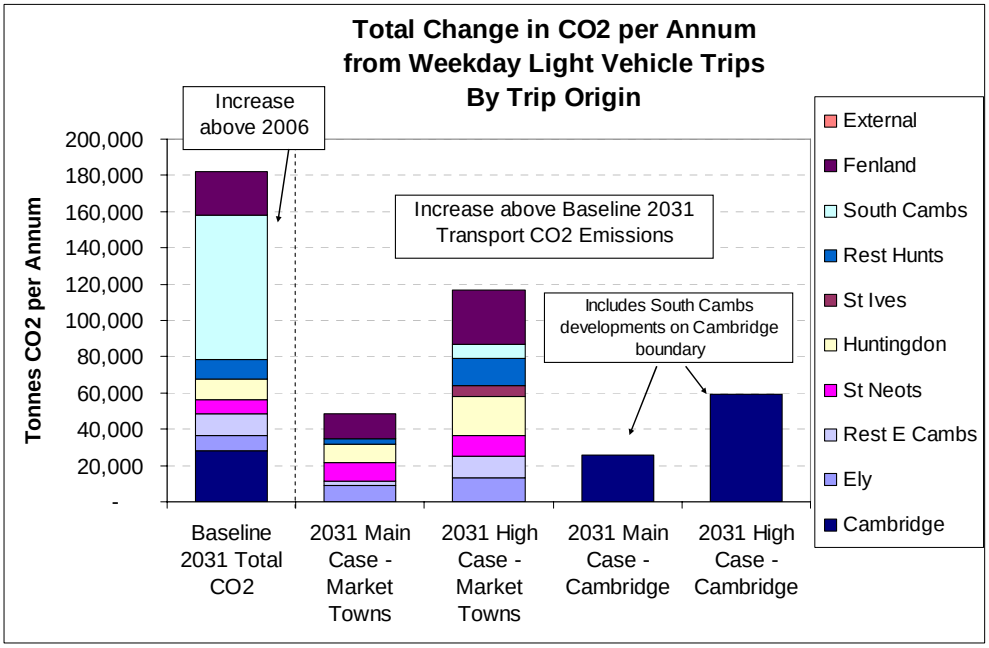


Figure 7.25 Total Change in CO_2 per Annum from Weekday Light Vehicle Trips, By Origin

Source: WSP calculations from CSRM 2006 trip patterns, dwellings growth and Defra current average emissions

7.13.19 A strategy of Cambridge centred growth has the potential of significantly reducing the increase in carbon emissions over the baseline 2006-2031 increase compared to a Market Town based approach to housing growth. Albeit, it should be noted that the majority of CO2 increase occurs in the baseline period between 2006 and 2031.

7.13.20 However, whilst a Cambridge based strategy may result in less carbon emissions there are wider implications in terms of the green belt and physical capacity to cater for such growth and the lack of an agreed transport solution to cater for the likely number of trips resulting from these higher levels of housing growth in the longer term.

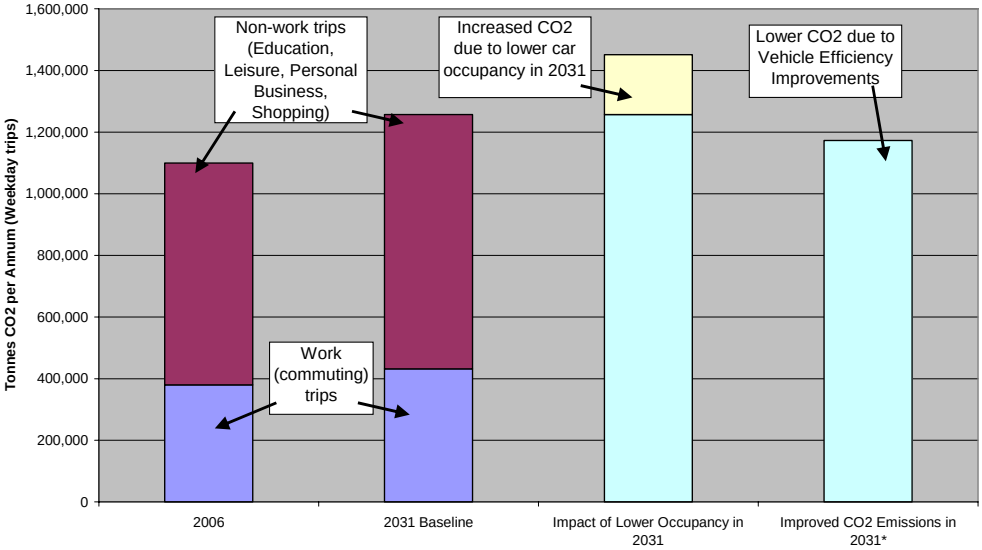


Figure 7.26 Contribution of Work and Non-work Trips to Carbon Emissions, and impact of lowered emission rates

7.13.21 Figure 7.26 shows the contribution of work and non-work trips to the level of carbon emissions; non-work trips account for around 77% of trips and 65% of carbon emissions. Though consideration of sustainability of spatial developments often focuses on employment location, this illustrates the importance of also considering non-work trips, such as education, shopping, leisure and other personal business. These trips are equally susceptible to variation in mode share and trip length by location, and therefore a spatial strategy which carefully considers accessibility to personal trip destinations will improve sustainability.

7.13.22 The figure also illustrates the potential impact of trends in both vehicle occupancy and emissions rates and carbon emissions over the same period. Department for Transport figures project a continued fall in vehicle occupancies as car ownership continues to increase, which leads to a rise in CO_2 emissions by 2031 of around 15% (current at time of modelling).

7.13.23 Conversely, ongoing improvements in the efficiency and emissions rates of vehicles are forecast to reduce CO2 emissions per kilometre. The figures shown here assumed that all vehicles by 2031 are at least as efficient as new cars in 2007 (Source: Defra Figures), leading to an overall reduction in carbon emissions compared with 2006. The chart shows the combined impact of the two effects, which lead to vehicle emissions slightly below that caused by dwellings growth alone, but still well above 2006 levels.

Summary

7.13.24 The employment and dwelling growth has been set out in the earlier chapters of this report. For the County as a whole this results in up to an additional 35,000 homes above the 75,415 committed supply and an extra 40,000 jobs. The population growth and economic activity associated with the levels of tested employment and housing gives rise to increased carbon impacts. The extent of the carbon rise is related to:

- increase in total trips, with non-work trips likely to be outside the AM peak contributing 65% of the increase.
- decrease in car occupancy i.e. less car sharing due to projected rises in car ownership, which are equal in scale to population and dwellings led growth in terms of CO_2.emissions.

7.13.25 The chief mitigating factors are:

- improvements in vehicle emissions; and
- to a lesser extent, the spatial concentration inherent in all options.

7.13.26 The modelling applied does not take account of transport policy measures which would reduce car use or trip lengths. It could hence be expected that carbon emissions can be reduced further. Consideration of trip patterns clearly indicates that spatially concentrated development in or near Cambridge or Huntingdon has the most scope for further CO_2 reductions through policy interventions or promote car sharing.

7.13.27 It should be noted that, if growth does take place, the most important measures to reduce CO_2 transport emissions in the short to medium term will be those centred on improving engine technology, reducing fuel use and promoting the use of alternative fuels. These are more likely to be more effectively delivered at a national rather than local level and vehicle excise duty is already having an effect through changing levels related to CO_2 emissions.

7.14 ENERGY CARBON EMISSIONS

7.14.1 This section presents the results of modelling the potential CO_2 emissions associated with the pattern of economic development represented in the proposed development scenarios. The scope of the analysis is at the level of the County rather than at a more disaggregated district level and considers the emissions associated with the use of energy by industry and commerce and households and is based on the population increases assumed within the CSRM modelling work presented earlier in this Chapter.

Key Drivers of Future Energy-Related CO_2 emissions

7.14.2 The modelling approach adopted links future CO_2 emissions in the county to future use of energy and the fuel-mix by which this overall demand is met. The level of future energy demand will be influenced by

- the size of the economy (level of output produced, size of the population)
- the composition of economic activity (services are typically less energy-intensive than manufacturing, so future growth in services can be expected to make less demands on energy than similar growth in manufacturing)
- trends in energy efficiencies (many policies are seeking to influence this, either directly or indirectly; trends can expect to vary between sectors of the economy)

7.14.3 In addition, the future can be expected to bring changes in fuels used by different sectors of the economy. A clear example of this is in the past move towards the use of gas in electricity generation and the current move to increase the role of renewables in future generation. The future fuel mix is important, as clearly, different fuels have different carbon intensities.

7.14.4 In addition to the economic scenarios for Cambridgeshire discussed, the analysis below has been utilised:

- district-level data on energy use and CO_2 emissions published by DECC and Defra;
- data on energy use and associated emissions from the REEIO model for the East of England (these data are available at a greater level of industrial disaggregation than are the district-level data); and
- National trends in future energy use[19] and forecasts for trends.

Current Pattern of CO_2 emissions

7.14.5 In 2006[20], activity in the Cambridgeshire economy caused the emission of 5.2m tonnes of CO2[21], around 13% of the total for the East of England. Of this (see Figure 7.27), industry and commerce were responsible for 40% of emissions, road transport for around a third and households the remainder. As illustrated in Figure 7.28, over 40% of all emissions are associated with the use of petroleum products, 35% with the consumption of electricity and 20% with the use of natural gas.

[19] Published by Cambridge Econometrics in *UK Energy Environment, February 2009*.
[20] This is the most recent year for which data are published.
[21] This includes the emissions associated with the electricity that is consumed in the county but excludes emissions from any power generation activities that feed into the National Grid.

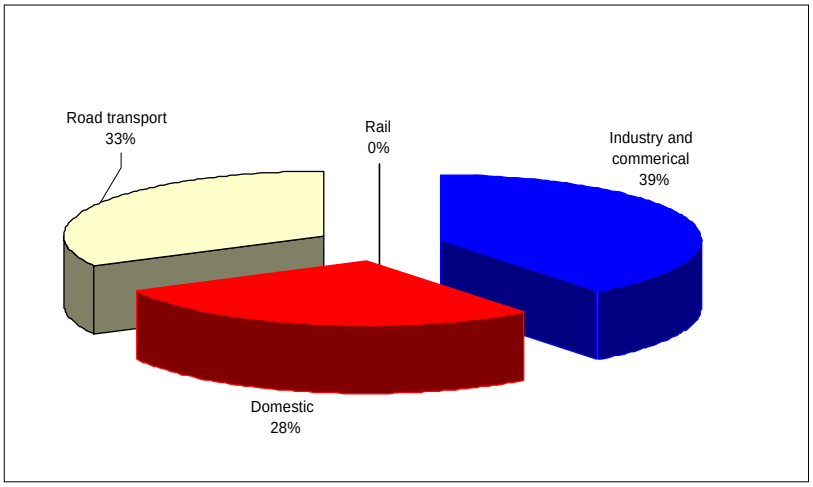


Figure 7.27: CO_2 Emissions in Cambridgeshire in 2006, by Sector

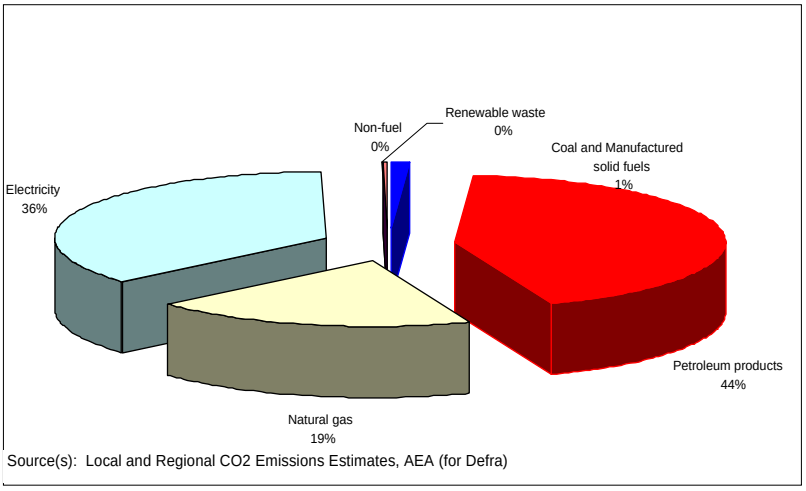


Figure 7.28: CO_2 Emissions in Cambridgeshire in 2006, by Energy Source

Future CO2 emissions

7.14.6 Future growth in CO_2 emissions is expected to be much weaker than the expected growth in both economic activity and population. Emissions (and energy use) are expected to fall sharply in the short term, but to rise (albeit modestly) in the longer term as rates of economic and population growth quicken. However, by 2030 emissions are expected to be 12% below current levels despite the economy almost doubling in value over the period and the population rising by 20%. Table 7.15 summarises the analysis, and Figure 7.29 presents the trajectories.

	2007-2010	2010-2015	2015-2020	2020-2030
GVA	0.5	3.1	2.8	3.2
Employment	-0.3	0.7	0.3	0.6
Population	0.6	0.7	0.8	0.9
Energy Use	-2.0	-0.2	0.2	0.4
CO2 Emissions	-3.0	-0.5	-0.6	0.1

Table 7.15: Summary of Cambridgeshire's Economic and CO2 Emissions

Note: Energy Use and CO_2 emissions relate to only the domestic and industrial & commercial sectors.

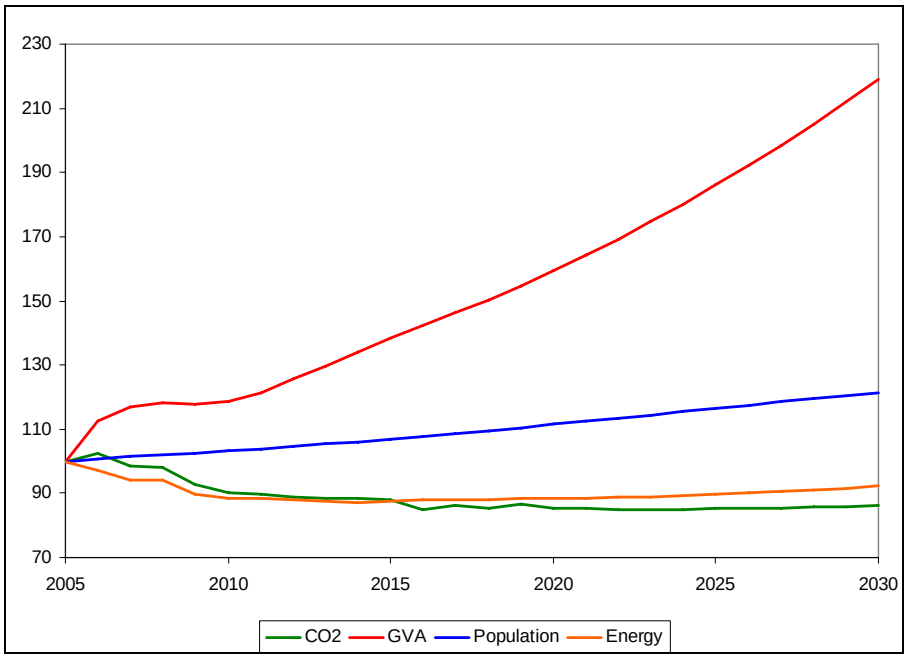


Figure 7.29 Economic and CO2 Projections; Index 2005 = 100

7.14.7 A major contribution to this underlying reduction in CO_2 emissions (and the CO_2-intensity of economic development) comes from the continued decarbonisation of electricity generation and a trend towards an increasing share of energy demand being met through electricity, particularly in the industrial and commercial sector. By 2030 the carbon-intensity of electricity generation in the UK is expected to be 25% lower than in 2008.

7.14.8 Figure 7.30 below illustrates that different trends are expected in the emissions from industry & commerce, and from households. Emissions from both sources are projected to fall for the next decade or so, with stronger falls in emissions from industry and commerce than in households. This reflects both the impact of the recession and that the strongest economic growth is expected in services rather than manufacturing, which tend to be less energy (and CO_2) intensive. The domestic sector is also expected to achieve efficiency savings, but rising average incomes will limit this effect.

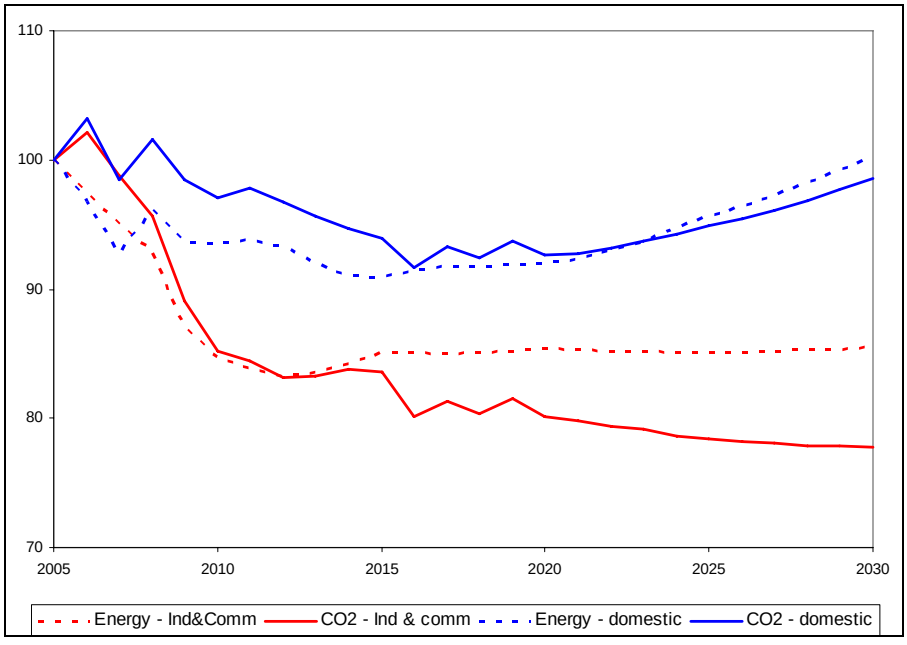


Figure 7.30: Energy and CO_2 Emissions Trends by Sector

7.14.9 In the longer term, emissions from industry & commerce are projected to continue to fall while those from the domestic sector begin to rise as underlying trends in energy efficiency improvements and decarbonisation of electricity generation slow[22]. The projected rise in emissions from the domestic sector is the stronger growth in population predicted over this period. At the same time, the domestic sector meets a higher proportion of its energy need from gas than does Industry & commerce, and is also thought to be less likely to switch to electricity from (the more CO_2-intensive) gas than industry & commerce. Therefore, the trend in CO_2 emissions from the domestic sector tracks the trend in overall energy use than are the trends in the industry & commercial sector.

7.15 CARBON IMPACTS

7.15.1 The assessment above of transport and energy related carbon emissions has shown the following main headlines:

- Under the committed supply between 2006 to 2031 and the growth of 75,415 homes transport related carbon emissions will increase significantly;
- There are modest increases in transport related carbon emissions under all growth scenarios, however the Cambridge based option performs better and the New Settlement Option relates in the potential greatest increase in transport related carbon emissions;
- Energy based Carbon emissions are likely to decrease relative to population growth over time ; and
- Whilst domestic related carbon emissions will reduce in the short term, there will be a continuing rise in the longer term.

7.15.2 The transport analysis is based on the current levels of sustainable travel patterns and modal share and does not account for significant investment in public transport or changes in travel behaviour that might reduce car use or even significant changes in vehicle engine technology.

7.15.3 The economic and domestic related analysis assumes relevant policy interventions nationally to reduce carbon emissions and is based on underlying trends in employment growth across the County and therefore carbon emissions may vary or increase depending upon levels of growth.

7.15.4 With this in mind it is worth noting that the work undertaken by ESD ltd on behalf of Cambridgeshire Horizons set out in the "Carbon Appraisal of the Cambridge Sub-Region Long Term Delivery Plan" produced in May 2008. This report summarises that "*The current carbon footprint of Cambridgeshire is 6.5 million tonnes of CO_2 annually and this could grow to 8 millions tonnes by 2031 if energy consumption in existing communities is not controlled and if the Cambridge Sub Region growth were to follow a business as usual trajectory. However, the IPCC recommended carbon reduction target of 60% by 2031 for Cambridgeshire would reduce CO_2 emissions to 3 million tonnes. The study highlights that in order to keep on track for achieving long term carbon targets for 2031 and 2050, the housing growth for the sub region would need to be built to zero carbon standards. In addition, the growth process will need to be used as a key opportunity for rolling out low carbon infrastructure that can facilitate carbon reductions in the existing building stock.*"

[22] Understandably there is less information to assess likely trends in the long term. Trends for earlier periods can be informed by stated objectives and more detailed policy announcements.

7.15.5 Therefore based on the assessment of the carbon emissions set out above and the findings of the ESD ltd work undertaken on behalf of Cambridgeshire Horizons it can be seen that there is a significant challenge of dealing with the carbon implications of the existing strategy let alone further growth.

8 Evaluation – Summary

8.1 EVALUATION – KEY ADVANTAGES AND DISADVANTAGES

8.1.1 This section sets out the evaluation based on the criteria set out in Chapter 3 and considers the three spatial options in turn. The findings are shown in summary tables for each option. For clarification the scoring is as follows:

8.1.2 The scoring criteria used for the evaluation is as follows:

- - - - very strongly negative
- - - strongly negative
- - negative
- o neutral
- + positive
- + + strongly positive
- + + + very strongly positive.

8.1.3 The evaluation criteria draws upon the Cambridgeshire Objectives and the Quality Charter for Growth.

8.1.4 Table 8.1 summarises the key advantages and disadvantages of the Market Town option.

8.1.5 Table 8.2 summarises the key advantages and disadvantages of the Cambridge based option.

8.1.6 Table 8.3 summarises the key advantages and disadvantages of the New Settlement Option.

8.1.7 The evaluation shows that the Market Town and Cambridge based options perform better than the New Settlement option. Key elements of the findings are as follows:

- Cambridge Base Option has the lowest Carbon emissions and greatest opportunity for modal shift to sustainable modes depending upon satisfactorily resolving the capacity constraints and lack of a transport solution;
- The new settlement option has the potential for the largest carbon emissions and reliance on the car;
- Both the New Settlement and Market Town options may face challenges for attracting jobs;
- Larger sustainable urban extensions of Market Towns offer improved deliverability of facilities and in particular education provision;
- Market towns face challenges for tackling flood risk; and
- There are significant infrastructure requirements for new settlements, such as public transport, wastewater treatment, drainage and other utilities.

8.1.8 Table 8.1 shows the evaluation for the market towns options

MARKET TOWN OPTIONS			
Criteria	**Qualitative assessment (commentary on key advantages and disadvantages)**	**Quantitative Measure (where applicable)**	**Comparative Scoring (relative performance)**
Delivery			
Resources for and ability to provide infrastructure Impact on Infrastructure Deficit Capacity of existing infrastructure Maintaining the overall vision Land type	*Use of agricultural land on largely greenfield sites* *Potential to utilise existing infrastructure but limited capacity on road and rail*	*n/a*	+
Climate Change			
Carbon Footprint - minimising CO2 emissions Renewable Energy Generation Waste arisings and recycling Access to public transport (HQPT) Water cycle impacts and water use Anticipating climate change Impact on Flood risk	*Potential for reducing out-commuting subject to attracting jobs.* *Potential for renewable energy use (particularly Fenland)* *Need to avoid dispersed growth across too many centres as this would increase C02 due to commuting* *Fenland – potential for renewable energy generation* *Sufficient Water Resource* *Ely, St Neots, Huntingdon, St Ives and March have access to HQPT* *Some market towns have limited HQPT availability – need further sustainable transport interventions* *Potential impact on flood risk and impacts of Climate Change*	*25% increase in transport CO2 (medium growth) and 33% CO2 (higher growth) – based on current behaviour*	*o*
Environment			
Impact on Designations Habitat loss Loss of Agricultural land Biodiversity value Relationship to existing landform Impacts on landscape/water/townscape	*Potential for impact on Wetland SSSI sites* *Limited habitat loss* *Loss of high quality agricultural land* *Urban extensions of market towns need to include biodiversity value and access to surrounding greenspace*	*n/a*	-
Quality of Development			
CABE Design for Life issues Diversity of housing need, Community deprivation indicator studies and Community Health and Health Impacts Modal Split Access to facilities and historic environment	*Diversity of Market Towns offer potential for quality of development, however challenges given land values in some cases* *Modal shift will require significant investment but subject to success of jobs potential to provide homes within cycle and walk distances* *Established historic market towns and proximity to green space*	*<1% change in modal shift based on current transport provision*	+

MARKET TOWN OPTIONS			
Criteria	**Qualitative assessment (commentary on key advantages and disadvantages)**	**Quantitative Measure (where applicable)**	**Comparative Scoring (relative performance)**
Proximity of green/open space			
Quality of Community Life			
Economic (job) potential Ease of establishing accountable, democratic community governance Access to shops and services Capacity of existing local community infrastructure	*Job growth subject to proactive economic development policy (Wisbech, March and Ely)* *Ouse Valley Towns have greater employment potential* *Established communities* *Need education facility expansion*	*n/a*	-
Housing Delivery			
Land values Ease of Development Ability to deliver affordable housing Land allocations and availability	*Reduced land values in some market towns will give rise to challenges to deliver range of facilities, albeit from an existing base* *Many of the Market Towns have potential for sufficient land supply*	*n/a*	++
Economic Growth			
Employment land availability Relationship to existing "engines" of growth Accessibility Access to labour markets Skills Development	*Market towns (Wisbech, Ely and March) will require serious proactive policies to encourage successful employment* *Ely and Ouse Valley towns closer to Cambridge* *Fenland Market Towns could build on Peterborough and Kings Lynn* *Market towns need support to widen the skills base (i.e. college in March)*	*n/a*	-
Travel Planning			
Reduce need to travel and distance to services and facilities Public Transport Capacity Promotion of sustainable modes Impacts on existing and future travel behaviours	*Subject to success of job growth market towns can offer reduced travel and through smarter travel and technology could improve sustainability* *There are existing capacity issues for bus and rail*	*n/a*	+

Table 8.1: Evaluation of Market Town Option

8.1.9 Table 8.2 shows the evaluation for the Cambridge based expansion option.

CAMBRIDGE BASED EXPANSION OPTION			
Criteria	**Qualitative assessment (commentary on key advantages and disadvantages)**	**Quantitative Measure (where applicable)**	**Comparative Scoring (relative performance)**
Delivery			
Resources for and ability to provide infrastructure Impact on Infrastructure Deficit Capacity of existing infrastructure Maintaining the overall vision Land type	*Lack of physical capacity and space in City Centre* *Limited rail, road and bus capacity* *Largely Greenfield sites – lack of land without green belt review* *Significant impact on increasing the infrastructure deficit* *Strong market conditions*	*n/a*	- -
Climate Change			
Carbon Footprint - minimising CO2 emissions Renewable Energy Generation Waste arisings and recycling Access to public transport (HQPT) Water cycle impacts and water use Anticipating climate change Impact on Flood risk	*Reduced travel distances* *HQPT available but requires expansion* *Potential stress for water resources* *Limited flood risk*	*23% increase in transport CO2 (medium growth) and 26% CO2 (higher growth) – based on current behaviour*	-
Environment			
Impact on Designations Habitat loss Loss of Agricultural land Biodiversity value Relationships to existing landform Impacts on landscape/water/townscape	*Not significant SSSI or wildlife site impacts* *Significant impact on green belt and setting of Cambridge* *Some loss of agricultural land*		-
Quality of Development			
CABE Design for Life issues Diversity of housing need, Community deprivation indicator studies and Community Health and Health Impacts Modal Split	*Further sites on the edge of Cambridge could be obtrusive due to open landscape and rising ground in the southerly direction* *Sensitive and many locations potential gateways into Cambridge*	*2-3% change in modal shift based on current*	-

CAMBRIDGE BASED EXPANSION OPTION			
Criteria	**Qualitative assessment (commentary on key advantages and disadvantages)**	**Quantitative Measure (where applicable)**	**Comparative Scoring (relative performance)**
Access to facilities and historic environment Proximity of green/open space	*Expansion of Northstowe could reduce quality if delivered in similar timescale but can take advantage of CGB*	*transport provision*	
Quality of Community Life			
Economic (job) potential Ease of establishing accountable, democratic community governance Access to shops and services Capacity of existing local community infrastructure	*Close to employment* *Established community structure* *Challenges for physical capacity* *Urban congestion*	*n/a*	++
Housing Delivery			
Land values Ease of Development Ability to deliver affordable housing Land allocations and availability	*Strong land values and convenient to Cambridge market and needs* *Lack of previously developed land* *Able to deliver affordable housing*	*n/a*	+
Economic Growth			
Employment land availability Relationship to existing "engines" of growth Accessibility Access to labour markets Skills Development	*Close to existing employment* *Skilled workforce* *Access by sustainable modes* *However growth is largely dependent upon delivery above, and in particular transport solution and physical space issues*	*n/a*	+
Travel Planning			
Reduce need to travel and distance to services and facilities Public Transport Capacity Promotion of sustainable modes Impacts on existing and future travel behaviours	*Close to City Centre for good links to jobs, services and facilities* *Existing sustainable travel patterns to build on* *Limited public transport capacity* *Need significant investment*	*n/a*	+

Table 8.2: Evaluation of Cambridge based expansion Option

8.1.10 Table 8.3 shows the evaluation for the new settlement option.

NEW SETTLEMENT OPTION			
Criteria	**Qualitative assessment (commentary on key advantages and disadvantages)**	**Quantitative Measure (where applicable)**	**Comparative Scoring (relative performance)**
Delivery			
Resources for and ability to provide infrastructure Impact on Infrastructure Deficit Capacity of existing infrastructure Maintaining the overall vision Land type	*Lack of funding and delivery expensive as no existing infrastructure in many cases* *Largely Greenfield but some previously used sites* *Nearby infrastructure has lack of capacity*	*n/a*	- -
Climate Change			
Carbon Footprint - minimising CO2 emissions Renewable Energy Generation Waste arisings and recycling Access to public transport (HQPT) Water cycle impacts and water use Anticipating climate change Impact on Flood risk	*Largest CO2 impacts* *Some potential for renewable energy* *Increased amount of new infrastructure so more waste* *Require new costly HQPT* *Significant water stress and flood risk issues* *Overall least sustainable and largest climate change impacts*	*29% increase in transport CO2 (medium growth) and 40% CO2 (higher growth) – based on current behaviour*	- -
Environment			
Impact on Designations Habitat loss Loss of Agricultural land Biodiversity value Relationship to existing landform Impacts on landscape/water/townscape	*Potential habitat loss and impact on SSSI* *Loss of agricultural land in some cases* *Most sites are within open landscape so larger impacts*	*n/a*	- -
Quality of Development			
CABE Design for Life issues Diversity of housing need, Community deprivation indicator studies and Community Health and Health Impacts Modal Split Access to facilities and historic environment Proximity of green/open space	*Difficulties integrating new settlements into the landscape* *No existing community base* *Quality of development may reduce with significant sized settlements delivered at once* *Poor modal split* *Lack of historic environment* *Can include greenspace and access to countryside within the designs*	*Modal split likely to be in favour of car (80% car use)*	-

NEW SETTLEMENT OPTION			
Criteria	**Qualitative assessment (commentary on key advantages and disadvantages)**	**Quantitative Measure (where applicable)**	**Comparative Scoring (relative performance)**
Quality of Community Life			
Economic (job) potential Ease of establishing accountable, democratic community governance Access to shops and services Capacity of existing local community infrastructure	*Starting from zero base for job potential so not proven* *No existing community infrastructure or established governance – delays cause out-commuting and severance*	*n/a*	-
Housing Delivery			
Land values Ease of Development Ability to deliver affordable housing Land allocations and availability	*Market conditions not proven in all locations* *Development starting from nothing so difficult in terms of delivery and feasibility* *Generally not previously developed land* *Might not meet housing needs*	*n/a*	- -
Economic Growth			
Employment land availability Relationship to existing "engines" of growth Accessibility Access to labour markets Skills Development	*Employment land and facilities not available at start* *Reliant on sustainable transport links to centres such as Cambridge* *Not proven job potential* *May attract skilled workers* *Waterbeach a possible site for Marshall Aerospace?*	*n/a*	-
Travel Planning			
Reduce need to travel and distance to services and facilities Public Transport Capacity Promotion of sustainable modes Impacts on existing and future travel behaviours	*Likely to generate significant traffic movements* *Need new HQPT* *Uncertain impact on future travel behavior* *Potential lack of facilities that would reduce the need to travel*	*n/a*	-

Table 8.3: Evaluation of New Settlement based Option

8.2 EERA'S CALL FOR DEVELOPER PROPOSALS

8.2.1 In September 2008, EERA requested that developers submit proposals for new settlements and urban extensions that could range in size from about 2,000 dwellings upwards, and which may have the potential to reach at least 5,000 to 10,000 dwellings by 2031. Twelve schemes in Cambridgeshire, which met the above criteria, were submitted and included on EERA's "Call for Developer" proposals schedule published in November 2008.

8.2.2 The above EERA schemes are summarised and cross referenced to those tested in the study, in Table 8.4 below.

District	Call for Developer Schemes (2,000 to 5,000-10,000 dwellings by 2031)	Corresponding Cambridgeshire Development Study Tested Spatial Options
South Cambridgeshire	Cambourne East	New Settlements Main & High Cases (3,000 dwellings)
	Cambourne West	
	Cambourne North	
	Hanley Grange, Hinxton	The Abingtons - New Settlements High Case (10,000)
	Northstowe Extension	Cambridge High Case (12,500)
	Waterbeach (Denny St Francis)	New Settlements Main & High Cases (12,000)
Cambridge City/South Cambridgeshire	South East of Cambridge (Fulbourn/ Cherry Hinton)	Fulbourn - Cambridge Main & High Cases (5,000)
	Land West of Shelford Road	The Shelfords and Stapleford - Cambridge Main & High Cases (3,000)
Huntingdonshire	Alconbury Airfield	Alconbury and The Stukeleys – New Settlements High Case (10,000)
	Wintringham Park (St Neots East)	Gransden and The Offords (St Neots East) Market Towns Main Case (3,000) & Market Towns High Case (3,500)
East Cambridgeshire	North Ely Extension	Ely North – Market Towns Main Case (3,000) & Market Towns High Case (3,750)
	Mereham	Not tested (already discounted by inspector)

Table 8.4 Call for Developer Proposals cross referenced to Study testing

8.2.3 The EERA's free standing schemes include Cambourne, Waterbeach, Alconbury, Hanley Grange and Northstowe, and these lie in or close to the wards of Bourn, Waterbeach, Alconbury and The Stukeleys, The Abingtons and Longstanton respectively.

8.2.4 It should be noted that the spatial options only give an approximate indication of the strategic growth pattern and not specific locations to provide broad indicators of the implications for levels and distributions of future growth.

8.2.5 Although the Cambridgeshire Development Study is independent, the additional commuting trips due to growth in the wards that contain the EERA's free-standing schemes are summarised in Table 8.5 in order to allow for estimation of the likely impacts on transport of the EERA's call for developer and/or regional settlement schemes. The results in Table 8.5 are a result of only the growth allocated to the wards by the study. Growth in Longstanton (Northstowe) was tested under the Cambridge Expansion Options while that in others listed in the table were under the New Settlement Options.

	2031 Baseline (Additional to 2006)	**Free Standing Locations (Additional to Baseline)**	
	By Origin	**By Origin**	
		Main Case	**High Case**
Bourn	**0.3**	+3.3	+3.3
Waterbeach	**0.5**	+13.0	+13.0
Alconbury & The Stukeleys	**0.3**		+9.8
The Abingtons	**0.2**		+10.8
Longstanton	**0.2**		+10.5

Table 8.5 2031 Commuting Trips in '000 trips, based on 2006 CSRM Trips, scaled by population

8.2.6 At this part of the study it is worth noting the changes in vehicle km travelled across the three spatial options and these are summarised in Table 8.6 below.

Indicator	**Market Towns – Main**	**Market Towns – High**	**Cambridge – Main**	**Cambridge – High**	**New Settlements – Main**	**New Settlements – High**
Total trip km ('000)	3,808	3,752	3,647	3,779[23]	3,970	4,210
Average Distance (km)	25	24.3	19.2	21.9	27	29.3
Self containment	65%	67%	72%	71%	50%	52%

Table 8.6 2031 Trip characteristics, based on 2006 CSRM Trips, scaled by population

8.2.7 However, the trip characteristics of the free standing settlement locations tested under the New Settlement option would be the case only if all the proposed new development schemes offer the same level of sustainable transport as Northstowe with high quality public transport providing suitable connections to Cambridge, Huntingdon and Peterborough (in the case of Alconbury), and to existing quality public transport links.

8.2.8 In chapter 7 the carbon emissions were shown to be the largest for the free standing New Settlements with growth of 29% and 40% respectively for the medium and higher growth scenarios.

[23] Includes Northstowe expansion

8.2.9 Water quality poses a serious environmental capacity constraint to the development of a potential new settlement at Abington. To overcome this constraint will require the construction of major strategic sewers to allow the wastewater to be treated in an area that can accommodate the large volumes of wastewater. The constraints of serving potential new settlements at Alconbury or Waterbeach could be overcome, however this would still rely on treating the wastewater at locations away from the New Settlements, such as at Huntingdon or Cambridge. Therefore the development of the New Settlement option would require commitment to long term energy intensive pumping systems. This requires further detailed work to determine the implications and limits to growth.

8.2.10 Table 8.7 below summarises the infrastructure requirements of free standing New Settlement options.

Spatial Option – Free Standing New Settlement Locations	Likely Infrastructure Requirements
Waterbeach Cambourne Alconbury Abingtons	New Wastewater treatment New schools (primary 1 per 1,000 dwellings and secondary 1 per 3,000-4,000 dwellings) High Quality Public Transport (similar to CGB) – which may be challenging for more remote sites Flood risk and groundwater mitigation and protection New utilities provision New community and social facilities New governance structures Retail and other services Ecological and landscape mitigation Green infrastructure provision *All of the above are treated as freestanding because any nearby existing settlements only function as villages*

Table 8.7 Likely Infrastructure requirements associated with New Settlements

8.2.11 It should be noted that Waterbeach may be needed to relocate the Marshall Aerospace businesses to enable the delivery of housing at Cambridge East on the edge of Cambridge and this is a key constraint to further - Cambridge centred growth under the current strategy..

8.2.12 On the basis of the above, the potential for achieving any sustainable new settlement by 2031 looks challenging such that further detailed testing of individual proposals may not be appropriate at this stage. Furthermore Cambridgeshire is already committed to delivering a new settlement at Northstowe and when taking account of the committed supply of 75,415 homes within the current strategy another new settlement is not necessarily needed.

8.3 REGIONAL SCALE SETTLEMENT STUDY

8.3.1 EERA commissioned work to consider a Regional Scale Settlement in the East of England and this was published in January 2009.

8.3.2 Alconbury was identified in the Regional Scale Settlement Study by consultants ARUP as a potential location for new growth of +20,000 dwellings.

8.3.3 However, as noted above in the testing as part of this study the key constraints and challenges for delivering a new settlement at Alconbury are as follows:

- Remote from larger cities for higher order services and retail facilities;
- May not attract employment;
- Lack of employment may lead to significant commuting towards Cambridge and Peterborough and this will have significant carbon emission impacts;
- Site allocated and has permission for employment in the form of distribution, which has yet to come forward;
- Growth at Alconbury could undermine efforts to regenerate existing Market Town settlements;
- Connection to ECML remote and difficult and no direct public transport connection to Cambridge without significant expansion of CGB; and
- Large infrastructure costs associated with starting up new development.
- Could undermine both the committed and planned proposals for the delivery of growth and regeneration in Peterborough.

8.3.4 The Regional Scale Settlement Study also makes assumptions for growth in Cambridge and sets out that Cambridge (albeit the definition of the area is not clear) should be a Key Centre for Development and Change with a population of 300,000 to 400,000. The work undertaken through this study, and as set out above, raises the following concerns with this:

- There is not sufficient physical capacity or space in Cambridge, whether for facilities and services or to accommodate public transport;
- The impacts on the Green Belt would be significant and are not justified at this stage based on the continuation of the current strategy, which has already identified significant growth yet to be delivered; and
- Significant growth at Cambridge would severely impact on the quality and character of the City.

9 Developing a Spatial Strategy

KEY MESSAGES

- Growth rates above the current RSS rates are challenging in terms of related job creation, funding for infrastructure and impact upon the Cambridge Green Belt.
- Growth in Cambridge and its environs would impact on the integrity of the green belt and the concept of the Compact City, and there are still no agreed transport solutions in Cambridge to facilitate such growth
- Cambridge centred growth would require a step change in demand management and travel behaviour and there are limits on physical space in Cambridge for services, retail and public transport
- Market towns would need major economic and transport interventions
- New settlements may not attract jobs and/or be sustainable due to out-commuting
- Prospects for future infrastructure may be limited so use of existing infrastructure will be key to any spatial strategy
- The RSS continuation rate for Cambridge would be 3,900 homes per annum;
- The most appropriate and deliverable level of growth is 75,415 homes by 2031 following the existing strategy and committed supply at a rate of 3,000 homes per annum
- The approach would be dependent upon where growth would be justifiable and deliverable and where capacity is shown to be available.
- With an achievable maximum of 90,000 homes (at 3,600 per annum) this would be an extra 15,000 over the committed supply following the current strategy and would allow some further flexibility for higher rates of growth.
- Further work would need to be done to identify the distribution and pattern for this additional housing based on the spatial framework set out above and focusing on economic drivers, but the focus would be to first look at the market towns, followed by limited consideration of transport links and a green belt review would not be considered at this stage.

9.1 OVERVIEW

9.1.1 The study has investigated three growth scenarios (75,415, 90,415 and 110,415 homes by 2031) and three spatial options (Market Towns, Cambridge based and New Settlements).

9.1.2 It has also shown that the EERA growth scenarios are not realistic for Cambridgeshire given the economic downturn and rate of recovery and delivery.

9.2 POSSIBLE STRATEGIC OPTIONS AND PATTERNS OF GROWTH

9.2.1 Taking forward the evidence base and the work completed by the consultant project team the emerging views on possible strategic growth options are set out below.

9.2.2 Any higher growth scenario would require a significant increase in dwelling provision in Cambridge and its surrounding area. If that degree of change is to be accommodated in Cambridge, a strategic review of the existing green belt will be required to identify appropriate locations to accommodate further housing in the period to 2031 and beyond. It will not be possible to accommodate likely housing requirements associated with the economic growth of Cambridge within the existing built-up area without significant detrimental impacts.

9.2.3 The potential concentration of further economic growth in Cambridge could well have a harmful impact upon the historic character and setting of Cambridge. Policy CSR1 of the EEP seeks to protect and enhance the historic character and setting of Cambridge, a key objective of the Cambridge Green Belt. Additionally, there could be an adverse impact on high technology and cluster development important to Cambridge: Policy CSR2 maintains the selective management of employment-generating development to protect and foster local science and information-based employment.

9.2.4 The conclusions of the study undertaken for South Cambridgeshire District Council by LDA in 2002 regarding the key contribution that particular tracts of land make to the setting of Cambridge should also be noted, but minor changes to the green belt could be contemplated with limited impacts. This would be undermined by the creation of a spatial strategy which seeks to accommodate the implications of higher growth scenarios. It will also be essential that a step change with significant levels of sustainable transport measures are delivered to accommodate such higher levels of growth, as these are necessary to accommodate current levels of growth. The role of demand management also needs to be considered.

9.2.5 However, at this stage it is not possible to pre-judge any results of any such Green Belt review and therefore it is not known whether any further suitable land would be able to be released for development. In any case sufficient land has already been released from the Green Belt, when including Cambridge East, for up to the next 20 years.

9.2.6 Whilst there is a considerable supply of housing land available in Cambridge City and South Cambridgeshire, a spatial strategy which seeks to maximise the economic potential of Cambridge and provide future strategic growth would require the identification of further land to accommodate new housing at the edge of the city. If the historic setting of Cambridge is to be protected and enhanced, it will not be possible to construct an environmentally acceptable spatial strategy if it is assumed that the new housing in support of the enhanced Cambridge economy is provided either within or at the edge of the existing built-up area.

9.2.7 If that key environmental policy imperative is maintained, the accommodation of growth associated with higher levels of growth will inevitably require consideration to be given to enlargement of existing settlements or further new settlements. On this basis expansion of selected market towns and the delivery of Northstowe is an essential component of any strategy.

9.2.8 In addition, Paragraph 13.9 of the East of England Plan states that "*to ensure delivery of Cambridge East as a strategic development location, this RSS supports the relocation of operations at Cambridge Airport to a suitable alternative location subject to timely provision of necessary infrastructure and environmental safeguards*." We therefore acknowledge the perceived strategic significance of Cambridge Airport to accommodate new housing and jobs in the period to 2031.

9.2.9 The funding available for planned infrastructure and, potentially, for new infrastructure is limited. As a consequence, it is considered that the maximum use should be made of planned improvements to existing and planned sustainable transportation infrastructure, such as in the Cambridge to Huntingdon corridor. Given that Policy CSR1 of the East of England Plan acknowledges the role to be played by market towns and key service centres, a sustainable spatial strategy would seek to accommodate further employment and housing in such areas, albeit this may still result in commuting patterns that are not sustainable.

9.2.10 Paragraph 13.13 of the East of England Plan states that the successful implementation of the development strategy for the Cambridge area "*relies on integration of development with new and upgraded transport infrastructure. Central to this is the provision of high quality public transport, in particular the Cambridgeshire Guided Busway, improvements to the strategic and local road network, and enhanced provision for cyclists and pedestrians*." That linkage between development and infrastructure will continue in the period to be covered by the review of the EEP. At this stage, it is considered that with regard to future sources of funding it would be unwise to construct a spatial strategy which did not reflect possible further improvements to the local transportation infrastructure.

9.2.11 Whilst, in spatial terms, it is possible to describe a planning framework based upon increases in dwelling provision along public transport corridors, uncertainties regarding likely future sources of funding have an impact upon the deliverability of such an approach. In such circumstances, the policy approach which is most likely to secure a sustainable pattern of growth would be based upon further housing and employment opportunities at the main market towns, however it is possible that this may also create out-commuting if not successful and is therefore subject to attracting jobs.

9.2.12 It is recognised that this potential approach represents, in essence, similarities to the continuation of the strategy already in the East of England Plan and the options already set out. Nonetheless, such a spatial pattern of growth has the potential for greater self-containment for the settlements involved and is predicated upon the availability of funds to achieve a marked improvement in transportation infrastructure across Cambridgeshire, particularly in the southern part of the county.

9.2.13 The economic prospects of northern Cambridgeshire are subject to greater uncertainty but any spatial strategy should be sufficiently flexible to accommodate new housing in north Cambridgeshire if new employment opportunities can realistically be created. If increases in employment opportunities can be achieved through proactive and vigorous economic stimuli, these towns could accommodate further housing and employment growth, enhancing their potential to secure self-containment.

9.2.14 We recognise that it will not be possible to fully achieve a balance between new homes and jobs but those settlements identified to accommodate further housing should be capable of supporting enhanced economic development opportunities. A sustainable pattern of growth will not arise if new housing is not secured in association with new job opportunities, otherwise it would lead to an increase in commuting patterns. The chosen spatial strategy should therefore seek a closer correlation between homes and jobs.

9.2.15 The most appropriate and realistic level of growth for the County is the delivery of the current strategy for the committed 75,415 homes by 2031 at 3,000 homes per annum.

9.2.16 This is based on the following:

- delivery of the current strategy being the main priority;
- likely prospects for economic growth;
- available land supply;

- rates of housing growth that are deliverable; and
- levels of infrastructure funding available.

9.2.17 It is recognised that there is potential flexibility for higher rates of up to around 90,000 homes by 2031 at a rate of 3,600 homes built per annum, and this is based on the following:

- Taking account of the downturn and its impact on the rate of delivery;
- The projected future housing completions in Fenland, East Cambridgeshire and to a lesser extent Huntingdonshire are likely to be lower that compared to 2006-08. This was noted earlier in this report. Whilst being mindful of the employment projections and potential gap between housing and employment this may offer some flexibility for the market towns for catering for additional growth to 2031, subject to satisfactorily addressing infrastructure constraints and attracting suitable employment and economic growth;
- It should also be noted that in considering any green belt review any development around Cambridge, such as West of Trumpington Road, would be difficult noting that such releases were strongly rejected as part of the 2003 Structure Plan Review;
- The study acknowledges that the CE employment projections are the best indication at present and other projections may be more positive about levels of growth. It should also be noted that further economic projections have been carried out and published by Oxford Economics recently. These employment forecasts (there are 3 scenarios, which are essentially baseline, severe recession and faster recovery) are substantially lower than those published in Autumn 2008 and possible implications could be that they are more realistic for likely employment growth. However, the clear message is that it is not possible to rely on the number of jobs to match the housing and associated labour supply and therefore economic interventions are required. Therefore 90,000 homes provides flexibility to meet any opportunities resulting from an upturn in economic prospects;
- 90,000 is limit of what is deliverable and acceptable within the timescale both in terms on infrastructure required and impacts and is a desirable maximum level of development to sustain qualities and ensure Cambridgeshire continues to remain a place where people want to live and work;
- Would require 15,000 above the committed supply to 2031 which could be achieved through a sensible approach to planning such that growth is provided only where justifiable and deliverable with further balanced expansion, following the Cambridgeshire Vision and Objectives;
- A 15,000 increase could be achieved without significant impact on the green belt or the need for any new settlement and therefore reflects these constraints; and
- Such levels of growth can best utilise existing and planned infrastructure without significant further investment, given the limitations for likely future investment. Best advantage could then be taken of the opportunities to use any limited capacity available on existing transport corridors.

9.2.18 From the findings above the favoured approach to a spatial strategy for Cambridgeshire is based on delivering the current strategy with further balanced expansion as follows:

- Regeneration in selected market town locations where it is shown that environmental constraints such as flood risk and suitable levels of jobs can be attracted to support housing can be demonstrated; and
- Focus on making best use of existing infrastructure for sustainable transport links, such as CGB.

9.2.19 The growth in the market towns should take the form of larger sustainable urban extensions, based on the tentative findings of this study regarding the need to increase the population of urban areas to 25,000-30,000 population for self-containment and that education and other services and facilities become easier to deliver. Therefore financial and policy interventions need to be focused on the market towns to deliver regeneration to provide sustainable housing growth supported by local retail and services.

9.2.20 A further review of the Green Belt remains an option for the consideration of longer term strategic issues. Any further development in the green belt is not considered a priority, as it was reviewed in the 2003 Structure Plan and significant development is already planned for about 20,000 homes, including Cambridge East, over the next 10-20 years and this should be the focus for delivery. Taking on board the other constraints in Cambridge for physical capacity and the lack of a transport solution it is not considered that a further review of the green belt is required at this stage.

9.2.21 If there is not a transport solution to enable further Cambridge centred housing growth then this may also strengthen the case for retaining some measure of selective economic management in the Cambridge area. Therefore under these circumstances there would potentially be reduced planning and provision for growing the economy in Cambridge but reserving land for uses that need to be in Cambridge to preserve its strength.

9.2.22 The strategy needs to be taken forward in joined up approach across the County and also including connections to neighbouring authorities, as described in chapter 7. The key objective of the strategy remains to locate homes close to Cambridge or other main employment centres, avoiding dispersed development, and ensuring travel is reduced and that travel by sustainable modes is maximised through connections focusing on improved public transport. The strategy should improve accessibility whilst reducing the need to travel, particularly by car, through utilising new technology.

10 Summary and Conclusions

10.1 INTRODUCTION

10.1.1 The Study has been undertaken by consultants WSP in association with Pegasus Planning, SQW Consulting and Cambridge Economics. The key findings have already been made known as reported to CReSSP on 7th April.

10.2 BACKGROUND ANALYSIS

10.2.1 The findings from the analysis are as follows:

- There is already committed land for some 75,000 dwellings in Cambridgeshire which could last up to 20 years;
- Revised job growth projections suggest fewer than 2,000 new jobs will be created per annum up to 2030 compared to an assumption of 3,750 per annum in the current RSS to 2021[24];
- 69% of jobs growth is projected for Cambridge or South Cambridgeshire with 14% in Huntingdonshire, 14% in East Cambridgeshire and 3% in Fenland;
- Congestion and high carbon emissions emerge as major risks in the infrastructure assessment.; and
- The failure to invest and the lack of resources for the future are major risks to infrastructure delivery to support growth.

10.3 GROWTH SCENARIOS

10.3.1 Compared to the range of 98,000 to 129,000 dwellings (2006 – 2031) in the EERA scenarios, more realistic growth scenarios for testing in Cambridgeshire have been set at 75,415, 90,415 and 110,415 new homes.

10.4 OPTIONS TESTED

10.4.1 The following spatial themes emerged from the findings coming out of the background analysis and as such these options have been tested.

- baseline (current strategy included in all options);
- north of the County – market towns and key centres;
- urban extensions around Cambridge; and
- new settlements.

10.4.2 These spatial options have then been used to test against the growth scenarios within the WSP CSRM land-use model using varying distributions of housing.

10.4.3 The employment projections produced by Cambridge Econometrics with a reality check by SQW have also been input into the WSP land-use model to generate demand for commercial floorspace and transport outputs.

[24] For comparison purposes only as considers different periods and modelling undertaken before and after the impacts of the economic downturn

10.4.4 This study has used a range of models, as follows:

- Cambridge Econometrics Employment Forecasting Model;
- The County's CSRM Land-use Model provided by WSP; and
- Cambridge Econometrics Carbon Projections Model.

10.4.5 Through this study these models have provided an appropriate means of testing the various growth scenarios and spatial options to provide useful indicators for future trends resulting from varying levels of growth and differing spatial distributions of such growth. It should be noted that they are based on information that was available and current at the time of modelling. Whilst these models are the best tools available for such testing, they have not been used in isolation. Therefore throughout this study reference is also made to wider practical planning implications and evaluation and in particular Cambridgeshire's Vision and Objectives.

10.4.6 As also noted in the next steps below, further work is suggested to determine an agreed future strategy for Cambridgeshire and to build on the findings from this study. This further work will complement the indicators coming out of the modelling.

10.5 CONCLUSIONS

10.5.1 Considering testing up to 2031 the main findings are as follows:

- Delivery of the current strategy will be challenging in terms of responding to the challenges presented by climate change, the provision of suitable infrastructure, implementing appropriate transport solutions and achieving economic growth targets;
- All further options pose additional environmental, infrastructure and job creation challenges, especially at the higher levels of growth, suggesting that 90,000 homes might be a deliverable maximum for planning purposes;
- An appropriate balance of homes to jobs in locations for growth across the County is crucial to seeking to encourage sustainable commuting patterns;
- With this in mind homes need to be located where there are suitable, attainable employment opportunities and the land-use modelling supports this through the findings on the distances travelled for commuting journeys to work;
- The study has considered the cross-boundary links and for example includes an allowance for an increased attraction in Fenland due to growth at Peterborough;
- There are a number of risks relating to flooding and other water based issues that could affect the future pattern of development;
- The number of trips and commuting levels increase significantly even in the baseline case and depending upon where housing is located in the options the number of trips increase, and overall;
- The carbon emissions will be directly related to the changes in likely trip km travelled and carbon impacts increase for all the levels of employment and population growth associated with the dwelling increases;
- Mode shares in Cambridgeshire are still dominated by car travel and are likely to be even in the baseline. Whilst providing housing around Cambridge and the market towns is likely to lead to an increase in the use of non-car modes significant changes to travel behaviour are dependent upon provision of suitable high quality public transport and other sustainable transport infrastructure; and
- Providing transport infrastructure and high quality public transport will be a huge challenge in all options but is essential if future development and travel patterns are to be sustainable.

10.5.2 Other Key challenges ahead include:

- delivery of the current strategy;
- potential of a further new settlement to attract employment opportunities and be supported by adequate transportation and social infrastructure;
- the difficulty of diverting growth and economic prospects from the south to the north and the market towns enabling market towns to become more self contained;
- limited capacity and pressure on services where growth pressures are greatest around Cambridge;
- impact upon the integrity and purposes of the Cambridge green belt;
- ability of Cambridge city centre to accommodate further bus and car movements; and
- availability of sufficient funding to improve infrastructure to support growth.

10.6 SPATIAL STRATEGY APPROACH

10.6.1 From the conclusions above the favoured approach to a spatial strategy for Cambridgeshire is based on delivering the current strategy with further balanced expansion as follows:

- Regeneration in selected market town locations as sustainable extensions where a change towards non-car travel can be achieved;
- Focus on making best use of existing infrastructure for sustainable transport links, such as CGB, with possible selective growth along such corridors; and
- Cambridge, incorporating a limited review of the green belt boundary.

10.6.2 This approach would be dependent upon where growth would be justifiable and deliverable and where capacity is shown to be available. With an achievable maximum of 90,000 homes this would be an extra 15,000 over the supply following the current strategy. This provides some flexibility, subject to market conditions, to accommodate further growth to 2031. Further work would need to be done to identify the distribution and pattern for this additional housing based on the spatial framework set out above.

10.6.3 Based on a maximum of 90,000 homes to 2031 delivered through the existing supply of 75,415 homes within the current strategy and a balanced approach for further expansion, as above, the need for new settlements at this stage is questionable.

10.6.4 There are also significant challenges with new settlements, as follows:

- Costly to provide suitable infrastructure; and
- There are challenges with delivering sustainability for jobs, services and transport.

10.6.5 Therefore new settlements do not need to be considered at this stage.

10.6.6 If further housing is to be delivered at Cambridge, an assessment of the extent and purposes of the green belt will be required and appropriate exceptional circumstances identified to warrant any possible change to the existing boundary. If there are limited opportunities to achieve further housing growth at Cambridge, the policy emphasis will need to be placed upon the market towns and locations best placed to maximise the benefits arising from existing and other deliverable infrastructure commitments. However, at this stage it is not possible to pre-judge any results of any such Green Belt review and therefore it is not known whether any further suitable land would be able to be released for development. In any case sufficient land has already been released from the Green Belt, when including Cambridge East, for up to the next 20 years.

10.6.7 Furthermore in the first instance the focus should be on the delivery of the current strategy for the planned growth around Cambridge and at Northstowe before consideration of any further green belt review.

10.6.8 The key element to the delivery of sustainable growth beyond the current strategy including the growth of market towns will be identifying the crucial interventions that allow sustainable travel behaviours and identifying the sources of public and private funding to deliver such growth. Most importantly this will need to place homes in close proximity to successful employment locations and facilities and services within cycling and walking distance as well as being placed close to high quality public transport.

10.6.9 Whilst this study and the findings in this report are based on current travel habits and the best known projections of future changes, there are likely to be changes in technology in the period to 2031 and beyond which will influence behaviours. Any strategy for growth therefore should aim at reducing carbon impacts based on the latest emerging guidance and legislation whilst embracing initiatives for smarter travel and appropriate use of technology.

10.7 NEXT STEPS

10.7.1 Taking the work completed as part of this Study and as outlined in this report the next stage would be to consider the additional growth of 15,000 homes above the committed supply of 75,415 dwellings and its spatial distribution within the County.

10.7.2 The suggested scope for further work is as follows:

- Following testing of the "extremes" as part of this study the next stage would be to consider a combined approach and to determine prioritisation, the distribution and scale of additional growth above the committed supply;
- The driver for the next stage should be further consideration of the employment prospects (such as for the market towns) for jobs and economic drivers for growth and then to consider associated dwelling numbers to match with this and the infrastructure and land supply constraints associated with this – this has been explored in Draft from, and included in Appendix H, to provide emerging views and pointers for further work;
- Further consideration should be given the latest Oxford Economics projections and the impact this may have in terms of more realistic employment projections;
- Consideration should be made of the potential impacts of the changing population characteristics and particularly the implications for reducing household size and proportion of working age residents in the County as well as migration implications, as this has an effect on the balance of homes to employment levels;
- Key element would be to look at the commuting balance relating to the jobs and dwellings fit with a focus on delivering a sustainable growth pattern/strategy up to 2031 and beyond;
- As part of such analysis consideration could be given to a possible limited range of additional detailed analysis, such as specific infrastructure requirements;
- The findings of the revision to the Green Infrastructure Strategy need to inform any further decisions on the distribution and levels of growth;
- Further work is needed to identify the cost and funding for additional infrastructure;
- Further work needs to be done on the full range of greenhouse gases contributing to climate change;
- Further detailed assessment of the drainage and flood risk elements and implications, particularly for the market towns and Cambridge based expansion including Northstowe; and

- Further work will be required to identify how public transport can be accommodated in Cambridge.. This work could also look at the capacity of the City to accommodate any further growth beyond that already committed in the current RSS if significant transport investments, such as proposed through TIF are not forthcoming.

Figures

Appendices

Appendix A Policies CSR1 to CSR4

Appendix B Land Supply Paper

Appendix C Employment Supply by District

Appendix D Validation of EERA Growth Scenarios

Appendix E Economy Papers

Appendix F Infrastructure Supply and Constraints Paper

Appendix G Evaluation of Potential To Impact On Growth for Flooding and Other Water Related Aspects

Appendix H Draft Spatial Implications for Economic Drivers