APPENDIX F – Infrastructure Supply

Infrastructure Supply and Constraints

1.1 INTRODUCTION

1.1.1 The purpose of this paper is to provide an outline of the infrastructure related supply side of future growth in Cambridgeshire. This paper covers the following 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[1].

1.2 PROCESS AND FINDINGS

1.2.1 The process in determining the findings is based on an assessment of the evidence base and the paper therefore identifies infrastructure related supply issues, constraints and planned interventions that would have an impact on growth. This is set out in the following sections.

1.3 TRANSPORT

Context

1.3.1 The key aspects of considering transport infrastructure constraints relate primarily to congestion, travel time and distance, journey cost, CO2 emissions and air quality together with choice and attractiveness of modes on the local road and public transport networks within Cambridgeshire and across the border into adjoining counties.

1.3.2 By way of background the commuting patterns are shown below for Cambridgeshire.[2]

	Cambridge	East Cambs	Fenland	Hunts	South Cambs	Peterborough
Cambridge	78.92%	1.28%	0.18%	1.42%	17.72%	0.48%
East Cambs	20.98%	60.79%	1.11%	2.23%	13.90%	0.99%
Fenland	2.61%	2.21%	71.00%	6.42%	2.46%	15.30%
Hunts	6.32%	0.55%	1.34%	78.04%	7.37%	6.38%
South Cambs	35.73%	1.01%	0.31%	3.50%	59.11%	0.35%
Peterborough	0.90%	0.12%	2.29%	3.84%	0.58%	92.27%

Source CCC. It should be noted that the Cambridge City/South Cambridgeshire boundary means for example the Science Park is within South Cambridgeshire and Cambridge is effectively surrounded by South Cambridgeshire, hence the proportion of those living and working within South Cambridgeshire.

1.3.3 In summary existing commuting patterns include the following aspects:

- Cambridge and Peterborough play dominant roles for attracting journeys to work;
- Most people living in Cambridge also work in Cambridge, albeit there is considerable commuting to London. There is very few commuting patterns to the north of the County;
- South Cambridgeshire and Cambridge have a close relationship, given South Cambridgeshire surrounds Cambridge and also residents of South Cambridgeshire commute to London;
- In East Cambridgeshire has substantial commuting patterns to Cambridge and South Cambridgeshire as well as Suffolk;
- Most people living in Huntingdonshire also work in the District, but there are also strong commuting flows into Bedfordshire; and
- The size of the County and therefore the distance between the north and south of the County is indicated by the low level of commuting between Fenland and the southern parts of Cambridgeshire. Whilst most people stay within Fenland for work there are strong movements to Kings Lynn and Peterborough.

[1] The Cambridgeshire Development Study Tender Documents Table 1.4 Evidence List pages 31 to 49
[2] Source: ONS, Census 2001, Table W206

1.3.4 Traffic levels in the County are 70% higher that the national average on trunk roads and 35% higher on principal roads. The main reasons for this are the high level of growth around Cambridge and the increase in through traffic due to the County's strategic location on main road and rail routes.

1.3.5 It is also bearing in mind that mode share for new developments indicates the importance of location and the available choice of travel modes. Surveys for Cambourne show that the dominant mode of choice is car, with 80% of working age residents travelling to work by car.[3] This is with a non-fixed type bus service only in place. For Northstowe the Transport Assessment indicates an overall mode share for all trips of around a minimum of 50% for car use with Cambridgeshire Guided Busway (CGB) in place and extensive Travel Planning techniques. It also showed that 30-35% of vehicle trips would be towards Cambridge in the AM Peak.[4]

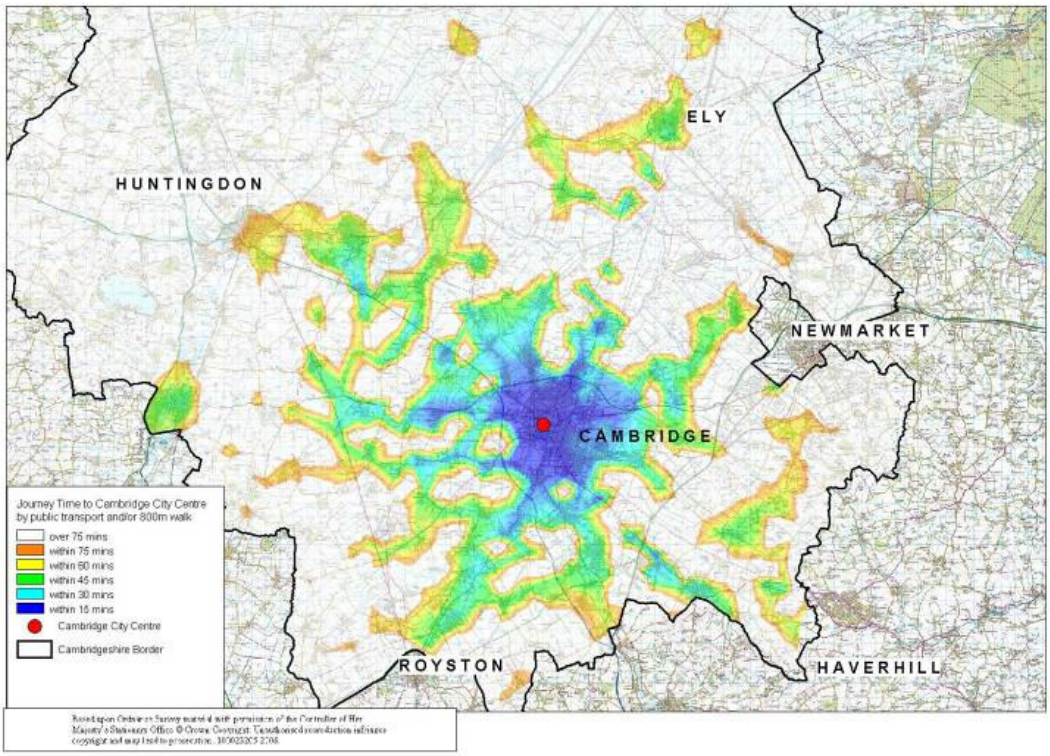
1.3.6 Turning now to considering transport across the County in the main urban areas and corridors between them.

Cambridge and its surrounding area

1.3.7 Almost 200,000 person movements occur into and out of Cambridge on a typical weekday. Vehicular traffic growth entering and leaving the City is fairly static suggesting a combination of switch to public transport (such as Park & Ride) together with congestion limiting traffic growth as well as peak spreading. There is a reduction in traffic movements within the City across the River Cam, largely due to ongoing improvements in public transport, the Historic Core Scheme, as well as cycling and walking measures.

1.3.8 A significant proportion of journeys are made by cycle in Cambridge, some 25%, as well as public transport.

1.3.9 Current Public Transport Accessibility to Cambridge is indicated below[5].



[3] Cambourne Survey 2006 http://www.cambridgeshire.gov.uk/council/involved/findings/cambourneresidentssurvey2006results.htm
[4] Northstowe Transport Assessment
[5] Taken from CCC TIF Draft Package Outline Proposal for Funding

1.3.10 By 2021, with the current development strategy, and without significant investment in new infrastructure and demand management public transport journey times could increase by around 5-10mins around Cambridge and by up to 25mins towards Ely.[6]

1.3.11 By 2021 (with CGB and A14 improvements in place) there are likely to be the following congestion related impacts with the current development strategy in place[7]:

- Over 32,500 extra inbound trips to the city;
- 46% increase in total travel time in Cambridge;
- 11% reduction in average speeds;
- 84% increase in delay at junctions;
- 23% increase in travel time in the wider area around Cambridge;
- 16% increase in distance travelled in the wider area around Cambridge.

1.3.12 The work for the Transport Innovation Fund (TIF) Outline Proposal for Funding identified significant congestion, including in the following locations:

- In Cambridge City;
- A10 to Ely;
- All radial routes into Cambridge on City boundary;
- A428 St Neots to Caxton; and
- A505 near Duxford.

1.3.13 However, the effects would be much wider with increases in journey times and decreasing journey time reliability with significant difficulties for those accessing Cambridge by public transport or car. This is summarised in the table below to show the future with the non TIF package in place[8].

Indicator	Comparison to 2021
Change in highway trips	+9%
Distance travelled by car	+12%
Delay (hours)	+28%
Transport $C0_2$ Emissions	+12%
Overall time spent on highway in Cambridge	+15%

1.3.14 Clearly this has significant implications for Cambridge and accommodating future growth and as TIF is intended to address the current growth strategy it is difficult to see how any further additional growth could be delivered without the TIF proposals, including significant sustainable transport measures and a serious form of demand management.

1.3.15 The Cambridge Access Strategy has successfully delivered priority for public transport, cyclists and pedestrians within the historic core area, however to cater for any future growth a step change is required to further deliver modal shift away from the car and promote use of sustainable travel modes. The proposals within TIF seek to provide this to cater for the current growth strategy.

1.3.16 A key aspect of any future growth strategy, including the current one, is ability to access Cambridge, particularly by public transport, whether from new development on the edge of the City or via corridors into the

[6] CCC Transport Innovation Fund Outline Proposal for Funding Oct 2007
[7] CCC Transport Innovation Fund Outline Proposal for Funding Oct 2007
[8] Taken from CCC TIF Draft Package Outline Proposal for Funding, page 13

City from outlining existing and new settlements. Recent work by the County Council[9] has identified serious capacity issues for buses accessing Cambridge City centre. Essentially there are significant capacity issues and a lack of physical space in Cambridge to cater for growth.

1.3.17 The work carried out showed that once all of the planned development (under the current strategy) is in place, the ability to cater for around 270 bus movements an hour will be needed in the city centre. This represents a 117% increase over current peak hour bus movements in the central hub area. If these bus services are not catered for the potential is for a corresponding increase in car journeys, albeit roadspace is not available to cater for such journeys and the road network is already congestion in and around the peak periods so this is likely to have wider impacts on economic growth and the ability of Cambridge to function.

1.3.18 Recommendations in this report raise wider issues for tackling increases in bus use, such as streetscape impacts, conflicts with other highway users and whether operations can be successfully accommodated, but at this stage no firm conclusions have been reached and further work is needed.

Market Towns

1.3.19 All of the Market Towns are showing 2-3% annual growth in traffic entering and leaving the towns. The table below summarises the characteristics of the Cambridgeshire towns and cities, including the market towns.[10]

Place	Population (2006)	Motor Vehicles	No of radial routes	Average Flow	Max Flow
Cambridge	113,800	188,684	17	11,099	26,708
Huntingdon	19,910	78,878	5	15,776	16,946
St Ives	15,000	48,045	5	9,609	17,769
Wisbech	21,010	61,801	7	8,829	16,230
St Neots (exc Eatons)	15,860	52,615	6	8,769	14,498
Ely	17,430	41,296	7	5,899	12,572
Whittlesey	8,530	31,024	6	5,171	9,658
March	9,660	36,113	9	4,013	10,098
Chatteris	15,990	18,338	5	3,668	6,451
Ramsey	20,770	18,869	6	3,145	6,993

1.3.20 Market Town Transport Strategies have been produced through the Local Transport Plan (LTP) process for the majority of the market towns in Cambridgeshire:

- Wisbech;
- March;
- Ely;
- St Neots;
- St Ives; and
- Huntingdon.

1.3.21 These set out transport proposals, phasing of delivery, likely costs and possible means of funding in line with the timescales within the LTP and usually over a 5-year period. In line with the LTP they set targets and measures for improving mode share towards sustainable modes of travel. These are based on current growth

[9] Bus Issues in Cambridge report for Joint Transport Forum 27th Feb 2009
[10] CCC Annual Traffic Monitoring Report 2007

strategies and not further additional growth. These strategies have however, succeeded in achieving almost a 24% mode share for sustainable modes within the market towns.

1.3.22 Further strategies are underway for Ramsey and Chatteris.

Huntingdonshire

1.3.23 Huntingdonshire benefits from excellent strategic communication links. The East Coast mainline rail services are accessible at Huntingdon and St Neots. The A1 offers access north to south on the trunk road network. The A14 provides strategic east to west links and facilitates access to both the midlands and the east coast ports, such as Felixstowe. The east to west linkages are also facilitated by the A428 crossing the southern part of the District.

1.3.24 Private car ownership in Huntingdonshire is higher than the national average reflecting the relatively rural nature of most of the District and consequent dependence on private cars for personal transport. The most frequent bus services operate within and between the Market Towns where there are greater concentrations of potential passengers. Only 17 other villages have a bus service timetabled to be hourly or better between 7am and 7 pm Monday to Saturday operating to at least one Market Town, Cambridge, Peterborough or Bedford. Services are due to start on a Guided Busway between Cambridge and St Ives in 2009, with on-road services continuing to Huntingdon.

1.3.25 Huntingdon is located on the main East Coast Main Line (ECML) railway with possible rail travel towards Peterborough or London as well as across the UK with 91% of users of the station commuting to London. The level of car ownership is very high with 76% of residents in Godmanchester and 69% of residents in Huntingdon owning one car or more. The railway station is situated 0.25 km from the town centre. The majority (50%) of Huntingdon residents work locally within 2 km of where they live and nearly 80% of residents work within 20 km of their homes.

1.3.26 After Cambridge, Huntingdon has the highest number of vehicles entering and leaving the town in Cambridgeshire some 74,000 each day, of which 85% are cars. Within the town itself, 54% of all journeys are made by car.

1.3.27 In 2005, approximately 73% of journeys in St. Ives town centre were made by car, 9% by bus, 3% by cycle, 7% on foot and 8% by goods vehicles. Compared to other Market Towns in the County, St Ives has comparable numbers of buses, goods vehicles and motorcycles, an above average share of car use, and below average share of pedestrians and cyclists. St. Ives has good road links and is situated close to the A14 Trunk Road, the A141, the A1123 and the A1096. These roads link St. Ives to other nearby towns and cities, such as Huntingdon and Cambridge. While there is no railway station in St. Ives, Huntingdon is nearby and situated on the East Coast Mainline, providing direct trains to and from London (Kings Cross) and Peterborough. With CGB in place connections to Cambridge by sustainable transport will be easily available.

1.3.28 St Neots is situated in Huntingdonshire district at the western edge of Cambridgeshire, close to the border with Bedfordshire. It is the largest of Cambridgeshire's market towns with a population of 28,000. St Neots is well connected to the national rail network. The railway station is on the East Coast Mainline, with links to Huntingdon and Peterborough, and a direct half-hourly service to London. The railway station is only 1.5km from the town centre. The link to London has made St Neots a popular place for rail commuters, including those accessing the station in St Neots from Cambourne and the surrounding rural areas. This has resulted in St Neots becoming a significant railhead for the local area. St Neots is also situated on the A1 and A428.

Fenland

1.3.29 The Fenland average distance travelled to work is 16.01km or 9.94 miles, higher than the region and England where the average is 13.31km or 8.27 miles. The average figure, however, hides the fact that 50% of the working population of Fenland are travelling a distance of 10km (6.21 miles) or less. Public Transport use for work is low. The district is predominantly rural and sparsely populated with services and facilities mostly found

within the market towns or within neighbouring districts. These factors increase the need for travel, and they place an important emphasis on the ability to access services and facilities on the door step.

1.3.30 Wisbech is located to the north of the district and is bypassed by the A47, which suffers from congestion. It has high levels of car use at 72%, partially reflecting the rural nature. The town has links to Kings Lynn and Peterborough by frequent bus services, but has no rail services. It is situated on the tidal section of the river and presents a possible opportunity for port related transport facilities.

1.3.31 March is located more centrally within the district and is bypassed by the A141. It has high levels of car use with 82% of people travelling into March by car. It is however, well located in terms of public transport being situated on the Peterborough to Ely and Cambridge Railway line.

1.3.32 Chatteris and Whittlesey are smaller market towns. Chatteris is located on the A141/A142 between Ely and March and has only bus based public transport services and also looks towards Huntingdon. Whittlesey is located close to Peterborough and is on the same railway line as March.

East Cambridgeshire

1.3.33 At the time of the 2001 Census, in East Cambridgeshire 67% of people travelled to work by car. This is higher than both the East of England (59%) and England as a whole (55%) and reflects the rural nature of the district.

1.3.34 Ely is situated on two major routes, the A142 and the A10 as well as the mainline railway between Kings Lynn and Cambridge to London together with the railway across to Peterborough and beyond, as well as rail freight between Felixstowe and Nuneaton. Following significant housing growth in recent years there is also significant out-commuting towards Cambridge. The overall level of car use is 80%. In the face of continuing growth, the challenge presented to Ely's transport network is to sustainably support an economically vibrant, multi-functional City while preserving the unique character and heritage that gives Ely its identity.

South Cambridgeshire

1.3.35 South Cambridgeshire is located centrally in the East of England region and has both the strategic routes of the M11 and A14 roads passing through it. South Cambridgeshire also has direct rail access to London and to Stansted Airport. It is a largely rural district which surrounds the City of Cambridge and comprises over 100 villages, with a maximum size of around 8,000 people. It is surrounded by a ring of market towns just beyond its borders (such as Royston, Haverhill, St Ives) which are generally 10–15 miles from Cambridge.

1.3.36 South Cambridgeshire, due to its rural characteristics experiences commuting by car for a significant proportion of all journeys, particularly away from existing public transport corridors. There are also a range of large employment sites within the district, such as to the south of Cambridge at Granta Park and Genome Campus, that are not situated close to housing or public transport links that generate car journeys. South Cambridgeshire also looks towards Cambridge for employment and services and therefore significant commuting occurs into the City, albeit locations such as the Science Park are actually located in South Cambridgeshire.

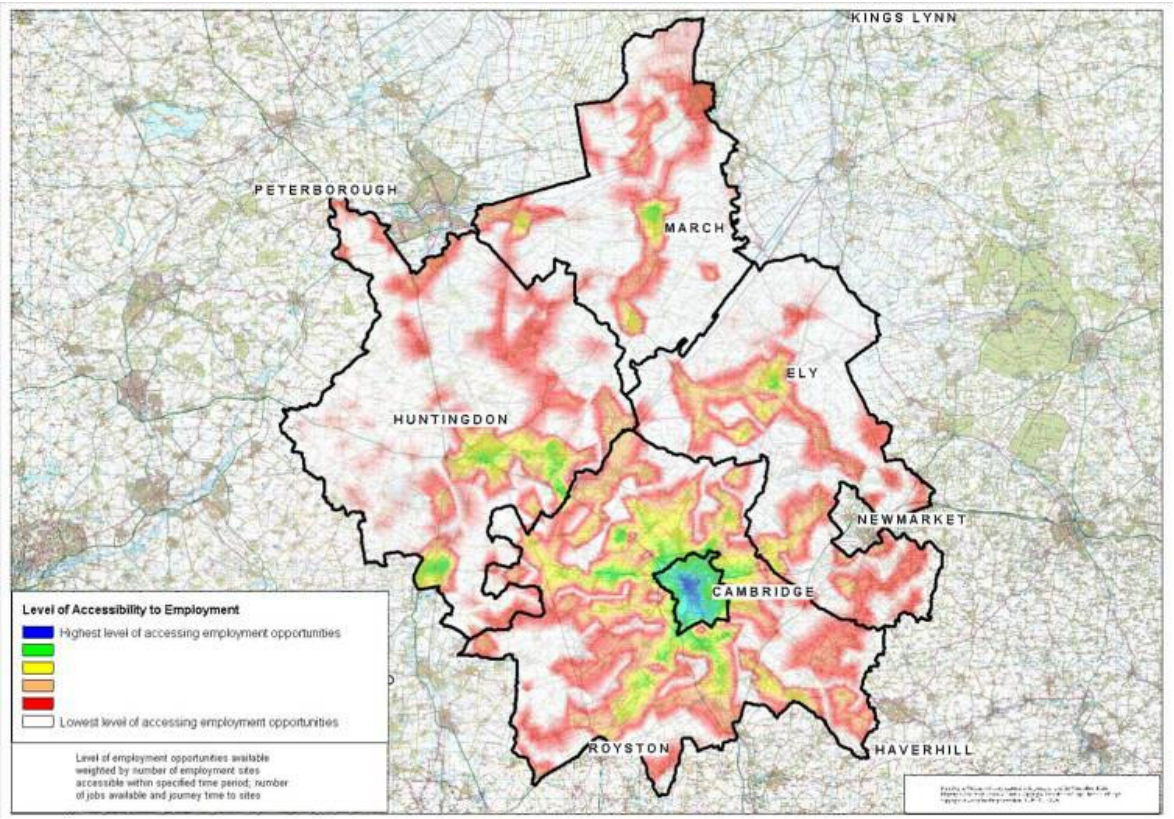
1.3.37 Many of the transport issues that affect South Cambridgeshire are described above for Cambridge itself given the relationship between them.

Accessibility to Employment

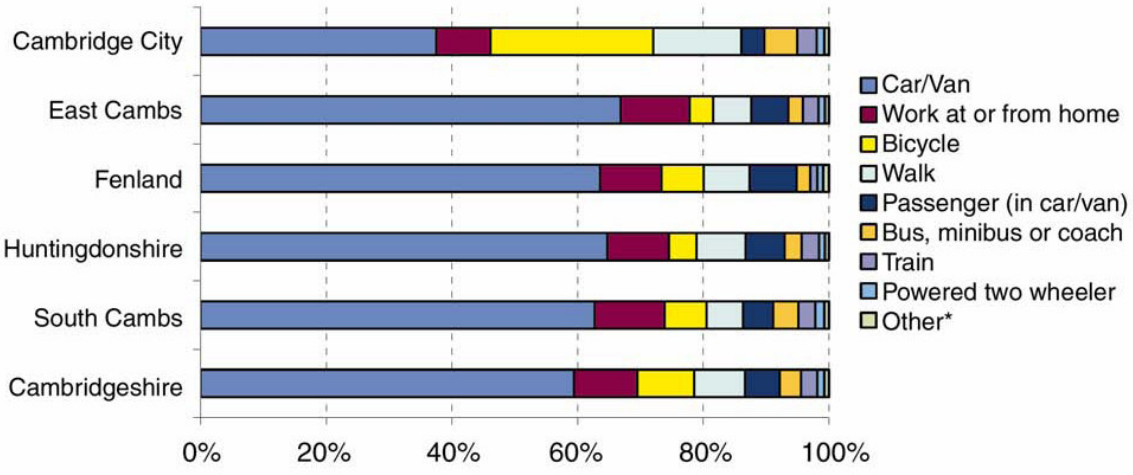
1.3.38 Many of the rural areas surrounding both Cambridge and the Market Towns rely on the car for journeys to work, demonstrated by the high mode share of car journeys into the Market Towns and to a lesser extent Cambridge due to higher levels of public transport and the influence of Park&Ride.

1.3.39 However, it is important to consider travel by public transport as a means to access jobs. Existing relative accessibility to employment opportunities within Cambridgeshire, including the market towns and other

urban areas, by public transport is shown below.[11] It should also be noted that throughout Cambridgeshire bus use has increased by just under 20% over the past 2-3 years.



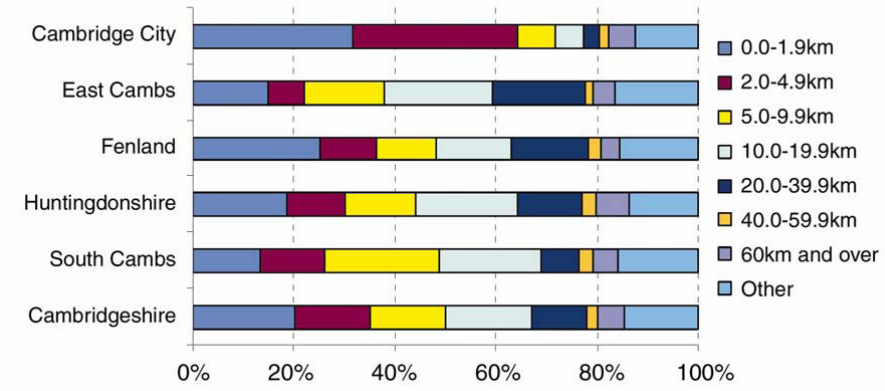
1.3.40 The journeys to work across each of the districts are shown below.



Journeys to work by mode from 2001 census

[11] Provided by CCC from work on TIF

1.3.41 The distance travelled for journeys to work has actually decreased between 1991 and 2001. The number of journeys of less than 5km was 35% in 1991 and increased to 51% in 2001.



Distance travelled to work 2001 Census

Corridors

1.3.42 The table below shows the various current traffic flows and congestion levels on key corridors, as well as existing public transport provision.[12] This provides a broad indication across the various corridors as to the current traffic flows and capacity of the main roads and shows a significant number of routes are approaching, at or have exceeded capacity resulting in congestion. This is particularly the case in morning and evening peak periods, which is not reflected in the table.

Corridor	Distance (km)	Indicative Traffic Flow (AAWF 16hr) and capacity[13]	Approx Current Car Journey Time (mins)	Current Public Transport Service	Comments
A14 (Cambridge to Huntingdon)	28km Huntingdon 25km St Ives	Flow 74,000 Capacity 65,000	40mins Huntingdon 30mins St Ives	Bus - 20-30 minute peak frequency (time 25 St Ives to 60mins Huntingdon)	Note A14 improvements by around 2015 CGB Opens 2009 minimum 10min frequency HQPT[14] (journey 25mins St Ives and 45mins Huntingdon)
A14 (Cambridge to BSE)	24km Newmarket 45km Bury St Edmunds	Flow 62,000 Capacity 65,000	25-30mins Newmarket 35-45mins Bury St Edmunds	Bus - 60mins frequency and 60min journey Rail – 60mins frequency and 45mins journey time	Via Newmarket
M11 (south Cambridge to A11)	15km to A11 46km Stansted Airport	Flow 63,000 Capacity 63,000	20-25mins A11 45mins Stansted Airport	Rail - Liverpool St Rail (75min time to London)	Serves M11 Corridor to London (inc Stansted Airport, Harlow etc)
A11 (south Cambridge A14 to M11)	20km	Flow 36,000 Capacity 65,000	15mins	n/a	
A505 near M11 (Royston to A11)	18km	Flow 26,000 Capacity 21,000	25mins	n/a	

[12] Data from CCC Annual Traffic Monitoring Report 2007 and Public Transport timetable information
[13] Flows taken from CCC Traffic Monitoring report and Capacity taken from DMRB TA26/97
[14] High Quality Public Transport

Corridor	Distance (km)	Indicative Traffic Flow (AAWF 16hr) and capacity[13]	Approx Current Car Journey Time (mins)	Current Public Transport Service	Comments
A10 (north to Ely)	25km	Flow 21,000 Capacity 21,000	30mins	Bus – 60min frequency and 40min journey time Rail – Kings Lynn to Kings Cross 30 min frequency	Rail – Ely 15mins to Cambridge and 60-70mins to London plus serves other villages and towns (Waterbeach, Downham Market)
A10 (south to Royston)	20km	Flow 20,000 Capacity 21,000	30mins	Bus – 60min frequency and 45min journey time Rail - Cambridge to London Rail	Rail - Cambridge 50mins to London. Royston 15mins to Cambridge. (Also serves other villages along route)
A428 (Cambourne and St Neots)	13km Cambourne 27.5km St Neots	Flow 27,000 Capacity 21,000 and 65,000 (dual section only)	20-25mins Cambourne 30-40mins St Neots	Bus – Cambourne 20min frequency. St Neots 30min frequency (both 30min journey time)	A428 Now dualled between Cambridge and Caxton. (single carriageway flow 20,000 capacity 22,000)
A142 (Ely to Newmarket)	21km	Flow 15,000 Capacity 21,000	25-30mins	Bus – 60min frequency and 45min journey time	
A142 (Ely to Chatteris)	20km	Flow 15,000 Capacity 21,000	25mins	Bus – 60min frequency and 40min journey time	
A141 (March to Huntingdon)	38km	Flow 17,000 Capacity 21,000	40-45mins	Bus – 2hour or less frequency and 60min plus journey time	
A47 (Peterborough to Guyhirn/March)	25km	Flow 19,000 Capacity 21,000	30mins	Bus – 60min frequency and 30min journey time	
A47 (Guyhirn/March to Wisbech)	10km	Flow 20,000 Capacity 21,000	15mins	Bus – 60min frequency and 30min journey time	
A47 East of Wisbech (to Kings Lynn)	21km	Flow 17,000 Capacity 21,000	25mins	Bus – 30min frequency and 35min journey time	
A1 (St Neots to Huntingdon)	18km	Flow 42,000 Capacity 65,000	25mins	Bus – 60min frequency and 45min journey time Rail - ECML	Rail – St Neots 45 mins to London
A1 (Huntingdon to Peterborough)	35km	Flow 66,000 Capacity (4 lane 126,000)	30-35mins	Bus – 60min frequency and 45min journey time Rail - ECML	Rail - Peterborough 60mins to London and 60 mins to Cambridge. Huntingdon 50mins to London
A1307 Haverhill to Cambridge	30km	Flow 16,000 Capacity 21,000	30-40mins	Bus – 20-30min frequency and 30min journey time	

Source: Consultants own analysis

1.3.43 Other particular corridor based capacity constraints include:

- A14 between Ellington and east of Cambridge;
- M11, between junctions 9 and 14 and the lack of all movements at junction 13 at Madingley;
- A428 between St Neots and Caxton;
- Some sections of the A141 and A142;
- A10 both north and south of Cambridge;
- A505, particularly between M11 and the A11;
- A47 between Guyhirn and Wisbech and there are significant difficulties widening through this section;
- A605 King's Dyke and A142 Ely level crossings;

- The East Coast Mainline has limitations on line and train capacity;
- The Cambridge to Liverpool Street rail route has capacity constraints in terms of length of platforms limiting train lengths that could be exacerbated by Stansted Airport expansion;
- Passenger overcrowding is experienced on all rail routes in Cambridgeshire in peak periods, particularly towards London, and there are restrictions on the railway north of Cambridge towards Ely and due to single tracking towards Newmarket and Ipswich;
- Cambridge station requires capacity improvements, both for trains and passenger access through the station.

Peterborough

1.3.44 Peterborough suffers congestion in the City Centre, particularly around Queensgate and the Railway Station in peak periods. However, the Parkway system provides for the highest urban average vehicle speeds in the UK.[15] Up to 2021 significant increased congestion is anticipated on the Parkway system to the north and south of the City Centre.

Transport Interventions

1.3.45 It is considered that the previous process of strategic planning of proposing housing in locations that then need extensive Central Government funding support for associated infrastructure (such as roads, public transport etc) is likely to be difficult. Furthermore for this study an approach should be to focus growth on utilising existing transport corridors where demonstrated to be appropriate and sustainable but in the first instance a focus on reducing the need to travel by providing homes and jobs in existing urban areas, such as the Market Towns.[16]

1.3.46 With this in mind the section below summarises the current significant schemes being delivered or considered for delivery with existing Local Transport Plan programmes or regional funding allocations.

Current Schemes

1.3.47 Current schemes being delivered include:

Cambridgeshire Guided Busway (CGB) to open in Summer 2009 serving villages on route to St Ives, with an on-road section to Huntingdon, as well as new developments at Northstowe and in the Southern Fringe. CGB will also provide connections to existing major employment areas, such as Science Park and Addenbrooke's as well as links to rail services at Cambridge railway station and a new railway interchange at Chesterton sidings and is proposed to cater for 20,000 journeys per day;

Addenbrooke's Access Road will be completed by end of 2009 and will provide access to Addenbrooke's hospital from near to M11 junction 11 and will also provide vehicular access to new developments in the Southern Fringe.

Future Schemes

1.3.48 In 2007 Cambridgeshire Horizons and its partners drew up a Long Term Delivery Plan (LTDP) which considered the infrastructure needs for all development sites larger than 100 dwellings up to 2021 under the current strategy.

1.3.49 It was considered that for such a level of growth that the amount of funding needed to address the deficit in transport infrastructure alone was some £2.276 billion and the key element of this is the need to reduce the carbon footprint as part of new growth as part of a low carbon future. This is beyond the levels of funding achievable through the LTP process. To go some way to addressing this deficit and to tackle the challenges that

[15] Peterborough CC LTP 2006-2011
[16] Cambridgeshire Horizons Economic Workshop 6th Jan 09 and CReSSP meeting 9th Jan 09

such levels of growth present us with, in October 2007 CCC made a £500 million bid to the Government's Transport Innovation Fund (TIF).

1.3.50 In terms of progress on transport expenditure across Cambridgeshire since 2006 this is summarised below.[17]

Scheme	Funding Source	Expenditure (£000s)
Integrated Transport	LTP and Other	22,122
LTP Major Schemes (CGB etc)	Major Schemes Funding	67,312
Growth and Community Funded Schemes	GAF and CIF Funding	16,120
Total		105,554

1.3.51 It should be noted that a significant element of the above relates to a major schemes, such as CGB, and therefore funding for other transport measures when spread across the whole county is not significant when considering the level of expected growth. This has been recognised in the LTDP and the refreshed Programme of Development (POD) produced in October 2008 by Cambridgeshire Horizons. It sets out that transport is the most under-funded element of our current expenditure proposals and this is supported by the Transport Economic Evidence Evidence Study (TEES)[18] that identified a need for greater emphasis on transport investment in the Cambridge area.

1.3.52 The POD identifies key transport projects to facilitate current planned growth within and around Cambridge and also at market towns and Northstowe. A key factor is that even with the expected funding via the A14, CGB and other spending as set out above this still does not go a significant way towards achieving the identified levels of transport infrastructure deficit. This adds weight to seeking to utilise existing infrastructure as part of developing any spatial options to cater for future growth.

1.3.53 It is estimated that £50m is required for transport across the market towns to 2021 and the Local Transport funding is set up to 2016 of around £175m.

1.3.54 Cambridgeshire County Council has also submitted an outline funding proposal under the Transport Innovation Fund (TIF) for around £500 million transport investment for a package of measures to reduce congestion including sustainable transport measures and congestion charging in Cambridge.

1.3.55 Cambridgeshire is seeking funding through regional allocations, as set out below.

Pre 2013/14			
Scheme Name	**Scheme Promoter**	**Cost of scheme (£m)**	**Contribution sought from RFA (£m)**
A142 Ely Southern Bypass	Cambridgeshire County Council	£15.0	£15.0
Chesterton Station	Cambridgeshire County Council	£22.0	£19.8
Northstowe Access Link Roads	Cambridgeshire County Council	£30.0	£30.0

Post 2013/14	
Scheme Name	**Scheme Promoter**
A605 King's Dyke Level Crossing - bridge replacement	Cambridgeshire County Council

[17] LTP 2006-2011
[18] TEES produced for EERA by SDG

Access to East Cambridge development from A14	Cambridgeshire County Council
Cambridge eastern corridor rapid transit links	Cambridgeshire County Council
Huntingdon to St Ives on street bus priority	Cambridgeshire County Council
St Neots to Cambridge public transport corridor scheme	Cambridgeshire County Council
A428 (A1 to Caxton)	Highways Agency

1.3.56 Bids and/or projects that are proposed for delivery[19] are as set out below, these are however dependent upon securing funding as they are beyond the level of committed funding streams within the LTP. In terms of Ely the level crossing problems are a key constraint for traffic, effecting rail services and barrier downtime at Ely Railway Station. It is recognised that funding is an issue and that further external funding will be required over and above the contributions from the rail industry and developers.

Pre 2013/14

- To cater for capacity constraints on the railway network in the Cambridgeshire area the Liverpool Street Railway Line, ECML to Peterborough and the Kings Cross to Kings Lynn routes are due for upgrade to increase platform lengths and trains from 8-12 carriages[20];
- A range of sustainable transport measures in the Market Town Transport Strategies over the period in line with the LTP;
- Felixstowe to Nuneaton Rail Freight improvements (to cater for Olympics);
- Chesterton Station, as this was recently approved through the Regional Funding Allocation; and
- New interchange facilities may also come forward as part of the Cb1 development at Cambridge railway station to complement CGB and the POD also proposes funding towards re-development of the Cambridge Station Area to provide a gateway to the City.

Post 2013/14

- A14 Upgrade Fen Ditton to Ellington[5];
- New rolling stock for rail routes into Cambridgeshire;
- Ely Southern Relief Road;
- A428 A1 St Neots to Caxton[21] - this is not directly a local issue, however the report prepared on the economic impact of the scheme22 indicates that it will improve "*St Neots' accessibility enabling greater east-west economic orientation and participation in/contribution to Cambridge's continuing growth*". This is primarily focused on car travel however the following scheme seeks to counterbalance this to provide attractive public transport alternatives as below;
- A428 high quality bus scheme creating a public transport corridor between St Neots and Cambridge and details of this are currently emerging;
- A14 to East Cambridge development Access and eastern corridor public transport;
- Huntingdon to St Ives On-street Bus Priority, albeit this is dependent upon funding through other mechanisms and some elements have currently been reduced from those previously proposed;
- A605 Kings Dyke Level Crossing Replacement (Whittlesey);

[19] http://www.eera.gov.uk/News/news/2008/dec/region-faces-tough-choices-100-transport-schemes/
[20] Network Rail's Business Plan covering Control Period 4
[21] Highways Agency
[22] Economic Impact Report on the A428 Upgrade Jan 2008

- Package of measures through TIF to tackle congestion and enable delivery of the current growth strategy. This is, however, subject to further discussion with Government and undergoing Council decision making processes following the Transport Commission[23] reporting on its recommendations in Summer 09; and
- In the longer term widening of the M11 but no funding is identified.

1.3.57 Through Cambridgeshire Horizons £28.8 million has been allocated to the county from 2009 to 2011, which builds upon the £14.9 million already allocated for 2008 to 2009.[24] Such funding has been used to deliver such projects as the Addenbrooke's Access Road.

1.4 FLOOD RISK

1.4.1 Overall, an estimate by the Environment Agency suggests that around 23% of the county is at risk of 1 in 100 year flood events.

1.4.2 In order to inform this study of the constraints posed by flooding in Cambridgeshire, a review of the Strategic Flood Risk Assessments (SFRA) prepared by each of the planning authorities within the county has been undertaken.

1.4.3 The main source of information is flood zone mapping, which illustrated the extent of tidal and fluvial flood zones as defined in Planning Policy Statement 25: Development and Flood Risk.

1.4.4 Annex D of PPS 25 provides further information on Flood Zones, Flood Risk Vulnerability Classification and the sequential and exception tests. The flood zones described in the following sections are those defined in PPS25 Table D2 and as follows.

Flood zone	Classification
Zone 1 - Low Probability	This zone comprises land assessed as having a less than 1 in 1000 annual probability of river and sea flooding in any year (<0.1%).
Zone 2 - Medium Probability	This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% – 0.1%) in any year
Zone 3a - High Probability	This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
Zone 3b - The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes).

1.4.5 A summary of flood risk across each of the districts is shown below.

[23] An independent Transport Commission has been set up to consider tackling congestion in Cambridge
[24] Cambridgeshire Horizons Delivery Plan

	Total Area (square km)	Area at 1% risk of flooding from rivers		Area at 0.1% risk of flooding from rivers	
		Area (square km)	Percent of total area	Area (square km)	Percent of total area
Cambridge City	40.7	2.6	6.4%	3.5	8.6%
East Cambridgeshire	651.7	197.0	30.2%	221.1	33.9%
Fenland	547.4	260.2	47.5%	304.4	55.6%
Huntingdonshire	912.6	156.4	17.1%	186.6	20.5%
South Cambridgeshire	901.7	85.2	9.4%	103.1	11.4%
Cambridgeshire	3,054.1	701.4	23.0%	818.7	26.8%

Market Towns

1.4.6 Flood mapping contained within the SFRA's for the districts has been reviewed for the following Market Towns; March and Wisbech in the Fenland District, Huntingdon, St Ives and St Neots in Huntingdonshire, and Ely in East Cambridgeshire. It should be noted that a number of the studies pre-date the introduction of PPS25 and do not necessarily reflect the current predicted climate change scenarios.

March

1.4.7 Much of the land surrounding March is located within fluvial Flood Zone 3, with the majority of March town itself located in Flood Zone 2. Areas of higher ground to the south west of the town, and further south around Wimblington and Doddington are located in Flood Zone 1.

1.4.8 The above shows that flood risk poses a significant potential constraint on the land available for development around the town.[25]

Wisbech

1.4.9 The Fenland District Council Boundary borders the extents of Wisbech town to the north east and west, this assessment is limited to land within the Fenland District to the west of this boundary.

1.4.10 Flood mapping indicates that fluvial and tidal floodplains cover the entire area of Wisbech and the surrounding land. Tidal Flood Zone 3 covers the north of the town; the rest of the town is located in Flood Zone 2 of the fluvial flood plan.

1.4.11 The above shows that flood risk poses a significant constraint on the land available for development around the town, particularly in West Wisbech.[26] However, FDC are commissioning further work and it is possible that it will be possible to progress development by satisfactorily tackling flood risk issues.

Huntingdon

1.4.12 The land to the south of Huntingdon is located within Flood Zone 3 of the River Ouse, with much of the land located within the functional flood plain (1 in 10 annual probability of flooding). The majority of the land to the north, east and west of the town is located in Flood Zone 1.

1.4.13 Areas to the south west of Huntingdon are located in Flood Zone 3 relating to the Alconbury and Ellington Brooks, and the River Ouse, with areas of Brampton and Godmanchester located in Flood Zone 2.

1.4.14 Flood risk would limit development to the south of Huntingdon; however areas to the north, east and west of the town, as well as to the south of Brampton and Godmanchester, are not affected. Refer Huntindonshire SFRA, Drawing No. HDC/SFRA/ 3A/ TL27SW.

[25] Refer Fenland District Council SFRA, Figure 5, sheet 4 of 5.
[26] Refer Fenland District Council SFRA, Figure 5, sheets 1 and 2 of 5

St Ives

1.4.15 Flood mapping shows that a large proportion of the land to the east and south of St Ives if located within the floodplain of the River Ouse and its tributaries, with parts of the town itself located in Flood Zone 2.

1.4.16 The land to the west of the town, and the majority of the land to the north, is located in flood zone 1. Refer Huntindonshire SFRA, Drawing No. HDC/SFRA/ 3A/ TL37SW.

St Neots

1.4.17 The Huntingdonshire District Council Boundary borders St Neots to the south and west adjacent to the A428 and A1. Much of the land between St Neots and Eaton Socon is located in Flood Zone 3, with areas of the settlements themselves located within Flood Zone 2.

1.4.18 The majority of the land to the east of St Neots and the railway line, and areas to the north of the town, are located within Flood Zone 1.[27]

Ely

1.4.19 The land to the east and south of Ely is located within Flood Zone 3, or the zone of rapid inundation. To the north, west and south west of the town the land is located within Flood Zone 1.[28]

City Areas

Cambridge

1.4.20 The SFRA for Cambridge City was produced by Mott Macdonald in February 2006. Flood mapping contained within the report indicates that flood risk in and around the City is mostly limited to relatively small areas adjacent to the river Cam. The floodplain extends to wider areas around Chesterton Fen and Ditton Meadows to the north east of the city, and around Grantchester to the south.

1.4.21 The mapping illustrates that fluvial flood risk does not pose a significant constraint on development in and around Cambridge.[29]

1.4.22 However there are a number of areas within Cambridge where surface water flooding has been identified as a constraint. The Cambridge Catchment Local Asset Management Plan (LAMP) Report produced by Faber Maunsell in February 2003 gives a good indication of flooding problems within the foul and surface water sewerage systems of Cambridge City. These are summarised below:

- **East Cambridge Main Drain** – Surcharging was noted as a regularly occurring problem in this drain in the Mill Road area. There are also potential flooding issues in a number of other locations including Cherry Hinton High Street, Cherry Hinton Road, Marshall Road and Rustat Road.
- **First Public Main Drain** – Principal flooding problems occur in the Halifax Road, Richmond Road, Oxford Road area. Surface drainage is also an issue for the Birdswood Road ditch in Coleridge Ward, which is not an Awarded Watercourse.

Peterborough

1.4.23 A Peterborough SFRA Stage 2 report was produced by Haskoning UK Ltd in November 2005. Flood mapping indicates that the flood plains of the River Nene cover most of the land to the east of the City, but are constrained to a relatively small area within the city itself.

1.4.24 Therefore flood risk does not pose a significant constraint to development in and around Peterborough. Flood mapping for Peterborough can be viewed on Peterborough City Council's interactive mapping system.

[27] Refer Huntindonshire SFRA, Drawing No. HDC/SFRA/ 3A/ TL16SE and HDC/SFRA/ 3A/ TL15NE.
[28] Refer East Cambridgeshire District Council SFRA, Flood Zone Map Ely
[29] Refer Cambridge City Strategic Flood Risk Assessment Drawings 221139/SFRA/1B.

Corridors

A14

1.4.25 Flood mapping indicates that flood risk would not pose a significant constraint to development along the A14 corridor. The flood plain of the River Ouse would potentially restrict development around the St Ives, Huntingdon area.

A10

1.4.26 The Rivers Cam and Ouse potentially provide a constraint to development adjacent the A10 corridor, specifically to the north of Littleport where the entire area is located within the flood zone.

A428

1.4.27 There is little or no constraint in terms of flooding for development along the A428 corridor, the majority of the section from Cambridge to St Neots is located within Flood Zone 1. However, significant areas of St Neots itself are affected by flooding as described above.

A47

1.4.28 Flooding poses a significant constraint on development along the A47 corridor, with most of the land adjacent to the route between Peterborough and Kings Lynn located within the flood plain.

Planned interventions – flood alleviation

1.4.29 Preliminary consultation with the EA have identified a number of flood alleviation schemes which are either in the process of being delivered, or are programmed for future completion. These are summarised below.

- Godmanchester - Public consultation has been undertaken for a fluvial flood alleviation scheme, which will provide protection to 600 properties and provide protection against the 1% annual probability event. The scheme has currently undergone public consultation. Under proposals a new flood wall will be constructed along the Quayside /Post Street area;
- St Neots - A fluvial flood alleviation scheme is currently being constructed in the vicinity of The Paddocks. This will increase the standard of protection to the 1 in 100 year (1%) flood event, and improve protection to 115 properties;
- Wisbech- Flood protection improvement works are planned. The scheme will involve improvements to the existing defences along the River Nene (upstream and down stream of Town Bridge) to maintain the existing standard of protection against tidal flooding. The standard of protection will protect against the 0.5% annual probability, (1 in 200 year return period) event;
- There are no known planned fluvial flood alleviation schemes planned for Cambridge or Peterborough; and
- Similarly, the there are currently no further programmed schemes for the market towns of Ely, Huntingdon, St Ives and March.

WATER RESOURCES AND STRESS

Context

1.4.30 The Environment Agency has classified water company areas in England in terms of their relative levels of water stress. Two water companies provide water supply to Cambridgeshire, Anglian Water and Cambridge Water, both of which have been designated as operating in areas of serious water stress. Cambridgeshire presents significant challenges to water management and drainage due to its flat topography and low lying areas.

1.4.31 Water stress is related to the amount of water available per person for a given area, both now and in the future. An area of serious water stress is defined as an area where the current household demand for water is a high proportion of the current effective rainfall or, the future household demand for water is likely to be a high proportion of the effective rainfall available to meet that demand. When the demand for water is high or growing, this can result in a serious level of stress on the available water resources.

1.4.32 Anglian Water, which supplies Huntingdonshire, Peterborough, Fenland and East Cambridgeshire, produced a draft Water Resources Management Plan in August 2008. The report provides mapping which illustrates predicted supply deficits in 2035 for planning zones within the supply area of up to -8.20Ml/d. It reflects the areas where growth in demand for water is expected to be greatest, namely Lincoln, the Lincolnshire and Cambridge Fens, the Milton Keynes & South Midlands Sub Region, Huntingdon, Norwich and Ipswich.

1.4.33 The Anglian Water supply area is divided into 12 water resource zones, which are subsequently divided into planning zones. Water resource zones represent the largest area in which water resources can be shared.

1.4.34 A draft water resources management plan produced by Cambridge Water in May 2008 indicates that the company's supply and distribution network is fully integrated, and forms a single water resource zone. Therefore the entire supply area for Cambridge Water, Cambridge City and South Cambridgeshire, experiences the same risk to supply from resource shortfall. The supply-demand deficit set out in the report for the area is a surplus of 0.35 M l/d, for 2034/35. This figure provides a comparison with the deficits described for each planning area in the Anglian Water supply area, refer Anglian Water Draft Resource Management Plan, Figure 5.1.

1.4.35 The supply-demand deficit is the difference between the total demand in an area, plus a target headroom, and the total supply that can be produced. The target headroom is a planning margin, based on the current strategy, providing an allowance for the risks and uncertainties associated with the forecast components.

1.4.36 It should be noted that even with achievement in the future of level 6 of the Code for Sustainable Homes, 80 litres per person per day the increase in demand on local water supplies will be large for significant growth in dwellings. The average new build house has water use of around 150 litres per person per day, although DEFRA has set a vision of achieving between 120-130 litres per person per day by 2030. Therefore a key component of new development and growth will be effective water management.

1.4.37 In addition, waste water will be generated by new developments and this needs to be dealt with adequately. Existing waste water treatment is near or at capacity around much of the County and therefore significant upgrades will be required as well as measures to manage and reduce the amount of waste water, including SUDS measures and greater water harvesting and recycling.

Interventions

1.4.38 Various Water Cycle Strategies are under way or being commissioned across the County. These will seek to identify potential constraints and impacts together with providing guidance on responsibilities and actions to deliver water cycle infrastructure to achieve sustainable development. Outcomes will come forward at a later stage.

1.4.39 It should be noted that the Water Cycle Strategy for Major Growth Areas around Cambridge Phase 1 concluded that there are no insurmountable technical constraints to the planned levels of growth, but did point to a number of important issues regarding mitigating flood risk, developing an integrated water management plan and drainage strategy, and looking at cost benefit of achieving water neutrality. The study did also provide a broad assessment of future growth beyond 2021 and outlined that such levels of growth would create potential issues for ecology, capacity of existing sewerage networks and would increase the need for further mitigation against flood risk. Such issues are likely to be similar across the rest of the County, and particularly for areas of current higher flood risk.

1.4.40 It is likely that in the future there could be more extreme weather events and Anglian Water are seeking to take this into account in planning for resilience and for adaption to and mitigation of climate change.

1.5 ENVIRONMENT

Context

1.5.1 The environment in its broadest sense plays a key role in determining the character of Cambridgeshire. The sections below provide an outline of the current situation in Cambridgeshire[30], any interventions and what this means for new development.

Air Quality

1.5.2 The air quality within the region and Cambridgeshire is generally good, however there are problem areas which may slowly deteriorate due to additional growth. The main causes of this are traffic and population growth. There are the following Air Quality Management Areas as a result of emissions from motor vehicles and these are declared where national air quality objectives are not met.

- Cambridge City Centre;
- In Huntingdonshire at Huntingdon, St Neots, Brampton, A14 Hemingford to Fenstanton;
- Within Fenland at Wisbech and Whittlesey as a result of industrial processes (SO2 and PM10); and
- Along the A14 between Bar Hill and Milton in Cambridgeshire.

1.5.3 The A14 improvements and Cambridgeshire Guided Busway will have an impact on these areas.

1.5.4 The additional growth could result in impacts on existing air quality management areas due to increased traffic and commuting and the likelihood of further designations. Therefore a key factor will be the impact of the generation of additional traffic from new development.

1.5.5 In terms of air quality Cambridge Environmental Research Consultants (CERC) are undertaking modelling for Cambridge City and South Cambridgeshire to assess the impact of the current planned growth up to 2015 and to investigate the impact on emissions of various emission reduction strategies. More information may be available during the evaluation stage of this study.

Historic Environment

1.5.6 In terms of the historic environment the county distribution across the district areas for all types of historic asset is:

- Cambridge City 9%;
- East Cambs 18%;
- Fenland 11%;
- Huntingdonshire 27%;
- South Cambs 35%.

1.5.7 Both Cambridge and Ely include built environments of exceptional importance. The market towns retain quality buildings and are locally distinctive. Concentrations of archaeological discoveries exist along chalklands, rivers, main corridors, silt fen, fen edge and fen islands. The majority of sites and landscapes are not designated and occur largely in the dry “uplands” and some specific areas of the fen margins. The distributions of specific national designations and listed buildings follow a similar pattern. Registered parks and gardens are concentrated mainly in the south of the county due to historic nature.

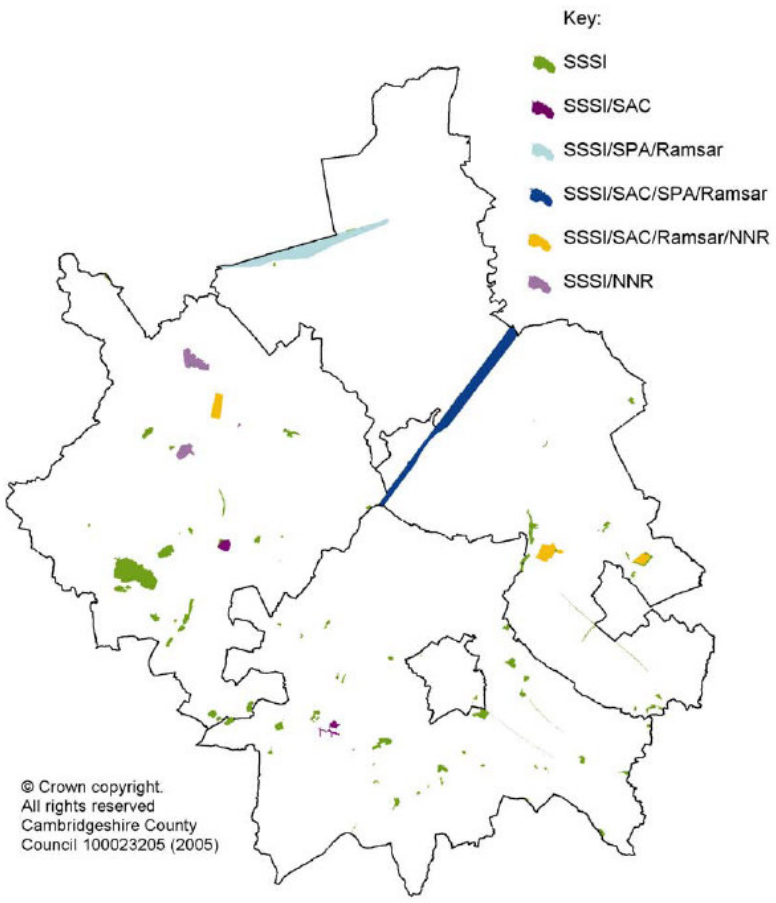
[30] Detail taken from CCC Environment Report 2005

1.5.8 The key aspect for new development is to ensure understanding of the wider historic environment and ensure input into major projects rather than restricting development entirely.

Biodiversity and landscape

1.5.9 Within Cambridgeshire there are many sites that have been designated internationally, nationally and at the local level for their value whether landscape, historical, geological and/or ecological importance. The most important sites for wildlife are those identified through international conventions and European directives, such as Special Protection Areas and Special Areas of Conservation. In Cambridgeshire this includes Ouse and Nene Washes, Wicken Fen and Devil's Dyke. Sites of Special Scientific Interest (SSSIs) are of national importance for their nature conservation, geological or geomorphological interest and provide the county's best wildlife sites. There are also a network of locally important sites identified for their biodiversity, such as County and City Wildlife sites, nature reserves and protected road verges.

1.5.10 The statutory nature conservation sites are shown below.



1.5.11 The area of land within each district assigned as wildlife site status is shown below.

	No. of Sites	Area (ha)	Proportion of land designated as CWS
Cambridge City	15	211.2	5.2%
East Cambridgeshire	78	1,646.7	3.0%
Fenland	31	511.0	0.6%
Huntingdonshire	125	2,290.9	3.5%
South Cambridgeshire	103	2,435.9	2.7%
Cambridgeshire	352	7,095.7	2.3%

1.5.12 There are no nationally protected landscape character areas in the county. The Cambridgeshire Landscape Guidelines indentified six distinct character areas.

1.5.13 The presence of land assigned as important for biodiversity does not necessarily restrict development, however, key factors to consider when planning future growth are as follows:

- New development and associated climate change impacts can impact on habitats;
- Need to protect existing sites and avoid habitat loss, fragmentation and severance of wildlife corridors by development;
- Include within new development opportunities for habitat creation and enhancement to assist with Biodiversity Action Plan targets to integrate biodiversity;
- Ensure sufficient water quality and quantity to minimise impacts on habitats and biodiversity;
- Improve access to nature particularly in urban areas and urban fringes;
- Impacts of growth on the landscape and the Cambridge Green Belt (albeit the Green Belt is not a landscape designation); and
- Tackling long term management of sites and landscaping and obtaining funding for such management.

Cambridge Green Belt

1.5.14 As part of the preparation of the recently approved Structure Plan, all land adjoining the City that was capable of being released from the greenbelt without fundamental harm to the character and setting of Cambridge was identified and is in the process of being released from the green belt. Those green belt releases, which are included in policy P9/2 of the Structure Plan, will provide for the long term development needs of the Cambridge area under the current strategy.

1.5.15 The primary purpose of the Cambridge Green Belt is to 'preserve the special character of Cambridge and to maintain the quality of its setting'. The study in 1992 defined 'special character' as 'in addition to the city's historic core and associated university colleges (it) comprises:

1.5.16 The Cambridge Green Belt serves a number of purposes which are derived from Government guidance (PPG2) and the Cambridgeshire and Peterborough Structure Plan. The Green Belt keeps land open and free from development over a long period, which extends beyond the plan period, in order to give assurance that its boundaries will endure.

1.5.17 The Cambridge Green Belt is relatively small in extent. It's purposes are defined as:

- To preserve the unique character of Cambridge as a compact, dynamic city with a thriving historic centre;
- To maintain and enhance the quality of its setting;
- To prevent communities in the environs of Cambridge from merging into one another and with the city.

1.5.18 In defining the Green Belt and the policies which should be applied to it, regard will be given to the special character of Cambridge and it's setting, which include:

- Key views of Cambridge from the surrounding countryside;
- A soft green edge to the city;
- A distinctive urban edge;
- Green corridors penetrating into the city;
- Designated sites and other features contributing positively to the character of the landscape setting;
- The distribution, physical separation, setting, scale and character of Green Belt villages;
- A landscape which retains a strong rural character.

1.5.19 Any further growth beyond that within the current strategy and release of the green belt would require a further major review of the green belt.

Climate Change

1.5.20 The RSS recognises the importance of climate change and meeting obligations on carbon emissions in taking forward sustainable development. Since then the UK has passed the Climate Change Act which will drive policy on climate change and delivery of greenhouse gas reduction goals nationally.

1.5.21 Currently within Cambridgeshire the C02 emissions are as follows:

- Industrial and Commercial 39%;
- Domestic 23%;
- Road Transport 31%; and
- Land-use, land-use change and forestry 7%.

1.5.22 The C02 by district is South Cambs 28%, Cambridge City 12%, East Cambs 14%, Fenland 17% and Huntingdonshire 29%.

1.5.23 Within Cambridgeshire the County Council published a Climate Change and Environment Strategy in 2008, which sets a vision for Cambridgeshire in 2021. This sits alongside climate change targets for the Local Area Agreement.

1.5.24 A carbon appraisal of the Long Term Delivery Plan (LTDP) for the current growth strategy has been undertaken. This set out a number of steps to make progress towards zero carbon growth, including the need to facilitate low carbon energy infrastructure such as renewable energy and heat and power networks as well as supporting low carbon travel, through measures such as the Transport Innovation Fund package and other challenging measures.

1.5.25 For new development from 2016 onwards zero carbon standards for new homes and schools, from 2018 all public sector buildings and from 2019 all new buildings will help limit C02 emissions from buildings sector, however this will not address current existing built environment.

1.5.26 Emissions from the transport sector are of concern, and especially from new development and growth. Therefore the location of new development and critically the relationship of homes to jobs is crucial to reducing transport emissions together with seeking to change travel behavior. However, even with the most significant measures there will always be residual emissions from transport in the growth areas. Further modelling is required to better inform the future impacts of growth.

Energy

1.5.27 The UK has agreed a target of 15% renewable energy by 2020. The current renewable energy outputs for Cambridgeshire are around 25% of County total ouputs for electricity. The large majority of this is produced in East Cambs through biomass (straw).

1.5.28 The county is doing relatively well, however, meeting the targets is particularly challenging for energy required for heat and for transport fuel. New development will need to consider large scale schemes and renewables as part of new buildings to deliver reduced carbon footprint.

Green Infrastructure

1.5.29 There is a Green Infrastructure Strategy for the Cambridge sub-region, published in 2006. A review is planned for this year, which will expand the strategy to all of Cambridgeshire. Outside of the Cambridge sub-region the Wash and Fens Green Infrastructure Masterplan is currently under preparation for green infrastructure proposals for the north of Cambridgeshire.

1.5.30 At present there is approximately 5-6 hectares per 1000 population of strategic large scale publicly accessible green infrastructure in Cambridgeshire. The Green Infrastructure Strategy has highlighted that there are deficiencies in the level of accessible green infrastructure in the Cambridge Sub-Region. The main elements of the strategy are:

- 22 Green Corridors based on existing features to give biodiversity linkages and enhanced public access;
- 25 larger projects to create major new greenspaces to form “green hubs”; and
- “Big six” landscape projects to enhance the quality of the landscape and wildlife across Cambridgeshire, mainly in the agricultural areas including West Cambridgeshire Hundreds, South East Cambridgeshire Claylands, West Cambridge Claylands, South East Cambs Chalklands and the Heath Protection and Restoration Projects for east and west Cambridgeshire.

1.5.31 These projects will be increasingly important in terms of low carbon economies and tackling congestion issues.

Minerals and Waste Management

1.5.32 The Minerals and Waste Local Development Framework (LDF) sets out objectives and policies to guide minerals and waste development in Cambridgeshire and Peterborough between 2006 and 2026. Provision has been made for 3 million tones per annum of sand and gravel and also to create a network of waste management facilities address waste arisings.

1.5.33 Over the plan period to 2026 there is a need to identify a further 4 million tonnes of reserves to meet likely demand for minerals extraction for supply to the construction industry. Waste arisings are due to increase from 5,200,000 tonnes in 2006 to 6,200,000 by 2026.

1.5.34 In addition, to the above Cambridgeshire is required to also make provision for waste arising from London.

1.5.35 Minerals provision and waste management has been identified up to 2026 on the current strategy and there are some considerations for ensuring this supply. Therefore there is a need to address the likely impacts from increased levels of growth and whether this can be accommodated in terms of future supply to cater for increased levels of growth.

1.6 OTHER INFRASTRUCTURE

Context

1.6.1 As part of future growth a critical element, beyond water supply as discussed above, will be the supply of other services, such as electricity, gas and telecoms. The table below summarises the implications of current future growth within each district.

Area	Description
Cambridge and South Cambs	Significant upgrades are required to the existing sewerage capacity and treatment. Reinforcement of water transfer mains required within Cambridge area together with connections to new settlements. The Phase 1 Water Cycle Strategy commissioned by Cambridgeshire Horizons also considered the impacts of an extra 20% of growth beyond the current strategy and concluded that in many areas new rather than upgraded infrastructure would be required for sewerage capacity, but not likely to be a major issue for flood risk with suitable mitigation measures Significant upgrades to electricity supply required
East Cambridgeshire	20% increase in electricity use would require sub-station upgrades All sewerage treatment plants need upgrading Reinforcement to foul drainage and water supply required across the District and particularly in parts of Ely
Fenland	Will require key upgrades to sewerage treatment plants in main market towns Increased capacity and reinforcement to foul drainage and water supply networks Tackling flood risk and waste water management in Wisbech Upgrading of electricity supply
Huntingdonshire	Insufficient capacity in existing sewerage treatment works. This could particularly have an impact on growth in St Neots as a new treatment works is required. The proposed growth in St Neots would require a new primary substation (10-12MW). For Huntingdon and St Ives improvement to the grid is being undertaken along with additional circuits to provide increased capacity and reliability of supply within EDF's control.

1.6.2 The Cambridgeshire Horizons Long Term Delivery Plan (LTDP) identifies priorities for investment up to 2031 including the transport measures outlined above as well as a range of other projects.

1.6.3 The LTDP sets out significant investment in healthcare (particularly Addenbrooke's and Hinchingbrooke) as well as more local facilities to support new development. It also outlines the need for £670m towards education, community facilities and other quality of life infrastructure.

1.6.4 The latest refreshed POD proposes a total of £83.758m for 2009/10 and 2010/11 for the Housing Growth Fund bid to cover infrastructure in Northstowe, Cambridge Fringe Sites and Market Towns and other major settlements.

1.6.5 Green infrastructure investment has been proposed to focus on the Cambridge Green Necklace Project, Peterborough & Yaxley Great Fen and other countryside access projects and these are proposed within the Green Infrastructure Strategy.

1.6.6 Investment is also needed for the key services (water, electricity, gas etc). The major utilities companies have set out that they would be able to plan investment for catering for future growth along with the current strategy.

1.7 SUMMARY OF MAIN FINDINGS

1.7.1 The main points in terms of relationship to growth in Cambridgeshire and the likely challenges are outlined below:

1. Significant congestion currently occurs within and around Cambridge, even without any future growth and any measures such as TIF only cater for current growth strategies;
2. Even with development in place under the current strategy to 2021 there are likely to be significant 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[31];
3. 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;
4. Many of the Market Towns are on existing railway stations (Ely, March, St Neots, Huntingdon, Whittlesey), but others such as St Ives, Wisbech, Ramsey and Chatteris are not;
5. 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;
6. Tackling the productivity agenda[32] and climate change[33] through sustainable transport will be challenging without significant investment;
7. Existing travel patterns and commuting habits are not sustainable (significant out-commuting from market towns, such as Ely and newer settlements such as Cambourne);
8. 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;
9. 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. Significant modal shift and sustainable travel patterns requires high quality mass transit public transport systems (rail and guided bus) and not just an upgraded bus service, and it should also be noted that new road building, such as the A14 and A428 could make travel by car more attractive towards Cambridge promoting the need for measures in the city to tackle this, such as expanded Park & Ride and other package of measures that are proposed through TIF;
10. Transport is identified as the most underfunded element of the current expenditure proposals with greater emphasis needed on transport investment in Cambridgeshire;
11. Noting CGB above and other bus improvements there may 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;
12. Infrastructure deficit of around £2bn relating to transport for the current strategy and the A14 improvements, CGB, Chesterton Station, Addenbrooke's Access Road and other planned measures only go part of the way to meeting this and therefore points towards making effective use of existing infrastructure to accommodate growth. There are also growth pressures in relation to the affordability of infrastructure versus ability to

[31] CCC TIF Outline Proposal for Funding Oct 2007
[32] In line with the Eddington Study
[33] In line with the Stern Review

achieve s106 contributions leading to the key role for Cambridgeshire Horizons in seeking to facilitate sustainable growth;

13. There is potential future constraints to development due to potential impact on flood risk - many of the Market Towns are in or close to flood zones of medium to high probability of flooding as well as being with functional floodplain areas (nearly a quarter of Cambridgeshire is at 1% risk of flooding), however in some cases it may be possible to overcome flood risk constraints, such as in Fenland areas, through suitable mitigation and technical solutions;
14. Across Cambridgeshire water stress is a potential issue for future development (driest part of the Country), but water can be sourced from other areas of the UK, although this does not promote self sufficiency and efficient water management locally;
15. The majority of main corridors are not significantly impacted upon by flood risk for expansion of roads or new schemes, except the A47 and A141 in Fenland;
16. Within Cambridgeshire waste water needs to be dealt with at a more local level, but suitability of watercourses could present problems given need to maintain water quality;
17. New development needs to have a positive influence on water resources rather than be a problem, through water efficiency and strategies for re-use and sustainable drainage that will reduce flood risk;
18. However, in terms of the issues with water quality, wastewater treatment and flood risk there are no insurmountable technical constraints to the current strategy for levels of growth, albeit there are potential challenges for catering for higher levels of growth due to capacity of existing systems and the significant costs for upgrading existing facilities and providing new infrastructure;
19. The provision of high-tech media to support technological advances in home IT use and home-working opportunities will be expensive;
20. Capacity can be delivered for current expected growth by utilities, albeit at significant cost;
21. Transport contributes 33% of County's carbon emissions ;
22. The main contributor to poor air quality is transport and any additional commuting along corridors would have an impact on Air Quality Management Areas;
23. Delivery of a low carbon transport strategy could be very challenging due to the existing transport related carbon emissions;
24. Protection of the wider historic environment is required, whether in Cambridge or the market towns or elsewhere and this could present challenges for creating sufficient capacity for future growth within historic centres and further work is needed to determine the limits and impacts;
25. Potential significant impacts on Cambridge green belt for any further growth in the future, and whether this can be consistent with maintaining the green belt purpose;
26. There are no nationally protected landscapes with Cambridgeshire, however, there is a wide range of landscape character areas and statutory nature conservation sites as well as other sites of countywide importance. These do not have significant impacts on delivering new development, subject to specific location constraints and direct impacts where development in some parts of the County may have a significant adverse impact, but there is a need to ensure for developments to recognise, protect and enhance the landscape and biodiversity. Further work would be needed to investigate this and provide a consistent strategy for the County;
27. Climate change will impact on habitats and species;

28. There is a need to protect existing sites and features of biodiversity value to avoid severance and fragmentation;

29. Need to improve access to nature and integrate biodiversity into development, as currently there is deficiencies in the level of accessibility to green infrastructure for the Cambridge Sub-Region – green infrastructure provides mitigation benefits for climate change;

30. It is estimated that with the current development growth strategy there will be an increase of 28% in waste arisings (noting need to make provision for waste from London);

31. Need a strategic approach to lower carbon energy infrastructure, such as renewables and combined heat and power and opportunities with waste – step change required to meet targets;

32. Delivery of low carbon homes necessary to work towards meeting climate change targets, but this does not tackle the existing stock of dwellings across the County; and

33. Likely to be impact on high grade agricultural land in North Cambridgeshire from growth.

1.8 IMPLICATIONS

1.8.1 The current 4 spatial options[34] are:

- 1 a continuation of the current "sequential" strategy in which urban capacity and urban regeneration - in Cambridge (in the south of the county) and market towns (in the north of the county) - are maximised
- 2 as 1 but with a major Green Belt review and/or new settlements;
- 3(a) a more multi-centred approach to growth with greater emphasis on linear transport corridors linked to main centres and key market towns; and
- 3(b) a more concentrated corridor option with development focused in one or two key areas.

1.8.2 The implications for the spatial options based on infrastructure supply are summarised in the table below.

Spatial Option	Infrastructure Implications
1 and 2	▪ Significant congestion in Cambridge and surrounding area ▪ Environmental quality of Cambridge and impact on Green Belt ▪ Flood Risk in Market Towns that reduces developable areas, however further work may demonstrate feasible technical solutions, albeit at a potentially significant financial cost ▪ New settlement(s) in north, and much of the northern part of East Cambs, areas of the County would be difficult due to flood risk as significant areas are in Flood Zones 3a and 3b ▪ Critical mass needed to create self-sustaining market towns that reduce out-commuting, however if successful could alleviate transport pressures along existing networks; ▪ Serious capacity issues for historic Cambridge to accommodate growth in terms of physical space for new infrastructure and public transport, albeit the new station at Chesterton and improvements to the existing railway station will assist;

[34] Taken from 3.17 of the ITT

Spatial Option	Infrastructure Implications
	▪ Transport Innovation Fund measures including a significant package of sustainable transport proposals and some form of serious demand management, such as congestion charging required for current strategy and further measures likely to be needed to cater for any further additional growth
3(a)	▪ Main road corridors have reached or are over capacity, such as the A10, A505, A47 etc and need to avoid reliance on road based corridors ▪ Lack of significant high quality public transport on some corridors, such as the A47, A142, A141, A505, A14 (east). ▪ Appropriate use of transport corridors (only those with attractive and high quality public transport) to maximise sustainable travel patterns and take advantage of existing infrastructure and/or proposed public transport infrastructure ▪ Corridor approach still creates increased commuting distances whether by public transport or car and doesn't reduce the need to travel ▪ Significant car based travel patterns outside of Cambridge and in areas away from main rail corridors ▪ May lead to dispersed travel patterns with multi-centres and a lack of focus in coordinating infrastructure and facilities ▪ Rail lines programmed for upgrade and some market towns are located on existing railway stations (Ely, Huntingdon, St Neots, March) ▪ Improvements proposed for some roads (A14 and A428 etc) – albeit car and bus may compete with one another and reduce both sustainable travel potential and modal shift away from the car ▪ Transport schemes proposed for market towns through transport strategies and other major schemes (such as Ely Southern Relief Road, A605 Kings Dyke – subject to funding)
3(b)	▪ A14 improvements whilst a strategic route also provide a locally defined corridor ▪ Cambridgeshire Guided Busway (CGB) provides for significant fixed mass transit along the same corridor as A14 ▪ County has main railway lines although not all settlements are served ▪ Concentration of growth (rather than a more dispersed pattern) may be able to deliver greater levels of sustainability in terms of coordinated infrastructure provision and services ▪ Corridor approach still creates increased commuting distances whether by public transport or car ▪ May focus travel and hence congestion all in one area ▪ More concentrated impacts in terms of dealing with water management and protecting the landscape and environment

1.8.3 These views have been merged with the other independent views of the economy and land supply workstreams and have identified similarities to enable the development of common themes for spatial patterns and to formulate the options for growth.

Appendix A Evidence List

The following table sets out the local information which is currently available for Cambridgeshire.

Evidence Strands	**Available evidence**
Water cycle studies/Water Resources	• Water Cycle Study for Cambridge area (Phase 1 complete) • Discussions are underway on the content of Phase 2. • Water Cycle Study for Huntingdonshire District (timescale TBC) • Cambridge Water Company Water Resource Management Plan (final version expected July 2009) • Cambridge Water Company Business Plan • Anglian Water Company Water Resource Management Plan (final version expected July 2009) • Anglian Water Company Business Plan • Three Valleys Water Company Water Resource Management Plan • Three Valleys Water Company Business Plan • Environment Agency Water Resources Strategy (new version expected in early 2009 and regional action plan to be produced by Autumn 2009) • Water Supply Impacts Study (March 2008 to be updated to take into account NHPAU recommendations by the end of 2009). • River Great Ouse Catchment Flood Management Plan (due for publication in January 2009)
Core Strategies	• Cambridge City Core Strategy Issues & Options (June 2007) • East Cambridgeshire Submission Draft Core Strategy (May 2008) • Fenland Core Strategy & Development Policies Preferred Options 2 (September 2007) • Huntingdonshire Submission Draft Core Strategy (July 2008) • South Cambridgeshire adopted Core Strategy (January 2007)

Evidence Strands	Available evidence
Regional Flood Risk Assessment	• Cambridge City Strategic Flood Risk Assessment – February 2006. • East Cambridgeshire Strategic Flood Risk Assessment Stage 2 report • Huntingdonshire Strategic Flood Risk Assessment 2004 (to be updated) • Fenland Strategic Flood Risk Assessment March 2005 and Strategic Flood Risk Assessment update 2008 for Wisbech and environs (The anticipated date for completion is October 2008). • South Cambridgeshire Strategic Flood Risk Assessment 2005

Evidence Strands	Available evidence
Transport	• Local Transport Plan 2011-2016 • Ely Market Town Strategy and Draft Revised Ely Market Town Strategy • March Market Town Strategy • Huntingdon and Godmanchester Market Town Strategy • St Ives Market Town Strategy • Fenland District Transport Evidence Base (2007) • St Ives Market Town Strategy • St Neots Market Town Strategy and St Neots Market Town Strategy Review 2007 • Wisbech Market Town Strategy • Cambridgeshire Transport Innovation Fund: Package Outline for funding • Further research associated with Transport Innovation Fund • Long Term Transport Strategy • Cambridge Area Transport Plans • Cambridge East Transport Study • Cambridge North West Transport Study • Ely Area Transport Study (March 2009) • March Area Transport Study (to be started by the end of 2008) • Wisbech Area Transport Study the anticipated date for completion of phase 1 is October 2008. • Greater Anglia Rail Route Utilisation Strategy (December 2007) • Norwich to Peterborough Multi Modal Study (March 2003) • London to South Midlands Multi-Modal Study (2003) • Operational Assessment of Strategic Highway Network May 2005 • Transport Economic Evidence study

Evidence Strands	Available evidence
Transport (Continued)	• East Coast Mainline Rail Route Utilisation Strategy (February 2008) • Cambridge to Huntingdon Multi Modal Study (November 2001)
Green Belt	• Cambridge Green Belt Study 2002 • East Cambridgeshire District Green Belt Review Report 2005
Infrastructure including green infrastructure	• East of England Capacity Delivery Study (December 2006) • Cambridge Northern Fringe East – Viability of planning options (May 2008) • Cambridge Sub Region Long Term Delivery Plan (November 2007) • Carbon Appraisal of Long Term Delivery Plan (Final Draft Report) • Cambridgeshire Programme of Development (September 2007) and refresh (October 2008) • Ely, Soham and Littleport Masterplans (May 2009) • Huntingdonshire Local Investment Framework Interim Report June 2008 (Anticipated date for final report is October 2008) • Green Infrastructure Strategy for Cambridge Sub Region (June 2006) • Wash and the Fens Green Infrastructure Masterplan (Autumn 2009) • Fenland District Natural Green Spaces Study & Outdoor Sports Facilities Study consultation version (Anticipated date for consultation is late 2008)
Historic Environment	• Cambridgeshire Historic Environment Record • Cambridgeshire Extensive Urban Survey • Cambridge City Urban Archaeological Database • Cambridgeshire Historic Landscape Characterisation Assessment
Landscape and Biodiversity	• Cambridgeshire Landscape Guidelines • Huntingdonshire Landscape and Townscape Assessment SPD • Local Biodiversity Action Plans • Ely Environmental Capacity Study 2002

APPENDIX G1 – Summary of Risk of Flooding

Risk of various sources of flooding posing a contraints to the future development in each ward 01/05/2009 Rev 1.1

Key: Risk of various sources of flooding posing a contraints to the future development in each ward	Low	Low to medium	Medium	High

Scenario	Location	Source of Flooding			
		Fluvial	**Groundwater**	**Overland**	**Artificial**
Market Towns	Ely	Low to Medium: While Ely itself is on high ground, areas surrounding the town are in Flood Zone 3, particularly on the eastern border of the town.	Low to medium: Underlain primarily by impermeable clay confining layer, peat and till, but there is a small area of Lower Greensand to the north and west of Ely which might act as a small perched aquifer.	Medium: Impermeable bedrock combined with steep topography down from the 'Isle of Ely' could present a risk of overland flooding to development at the base of slopes.	Low to medium: Small raised reservoirs located to the east of Ely at Queen Adelaide and Stuntney. No local gravel works indicated.
	Huntingdon	Low: Areas to the south of Huntingdon are in Flood Zone 3 for the River Great Ouse.	Low to medium: Underlain by impermeable clay confining layer, but the River Great Ouse corridor to the South includes superficial river terrace deposits which may act as a small perched aquifer.	Medium: Impermeable bedrock combined with steep slopes from the north down into Huntingdon.	Medium: No local gravel works or raised reservoirs indicated, but potentially downstream of Grafham Water.
	Wisbech	Medium: Areas to the north and south are in Flood Zone 3.	Low: Underlain by impermeable clay confining layer and clay, silt and sand alluvium superficial deposits.	Low: Impermeable bedrock but low gradient topography.	Low: No local gravel works or raised reservoirs indicated.
	March	Medium to High: While the town itself is not in the floodplain, most of the surrounding areas are in Flood Zone 3.	Low: Underlain by impermeable clay confining layer and till and peat superficial deposits.	Low: Impermeable bedrock but low gradient topography.	Low: No local gravel works or raised reservoirs indicated.
	Whittlesey	Medium to High: While the town itself is not in the floodplain, most of the surrounding areas are in Flood Zones 2 and 3.	Low to medium: Underlain by impermeable clay confining layer, but the local superficial river terrace deposits may act as a small perched aquifer.	Low: Impermeable bedrock but low gradient topography.	Medium: Reservoirs located to the west at the Brick Works and to the east (Gildenburgh Water).
	Melbourn	Low: The flood zones in the vicinity of Melbourne are small and for minor watercourses.	Medium to high: Underlain by permeable Chalk aquifer. Borehole risk factors are low to the south and medium to high to the east and west. Highest borehole risks are in the east.	Low: Steep slopes to the south but permeable bedrock therefore low surface runtooff rates.	Low: No local gravel works or raised reservoirs indicated.
	Soham	Medium: Areas to the west of Soham are in Flood Zone 3.	Medium to high: Underlain by permeable Chalk and Upper Greensand aquifers. Local borehole risk factors is medium, but there is a very high risk borehole to the south at Wicken.	Low: Permeable bedrock and low gradient topography.	Low: No local gravel works or raised reservoirs indicated.
	Sutton	Medium to high: Areas to the south and west of Sutton are in Flood Zone 3 for the Hundred Foot Drain.	Low: Underlain by impermeable clay confining layer, and till and peat superficial rocks.	Medium: Sutton is located on a slight hill and as there is impermeable bedrock there is a risk of overland flooding at the base of the hills to the north and south.	Low: No local gravel works or raised reservoirs indicated.
	St Neots * East (Gransden & Offords)	Low to medium: The town centre is in Flood Zone 3 for the River Great Ouse, but areas on the outskirts of the town are generally not in Flood Zones.	Low to medium: Underlain by impermeable clay confining layer, but the River Great Ouse corridor includes superficial river terrace deposits which may act as a small perched aquifer.	Medium: Impermeable bedrock combined with steep slopes into St Neots.	Low to Medium: No local gravel works indicated, development location potentially at risk from Grafton Reservoir (backflow).
	Godmanchester	Medium to high: The village is surrounded by Flood Zones 2 and 3 for the River Great Ouse, although areas approx. 500m to the south are in Flood Zone 1.	Low to medium: Underlain by impermeable clay confining layer, but small river terrace deposits may act as a perched aquifer.	Low to medium: Impermeable bedrock and slight slopes leading down to Godmanchester from the south.	Medium: No raised reservoirs indicated, but local gravel works to the northtoeast and potentially downstream of Grafham Water.
	Brampton	Medium to high: Areas to the north and west are in Flood Zone 3 for the River Great Ouse.	Low to medium: Underlain by impermeable clay confining layer, but small river terrace deposits may act as perched aquifer.	Low to medium: Impermeable bedrock and slight slopes leading down to Brampton from the south and west.	Medium: No local gravel works or raised reservoirs indicated, but potentially downstream of Grafham Water.
	Alconbury	Medium to high: The western and southern sides of the village are in Flood Zone 3.	Low to medium: Underlain by impermeable clay confining layer, but there are superficial river terrace deposits which may act as a small perched aquifer.	Medium: Impermeable bedrock and steep slopes leading down to Alconbury from the east.	Low: No local gravel works or raised reservoirs indicated.
	Ramsey	Medium to high: Areas to the north and southtoeast of the village are in Flood Zone 3.	Low to medium: Underlain by impermeable clay confining layer, but there are superficial river terrace deposits which may act as a small perched aquifer.	Low to medium: Impermeable bedrock and shallow slopes down into ramsey from the southtoeast.	Low to medium: Numerous small raised reservoirs indicated in the vicinity of Ramsey.
	Yaxley and Farcet	Medium to high: All areas to the south of these villages are in Flood Zone 3.	Low to medium: Underlain by impermeable clay confining layer, but there are superficial river terrace deposits which may act as a small perched aquifer.	Low to medium: Impermeable bedrock and shallow slopes to although SAR does not extend this far.	Low to medium: Raised reservoirs and gravel works to the north of Yaxley.
	St Ives	Medium to high: All areas to the south are in Flood Zone 3 for the River Great Ouse, and some areas to the north are in flood zones for minor watercourses.	Low to medium: Underlain by impermeable clay confining layer, but the River Great Ouse corridor includes superficial river terrace deposits to the south which may act as a small perched aquifer.	Medium: Impermeable bedrock and steep slopes to the north.	Low: No local gravel works or raised reservoirs indicated.

	Sawston	Low to medium: Areas to the west of the town are in Flood Zones 2 and 3.	Medium to high: Underlain by permeable chalk aquifer with local alluvium and river terrace deposits. Local borehole risk factors are variable, ranging from low to very high.	Low: Shallow slopes in area and permeable bedrock to although SAR does not extend over the full area.	Low: No local gravel works or raised reservoirs indicated.
Cambridge Green Belt	Cambridge / Shelfords	Low: No large flood zone extents in the area.	Medium to High: Underlain by chalk aquifer, the local borehole risk factor is high to the West.	Low: At base of Gog Magog Hills but permeable bedrock.	Low: No local gravel works or raised reservoirs indicated.
	Teversham / Fulbourn	Low: No large flood zone extents in the area.	High: Underlain by chalk aquifer with river terrace and lacustrine superficial deposits. The local borehole risk factor is medium, but there are reported groundwater flooding issues in Fulbourn (near Thomas Road).	Low: At base of Gog Magog Hills but permeable bedrock.	Low: No local gravel works or raised reservoirs indicated.
	Expansion of Northstowe	Medium: Flood Zones 2 and 3 to the east and north of the site.	Low to medium: Underlain by impermeable clay confining layer, but with potential perched aquifers from permeable river terrace superficial deposits and permeable Lower Greensand deposits which are close in proximity to the south.	Low: Impermeable bedrock but low gradient topography.	Low: No local gravel works or raised reservoirs indicated.
	Sawston	Low to medium: Areas to the west of the town are in Flood Zones 2 and 3.	Medium to high: Underlain by permeable chalk aquifer with local superficial alluvium and river terrace deposits. Local borehole risk factors are variable, ranging from low to very high.	Low: Shallow slopes in area and permeable bedrock to although SAR does not extend over the full area.	Low: No local gravel works or raised reservoirs indicated.
	Girton	Low to medium: Areas to the north and west of the village are in Flood Zones 2 and 3.	Medium to high: Underlain by permeable greensand aquifer and superficial river terrace deposits. Local borehole risk factors are high to very high.	Low: Girton is located at the top of a slight hill but permeable bedrock means low surface runtooff rates.	Low: No local gravel works or raised reservoirs indicated.
	Wilbrahams	Low to medium: Multiple small floodplains cross the areas surrounding the villages, but extents are small.	Low to medium: Underlain by permeable chalk aquifer and superficial river terrace deposits, but local borehole risk factors are low.	Low: The villages lie at the base of a shallow hill but bedrock is permeable.	Low: No local gravel works or raised reservoirs indicated.
	Histon & Impington	Low: Flood Zones 2 and 3 within the centre of the village but the surrounding areas are in Flood Zone 1.	Medium to high: Underlain by permeable greensand aquifer and superficial river terrace deposits. Local borehole risk factors are high to very high.	Low: Low topography and permeable bedrock.	Low: No local gravel works or raised reservoirs indicated.
	Waterbeach	Low to medium: Areas to the east of the village are in Flood Zones 2 and 3.	High: Underlain by Upper Greensand aquifer with river terrace superficial deposits. The local borehole risk factors are high.	Low: Low topography and permeable bedrock.	Low: No local gravel works or raised reservoirs indicated.
	Melbourn	Low: The flood zones in the vicinity of Melbourne are small and for minor watercourses.	Medium to high: Underlain by permeable Chalk aquifer. Borehole risk factors are low to the south and medium to high to the east and west. Highest borehole risks are in the west.	Low: Steep slopes to the south but permeable bedrock therefore low surface runtooff rates.	Low: No local gravel works or raised reservoirs indicated.
	Cambridge Castle	Low: There are no flood zones in the Madingley Road area.	Medium: Underlain by permeable chalk aquifer, greensand and river terrace superficial deposits. Local borehole risk factors are medium.	Low: Slight slopes but permeable bedrock.	Low: No local gravel works or raised reservoirs indicated.
New Towns	Waterbeach	Low to medium: Areas to the east of the village are in Flood Zones 2 and 3.	High: Underlain by Upper Greensand aquifer with river terrace superficial deposits. The local borehole risk factors are high.	Low: Low topography and permeable bedrock.	Low: No local gravel works or raised reservoirs indicated.
	Northstowe	Medium: Flood Zones 2 and 3 to the east and north of the site.	Low to medium: Underlain by impermeable clay confining layer, but with permeable river terrace superficial deposits and permeable Lower Greensand deposits in close proximity to the south which may be small perched aquifers.	Low: Impermeable bedrock but low gradient topography.	Low: No local gravel works or raised reservoirs indicated.
	Alconbury	Medium to high: The western and southern sides of the village are in Flood Zone 3.	Low to medium: Underlain by impermeable clay confining layer, but there are superficial river terrace deposits which may act as a small perched aquifer.	Medium: Impermeable bedrock and steep slopes leading down to Alconbury from the east.	Low: No local gravel works or raised reservoirs indicated.
	Potential new town at Abingdon	Low: Flood Zones 2 and 3 flow through the centre of the village, but areas outside are generally in Flood Zone 1.	Medium to high: Underlain by permeable chalk aquifer and alluvium. Local borehole risk factors are medium to high.	Low: At base of steep slopes but permeable bedrock.	Low: No local gravel works or raised reservoirs indicated.

APPENDIX G2 – Water Services Infrastructure

Potential for the Water Services Infrastructure to pose a contraint to the development scenarios proposed by the Cambridgeshire Development Study

01/05/2009 Revision 1.1

KEY: Potential to restrict growth	Not expected to pose a constraint	A constraint that is expected to be overcome sustainably without significant carbon cost	Further investigation required to confirm that this is not a constraint to development	A constraint that can not be overcome

	Number of homes (2006-31)	Flood Risk	Water Resources	Wastewater Treatment	Water Quality	Sewer Capacity	Ecology
Market Town Scenario and supporting wards (Market Towns denoted with *)							
Ely *	6,100	all sources a low risk	Additional water can be made available if the WRMP proposals are implemented	2 works, old works (central Ely) at capacity. All growth at new works ,located south of Ely. No current capacity, but works designed for expansion. Issues on both works, talk of new Ely north works - new process capacity study - further investigation.		Strategic sewer direct to works	The six development areas surrounding Huntingdon are upstream of the Ouse Washes, an internationally designated site (Ramsar and SAC), and a SSSI. One development area (2000 proposed homes) is relatively close to the upstream end of the Ouse Washes, increasing potential impacts from any pollution incidents. Management of the designated site is currently under review; it is too wet in Spring and Summer as a result of impeded seasonal drainage (caused by siltation in the Hundred Foot Drain). Therefore additional water supply from WwTWs is not desirable. One development area is adjacent to the Nene Washes and one is just upstream from it; the Nene Washes is an internationally designated site (Ramsar and SAC), and a SSSI. Issues of concern relating to water quality already exist; a proposed WwTW directly adjacent to the upstream end of the designated site increases water quality risks. There is another WwTW in close proximity to the site. Several development areas are upstream of SSSIs with wetland features.
Huntingdon *	5,050	all sources a low risk	Ruthamford Zone has been upgraded in AMP4 so water may be available to supply additional growth. Confirmation req'd from AWS	Has capacity, Expansion ok	Ouse		
Wisbech *	9,155	North and West at risk of flooding	Additional water can be made available if the WRMP proposals are implemented	Difficult process - based on high strength, potential for new treatment stream			
March *	8,691	Edges of town in flood zone	Ruthamford Zone has been upgraded in AMP4 so water may be available to supply additional growth. Confirmation req'd from AWS	No process capacity, needs expansion, not a problem, works is remote	Needs 2.6 ammonia - achievable, but not with existing process		
Whittlesey *	500	area surrounding town in the flood zone	Ruthamford Zone has been upgraded in AMP4 so water may be available to supply additional growth. Confirmation req'd from AWS	Reconstructed works, should be ok, but needs investigation	Load equivalent looks ok, WFD may need investigation		
Melbourn	1,000	Medium to high groundwater flood risk and west of Soham in flood zone	Water resources available for Market Town scenario within the areas supplied by Cambridge Water	Reconstructed works, 30% growth increase so needs investigation	Load equivalent looks ok, WFD may need investigation		
Soham *	1,500	Medium to high groundwater flood risk	Additional water can be made available if the WRMP proposals are implemented	Not quite enough headroom, works can be expanded, already 3 different streams.	Need to check flow data, but load equivalent looks ok		
Sutton	500	South and west of sutton in flood zone 3	Additional water can be made available if proposed WRMP works are undertaken	Needs expansion, but can probably be provided	Load equivalent looks ok, WFD may need investigation		
St Neots * East (Gransden & Offords)	1,750	Medium: Impermeable bedrock combined with steep slopes into St Neots.	Ruthamford Zone has been upgraded in AMP4 so water may be available to supply additional growth. Confirmation req'd from AWS	Needs expansion, but can probably be provided subject to further investigation	Load equivalent looks ok, WFD may need investigation		
Godmanchester *	1,000	Surrounded by flood zones	Ruthamford Zone has been upgraded in AMP4 so water may be available to supply additional growth. Confirmation req'd from AWS	Has capacity, Expansion ok	Ouse		
Brampton	1,000	North and west of Brampton in flood zones	Ruthamford Zone has been upgraded in AMP4 so water may be available to supply additional growth. Confirmation req'd from AWS	Difficulty in expanding works, has capacity for 500 homes before new consent required	Ouse		
Alconbury	2,000	West and southern sides in flood zone	Ruthamford Zone has been upgraded in AMP4 so water may be available to supply additional growth. Confirmation req'd from AWS	Works needs extension, but achievable	Needs new consent - SSSI downstream		
Ramsey *	750	Areas to north and south are in flood zone	Water resources available for Market Town scenario within the areas supplied by Cambridge Water	Works needs extension, but achievable	Load equivalent looks ok, WFD may need investigation		
Yaxley and Farcet	500	area to the south in flood zone	Ruthamford Zone has been upgraded in AMP4 so water may be available to supply additional growth. Confirmation req'd from AWS	Works needs expansion, but should be accommodated in upgrade to serve Peterborough	Works needs expansion, but should be accommodated in upgrade to serve P'boro		
St Ives *	2,000	Areas to south in flood zone	Water resources available for Market Town scenario within the areas supplied by Cambridge Water	Works needs extension, but achievable	Load equivalent looks ok, WFD may need investigation		
Sawston	1,000		Additional water can be made available if the WRMP proposals are implemented	Works has capacity, but may be needed to serve Cambridge expansion			
Cambridge Green Belt Scenario							
Cambridge / Shelfords (7,500) *	23,930		Sufficient water resource to develop the Main Case Green Belt Scenario. A review of Cambridge Waters FinalWater Resource Management Plan is required to confirm if the High Case can be supplied Cambridge Water	Needs expansion, but achievable	Environment Agency concerns over quality of watercourse, but needs to be addressed regardless of additional growth		Seven of the ten development areas are directly adjacent to watercourses upstream of the Cam Washes SSSI; therefore there are potential impacts from any pollution incidents. The sites are relatively close to the designated site, thereby increasing the risk of negative impacts from any pollution incidents. The SSSI is designated for wet grassland and breeding waters, and includes washlands 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. One development area is upstream of Wilbraham Fens SSSI.
Teversham / Fulbourn (7,500)	7,000	medium risk of groundwater flooding	Sufficient water resource to develop the Main Case Green Belt Scenario. A review of Cambridge Waters FinalWater Resource Management Plan is required to confirm if the High Case can be supplied Cambridge Water	Can't be accommodated at Teversham, and a strategic connection to Cambridge is likely to be required	Environment Agency concerns over quality of watercourse, but needs to be addressed regardless of additional growth		
Expansion of Northstowe (12,500)	22,500	flood zones 2&3 to the north	Sufficient water resource to develop the Main Case Green Belt Scenario. A review of Cambridge Waters FinalWater Resource Management Plan is required to confirm if the High Case can be supplied Cambridge Water	Work would need major expansion	Load equivalent is below best available technology. IDB drainage concerns	Strategic sewer direct to works	
Sawston	2,000		Sufficient water resource to develop the Main Case Green Belt Scenario. A review of Cambridge Waters FinalWater Resource Management Plan is required to confirm if the High Case can be supplied Cambridge Water	Works has capacity			
Girton	1,500	north and west in flood zones, medium risk of groundwater flooding	Sufficient water resource to develop the Main Case Green Belt Scenario. A review of Cambridge Waters FinalWater Resource Management Plan is required to confirm if the High Case can be supplied Cambridge Water	Needs expansion, but achievable	Environment Agency concerns over quality of watercourse, but needs to be addressed regardless of additional growth		
Wilbrahams	500	small areas of flood plain	Additional water can be made available if the WRMP proposals are implemented	Needs expansion, but achievable			
Histon & Impington	1,500	medium groundwater flooding risk	Sufficient water resource to develop the Main Case Green Belt Scenario. A review of Cambridge Waters FinalWater Resource Management Plan is required to confirm if the High Case can be supplied Cambridge Water	Needs expansion, but achievable	Environment Agency concerns over quality of watercourse, but needs to be addressed regardless of additional growth		
Waterbeach	1,000	some areas of flood plain and high potential fro groundwater flooding	Additional water can be made available if the WRMP proposals are implemented	Needs expansion, which is not easily achievable	Environment Agency concerns over quality of watercourse, but needs to be addressed regardless of additional growth		
Melbourn	1,000	Medium to high groundwater flood risk and west of Soham in flood zone	Sufficient water resource to develop the Main Case Green Belt Scenario. A review of Cambridge Waters FinalWater Resource Management Plan is required to confirm if the High Case can be supplied Cambridge Water	Reconstructed works, 30% growth increase so needs investigation	Load equivalent looks ok, WFD may need investigation		
Cambridge Castle (NorthWest Cambridge)	2,000		Sufficient water resource to develop the Main Case Green Belt Scenario. A review of Cambridge Waters FinalWater Resource Management Plan is required to confirm if the High Case can be supplied Cambridge Water	Needs expansion, but achievable	Environment Agency concerns over quality of watercourse, but needs to be addressed regardless of additional growth		
New Town Scenario							
Waterbeach	7,500	some areas of flood plain and high potential fro groundwater flooding	Additional water can be made available if the WRMP proposals are implemented	Needs expansion (300%), which is not easily achievable. Probably connect to Cambridge	Load equivalent looks ok		The three development areas are upstream of the Cam Washes SSSI and adjacent Wicken Fen (Ramsar and SAC) . The SSSI is designated for wet grassland and breeding waters, and includes washlands 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.
Potential new town at Abingdon	10,000	Medium risk of groundwater flooding	Sufficient water resource expected to be available for this New Town Scenario. A review of Cambridge Waters Final Water Resource Management Plan is required to confirm this.	Great Chestford & Linton has no capacity. Saffron Walden (100% expansion) has its own (odour) issues. Realistically would need a new works.	Load equivalent at Great Chesterford & Linton below BAT. Saffron Waldon would be within BAT		
Alconbury	10,000	West and southern sides in flood zone	Additional water can be made available if the WRMP proposals are implemented	No local capacity. Would have to go to Huntingdon, which could be extended	Treatment at Alconbury would be below BAT, potentially ruling out a new works. Would need to go to Huntingdon		
Expansion of Northstowe (7,500)	17,500	flood zones 2&3 to the north	Sufficient water resource expected to be available for this New Town Scenario. A review of Cambridge Waters Final Water Resource Management Plan is required to confirm this.	Work would need major expansion	Load equivalent is below BAT. IDB drainage concerns		

APPENDIX H – Draft Spatial Implications of Economic Drivers

APPENDIX H - Draft Spatial Implications for Economic Drivers

The tables below show the possible emerging views on spatial economic drivers for growth across the County and compare these to the Infrastructure constraints and Land Supply.

Table 9.1 Cambridge and Surrounding Area

Economic imperative/ opportunity	**Evidence**	**Spatial / development implications**	**Job growth potential**	**Infrastructure Response**	**Explanation**	**Land Supply Response**	**Explanation**
Economic activities linked directly or indirectly to the University of Cambridge need to be encouraged/enabled to grow	University of Cambridge remains critically important to the area and it needs to remain a world class establishment in terms of learning and research	Expansion of university facilities in **north west Cambridge** needs to be enabled Need to plan for the housing-related needs of academics and others linked to the university	High		Already part of current strategy		NWCAAP now emerging
Existing biotech and biomedical activity needs to be encouraged to grow	The Cambridge area has something really special in this sector and Addenbrooke's Hospital – and the wide range of co-located research institutes – provide a nationally significant asset	Development at **Cambridge Southern Fringe** – both housing and jobs – is critical Future development needs to be planned such that clustering processes can continue	High		Already part of current strategy		DPDS adopted and growth at Addenbrooke's included in 2006 Local Plan, but may not be sufficient land
ICT/software/wireless sector should be encouraged to grow	In terms of the high tech cluster, this is an important component (even if projections can be wildly optimistic)	**CSP/SJIC** have been important homes for firms in this sector, but the sector is also a generator of large numbers of micro-businesses, many of them home-based. This aspect of growth needs to be encouraged, including in major new developments like **Northstowe and Cambridge East**	Medium		Already part of current strategy and infrastructure planned or in place to cater for growth		Supply not sufficient if enhanced growth
Provision needs to be made to encourage the	In part this imperative is in anticipation of central	Provision needs to be made for the manufacturing activity in places that	Medium		Corridors and market towns		

Economic imperative/ opportunity	Evidence	Spatial / development implications	Job growth potential	Infrastructure Response	Explanation	Land Supply Response	Explanation
wider process of knowledge commercialisation – not just to proof of concept, etc., but also to proto-type and pilot high value manufacturing	government policy, but it is also a response to the wider imperatives surrounding the need to remain at the cutting edge of R&D and the wider business/physical infrastructure is key to this also diversifying employment	are sensibly located vis-à-vis the core of the high tech knowledge cluster. Some of this may need to be **reasonably close to either North West Cambridge or Cambridge Southern Fringe, Cambridge East** – although virtual proximity can work if transport links are good enough in this respect opportunities in corridors and market towns should also be considered.			need suitable sustainable transport infrastructure. Existing planned developments will not require further Green Belt releases in addition to those already proposed.		
Cambridge needs to mature as a medium-sized city with cultural/leisure provision for both residents and visitors	Cambridge has lacked amenities in the past while the continuing importance of tourism in generating wealth should not be underestimated, and provision should be made for it	Although the aspiration is for Cambridge to be a compact city, the "**city centre**" needs to continue to evolve. There is also a requirement for greater provision for cultural amenities, etc. and expanding the role of Northstowe and Cambridge East to provide satellite attactions to complement the city centre	High		Serious Challenges for the Green Belt, the historic environment and the capacity of Cambridge		
Cambridge needs to establish itself further as a regional services city, particularly as a hub for education, health and business services	In part this reflects the impact of a growing population Additionally, however, it is important that the city becomes a real business hub, with a focus that is broader than high tech An alternative scenario maintains selective management in recognition that development land for further Cambridge centred growth will remain limited.	Giving the growing population, additional provision may need to be made in relation particularly to **Further Education** – and possibly this can be achieved at Northstowe and/or Cambridge East. Additionally, within the city and its environs, it is important that **office-based activities are allowed to grow and prosper** As a business hub, an **effective transport infrastructure** – focusing on access to major employment locations within Cambridge – is absolutely imperative Recognise general office functions could be accommodated in the Market Towns.	High		Expansion of Cambridge relies on the delivery of demand management and significant sustainable transport measures.		Implementation of Cambridge East a necessity. May need more allocations South of Cambridge.

Economic imperative/ opportunity	Evidence	Spatial / development implications	Job growth potential	Infrastructure Response	Explanation	Land Supply Response	Explanation
		Could also exploit the strong synergies with specialist office functions in London.					
Recognise the particular opportunities linked to Ely	Ely has grown rapidly in the recent past in terms of housing/population, but – amongst in-movers – there is a lot of out-commuting to Cambridge while Ely remains an employment hub for those living further out. Separately, Ely has important tourism assets	Developing high quality jobs in Ely itself ought to be a priority. Key to this appears to be **redevelopment near Ely station** for employment uses, linked to a **southern relief road (albeit funding for this is uncertain)** Additionally, more needs to be done to reap the economic impacts of tourism in the town and provision for **a high quality hotel** would appear to be potentially catalytic. This would need to be sensibly located in relation to both the cathedral and the railway station	Medium		Delivery of southern relief road uncertain. Need to protect the historic character of Ely. Southeast side of Ely prone to flood risk		Implementation of current employment supply. Also need enhanced supply to underpin role
Need to recognise and respond to changing working practices across the Cambridge sub-region	The proportion of people who work from home is growing; more people are multi-jobbing; and more people are combining working and caring responsibilities	Homes ought to be **designed** as places of work as well as places to live Additionally though, there is evidence that home working is a poor option in terms of carbon footprints (because of heating lots of houses). Within the Cambridge area, there are lots of "**larger villages**" (Cottenham, Great Shelford, etc.): in these places, provision of local **home working hubs** may be possible, however is the same true for new communities and urban extensions?	Medium		New developments could achieve combined heat and power to overcome and lower carbon. Existing housing could have a negative impact on climate change		

Economic imperative/ opportunity	Evidence	Spatial / development implications	Job growth potential	Infrastructure Response	Explanation	Land Supply Response	Explanation
For the Cambridge area economy, it is important that a sensible and functional home is found for all key activities that are key to making the local economy "work"	The Cambridge area needs some economic activities that are not "special" or distinctive but are crucial in terms of making the area work (e.g. double glazing sales)	For the Cambridge area, it is important that good **road/public transport corridors** are "put to work", that employment sites are identified and used in a manner that helps Cambridge function better, both as a high tech cluster and as a vibrant medium-sized city with urban back-up services located near to the city but not on prime sites	Medium		Dependent upon appropriate demand management and significant investment in sustainable transport measures		

Table 9.2 The Fens

Economic imperative/ opportunity	Evidence	Spatial / development implications	Job growth potential	Infrastructure Response	Explanation	Land Supply Response	Explanation
There is a need to respond to – and encourage – long term economic growth linked to the agri-food cluster	The Fens provide the most fertile agricultural land in the UK and – for arable crop production and horticulture – the Fens agri-food cluster is amongst the most productive	Need to ensure that appropriate provision is made for the future of the cluster, including in relation to **water supply**, etc. Need to ensure that **employment sites** are retained in appropriate locations – both for food processing purposes and for activities linked to the wider cluster (light engineering, etc.) Need to ensure that **housing policy** is consistent with the sector's needs in terms of its workforce (i.e. wage levels are low and migrant workers are important)	Medium		Increase in development and associated effects could impact on the amount of quality agricultural land and the quality of water. Fen areas subject to considerable flood risk		Adequacy of employment land supply quality.
There may be particular opportunities linked to clean-tech, renewable energy, etc.	The evidence is limited, but Peterborough is promoting itself as a centre for environmental technology, etc., and potentially, the Fens	There may be an opportunity to make appropriate provision for **renewable energy**, perhaps linking this specifically to the Peterborough market Equally, is it possible to market parts of the Fens specifically in terms of	Medium		Whilst this will have a positive impact in terms of both jobs and generation of renewable energy it could result in		

Economic imperative/ opportunity	Evidence	Spatial / development implications	Job growth potential	Infrastructure Response	Explanation	Land Supply Response	Explanation
	area could strive to complement this, particularly as Peterborough itself is anticipating substantial population growth	the provision it can provide for **large, clean, sites**, etc.			commuting patterns that are not sustainable, such as between the Fens and Peterborough		
It is important to recognise the particular opportunities for economic growth that are provided in and around March	March is a hub in terms of public sector activity; it has seen recent population growth; and it is well-located in relation to the Peterborough-March-Ely-Cambridge rail corridor	Important that economic/employment growth is positively encouraged in and around March, perhaps through synergistic relationships with Peterborough. **Quality employment land provision may be needed in the centre of March** and close to the railway station. This asset then would need positive promotion March itself needs to be of a scale that means that people can enjoy leisure amenities in or close to the town, without having to go elsewhere. **Population/housing growth** may be required such that viability thresholds are achieved but how do we ensure this would not result in more unsustainable out-commuting?	Medium		March has sufficient land outside of flood risk areas to accommodate growth, however this could lead to unsustainable out-commuting		FDC core strategy not adopted.
Wisbech appears to be in need of comprehensive regeneration as a place and as an economy	Wisbech has some economic development assets – notably in relation to heritage and the amenities provided by the new Boathouse – but it is not currently "punching its weight". Its retail offer is poor, wages are very low locally, and the skills base is weak	A **comprehensive approach to economic regeneration** remains a priority, building on established investments (like Nene Waterfront, including the Boathouse), and recognising the possibilities for Wisbech linked to an inland harbour, etc. There is a need for a strong and interventionist approach to economic development, focusing especially on local skills and aspirations. Also, **Wisbech town centre** appears to be quite weak. There may be a need to think about promoting retail as part of an approach that grows the population of Wisbech (i.e. more housing) **however this could just**	Lower		Wisbech is subject to potential flood risk issues and if regeneration/economic stimulus were not successful this would result in out-commuting which would not be sustainable.		FDC core strategy not adopted.

Economic imperative/ opportunity	Evidence	Spatial / development implications	Job growth potential	Infrastructure Response	Explanation	Land Supply Response	Explanation
		promote out-commuting					
Other market towns – Littleport, Chatteris, Ramsey, etc.	Across the smaller Fens market towns, all the evidence suggests that economic performance is weak – both in terms of local services and exogenous activity There is some suggestion that the smaller Fens towns are turning into retirement destinations. Potentially this might provide a modest fillip to particular forms of economic growth – health and social care, but also "grey entrepreneurs".	There appear to be two options in relation to the **smaller market towns**: either accept them for what they are , make provision for a limited amount of endogenous growth, and focus development elsewhere, particularly on March and Wisbech or take steps to grow the towns such that they develop their own endogenous growth dynamic (However this would need to be informed by the possible impacts on Wisbech and March in particular and also take into account the strong risk that this would result in more out-commuting)	Lower		Very strong risk of out-commuting		

Table 9.3 Ouse Valley Towns

Economic imperative/ opportunity	Evidence	Spatial / development implications	Job growth potential	Infrastructure response	Explanation	Employment Land Supply Response	Explanation
St Neots has a diverse economy and has very good N-S connectivity	St Neots has grown in terms of population, but employment growth may not have kept pace, and out-commuting is a feature, particularly to London	Probably St Neots needs to grow a bit more so that it can achieve greater critical mass and support a more **vibrant town centre** Separately, steps ought to be taken to encourage **employment growth** in or close to St Neots (although recognising that there is substantial employment provision just over the border in Bedfordshire) This could tie in well with the aspirations for an "eco-extension" to	Medium		As long as successful there would not be any out-commuting, however London will always be a strong attraction		

Economic imperative/ opportunity	Evidence	Spatial / development implications	Job growth potential	Infrastructure response	Explanation	Employment Land Supply Response	Explanation
		the east of the town.					
Huntingdon has some economic assets but its town centre struggles relatively – and it is not helped by its ring road, however, given the recent investment and redevelopment already in progress in the town centre, there has been a good start which should be continued in the future	Huntingdon is among the most polarised of the Ouse Valley market towns with significant areas of acute deprivation. However there are opportunities linked to Hinchingbrooke hospital and the relocation of the Regional College. The town is also well located in terms of N-S links	Huntingdon appears to need a boost to both **economic/employment and housing growth**. The economic masterplan for Huntingdon could include a stronger role as an **education hub** with a focus on the FE sector a stronger and more **vibrant town centre** potentially, links and opportunities in terms of **high tech manufacturing**	Medium		No significant flood risk in much of the town, main line railway and CGB together with A14 improvements		More land will be required for employment and housing for Huntingdon to respond to potential
St Ives is well located in relation to the CGB	St Ives is a relatively small market town, but it will be on the route of the CGB and hence its population ought to be well connected to all of Cambridge's major employment sites	Potentially there ought to be scope for more employment growth in St Ives, which is already occurring on the eastern side of town, but this ought to be planned such that it is synergistic with that which might potentially be in Northstowe Worth noting that there are important physical constraints to the growth of the town e.g. flood plain.	Medium		Whilst located at the end of the fixed element of CGB there are potential issues for significant parts of St Ives (and particularly close to CGB) for flood risk		
Ouse Valley might be particularly suited to higher value manufacturing jobs	The area has a skilled labour force already, and this could be focused on the wider needs of the high tech cluster	Steps should be taken to identify sites in the Ouse Valley that are well connected (or potentially well connected via improved public transport) to Cambridge and could be used for high tech manufacturing purposes	Medium		CGB only public transport towards Cambridge and success of other public transport less certain		In terms of quality employment sites

Economic imperative/ opportunity	Evidence	Spatial / development implications	Job growth potential	Infrastructure response	Explanation	Employment Land Supply Response	Explanation
Within Ouse Valley, there are two big sites that – if put to good use and promoted appropriately – could provide a major catalyst for economic growth	Wyton and Alconbury are both large sites with potential for some form of strategic development. These could include an employment focus and there would be a major economic development fillip if either was to proceed in a targeted way	For all sorts of reasons, there appears to be much merit in thinking hard about one of these sites in relation to the relocation of Marshall Aerospace from Cambridge. The response ought to be part of an active (and proactive) strategy for development to benefit the Ouse Valley area. Plans for the redevelopment of Wyton/Alcolnbury therefore need to be managed and focused on economic impacts and the economic role of the wider area	High		Use of brownfield sites and are located on or close to public transport and existing settlements		Large commitment at Alconbury, but has not come forward for employment.
Particularly with planned improvements, the A14 Corridor including the Cambridge Guided Busway represents a major economic growth opportunity	Substantial improvements to the A14 between Ellington and Fen Ditton are planned within the National Roads Programme. The CGB is programmed for completion in 2009	A view will need to be taken on distribution – left to its own devices, the market would deliver distribution activities to the area	High		CGB available along length of corridor provides opportunity for growth		

Source: SQW Consulting, WSP and Pegasus