Harlow Infrastructure Study

Stage 1 - Final Report

November 2008

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1. Introduction

General

1.1 The Revision to the East of England Regional Spatial Strategy (RSS) 2001 – 2021 has now been published by Government and this confirms the role of Harlow as a regionally significant housing and employment growth point and a major sub regional town centre. The housing growth target for the town for the plan period is 16,000 dwellings by 2021. The Oxford Economics forecasting model suggest that in the same period a total of over 6,000 new jobs will also be generated in the town.

1.2 The distribution of the future growth is to be determined by a joint or coordinated development plan documents to be prepared by Harlow, Epping Forest and East Hertfordshire Districts. The Harlow Infrastructure Study (HIS) will now play a key role in informing the preparation of these documents.

1.3 This Stage 1 Report reflects the work carried out during that phase of the study. The Report covers the data collection and audit and review of existing infrastructure and is the result of extensive discussions with infrastructure and service providers. We are of course also aware that there are a number of key issues that will not be completely resolved within the timeframe of this study and are the subject of other work, for example the Water Cycle Study.

1.4 In order to progress our work, we have made very broad planning assumptions with regard to future growth in order to enable us to specify and broadly cost appropriate infrastructure. These will be used during the next stage of the study to provide the key questions of Stage 2 of the Study:

- A phased programme of provision
- Identification of sources of funding for the programme.

1.5 During the course of the project it was agreed that the infrastructure phasing and costing should match the timescale of the new RSS which will cover the period 2011 – 2031. This is also logical in terms of the consideration of costing and funding for infrastructure, since anything required before 2011 will already be in place.

This Report

1.6 This report comprises two principal components as follows:

1.7 The first part provides an inventory of the infrastructure in Harlow under 5 broad sector headings in Sections 2 - 6 as follows:

- **Section 2 - Social and Community Infrastructure**
- **Section 3 - Open Space, Recreation and Environment**
- **Section 4 - Transport**
- **Section 5 - Utilities**
- **Section 6 - Solid Waste.**

2. Social and Community Infrastructure

Introduction

2.1 Harlow was developed on the principle of providing a full range of facilities in each neighbourhood. As a result it has a higher provision of facilities such as schools, neighbourhood centres, and social care facilities than areas which have grown more organically.

2.2 Because most of these facilities were constructed over a short period over fifty years ago, the town faces a problem of aging buildings, some of which were designed to meet out-dated service patterns and are no longer fit for purpose; and some of which need investment or replacement to bring them up to modern standards. For example, upon the closure of the last County Council care home for the elderly a range of day care services needed to be relocated. There were several potential premises, but it was difficult to find one with suitable access and facilities.

2.3 Where service providers seek to provide a wider range of services from fewer, larger, modern premises there can be opposition to the loss of local services.

2.4 Harlow therefore needs investment in refurbishment and/or reprovision of social and community facilities to meet the current needs of the town as well as projected growth.

2.5 We examine the implications of these general issues for the individual service areas in the sections which follow. A summary of all the social and community facilities in Harlow is given in Appendix 1 and their locations shown on Figures 2.1 to 2.3. The sites are cross referenced between the appendix and the figures.

2.6 The information on individual services set out below has been obtained in discussion with service providers, or from reports produced by them. In setting out the position at a baseline of 2011, we have set out current proposals as possibilities where we do not have firm completion dates.

Adult Social Services

Residential Care

Baseline Position

2.7 Essex County Council no longer provides residential care for the elderly and within the next few years will not provide adult residential care for people with learning disabilities. By 2011 County Council residential provision should be ended in Harlow. The thrust of policy is to provide supported living in the home instead of residential care wherever possible.

2.8 Where residential care is required for people with learning difficulties there will be reprovision by an RSL. For example, by 2011, Berecroft, the Social Services long-stay hostel for people with learning difficulties in Harlow, will have been re-provided as supported housing, run by an RSL.

2.9 In 2008 Social Services are aware of 147 registered residential care beds in Harlow. There are some new developments coming forward but they do not yet know the scale of these. By 2011 the number of care beds will be increased by these coming on stream.

Proposals, Gaps and Issues

2.10 Harlow currently has fewer registered care beds per head of population than other areas in Essex, but as noted above, additional beds are coming on stream. Moreover, as the County's strategic aim is to reduce the numbers in registered care Social Services consider that the current level of provision may not represent an undersupply in the longer term. In addition, Social Services' projections of requirements to 2020 show an oversupply of beds in neighbouring areas.

Day Care

2.11 The main centre for day care for the elderly in Harlow is Harlow District Council's Leah Manning Centre, which offers a wide range of services. The premises also houses the Williams Day Unit, run by West Essex PCT, which offers physiotherapy, occupational therapy, speech and language therapy and treatment.

2.12 A wide range of other activities and services for the elderly are delivered from community facilities across Harlow. For issues concerning premises see Community Facilities below.

Arts, Culture and Heritage

Baseline Position

2.13 There are seven main arts facilities in Harlow. These are:

- **The Gibberd Gallery** at the Civic Centre is a purpose built exhibition space designed to house the Frederick Gibberd Collection of 20th Century watercolours & drawings alongside a varied programme of temporary exhibitions.
- **The Gibberd Garden** was designed by Sir Frederick Gibberd, Harlow's original master planner. There are more than 80 sculptures incorporated into the design and it is recognized as one of the most important gardens of the 20th century.
- **Parndon Mill**, an arts centre with 19 studios housing a wide range of artists and a gallery for the display and sale of work by local artists.
- **The Playhouse** is the main performing arts venue in Harlow. Its programme includes traditional theatre (both professional and community-based companies), ballet and contemporary dance, classical music events, comedy and pantomime. It also hosts a wide range of community arts activities. It is located in the town centre.
- **The Square** is a venue for young people to perform, record and enjoy live music.
- **St John's Arts and Recreation Centre** is a community arts centre in a converted church in Old Harlow. It offers a varied programme of activities and events including exhibitions, workshops and concerts.
- **Victoria Hall Theatre** is also a former church in Old Harlow converted to a theatre used particularly to stage productions by local community theatre groups.
- The new sports hall at the **Gateway Community Leisure Centre** will double as a concert hall, filling a current gap in provision, from 2009.

2.14 In addition, the **Museum of Harlow** has displays covering the history of Harlow from pre-historic times to the present.

2.15 The town has a strong tradition of public art. The Harlow sculpture collection is a major cultural asset. There are more than 70 works on display throughout the town, mostly owned by the Harlow Art Trust. The Stort Sculpture Trail is a recent addition. There is a

continuing commitment to public art in Harlow, as evidenced by contributions negotiated with the developers at the Gateway and New Hall.

2.16 Harlow also has a strong community arts scene whose continued development needs to be catered for as the town grows.

Proposals, Gaps and Issues

2.17 It is not clear that Harlow is underprovided with arts facilities but there are a number of issues which need to be addressed as the town grows.

Facility-specific Issues

2.18 There are a number of issues current in 2008 listed below. We anticipate most of these should be resolved by 2011. The main exception is likely to be the Playhouse (see below).

The Gibberd Gallery

2.19 There have been issues concerning the long-term management and funding of the Gallery. It is now managed by Harlow Art Trust and handover of the lease to the Trust is under consideration.

The Playhouse

2.20 This is a 'tired' 1970s building. The heating and air-conditioning are in need of expensive refurbishment. Re-provision is under consideration – this will need to take account of the proposed growth of the Town. There is a commitment to provide a new playhouse as part of new development at Market Square. In the current state of the market, reprovision by 2011 is not certain.

The Square

2.21 The facility is run as a youth and community music venue by a new community interest company (CIC). The site has been sold for development and the venue will move to the Latton Bush Centre (see community centres) as a temporary measure, but will need new permanent premises in the longer term. The intention is that developer contributions from the redevelopment of the existing site will provide funding for the new premises there.

Victoria Hall Theatre

2.22 Victoria Hall Performing Arts Association currently requires £90,000 in order to purchase the leasehold from Essex CC. Discussions are on-going.

General Issues

Funding

2.23 At the time of writing there is no standard charge or similar arrangement for obtaining planning contributions from developers towards art facilities. Contributions towards facilities and public art are currently negotiated on a case-by-case basis. By 2011 it can be expected that contributions will have been systematised.

Studio Space for Artists

2.24 There are 19 studio spaces at Parndon Mill which are currently the only ones in Harlow. There is demand for considerably more. There is a proposal to provide studio spaces for local artists at the new community centre at Newhall. This is planned for Phase 2 of the development. Whether it will be available by 2011 will depend on the rate of development.

Facilities in Community Centres

2.25 Community centres are used by community performance groups (theatre, music and dance) for rehearsal. There is a shortage of affordable provision. Re-provided and new community facilities provide an opportunity to fit facilities such as sound-proofing (for music rehearsals) and sprung floors for dance groups. There may be provision in the Town Centre scheme, in the re-provided community centre at Potter Street and the new one at Newhall. There is also an issue of providing more of these facilities in existing centres. There may be some additional facilities by 2011.

Youth Arts Provision

2.26 There are many established dance and theatre groups in the town that offer classes for young people but there is far less visual arts and music provision. There is only one visual arts group for young people (run by the Youth Service) and there is a shortage of rehearsal and performance spaces for young bands.

2.27 If there were more youth facilities more ad hoc arts and cultural activities would naturally take place as well as provide opportunities for projects to be developed.

Children's Services

Baseline Position

2.28 The position set out below is largely that in 2008, with changes to 2011 identified where known.

Children's Centres

2.29 There are two SureStart Children's Centres – the Tree House in Staple Tye and the Meadows in Hare Street, with associated nurseries. There are four smaller satellite centres at Burnt Mill School, Mark Hall School, Potter Street School and Sumners Leisure Centre. These provide a network which will have been open to families from the whole of Harlow since January 2009. Depending on the level of development there may be a need for further provision by 2011.

Day Nurseries

2.30 There are eight Day Nurseries. Most of these are private.

Pre-school Playgroups

2.31 There are 21 pre-school playgroups.

Social Services

2.31.1 Essex County Council runs the following children's services in Harlow:

- Adoption Services at Westfield House
- Assessment and Child Protection Services at Willowfield House
- Integrated Support Service (Team around the School Child and Community – TASCC and Special Education Needs Service) at Brays House
- Looked-after Children Service Base at Petersfield.

Current Proposals, Gaps and Issues

2.32 There are issues over accommodation. A general issue is childcare in dual-use building, described in the next section. There is a specific issue of relocating the Integrated Support Team from Brays House, which is only available until summer 2009.

2.33 Essex County Council have commissioned a comprehensive mapping exercise of provision for children in Harlow, which will provide further information on gaps and other issues.

Community Facilities

Baseline Position

2.34 The concept for Harlow was based on four residential areas, each with a neighbourhood centre. As the town has grown Church Langley and Old Harlow have also become residential areas. At neighbourhood level there are 18 small shopping centres, known as hatches. Within the neighbourhood centres and hatches are 12 community halls known as 'common rooms'.

2.35 The 12 Common Rooms are operated by Community Associations (CAs):

- Eight of them by the largest, Great Parndon CA – a large and successful CA
- Three by Mark Hall CA
- One by Potter Street CA

2.36 Community Rooms are supplemented by leisure centres, church halls and other premises which are used by community groups, arts groups, youth organisations and clubs – see Appendix 1, which lists 18.

2.37 By 2011 there may be an additional community centre at Newhall to serve the new housing there. Construction will take place as part of Phase 2 of the development.

2.38 Existing community centres at Potter Street (Prentice Place) and Staple Tye will have been reprovided as part of the GAF2 Southern Corridor programme. Reprovsion at Old Harlow should be nearing completion. This will have the potential to serve some of the new development in the area.

Proposals, Gaps and Issues

2.39 While there appear to be plenty of meeting rooms and small halls for community groups to hire/lease in the town, many local groups have expressed the view that there is an issue with affordability.

2.40 Some facilities have dual use that is not entirely compatible – e.g. buildings used for childcare during the day and sporting activities at night. Users often have to move furniture/mats/equipment around to accommodate this dual use.

2.41 As described above, there is also a problem of aging facilities which no longer meet current needs. By 2011 GAF2 funding will have helped improve existing facilities along the Southern Corridor at Old Harlow.

2.42 Re-modelling will be welcomed if it includes versatile space for community groups to use. But if it is not affordable in terms of rental/service charges it could stand empty, which raises issues of subsidy either of buildings or the groups using them.

2.43 At the new community centre at Newhall it is proposed to provide some studio space for artists, thus addressing a specific area of need.

Education

Primary Schools

Baseline Position

2.44 There are 31 primary schools in Harlow with a capacity of 7,900 and approximately 6,800 pupils.[1] Of these:

- 23 are combined infant and junior schools, of which 7 have a nursery class
- There are four infant schools (three with a nursery class)
- There are four junior schools.

2.45 There are also three primary schools outside Harlow in Hertfordshire which may have some potential to cater for proposed growth to the north of Harlow. These are at Hunsdon, High Whych and Stanstead Abbotts.

Current Proposals, Gaps and Issues

2.46 By 2012 the school organisation plan forecasts a surplus of 467 places across Harlow (taking into account housing growth), but the surplus will be mostly in the south of the town (Brays Grove, Kingsmoor), so there is likely to be a limited contribution towards growth outside the existing urban area. The LEA considers that there is sufficient spare capacity within schools in the town to cater for demand arising from new development within it.

2.47 The amalgamation of Purford Green infant and primary school will have been implemented in January 2009. This will not necessarily lead to a short-term reduction in capacity, as it is more to deal with the difficulty of recruiting primary heads than over-capacity. This problem must be exacerbated by the small size of Harlow primary schools. The town has a high proportion of one-form entry schools for an urban area. A further amalgamation is in the early stages of consideration in 2008, and may have been implemented by 2011.

2.48 On the other hand, the schools at Church Langley (Church Langley and Henry Moore) have already been expanded from one form entry to two form entry plus (480 and 570 places respectively) to meet growth in that area.

2.49 The LEA has identified two potential primary school sites at Newhall, for a one-form and a two-form entry school respectively. Whether either of these will have been provided by 2011 will depend on the rate of development there.

2.50 The LEA is to carry out a capacity planning exercise for both primary and secondary schools when the growth proposals are firmed up. The dense network of primary schools in Harlow, and their spare capacity, will be able to absorb much of the growth proposed for within the existing urban area.

Secondary Schools

Baseline Position

2.51 There are five secondary schools with a capacity of 5,300 with approximately 5,100 pupils.[2] Four schools cover the age range 11 to 16; one has a sixth form and covers 11 - 18. There will be no change in the number of schools by 2011.

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[1] Essex School Organisation Plan 2007-2012. Summary details of capacity and surplus/deficit places are provided on Appendix 1.

2.52 There is also one special school – age range 3-19 - with about 120 pupils.

Current Proposals, Gaps and Issues

2.53 Oversupply of places resulted in agreement to the closure of Brays Grove School which took place in August 2008. Passmores School will have been relocated to a new building on the Brays Grove site in September 2011 in order to provide a better distribution of secondary schools across the town. The existing Passmores site will be sold to help finance the new building.

2.54 The Essex School Organisation Plan shows a small deficit (-225 places) of secondary places by 2012, taking into account new housing. Depending on the level of development measures may be required to increase capacity in existing schools.

2.55 The capacity planning exercise will show the potential of the existing schools to absorb growth within the existing urban area and on its periphery, and identify where additional provision will be required.

Funding

2.56 Where developers propose housing developments of more than 12 dwellings, and there are insufficient actual or projected surplus school places in the local area to absorb the projected child yield, Essex CC will require a contribution based on the number of places the development will generate, multiplied by the current DfES costs of a school place.

Further and Higher Education

Baseline Position

2.57 Further education is delivered by Harlow College. Essex County Council deliver the Adult Community Learning.

Harlow College

2.58 Harlow College has 3,000 16-18 year-old students. 47% come from Harlow, most of the remaining 53% come from within a 10 mile radius. Within this the College faces competition from 30 schools with 6th forms. There are 5/6,000 adult students, from much further afield. The catchment area population is approximately 250,000.

2.59 Most of the College's provision is the same as its neighbours, but there are specialist courses for which local students go to other colleges and vice versa.

Higher Education

2.60 ARU and the College started delivering degree courses in Harlow on a franchise basis in September 2008. The courses are approved, funded, and monitored by ARU. Funding has been approved for an HE building adjacent to the College which should be ready by 2011.

Adult Community Learning Service

2.61 Adult Community Education is delivered from two sites in Harlow: Northbrooks House and Rivermill. The service currently caters for 1,000 learners undertaking FE funded courses and 1,700 undertaking non-accredited courses.

Proposals, Gaps and Issues

2.62 The College has significant plans for expansion over the next five years. It has a £40m replacement and expansion programme which is currently going through the LSC's

[2] Ibid

approval process. There is unlikely to be a physical start until 2009, and the programme will have three years to run in 2011.

2.63 The aim of this expansion is to meet the current need to extend coverage of 16-18 year-olds. In 2008 25% of 16 year-olds and 40% of 17 year-olds do not go to college. If the College is successful this percentage will be lower in 2011.

2.64 In 2008 there are 5/600 young people in the 16 – 18 year age group who are NEET.

2.65 The College is also moving towards regional specialist status and expanding adult provision.

2.66 The College has a role in regeneration in Harlow. Apart from its role in preparing young people for the labour market and enabling existing workers to upskill, it is the lead in a sub-regional consortium on employer engagement.

2.67 Projected growth for Harlow will increase the College's catchment population by about 50,000 (20%) over the plan period. Growing the College over 20+ years to meet this should be feasible.

2.68 The long-term aim of the Adult Community Learning Service is to integrate its two sites into one and use space associated with Harlow Central Library to provide a drop-in learning facility in the town centre. It is not clear whether this will be implemented by 2011.

Emergency Services

Police

Baseline Position

2.69 Harlow is a police district of Essex Police, whose boundaries are co-terminous with the local authority.

2.70 There is one police station, which is also the district HQ, in central Harlow, and two subsidiary buildings in Old Harlow.

2.71 There are five neighbourhood policing teams: Central, North, South, East and West.

Proposals, Gaps and Issues

2.72 A review of future requirements is being undertaken.

Fire

Baseline Position

2.73 The fire service in Harlow is provided by Essex Fire & Rescue. There are two fire stations:

- No 70 Harlow Central
- No 82, Old Harlow.

Proposals, Gaps and Issues

2.74 A review of future requirements is required.

Health

Primary Care Services

Baseline Position

2.75 Overall responsibility for the commissioning of healthcare rests with **West Essex PCT**, covering Harlow, Epping and Uttlesford The PCT headquarters are based in Epping The Harlow Locality Team, headed by the Harlow Locality Director is based at Terminus House, Harlow.

2.76 **Harlow Health Centres Trust** (HHCT) owns and leases seven health centres across the town, housing 8 of the 10 general practices in the town.

2.77 Barbara Castle Health Centre is owned by HDC and space is leased to a GP practice, dental practice and West Essex PCT.

2.78 There are 10 GP practices with 45 GPs. There is at least one GP practice in each health centre. All GP practices are in purpose-built accommodation. The ratio of GPs to population is above the national average of 1 GP per 1,900 patients.

2.79 Two of the Health Centres will have recently been re-provided by 2011 as part of the GAF2 funded Southern Corridor regeneration:

- Lister House at Staple Tye covers the Southern Corridor and will have been replaced with a new building, to increase its coverage from 17,000 to c20,000 patients. The new building will incorporate a GP practice, PCT Community Services, a dentist and a pharmacy. Due to be operational April 2010.

2.80 Osler House at Potter Street is to move into an unoccupied neighbourhood office. Current site to be replaced with housing. Reprovision will house a GP practice, pharmacy and some PCT community services. Coverage will increase from 3,500 to 5,500. Due to be operational April 2011.

2.81 Details of the location of the new Jenner House Health Centre at Old Harlow to be provided with GAF2 funding are currently under consideration. Subject to these being resolved construction of new premises to house a GP practice, PCT community services and pharmacy (dentist already nearby) should be nearing completion in 2011 for opening in 2012. Coverage is to increase from 8,000 patients to c20,000.

2.82 The increases in coverage at Lister House and Osler House will provide capacity to deal with development within the town. The increase in coverage at Jenner House will provide capacity to growth at Newhall and beyond.

2.83 There is a **walk-in centre** in Wych Elm which deals with, minor illness, minor injuries and provides advice. The PCT has integrated this service with Accident & Emergency services at Princess Alexandra Hospital. Both services will be co located on the Princess Alexandra Hospital site within three to five years (2011 to 2013).

2.84 The PCT will have reduced its involvement in the direct provision of care by tendering out Sydenham House, a 56 bed care home, to an independent organisation to be run as a nursing home.

Proposals, Gaps and Issues

2.85 The Barbara Castle Health Centre needs early consideration for redevelopment. Reprovision would provide an opportunity for expansion to cover any growth to the south and west of the town if the takes place.

Hospital Services

Baseline Position

2.86 The District General Hospital (DGH) is **Princess Alexandra** (PAH) at Harlow. It is run by the Princes Alexandra Hospital NHS Trust. 97% of its services are commissioned from the West Essex and East &North Herts PCTs in a 70:30 ratio.

2.87 Overall growth of 20 - 30% is projected over the next five years, 2009 - 2013, including the impact of networked services, which cover a larger catchment area. An Integrated Business Plan covering this growth is being drafted.

2.88 NHS policy of moving care to PCTs and nearer homes will be more than offset by growth arising from 'the Hertfordshire reconfiguration': the reduction in A&E services at the QE2 at Welwyn Garden City will lead to increased flow to PAH. There will also be a small change in flows as a result of changes at Chase Farm, Barnet. The population served by PAH will increase from the current 260,000 to 300,000 by 2013 driven by both demographics and patient flows. Through networking some services will cover a population of 500,000.

2.89 In 2008 PAH has 489 beds and provides the usual range of services, including intensive care and neo-natal. By 2011 the Trust plans to have added the equivalent of two new wards totalling 50 beds, making a total of 539 beds. All wards at PAH will have dedicated infection control side rooms.

2.90 In addition to the refurbishment described above, current proposals for development in the period 2009 - 2013 include:

- Additional birthing units to take account of the shift in demand from Hertfordshire
- Upgrading A&E, which will be too small
- Creating a paediatric out-patients department and an upgrade of the neonatal facilities
- A cancer unit, possibly a JV with MacMillan 'to bring patients back from London' for on-going care and treatment care
- A multi-storey car park.

2.91 In 2011, PAH will be in the middle of this five-year growth plan.

2.92 Some smaller specialities, such as Burns and ENT are/will be provided on a 'hub and spoke' basis, with, for example, a hub at Broomfield, Chelmsford, but most are at PAH, which will continue to provide a full range of services. Many cancer-related services are linked to specialist centres, although much of this care is delivered locally at PAH.

2.93 The following community services are provided from the PAH:

- Paediatrics
- Midwifery

2.94 For Community Hospitals, Harlow residents use facilities in Epping. There are no proposals to provide one in Harlow.

2.95 The Trust provides satellite outpatient and diagnostic services outside Harlow from:

- The Herts & Essex Hospital, Bishop's Stortford
- St Margaret's Hospital, Epping
- The Tower Clinic, Hoddesdon

- Saffron Walden Community Hospital.

Proposals, Gaps and Issues

2.96 The older (1960s) parts of the PAH will need 'radical investment' over the next 10-15 years as they will no longer be fit for purpose. The Trust has factored this into its current five-year plan. The current hospital site is suitable for this longer term development but opportunities for re-siting linked to Harlow regeneration and the growth of Harlow North are a potential subject to suitable planning gain.

Mental Health

Baseline Position

2.97 Treatment of Mental Health is the responsibility of the NE Essex Mental Health Partnership NHS Trust.

2.98 Two Community Mental Health Teams operate from the Latton Bush Centre and provide community and day services. There is a 24 hour assessment team for emergencies.

2.99 In-patient provision is at PAH.

2.100 Child and Family Services operate from central Harlow.

Ambulance Service

Baseline Position

2.101 Ambulance services are provided by the East of England Ambulance NHS Trust, which is an amalgamation of the Ambulance Trusts in the Region.

2.102 The Ambulance Station is located in central, adjacent to the PAH. In 2008 it had recently been extensively refurbished and the Harlow Walk-in Centre located in the former garage space. As described above, this will be integrated with A&E at the PAH in the period 2011 - 2013.

2.103 The ambulance service now seeks to locate ambulances and rapid response cars at mobile cover points. These are located close to 'hotspots', as determined by the location of incidents, in order to speed up response times. In Harlow in 2008 there is a mobile cover point at the Clock House Tower roundabout at the junction of Second Avenue and the A414.

Proposals, Gaps and Issues

2.104 Ambulance trusts are seeking to provide basic restroom facilities at 'hotspots' so that para-medics have somewhere other than their vehicles to wait, and the Trust wishes to provide facilities at the Clock House Tower roundabout. It is not clear whether these will have been provided by 2011.

2.105 Other "hotspots" will be created in time as the service is reviewed.

2.106 The creation of the new Trust has this has eliminated the boundary on the County border, so it will be possible to consider Harlow, including the North Harlow growth area, as a single area from the point of view of ambulance services.

Libraries

Baseline Position

2.107 In 2008 Harlow has five libraries: the Central Library and four local ones, at Great Parndon (Staple Tye), Mark Hall, Old Harlow and Tye Green.

2.108 By 2011 Great Parndon Library should be reprovided as part of the GAF2 funded Southern Corridor programme.

2.109 In 2008 Church Langley has no static library provision. The service is investigating a possible library site, and is seeking to use planning gain from the neighbouring Newhall housing development to provide the basis for a new library facility at Church Langley – this is still in its initial exploratory phases, so it is possible that a new library will not be completed by 2011. New provision here has potential to serve further expansion to the east.

Proposals, Gaps and Issues

2.110 There is a general issue with the four local libraries, which is that of making better use of the existing sites by exploiting their potential for co-location with other public services. In the case of Great Parndon this may involve relocation.

Regeneration

Baseline

2.111 Training and upskilling: the main facility in Harlow is the College – see Education above for the College's proposals for growth.

2.112 By 2011 there will be three sets of managed business space with common services in Harlow:

- The Harlow Business Centre with 55 units
- The Latton Bush Business Centre with 19 Council-owned office and light industrial business units.
- The Harlow Incubation Centre which opened in 2008, funded by EEDA and GAF2. It provides 51 units for new and growing businesses, particularly in knowledge sectors. The centre will provide business support to new businesses across Harlow as well as to its tenants.

Proposals, Gaps and Issues

2.113 It will be necessary to review demand for start-up and grow-on space as the town grows.

Youth Services

Baseline Position

2.114 There is a Young People's Information Centre (YPIC) for ages 13-25 with several youth workers located in the One Stop Shop in the town centre. The Connexions service is run from YPIC.

2.115 Essex Youth Service runs two dedicated youth club facilities: the Grove Youth Centre at the former Brays Grove School site, Traceys Road, and the Xperience Centre at Broadley Road. By 2011 the Grove Centre will have to have been reprovided on another site because of the redevelopment of the site for Passmores School.

2.116 There is a young people's café in the town centre: Café Youth, provided as a result of an initiative by Harlow Youth Council, opened in the town centre in March 2008.

2.117 A range of services for young people are delivered from sports and community facilities across the town, together with mobile facilities. This includes The Square (see Arts above).

2.118 An important element of provision for young people is Harlow Outdoor Education Centre at Burnt Mill Lane.

Proposals, Gaps and Issues

2.119 Essex Youth Service consider that a current gap in provision is the lack of a permanent youth facility in or near the town centre. There are no firm proposals for provision by 2011.

2.120 Harlow Arts consider that there is a shortage of arts provision for young people (see Arts above). Reprovided and new community facilities may provide an opportunity to create additional provision.

3. Environmental Protection, open space, recreation and sport

Introduction

3.1 This section considers infrastructure needs relating to Open Space, Outdoor and Indoor Sports facilities and public realm infrastructure consistent with the definition of open space provided in Annex A of PPG17 Open Space, Sport and Recreation.

3.2 The approach taken to review existing provision, identify future requirements and identify gaps and future requirements has been as follows:

- Review of existing Local Plan, Open Space/Planning Obligations SPDs and supporting Evidence Base;
- Discussions with relevant officers to identify key issues, future needs and opportunities;
- Review of Harlow Area Study (2005).
- Review of potential strategic greenspace opportunities from the Chris Blandford Green Infrastructure Plan (2006).

3.3 This review highlights where further analysis is needed to establish future needs and our proposed approach to establishing infrastructure costs.

Identification of infrastructure needs

3.4 We have reviewed the existing approach to establishing additional infrastructure needs and costs with each authority and identified the appropriateness of the existing approach for establishing future needs.

Harlow

Typologies

3.5 Harlow was designated as a New Town on the 25 March 1947 and covers an area of 2,588 hectares. The master plan was led by Sir Frederick Gibberd and implemented by Harlow Development Corporation and subsequently Harlow District Council from 1980. The recent '2020 Vision' proposes that the original principles of the masterplan are carried forward for the future growth of Harlow.

3.6 The key design principle of the Plan was for several self-sufficient 'cluster neighbourhoods' of 6,000-10,000 population. These were designed with: strong relationship between buildings and roads with their landscape; compact grouped buildings complemented by open spaces; a high density of development over the whole area, providing a clear contrast between the town and the countryside outside its boundaries; composition balanced around the centre; small gardens but large 'Green Wedges' between neighbourhoods.

3.7 Consequently public open space in Harlow comprises of the large 'Green Wedges' and the Town Park, along with the smaller green spaces within the residential and business areas of the town, termed 'Internal Open Space'.

3.8 Green Wedges are identified in Policy NE1 in the Local Plan as providing 7 purposes including contributing to the amenities of local residents which could encompass

activities such as sport and recreation facilities if these are compatible with landscape, ecological and other objectives.

3.9 Local Plan Policy NE2 identifies proposals for extensions to Green Wedges in the vicinity of Newhall and at Land to the East of Allende/Fifth Avenue.

3.10 The Green Space Strategy provides more detail on the sports and recreation value of the Green Wedges. It identifies that that in terms of their catchment they draw users both locally (i.e. under 400m) and further afield but within the town (up to 1000m, or greater). They differ in character and facilities and are likely to include the PPG17 typologies of parks and gardens, natural and semi-natural urban greenspaces, with some having secondary purposes of outdoor sports facilities.

3.11 The typologies identified in the Strategy and their close PPG17 equivalents are as follows:

Harlow Greenspace Strategy Definition	PPG17 Definition
Green Wedges	Primarily natural and semi-natural urban greenspaces or parks and gardens; some secondarily provide outdoor sports facilities and provision for children and teenagers.
Access and rights of way	Green Corridors
Accessible natural areas	Natural and Semi-natural Urban Greenspaces
Allotments	Allotments
Children's playgrounds	Provision for Children and Teenagers
Internal green spaces	Amenity Greenspace
Playing fields	Outdoor Sports Facilities
Not identified	Cemeteries and churchyards

3.12 Two of the open space types identified in PPG17 were not considered within the Greenspace strategy. There will be a need to consider whether additional space is required for these types of infrastructure in connection with new development. It is anticipated that cemetery provision would take place outside of the urban extension locations and that a cemetery/crematoria operator would be responsible for bringing forward any additional provision or extensions to existing facilities which may be required.

3.13 It is envisaged that civic spaces would be incorporated with each new neighbourhood as part of a neighbourhood centre. The scale of public realm would reflect the nature and type of facilities to be provided.

Greenspace, Sport and Recreation Standards

3.14 The Draft 2005 Green Space Strategy sets a long-term vision for the Green Wedges, and identifies specific standards for each of the 'facilities' or main uses of the green spaces in the District and proposals for their implementation. These standards have been taken forward and have been adopted within the Open Space, Sport and Recreation SPD (2007).

3.15 The local open space standards seek 2.09 hectares per 1000 population of open space made up as follows:

Table 3.1 – Open Space, Sport and Recreation Standards in Harlow

Type of Open Space	Provision Per 1,000 Population	Catchment	Comments
Playing fields (e.g. football, cricket etc)	1.00 ha	1,000m	Three Ward groupings.
Playing Fields (rugby)+	0.13 ha	District wide	Proportion of cost towards District wide provision until provision is made.
Children's Playing Space -Local equipped play areas (LEAPs) -Neighbourhood equipped play areas (NEAPs)	 0.13 ha 0.13 ha	 400m 1,000m	 Ward basis. Ward basis.
Allotments	0.3 ha	1,000m	Three Ward groupings.
Internal Open Space	0.4 ha	400m	
Rights of Way	District wide	Proportion of cost of District wide schedule of provision and enhancement	
Town Park		District wide	
Accessible Natural green spaces		Within 300m, 2km, 10km of home	
Water based recreation		District wide	
Green Wedges		District wide	
Total	**2.09 ha per 1,000**		

3.16 No specific standards are proposed for Green Wedges. It is stated that these are special landscape features and should be retained with the same principles used to inform future extensions to Harlow.

3.17 At present there are no specific standards relating to natural or semi natural greenspace, outdoor non pitch sports such as tennis, stadia, cycling etc, indoor sports facilities, cemeteries or public realm.

3.18 It is appropriate to consider the approach to identifying future needs for these types of facilities and provide a basis for identifying provision costs.

Existing deficiencies

3.19 The open space strategy identifies existing deficiencies in the district in comparison with the proposed standards. These are summarised as follows:

3.20 For ‘Accessible natural areas’ four deficiency areas have been noted in relation to small sites and the south of Harlow for larger sites. It is proposed to develop one small site and one larger site to address these deficiencies. The smaller site(s) could be delivered

by changing the management and maintenance of parts of exiting 'internal open space' areas, whilst the larger site could be established in the North and West around Harlow Marshes and possibly opening access to the common land.

3.21 In relation to allotments, there are several areas of deficiency within the district where provision is below the identified quantity standard or where there is a deficiency in access. The deficiency areas include Sumners and Kingsmoor which have no allotments and Church Langley, Harlow Common, Bushfair, Staple Tye and Toddbrook which are under provided for compared with their projected population in 2011.

3.22 Internal green spaces. (comprising PPG17 Amenity Greenspace plus non-NEAP/LEAP play areas). There are three wards within Harlow which are below the provision standard at 2011. In addition there are four areas within the District which have deficiencies in access these are (East Church Langley, North East Bushfair, Little Parndon and West Old Harlow).

3.23 For Playing fields the central, east and west sub areas are below the quantity standard for pitch provision. In addition, the district is below the provision standard for rugby.

3.24 For children's playgrounds, most playspaces are identified within the strategy as NEAP or LEAP type facilities. However, they score fairly low NPFA quality scores due to them being unfenced. There are significant disparities between wards particularly when child population levels are taken into consideration. The proposed standard is for one NEAP and at least two LEAPs in every ward. Specific sites and timescales for their provision have been identified and a number of improvements have been completed.

SPD Developer contribution levels

3.25 The Open Space SPD (2007) proposes contributions from developers of 10+ units of housing, for off site provision, of £525.23 per person capital cost and (if not directly funded by the developer) various rates for maintenance depending on the type of space as a 20-year commuted payment. These relate to Amenity Greenspace, Provision for Children and Teenagers, Allotments, Green Corridors and Outdoor Sports Facilities. It notes that for Rugby Playing Fields contributions will be put towards the provision of a whole-district facility. Table 3.2 provides a breakdown of provision costs by type. In establishing a basis for future provision costs it will be necessary to review the assumptions used.

Table 3.2 – Open Space Contributions Harlow

Type of Open Space	Sqm Per Person	Provision Cost per sqm (£)	Contribution Cost per person (£)
Playing fields (football and cricket)	10	15.75	157.50
Playing fields (rugby)	1.3	15.75	20.50
LEAPs	1.3	90	122.85
NEAPs	1.3	50	68.25
Allotments	3.0	10	31.50
Internal open space	5.0	10	52.50
Rights of Way	na	na	33.50
Town Park	8.22	4.70	38.63
Total			**£525.23/ person**
Accessible natural green space	To be negotiated		
Water based recreation	To be negotiated		
Green Wedges	To be negotiated		

3.26 The guidance states that capital and maintenance funding/arrangements for Accessible Natural Greenspace, Parks (i.e. Green Wedges), Water-based recreation (i.e. River Stort) and the Town Park in the case of large development proposals, would be negotiated on a site by site basis.

3.27 Table 3.3 sets out the current rates used for deriving maintenance costs for open space. Again these rates will be reviewed to identify whether an basis is needed to establishing future costs.

Table 3.3 – Contributions for Maintenance

Open Space Type	Cost per sqm (2004) / £	Commuted Payment for 20 year period
Playing fields (football and cricket)	£0.65/ sq m	£16.60/sq m
Playing fields (rugby)	Na	Na
LEAPs	£4.75/sq m	£121.31/sq m
NEAPs	£3.15/sq m	£80.45/sq m
Allotments	£1.05/sq m	£26.82/sq m
Internal open space	£0.52/sq m	£13.28/sq m
Rights of way	Na	Na
Town Park	To be negotiated on a one off basis in relation to large sites.	
Accessible natural green spaces	To be negotiated on a one off basis in relation to large sites.	
Water based Recreation	To be negotiated on a one off basis in relation to large sites.	
Green Wedges	To be negotiated on a one off basis in relation to large sites.	

Open Space Proposals

3.28 A range of proposals for upgraded greenspace infrastructure have been identified within the Councils Greenspace strategy (2004). Those relating to the provision of additional greenspace include:

- Harlow, Epping Forest, the River Stort and the Lea Valley Green Spaces Project: This project is being funded by ODPM and led by Groundwork. The first layer of the project incorporates projects in the Town Park and the Green Wedges within Harlow. The second layer encompasses the wider environs, examining strategic links such as Stort Valley and Harlow southwards to Epping Long Green, and the areas surrounding these links. The overall aims of the project are to enhance the intrinsic character and nature of the green spaces within Harlow and the wider countryside, and to acquire new accessible green spaces and to create links between them.
- North West Green Wedge: develop ‘accessible natural area’ using existing sites to establish accessible 'natural area' of minimum size of 20 ha;
- North East Green Wedge: develop new ‘accessible natural area’ of minimum size of 20 ha; could link to Gibberd garden;
- Bushfair (central part): develop new ‘accessible natural area’ of minimum size of 0.0625 ha (25 m x 25 m);
- South east Staple Tye/east Harlow Common Develop new ‘accessible natural area’ of minimum size of 0.0625 ha (25 m x 25 m);

- South east Great Parndon/north east Sumners and Kingsmoor. Develop new 'accessible natural area' of minimum size 25 m x 25 m.
- The town centre/Dashes area of Netteswell: Develop new 'accessible natural area' of minimum size 25 m x 25 m.
- East Church Langley: provide new internal green space to meet standard.
- North east Bushfair: provide new internal green space to meet standard.
- Little Parndon: provide new internal green space to meet standard.
- West Old Harlow: provide new internal green space to meet standard.
- The Stow: develop new pitch.
- New Hall: develop 4 new senior pitches (completed)
- Northbrooks: extend site and develop baseball field (completed)
- Rugby Club: develop new site for Harlow Rugby Club (site identified)

3.29 The Playing Pitch Strategy 2004 identified further proposals relating specifically to enhancing playing fields as follows:

- Improve Nicholls Field. Change the number and size of pitches to provide 3 seniors, 2 juniors and 3 mini pitches. Improve pitch quality and associated changing and car parking.
- Improve Bush Fair D to enable reestablishment of cricket at this site. Take out football.
- Improve Bush Fair changing, car parking and security.
- Improve Ladyshot Rec with pitch drainage, better changing and car parking.
- Improve The Stow by fencing if possible, or diverting informal path
- Improve the changing facilities at Church Langley
- Support Harlow Cricket Club in developing new pavilion at Marigolds/Spicers Field
- Develop 6 mini football pitches at Ash Tree Fields and improve car parking
- Improve Barn Mead with better drainage, changing and car parking
- Improve Goldings by works on pitches.
- Improve Tithelands by better drainage, changing, site security and car parking.

3.30 A new playing pitch strategy is in preparation and will be completed in 2009.

3.31 The Chris Blandford Green Infrastructure Plan (2006) identifies a further series of strategic green infrastructure proposals which include extending the network of Green Wedges, improving links to the countryside and the richness of landscapes and habitats in the Borough. Those proposals located within Harlow are located in Table 3.4. The schedule of proposals includes several projects which were identified within the Green Space Strategy.

Table 3.4 – Green Infrastructure Proposals

Project Type	Project Description
Strategic Parks	
Major areas of multi-functional public green	The Stort River Park

Project Type	Project Description
space.	N/A
New Strategic Parks	N/A
Local Green Space Parks	
Core Natural Green Spaces	
Historic Landscapes	
Heritage Landscapes should be given priority for integrated conservation management of archaeological, historical and cultural assets.	
Ancient Landscapes	5. Nazeing and Rye Hill
Historic Parklands	N/A
Historic Airfields	N/A
Stort Valley Historic Landscapes	Stort Valley Historic Landscapes
Strategic Destinations and Gateways	
Strategic destinations and gateways should be the focus of investment in high quality visitor facilities accessible by all.	
Major Strategic Destinations and Gateways	3. Harlow Town Park
Key Strategic Destinations and Gateways	N/A
New Strategic Destinations and Gateways	N/A
Greenways	
Linear habitats incorporating shared use paths	9. East Harlow to Matching Green 14. South Harlow to Rye Hill 15. North Harlow to River Stort 16. North West Harlow to River Stort 17. River Stort to Church Langley
Riverways	
Multi-Functional corridors and sequences of spaces and places	N/A
New Urban Landscapes of Distinction	
Urban gateways targeted for environmental design improvements	1. Harlow Rail Station/ Town Park 2. West Harlow 3. East Harlow/ New Hall 4. South East Harlow / M11 Approach
Parkways	
Road transport corridors targeted for environmental design improvements	M11 A414 A1184

Other Discussions

3.32 Discussions were held with officers from HDC to identify other deficiencies in provision and opportunities for additional provision within the District. Feedback was received regarding other needs within the district especially relating to additional provision particularly indoor and outdoor sport. The main se can be summarised as follows:

- No recent assessment of indoor and outdoor sports needs has been undertaken. The Council is in the process of updating the 2004 playing field strategy.
- The major leisure centre within the District is currently undergoing redevelopment as part of the Harlow Gateway proposals. The new 'Leisure Zone' centre encompassing wet and dry sports facilities including a fitness centre and outdoor artificial pitches is due to open autumn, winter 2008.
- Other Sports Hall provision in Harlow is centred at secondary school sites most notably Mark Hall School which has an 8 court hall but also Mill School, Burnt Mill School, and Stewards School which have community access arrangements. Harlow is within the 2011/2013 wave of the Governments Building Schools for the Future programme which could attract investment to improved sports facilities at secondary school sites.
- Local Recreation Centres are located within each of the neighbourhood clusters these represent multi-use facilities which accommodate not only sport but also other community uses. There is a perception that these facilities are well used. A new facility at Church Langley is proposed with associated football pitches, tennis courts, changing facilities, meeting space and crèche facilities.
- There is a perceived need for additional full size and junior artificial turf pitches (ATPs) within the district. The Essex Facility Strategy states that there are currently 2 ATPs within the District, at Passmores School in the south east and at Marks Hall Sports Centre, in the north east of the urban area. The Strategy also states that there is a need for one additional facility. No location for the additional facility is specified within the Strategy, but the facility could be located in the north east of the Borough in order to maximise accessibility to ATPs from all parts of the District.
- Tennis. The 13 tennis courts in the District are generally in a poor state of repair and merit upgrading to facilitate additional usage. A new tennis centre with indoor play facilities has been completed at Latton Bush Centre.
- Mark Hall School – Proposal for the Athletics Track to be upgraded to county standard.
- Cycling – An application has been submitted by the Council for Harlow to become a "cycling town", a scheme promoting the use of cycling as a means of transport. If successful investment equivalent to £10 per head would be attracted. The bid proposals would establish a Southern cycle way within the town and link major trip generators, schools and leisure facilities in the town.
- Extreme Sports – A new 650 sq.m skatepark has recently been established at Town Park. The town is also served by the Harlow Outdoor Sports Centre on the River Lea which includes a climbing barn and informal canoeing facilities. Potential exists to establish a floodlit flatwater slalom course (recent unsuccessful A4A bid). In addition there is a perceived need for a BMX dirt track and mountain bike course to be established but no firm proposal.
- There is a perception that many spaces within the urban area under perform in terms of their recreational role and quality. A full quality audit of individual spaces within the District was undertaken in 2006 but has not yet been provided. It is envisaged that contributions from development within the existing urban area could be directed towards upgrading and improving existing spaces.

- Harlow has attracted Growth Area Funding under GAF1 and POD (GAF 3). This has been directed towards initiating the implementation of the Stort Valley Park proposals and upgrading the Town Park.

Epping Forest

3.33 The study area also includes parts of Epping Forest District. Epping Forest District Council uses a different approach to planning open space, sport and recreation needs.

Typologies

3.34 Epping Forest DC has not completed a PPG17 compliant open space assessment. However such a study is currently under preparation, the scope of this work includes consultation with the community to identify local needs and priorities. It is understood that it will not be concluded until after this study is completed.

3.35 In terms of typologies the Adopted Local Plan (2006 Alterations and 1998 Saved Policies) distinguishes only between public open space, playing pitches and playgrounds.

3.36 A Playing Pitch Strategy was prepared in 2007 in accordance with the 'six-acre' standard, the 1991 *Towards a Level playing Field* guidance, and PPG17 guidance. This identified football, rugby, cricket and hockey and athletics provision.

3.37 The Community Strategy 2004-2021 identifies that, along with Epping Forest and the Lee Valley Park, there are 180 wildlife sites, 6 local Nature Reserves and 431 miles (694 km) of public rights of way.

3.38 The portion of the study area which lies within Epping Forest District is largely open countryside in character.

3.39 No "urban open spaces" providing dedicated recreation provision are located within the study area. However the Lee Valley Regional Park and several SSSIs, County Wildlife Sites, Ancient Landscapes and Protected Lanes are located within the study area.

Standards and costings

3.40 An open space standard is set in the Adopted Local Plan (2006 Alterations and 1998 Saved Policies) within Policy DBE7. This is a saved 1998 Policy and is not based on an up-to-date assessment or full PPG17 assessment. An 'adequate' amount of public open space must be provided in connection with large (>1ha) residential developments, which is to be at least 10% of the net site area. It is also stated that at least 50% of the total area of public open space should be on a single site and located within the public space network where it fulfils an appropriate design function.

3.41 A PPG17 Assessment has been commenced but may not be published until 2009.

3.42 No costings are provided, and no Planning Obligations SPD has been completed.

3.43 However, the Playing Pitch Strategy 2007 includes a user survey, club survey, estimated team generation rates (indicating fairly low latent demand compared with local authorities nationally) and identifies specific proposals to address deficiencies for specific sports and analysis areas. No quantitative standard is set.

3.44 The Playing Pitch Strategy 2007 recommends that developer contributions are sought in areas of shortfall. Other sources of funding are explored. However the costs of provision have not been estimated.

Proposals

3.45 The Chris Blandford Green Infrastructure Plan (2006) also includes proposals which extend into Epping Forest. These are summarised in Table 3.5.

Table 3.5 – Green Infrastructure Proposals (Epping Forest)

Project Type	Project Description
Strategic Parks	
Major areas of multi-functional public green space.	
New Strategic Parks	N/A
Local Green Space Parks	N/A
Core Natural Green Spaces	N/A
Heritage Landscapes	
Heritage Landscapes should be given priority for integrated conservation management of archaeological, historical and cultural assets.	
Ancient Landscapes	5. Nazeing and Rye Hill
Historic Parklands	N/A
Historic Airfields	N/A
Stort Valley Historic Landscapes	N/A
Strategic Destinations and Gateways	
Strategic destinations and gateways should be the focus of investment in high quality visitor facilities accessible by all.	
Major Strategic Destinations and Gateways	2. Parndon Wood Nature Reserve
Key Strategic Destinations and Gateways	1. Gibberd's Garden 10. Pishiobury Park
New Strategic Destinations and Gateways	N/A
Greenways	
Linear habitats incorporating shared use paths	4. Lower Nazeing / Clayton Hill Country Park to Latton Bush 5. Roydon via Nazeing Common to Epping Forest 13. West Harlow to Lee Valley 9. East Harlow to Matching Green
Riverways	
Multi-Functional corridors and sequences of spaces and places	N/A
New Urban Landscapes of Distiction	
Urban gateways targeted for environmental design improvements	N/A
Parkways	
Road trasport corridors targeted for environmental design improvements	M11

East Hertfordshire

Typologies

3.46 A full PPG17 Audit and Assessment, including indoor sports was published in 2005. It considers all types of provision except Civic Spaces and accessible countryside in urban fringe areas, stating that these typologies are not applicable in the district nor can be measured quantitatively. For the other 8 typologies of open space the PPG17 categories of provision are used to define open space types.

3.47 The audit identified a total of 566 open spaces in East Herts District, and the area of provision is listed in the Annual Monitoring Report 2006-7 (see Table 3.6).

Table 3.6 – Existing Open Space Provision East Herts District

PPG17 Typology	Number of Spaces	Size (ha)*
Parks and public gardens	9	68
Natural and semi-natural green space	106	1000
Outdoor sports facilities	87	503
Amenity green spaces	106	71
Provision for children and young people	170	17
Allotments	33	28
Cemeteries and Churchyards	47 (AMR states 49)	N/A
Green Corridors	8 (AMR states '4 main corridors')	N/A

*in AMR 2006-7, based upon PPG17 Audit

3.48 A 3-kilometre buffer zone was set around the district to account for cross-boundary travel by East Herts residents to access indoor facilities. The majority of the geographical area of Harlow is within the 3km buffer therefore most indoor facilities in Harlow are included within the audit.

Standards and costings

3.49 Quantitative standards of provision and accessibility were set as identified and are shown in Tables 3.7 and 3.8. Some of the provision standards were altered in the 2007 Adopted Local Plan 2nd Review (within Policy LRC3 at Appendix IV) to take account of changes in provision and these are also shown. The accessibility standards in the PPG17 Audit and the 2007 Local Plan are identical.

Table 3.7 – East Herts Provision Standards

PPG17 Typology	Recommended Quantity Provision Standard	2007 Adopted Local Plan 2nd Review Standard
Parks and public gardens	0.53 ha per 1000 population	0.53 ha per 1000 population
Natural and semi-natural green space	7.76 ha per 1000 population	7.64 ha per 1000 population
Outdoor sports facilities	3.90 ha per 1000 population	3.79 ha per 1000 population
Amenity green spaces	0.55 ha per 1000 population	0.55 ha per 1000 population
Provision for children and young people	0.20 ha per 1000 population	0.20 ha per 1000 population
Allotments	0.22 ha per 1000 population	0.21 ha per 1000 population
Cemeteries and churchyards	PPG17 suggests quantity standard not required. However if a quantity	No standard set

PPG17 Typology	Recommended Quantity Provision Standard	2007 Adopted Local Plan 2nd Review Standard
	standard is needed this should be a population based standard also taking into account the demand for future burial space.	
Green corridors	PPG17 suggests that the setting of a quantitative standard is inappropriate.	No standard set

Table 3.8 – East Herts Accessibility Standards

PPG17 Typology	Recommended Travel Time	Equivalent Distance
Parks and gardens	Walk 10 mins	0.8km
Natural open spaces	Walk 10 mins	0.8km
Amenity green space	Walk 5 mins	0.4km
Play spaces for children and young people	Walk 5 mins	0.4km
Outdoor sports facilities	Walk 10 mins	0.8km
Allotments	Drive by car 10 mins	4km
Cemeteries and churchyards	No standard set	
Green corridors	No standard set	

3.50 Qualitative provision standards were also recommended in the PPG17 Audit and adopted in the 2007 Local Plan, based upon PPG17 requirements.

3.51 An Open Space, Sport and Recreation Facilities SPD is being prepared and is expected to be consulted on in Autumn 2008. A Planning Obligations SPD draft has been consulted on and is likely to be adopted in October 2008.

3.52 Tables 3.9 and 3.10 set out the standard charges for open space provision and maintenance charges identified within the Draft SPD.

Table 3.9 – Standard Charges for Open Space Provision

Facility	Provision standard per person (sq.m)	Cost per sq.m	Contribution per person
Parks and gardens	5.3	£36.20	£191.86
Outdoor sports facilities	37.9	£14.02	£531.36
Amenity Green Space	5.5	£14.86	£81.73

Facility	Provision standard per person (sq.m)	Cost per sq.m	Contribution per person
Provision for children and young people	2.0	£39.24	£78.48

Table 3.10 – Maintenance Cost Per Sqm

Facility	Maintenance Cost per sq.m (2007 prices)
Parks and gardens	£7.99
Outdoor sports facilities	£3.52
Amenity Green Space	£4.18
Provision for children and young people	£7.53

Existing open space proposals

3.53 The PPG17 Audit did not identify firm proposals although noted that greater provision for teenagers (e.g. skate park in Hertford, youth shelters in Bishop's Stortford) should be made. The AMR 2006-7 includes an Action Plan for the management of the District's parks and open spaces. None of these proposals specifically relate to the study area.

Evidence base

3.54 With district-wide provision being good, the focus is upon improving the local deficiencies where there are some considerable disparities in provision of most types of space by analysis area. The standards explicitly take into account the views expressed in the Household survey and other surveys, about the value, accessibility and the existing provision of each typology.

3.55 For parks and gardens the standard was set at the current level of provision since respondents were overall satisfied with provision and valued parks and gardens 'very important'. Three analysis areas (Buntingford, Bishop's Stortford and Ware) are significantly below this whereas Sawbridgeworth has approximately six times the standard (due to Pishiobury Park) and this has the lowest population of all six analysis areas. No major proposals are suggested to remedy the under provision.

3.56 The provision of natural and semi-natural greenspace exceeds the 2ha/1000 population ANGSt standard, with 7.76ha/1000 population.

3.57 Amenity greenspace has been set fairly low at 0.55ha per 1000 population, which is the existing standard.

3.58 Current provision for Children and Young People is low at 0.13ha/1000 population. All analysis areas have between 0.11-0.15ha/1000 population. The standard has been set at 0.20ha/1000 population.

3.59 The outdoor sports facility standard is set at 3.79ha/1000 population, which is marginally below existing provision of 3.90ha/1000 population, excluding golf courses. There is a good distribution of these sites locally, with all but one analysis areas showing 3.00ha to 3.63ha/1000 population.

3.60 The allotments provision standard of 0.22ha reflects current provision, however it is unclear how this standard is justified.

3.61 Green Corridors and Churchyards and Cemeteries do not have quantitative standards. Qualitative standards reflect PPG17 requirements.

3.62 With regard to indoor facilities there was found to be a slight oversupply in quantitative terms except for sports hall provision. It should be noted that there may be access and qualitative deficiencies in provision. In addition programming of facilities may restrict the actual availability of provision. It should be noted that the current position does not reflect the needs post 2010.

Table 3.11 – Existing indoor Sport and Recreation Needs

Typology	Current (2005)	Future (2010)
Sports halls	Unmet demand equivalent to 8 courts	Unmet demand equivalent to 6 courts
Swimming pools	Oversupply equivalent to 741 sq m water (approx. 3 swimming pools*)	Oversupply equivalent to 350 sq m water (approx. 2 swimming pools*)
Health and fitness	Oversupply equivalent to 22 stations	Oversupply equivalent to 12 stations
STPs	Oversupply equivalent to 2.4 pitches	Oversupply equivalent to 1.9 pitches

Identifying future needs

3.63 The Chris Blandford Green Infrastructure Plan (2006) also includes several proposals which extend into East Hertfordshire. These are summarised in Table 3.12.

Table 3.12 - Green Infrastructure Proposals (East Herts)

Project Type	Project Description
Strategic Parks	
Major areas of multi-functional public green space. **New Strategic Parks** **Local Green Space Parks** **Core Natural Green Spaces**	 The Stort River Park N/A N/A
Heritage Landscapes	
Heritage Landscapes should be given priority for integrated conservation management of archaeological, historical and cultural assets. **Ancient Landscapes** **Historic Parklands** **Historic Airfields** **Stort Valley Historic Landscapes**	 N/A North of River Stort N/A N/A
Strategic Destinations and Gateways	

Project Type	Project Description
Strategic destinations and gateways should be the focus of investment in high quality visitor facilities accessible by all.	
Major Strategic Destinations and Gateways	N/A
Key Strategic Destinations and Gateways	2. Eastwick Medieval Settlement
New Strategic Destinations and Gateways	1. Gilston Park Area
Greenways	
Linear habitats incorporating shared use paths	3. Roydon Via Harlow Town Park to Bishops Stortford (via Stort Valley) 11. Gilston to Bishop & Stortford
Riverways	
Multi-Functional corridors and sequences of spaces and places	River Stort Navigation
New Urban Landscapes of Distiction	
Urban gateways targeted for environmental design improvements	N/A
Parkways	
Road trasport corridors targeted for environmental design improvements	A414 A1184

Basis for deriving future infrastructure needs and requirements

3.64 The three local authorities within the study area have different approaches to planning for future open space needs within their Local Plans and associated Planning Obligations SPDs. Variations relate to both the typologies used to establish open space standards, the standards themselves and existing provision costs for developer contributions.

3.65 There is a need for a consistent basis for establishing future greenspace and sports facility needs to apply to all areas. We propose the following approach to establishing requirements.

Step 1: Application of existing open space standards

3.66 For identifying the local provision requirements within each of the nodes we recommend that the Harlow Local Plan standards are used as the basis of deriving needs.

3.67 The existing provision standards would be applied to the population of each new node/urban extension for Internal Open Space, Playing Fields, Accessible Natural Green Space, Children's Play and Allotments.

3.68 The costs for establishment and maintenance of each type would be reviewed to check that these reflect the quality and character of spaces and the range of facilities to be established within new spaces.

3.69 For growth which is to take place within the existing Harlow urban area it is proposed that the sums identified are directed to addressing improving the range and quality of existing provision within the catchment area where a deficiency in quality exists.

Step 2: Review of Green Infrastructure Plan and Strategic Green Infrastructure and Sports Facility needs

3.70 The next step would be to quantify the additional green infrastructure required to support each node not reflected in defined standards as well as strategic infrastructure to serve the growth of Harlow as a whole. This would incorporate:

- Extensions to Green Wedges;
- Unfunded Stort Valley improvements
- Access and rights of way improvements
- Landscape and environmental improvements
- Other proposals identified within the Harlow Green Infrastructure Plan

3.71 The Green Infrastructure Plan proposals would be translated into broadly defined projects with assumptions made regarding the area of space to be included and the type of environments/habitats and supporting amenities to be provided.

Step 3: Other strategic infrastructure requirements outside of the existing standards

3.72 We would then identify appropriate requirements for other types of green infrastructure not covered by existing policies and standards to reflect the future population. This would include:

- Indoor sports provision including swimming pools, sports halls and recreation centres;
- Outdoor sports provision including tennis courts, bowls, water based recreation, mountain bike/BMX provision etc;
- Public realm improvements within the new nodes such as civic spaces;

3.73 Area assumptions and cost estimates for new provision would be established reflecting overall provision requirements.

Quantifying Areas for Improvement

Introduction

3.74 The Chris Blandford Green Infrastructure Plan (2006) identified a series of strategic green infrastructure proposals throughout the study area (Table 3.4, 3.5 and 3.12). By considering these proposals along with Figure 4.1 (Indicative Housing Distribution for Analysis Purposes) outlined in the Inception Report (2008), a number of potential Strategic Improvement (SI) and Housing Projects (HP) have been identified.

3.75 The aim of this section is to:

- Identify the extent of the Chris Blandford Proposed Green Infrastructure Network (ha). In terms of proposed strategic improvements and those relating specifically to strategic housing sites;
- Identify open space requirements associated with each Strategic Housing Site derived from Harlow open space, sport and recreation standards.

3.76 Table 3.13 identifies relevant components of the Chris Blandford Green Infrastructure Network and their extent within the study area. Table 3.13 shows the total area (ha) of these components along with any extent (ha) identified within Strategic Housing Sites. It

should be noted these figures do not take into account circumstances where proposed infrastructure typologies overlap, providing a separate figure for each 'type' only.

Table 3.13 – Proposed Green Infrastructure Network / Harlow Study Area (Chris Blandford Associates)

Proposed Infrastructure	Total (ha)	Area within Strategic Housing Site
Strategic Parks	578.2	0
Local Green Space Parks	727.5	28.4
Core Natural Green Spaces	223.4	16
Greenways	32.6	3.3
New Urban Landscapes of Distinction	532.9	122
Parkways	13.1	0

3.77 Table 3.13 illustrates large areas have been identified as Strategic Parks (578.2 ha), Local Green Space Parks (727.5 ha) and New Urban Landscapes of Distinction. Greenways (32.6 ha) and Parkways (13.1 ha) are associated with movement networks and occupy a smaller area. A large proportion (ha) of Strategic Housing Sites are identified as being New Urban Landscapes of Distinction (122 ha) within the Chris Blandford report.

Strategic Improvement and Strategic Housing Sites

3.78 Table 3.14 identifies Strategic Improvement (SI) and Strategic Housing Site Improvements' (SHSI). These were defined after site visit to Harlow with consideration given to proposals set out in the Chris Blandford Green Infrastructure Plan (2006) along with its relationship to Strategic Housing Sites. Strategic Improvement Projects consider the wider context of the expansion of Harlow as a whole while Strategic Housing Site Improvements are located within Strategic Housing Sites and are in addition to Open Space Requirements identified from open space, sport and recreation standards.

Table 3.14 – Strategic Improvement and Housing Projects

Straetgic Housing Site Improvements	Area (ha)
SHSI 1	7.1
SHSI 2	1.13
Strategic Improvement	**Area (ha)**
SI 1	40.3
SI 2	8.98
SI 3	8.79
SI 4	1.3
SI 5	2
SI 6	3.6
SI 7	4.31
SI 8	11.48
SI 9	8.84
SI 10	3.65
SI 11	7.86

3.78.1 Strategic Improvement and Strategic Housing Site Improvements are outlined below:

- SI 1 – 'Major Strategic Destination & Gateway 3', Harlow Town Park.

- SI 2 – ‘New Urban Landscape of distinction 1’, Harlow Rail Station / Town Park.
- SI 3 – ‘Key Strategic destinations & Gateways 1’, Gibberd’s Garden.
- SI 4 – ‘New Urban Landscape of Distinction 3’, Church Street.
- SI 5 – ‘New Urban Landscape of Distinction 3’, improving linkages.
- SI 6 – ‘New Urban Landscape of Distinction 3’, improving linkages.
- SI 7 – ‘New Urban Landscape of Distinction 4’, South East Harlow / M11 approach.
- SI 8 – ‘Major Strategic Destinations and Gateways 2’, Parndon Wood Nature Reserve.
- SI 9 – ‘New Urban Landscapes of Distinction 2’, West Harlow.
- SI 10 – ‘Local Green Space Parks & Core Natural Greenspace’, environmental improvements.
- SI 11 - ‘Local Green Space Parks & Core Natural Greenspace’, environmental improvements.
- SHSI 1 – ‘Key Strategic Destinations & Gateways’, Eastwick Medieval Settlement Site, Strategic Housing Site 9.
- SHSI 2 – ‘New Destinations and Gateways’, Gilston Park Area, Strategic Housing Site 10.

3.79 In addition to the improvements listed above, Recreational Improvements (RI) are shown below:

- RI 1 – BMX dirt track and mountain bike course (location not defined).
- RI 2 – One additional Artificial Turf Pitch (location not defined).
- RI 3 – Recreation Centre.
- RI 4 – Recreation Centre.
- RI 5 – Recreation Centre.
- RI 6 – Recreation Centre.
- RI 7 – Recreation Centre.
- R1 8 – Recreation Centre.
- RI 9 – Recreation Centre.
- RI 10 – Recreation Centre.
- RI 11 – Recreation Centre.

Strategic Housing Sites

3.80 The following tables provide a breakdown of each Strategic Housing Site within Harlow. Each table provides information on Chris Blandford Proposed Infrastructure within each housing site, additional recreational improvements and the total estimated open space requirement (2001 -2031).

Table 3.15 – Strategic Housing Site 1a

Strategic Housing Site: 1a	
Total Estimated Dwellings (2001-2031)	**750**
Total Estimated Population (2001-2031)	**1702.5**
Site Area (ha)	**15**
Proposed Strategic Improvement (Chris Blandford) (hectare)	
Local Green Space Parks	3.3
New Urban Landscape of Distinction 1 (Harlow Train Station/Town Park)	5.6
Estimated Open Space Requirement (Open Space, Sport and Recreation Standards in Harlow) (hectare)	
Playing Fields (e.g. football, cricket) (ha) (rugby)+ (ha) Children's Playing Space (LEAPs) (ha) Children's Playing Space (NEAPs) (ha) Allotments (ha) Internal Open Space (ha)	1.70 0.22 0.22 0.22 0.51 0.68
Total Estimated Open Space Requirement (2001-2031)	**3.56**

Table 3.16 – Strategic Housing Site 1b

Strategic Housing Site: 1b	
Total Estimated Dwellings (2001-2031)	**750**
Total Estimated Population (2001-2031)	**1620**
Site Area (ha)	**19.8**
Proposed Strategic Improvement (Chris Blandford) (hectare)	
Local Green Space Parks	13.6
New Urban Landscape of Distinction 3 (East Harlow/ New Hall)	10.7
Recreational Improvements	
RI 3 Recreation Centre (33%)	
Estimated Open Space Requirement (Open Space, Sport and Recreation Standards in Harlow) (hectare)	
Playing Fields (e.g. football, cricket) (rugby)+ Children's Playing Space (LEAPs) Children's Playing Space (NEAPs) Allotments Internal Open Space	1.62 0.21 0.21 0.21 0.49 0.65
Total Estimated Open Space Requirement (2001-2031)	**3.39**

Table 3.17 – Strategic Housing Site 1c

Strategic Housing Site: 1c	
Total Estimated Dwellings (2001-2031)	**750**
Total Estimated Population (2001-2031)	**1620**
Site Area (ha)	**24.2**
Proposed Strategic Improvement (Chris Blandford) (hectare)	
Local Green Space Parks	2.8
New Urban Landscape of Distinction 3 (East Harlow/ New Hall)	24.1
Recreational Improvements	
RI 3 Recreation Centre (33%)	
Estimated Open Space Requirement (Open Space, Sport and Recreation Standards in Harlow) (hectare)	
Playing Fields (e.g. football, cricket)	1.62
(rugby)+	0.21
Children's Playing Space (LEAPs)	0.21
Children's Playing Space (NEAPs)	0.21
Allotments	0.49
Internal Open Space	0.65
Total Estimated Open Space Requirement (2001-2031)	**3.39**

Table 3.15 – Strategic Housing Site 2

Strategic Housing Site: 2	
Total Estimated Dwellings (2001-2031)	**750**
Total Estimated Population (2001-2031)	**1702.5**
Site Area (ha)	**22.5**
Proposed Strategic Improvement (Chris Blandford) (hectare)	
Local Green Space Parks	2.4
Core Natural Green Spaces	7.1
New Urban Landscape of Distinction 3 (East Harlow/ Newhall)	22.6
Recreational Improvements	
RI 3 Recreation Centre (33%)	
Estimated Open Space Requirement (Open Space, Sport and Recreation Standards in Harlow) (hectare)	
(rugby)+	0.2
Children's Playing Space (LEAPs)	0.2
Children's Playing Space (NEAPs)	0.2
Allotments	0.5
Internal Open Space	0.7
Total Estimated Open Space Requirement (2001-2031)	**3.6**

Table 3.19 – Strategic Housing Site 3

Strategic Housing Site: 3	
Total Estimated Dwellings (2001-2031)	**3000**
Total Estimated Population (2001-2031)	**6480**
Site Area (ha)	**88.6**
Proposed Strategic Improvement (Chris Blandford) (hectare)	
Greenway 9 (East Harlow to Matching Green)	0.2
New Urban Landscape of Distinction 3 (East Harlow/ Newhall)	59.0
Recreational Improvements	
RI 4 Recreation Centre	
Estimated Open Space Requirement (Open Space, Sport and Recreation Standards in Harlow) (hectare)	
Playing Fields (e.g. football, cricket)	6.5
(rugby)+	0.8
Children's Playing Space (LEAPs)	0.8
Children's Playing Space (NEAPs)	0.8
Allotments	1.9
Internal Open Space	2.6
Total Estimated Open Space Requirement (2001-2031)	**13.5**

Table 3.20 – Strategic Housing Site 4

Strategic Housing Site: 4	
Total Estimated Dwellings (2001-2031)	**1500**
Total Estimated Population (2001-2031)	**3240**
Site Area (ha)	**34**
Proposed Strategic Improvement (Chris Blandford) (hectare)	
Greenway 17 (River Stort to Church Langley)	0.6
Recreational Improvements	
RI 5 Recreation Centre	
Estimated Open Space Requirement (Open Space, Sport and Recreation Standards in Harlow) (hectare)	
Playing Fields (e.g. football, cricket)	3.2
(rugby)+	0.4
Children's Playing Space (LEAPs)	0.4
Children's Playing Space (NEAPs)	0.4
Allotments	1.0
Internal Open Space	1.3
Total Estimated Open Space Requirement (2001-2031)	**6.8**

Table 3.21 – Strategic Housing Site 5

Strategic Housing Site: 5	
Total Estimated Dwellings (2001-2031)	**2000**
Total Estimated Population (2001-2031)	**4320**
Site Area (ha)	**60.3**
Recreational Improvements	
RI 6 Recreation Centre	
Estimated Open Space Requirement (Open Space, Sport and Recreation Standards in Harlow) (hectare)	
Playing Fields (e.g. football, cricket)	4.3
(rugby)+	0.6
Children's Playing Space (LEAPs)	0.6
Children's Playing Space (NEAPs)	0.6
Allotments	1.3
Internal Open Space	1.7
Total Estimated Open Space Requirement (2001-2031)	**9.0**

Table 3.22 – Strategic Housing Site 6

Strategic Housing Site: 6	
Total Estimated Dwellings (2001-2031)	**1500**
Total Estimated Population (2001-2031)	**3240**
Site Area (ha)	**75.3**
Proposed Strategic Improvement (Chris Blandford) (hectare)	
Local Green Space Parks	6.3
Greenway 14 (South Harlow to Rye Hill)	0.6
Recreational Improvements	
RI 7 Recreation Centre	
Estimated Open Space Requirement (Open Space, Sport and Recreation Standards in Harlow) (hectare)	
Playing Fields (e.g. football, cricket)	3.2
(rugby)+	0.4
Children's Playing Space (LEAPs)	0.4
Children's Playing Space (NEAPs)	0.4
Allotments	1.0
Internal Open Space	1.3
Total Estimated Open Space Requirement (2001-2031)	**6.8**

Table 3.23 – Strategic Housing Site 7

Strategic Housing Site: 7	
Total Estimated Dwellings (2001-2031)	**1500**
Total Estimated Population (2001-2031)	**3240**
Site Area (ha)	**62.6**
Recreational Improvements	
RI 8 Recreation Centre	
Estimated Open Space Requirement (Open Space, Sport and Recreation Standards in Harlow) (hectare)	
Playing Fields (e.g. football, cricket)	3.2
(rugby)+	0.4
Children's Playing Space (LEAPs)	0.4
Children's Playing Space (NEAPs)	0.4
Allotments	1.0
Internal Open Space	1.3
Total Estimated Open Space Requirement (2001-2031)	**6.8**

Table 3.24 – Strategic Housing Site 8

Strategic Housing Site: 8	
Total Estimated Dwellings (2001-2031)	**2300**
Total Estimated Population (2001-2031)	**4968**
Site Area (ha)	**112.6**
Proposed Strategic Improvement (Chris Blandford) (hectare)	
Core Natural Green Space	2.3
Greenway 11 (Gilston to Bishop & Stortford)	0.9
Recreational Improvements	
RI 9 Recreation Centre	
Estimated Required Open Space (Open Space, Sport and Recreation Standards in Harlow) (hectare)	
Playing Fields (e.g. football, cricket)	5.0
(rugby)+	0.6
Children's Playing Space (LEAPs)	0.6
Children's Playing Space (NEAPs)	0.6
Allotments	1.5
Internal Open Space	2.0
Total Estimated Open Space Requirement (2001-2031)	**10.4**

Table 3.25 – Strategic Housing Site 9

Strategic Housing Site: 9	
Total Estimated Dwellings (2001-2031)	**4500**
Total Estimated Population (2001-2031)	**9315**
Site Area (ha)	**205**
Proposed Strategic Improvement (Chris Blandford) (hectare)	
SHSI 1 Eastwick Medieval Settlement Site	7.1
Core Natural Greenspace	6.6
Recreational Improvements	
RI 10 Recreation Centre	
Estimated Open Space Requirement (Open Space, Sport and Recreation Standards in Harlow) (hectare)	
Playing Fields (e.g. football, cricket)	9.3
(rugby)+	1.2
Children's Playing Space (LEAPs)	1.2
Children's Playing Space (NEAPs)	1.2
Allotments	2.8
Internal Open Space	3.7
Total Open Space Required (2001-2031)	**19.5**

Table 3.26 – Strategic Housing Site 10

Strategic Housing Site: 10	
Total Estimated Dwellings (2001-2031)	**3500**
Total Estimated Population (2001-2031)	**7245**
Site Area (ha)	**118**
Proposed Strategic Improvement (Chris Blandford) (hectare)	
SHSI 2 Gilston Park Area	1.1
Core Natural Greenspace	3
Greenway 11 (Gilston to Bishop & Stortford)	1
Recreational Improvements	
RI 11 Recreation Centre	
Estimated Open Space Requirement (Open Space, Sport and Recreation Standards in Harlow) (hectare)	
Playing Fields (e.g. football, cricket)	7.2
(rugby)+	0.9
Children's Playing Space (LEAPs)	0.9
Children's Playing Space (NEAPs)	0.9
Allotments	2.2
Internal Open Space	2.9
Total Estimated Open Space Requirement (2001-2031)	**15.1**

Table 3.27 – Strategic Housing Site: Small sites, Town Centre, Other redevelopment

Strategic Housing Site: Small sites, Town Centre, Other Redevelopment	
Total Estimated Dwellings (2001-2031)	**1500**
Total Estimated Population (2001-2031)	**3312**
Site Area (ha)	**N/A**
Estimated Open Space Requirement (Open Space, Sport and Recreation Standards in Harlow) (hectare)	
Playing Fields (e.g. football, cricket)	3.3
(rugby)+	0.4
Children's Playing Space (LEAPs)	0.4
Children's Playing Space (NEAPs)	0.4
Allotments	1.0
Internal Open Space	1.3
Total Estimated Open Space Requirement (2001-2031)	**6.9**

Indoor Facility Assessment – Sports Halls and Swimming Pools

Introduction

3.81 The aim of assessing indoor sports needs within is to:

- Identify the provision of indoor sports facilities within the study area and identify issues relating to the accessibility and quality of facilities;
- Identify the adequacy of existing provision and the extent to which it meets demand and the needs of individual sports within the District both at present and up to 2031;
- Consider issues relating to latent and future demand; and
- Identify deficiencies in existing provision and opportunities to improve the range, quality and accessibility of provision within Harlow.

3.82 In order to address the issues identified above we have considered indoor sports in Harlow according to the type of facility and by sport in order to enable the identification of specific local needs. The technical aspects of the assessment are explained within the commentary relating to particular types of facility/sport. Further details of the assumptions used within the assessment are provided within appendices where appropriate.

Methodology

3.83 We have used Sport England's Active Places Power (APP) strategic planning tools as a starting point to inform our assessment of the relationship between the supply of and demand for indoor sports halls and swimming pools within the Harlow Council District.

3.84 The APP website provides a database of all indoor sports halls and swimming pools within England, including all such facilities within Harlow District. Using information held within this database, it has been possible to assess the total capacity of each type of facility within the District. By applying assumptions relating to the frequency of participation to the local population, the APP website also provides an indication of the total demand for these facilities. It is the analysis of the relationship between the supply of and demand for indoor facilities which forms the basis of this assessment.

3.85 The first stage of the needs assessment was to identify and establish the location of all indoor sports facilities within the District. This was carried out by identifying facilities from the Sport England APP database.

3.86 Table 3.28 identifies the number of facilities identified by type. A typology was developed to classify dry and wet facilities according to the type of provision, size, type of public access available at each site and whether the facility was large enough to meet the criteria of the facilities planning model.

3.87 Indoor Sports Hall facilities were only included if they met the Sport England criteria. Sport England defines a large indoor sports hall as being greater than 3 badminton courts (or 440sq.m), or if the hall has clearance for badminton. If a facility does not either have clearance for badminton or is smaller than 440sq.m, the facility is excluded from the analysis. The exception to this is when such a facility is part of a larger group of facilities which does meet the criteria, in which case all facilities are included.

Table 3.28 – Indoor Facilities (by type)

Type of Facility	No.
Swimming Pools	8
Sports Halls	45

Assessment of Capacity

3.88 The next stage was to derive the total capacity of each facility based upon assumptions set out by Sport England. The assessment looks at the total number of visits per week that could be accommodated at each facility within the peak period of usage.

3.89 As the two types of facilities are used in very different ways, the assumptions are different for Swimming Pools and Sports Halls.

Swimming Pools

3.90 The stages of the capacity assessment for Swimming Pools are as follows:

- Apply an estimate of the minimum total amount of pool space required per person at any one time.
- Apply an estimate of the total no. hours per week the facility is usually open during peak periods.
- Apply an estimate of the average duration of visit of 64 mins for tank pools and 68 mins for leisure pools.

Sports Halls

3.91 The stages of the capacity assessment for Sports Halls are as follows:

- Derive the total number of badminton courts accommodated within each sports hall.
- Apply an estimate of the maximum total number of people per badminton court to give the maximum capacity of the hall at any one time.
- Apply an estimate of the total no. of hours per week the facility is usually open during peak periods.
- Apply an estimate of the average duration of visit.

Assumptions used to identify swimming pool demand and capacity

3.92 The assumptions used to estimate swimming pool demand are:

Table 3.29 – Proportion of Participants by Age and Gender

Age	0-15 years	16-24 years	25-39 years	40-59 years	60-79 years	Age
Male	13.23	10.86	13.73	8.13	3.93	Male
Female	12.72	14.51	18.89	10.44	4.52	Female

Table 3.30 – Visits per Week by Age and Gender

Age	0-15 years	16-24 years	25-39 years	40-59 years	60-79 years	Age
Male	0.92	0.84	0.71	0.94	1.18	Male
Female	0.95	0.76	0.79	0.81	1.07	Female

3.93 It is estimated that 63% of all demand is within the peak period (defined below).

Assumptions used to identify swimming pool demand and capacity

3.94 The following assumptions have been used:

- The assumptions used to estimate swimming pool capacity are:
- Capacity is calculated for the site aggregated across all pools on the site but excluding outdoor pools. A site must have at least one pool of 100 sq.m or larger.
- Capacity = Area in sq.m. / 6x Number of hours open in peak / Duration
- Duration is 66 minutes
- Peak period is Mon-Fri 12:00 – 13:30 and 16:00 – 22:00, Sat 09:00 – 16:00, Sun 09:00 – 16:30

Assumptions used to identify sports hall demand

3.95 The assumptions used to estimate sports hall demand are:

Table 3.31 – Proportion of Participants by Age and Gender %

Age	0-15 years	16-24 years	25-34 years	35-44 years	45-59 years	60-79 years
Male	9.55	15.04	14.96	11.08	5.68	5.55
Female	6.03	9.31	11.66	9.4	5.4	4.28

Table 3.32 – Visits per week by age and gender

Age	0-15 years	16-24 years	25-34 years	35-44 years	45-59 years	60-79 years
Male	0.85	0.88	0.88	0.9	0.92	1.1
Female	0.99	0.85	1.03	0.9	1.02	1.27

3.96 It is estimated that 63% of all demand is within the peak period (defined below)

Assumptions used to identify sports hall capacity

3.97 The assumptions used to identify sports hall capacity are:

3.98 Capacity is calculated for the site aggregated across all halls on the site. Sites without at least one man hall are excluded. Capacity = Equivalent courts x 5 x number of hours open in peak / duration.

3.99 Duration is 1 hour.

3.100 Equivalent courts are calculated differently, depending on whether the hall is a main hall or an ancillary hall. A hall is considered to be a main hall as follows if it has clearance for badminton or is at least 3 badminton courts.

Assessment of Demand

3.101 The next stage of the assessment is to derive the total demand, in visits per week, for the District for both swimming pools and sports halls. This is achieved by applying assumptions on participation and frequency of participation, broken down by age cohort and gender, to the existing population in Harlow.

Relationship between Supply and Demand – Swimming Pools

3.102 The final stage of the assessment is to look at the relationship between the supply of and demand for swimming pools and sports halls.

3.103 Findings demonstrate that, overall within Harlow District, the total supply of 7234 visits per week is enough to satisfy the total demand of 4674 visits per week. Overall the existing capacity in the District is enough to satisfy 155% of current demand (including the new Leisure Zone centre).

3.104 It should be noted that the total demand figures shown are based upon applying assumptions to the existing population. In this case, the population has been taken from the 2001 Census. The analysis of the relationship between demand and supply therefore only represents a snapshot of demand and supply in 2001.

Future Demand and Supply

3.105 It is also necessary to estimate the scale of future demand in order to plan for sufficient capacity to meet this future demand. This has been achieved by applying the same participation and frequency assumptions to the estimated population of the District in 2031 (using 2021 population figures; source: Population and Household Growth in the East of England 2001 - 2021). It should be noted that the provision of pool space is assumed to be the same as the current provision.

3.106 Findings demonstrate that, overall within the District there would still be sufficient supply, with 7234 available visits per week, to meet the projected demand of 5767 visits per week, assuming that the current provision of facilities is retained. This would mean that the available capacity would be able to accommodate 126% of all visits generated in Harlow.

Relationship between Demand and Supply (in visits per week) for Sports Halls 2001

3.107 Using the methodology previously outlined, findings demonstrate that, overall within the District, the total supply of 6402 visits per week is enough to satisfy the total demand of 3760 visits per week. Overall the existing capacity in the District is enough to satisfy 170% of demand.

3.108 It should be noted that the total demand figures shown are based upon applying assumptions to the existing population. In this case, the population has been taken from the 2001 Census. The analysis of the relationship between demand and supply therefore only represents a snapshot of demand and supply in 2001.

Future Demand and Supply

3.109 It is also necessary to estimate the scale of future demand in order to plan for sufficient capacity to meet this future demand. This has been achieved by applying the same participation and frequency assumptions to the estimated population of the Borough in 2031. It should be noted that the provision of sports hall space is assumed to be the same as the current provision.

3.110 Findings demonstrate that, overall within the District there would still be sufficient supply, with 6402 available visits per week, to meet the projected demand of 4,640 visits per week, assuming that the current provision of facilities is retained. This would mean that the available capacity would be able to accommodate 137% of all visits generated in Harlow.

Conclusion

3.111 Findings suggest existing provision will be enough to satisfy future demand up to 2031. However, anecdotal evidence suggests local sports facilities are close to capacity. To address this discrepancy two scenarios are identified below. Scenario 1 summarises findings already discussed with consideration given to the relationship between supply and demand up to 2031, the conclusions do not reflect any demand from outside of Harlow District which may utilise facilities in the town. Scenario 2 considers the additional demand between 2001 and 2031 separately and the number of facilities which would relate solely to additional demand.

- Scenario 1:

  Swimming pools: a total supply of 7,234 visits per week would be enough to satisfy the total demand of 5,767 visits per week (2031). Overall existing capacity in the District would be enough to satisfy 126% of demand.

  Sports Halls: a total supply of 6,402 visits per week would be enough to satisfy the total demand of 4,640 visits per week (2031). Overall existing capacity in the District would be enough to satisfy 137% of demand.

- Scenario 2:

  Swimming pools: Additional demand from 2001 to 2031 equates to 1,094 visits. Not counting the potential of existing facilities to meet additional demand generated between 2001 and 2031, 203 sq.m of pool space would be needed equating to 1-2 25m pools depending on the no. of lanes.

  Sports halls: Additional demand from 2001 to 2031 equates to 880 visits per week. Again not taking existing facilities into consideration an additional 5 four court sport halls would be needed.

Next steps

3.112 Following the completion of Stage 1 and the agreement of requirements Stage 2 will identify the approach to the phasing of new provision, broad location of facilities, and apportionment approach. It will also establish cost estimates for the infrastructure identified.

4. Transport

4.1 For this Stage 1 Report we have undertaken an audit of the existing transportation infrastructure, together with a brief examination of current proposals, gaps and issues. This will be further developed following later work on this study, including the forthcoming Stakeholder Workshop. What follows is therefore the preliminary work of this study and includes a desktop review of various documents, a site visit and discussions with various stakeholders, although a key discussion with Essex County Council has yet to take place.

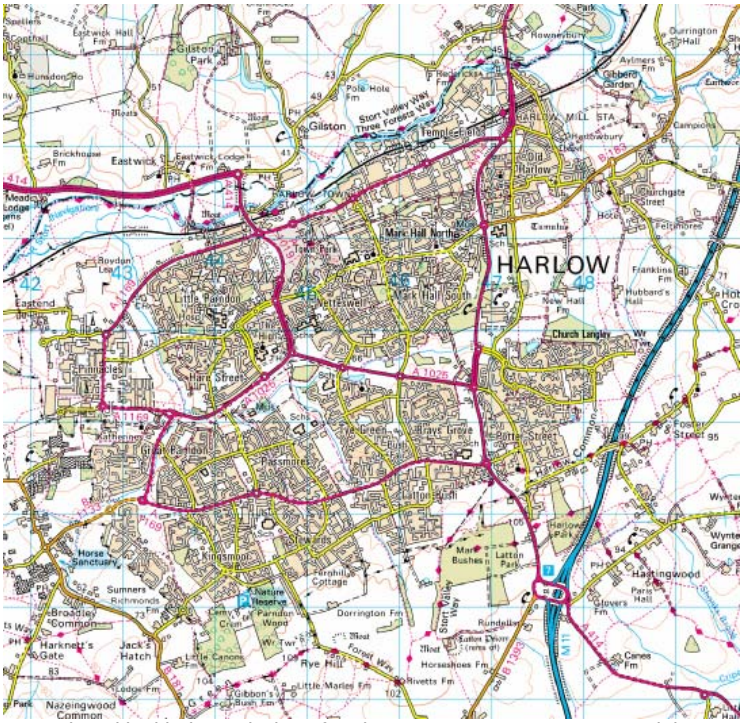
Existing Situation

4.2 Harlow was built in the 1950s as a post war New Town, designed by Sir Frederick Gibberd according to the principles of sustainability. The town is designed around a grid pattern, although, like many other New Towns Harlow's highway infrastructure allowed for much lower levels of car ownership and usage than is experienced today.

4.3 Harlow is strategically positioned to the north east of London, on the western side of the M11, which provides an important north-south strategic highway connection, particularly to the M25 (J27) 8kms to the south. Similarly, Harlow is in close proximity to Stansted Airport, which is 16km to the north east along the M11 (J8/8a).

4.4 Harlow currently has a population of approximately 80,000 people, but has suffered relative decline over the last 15 to 20 years. However, major new development and regeneration is planned for Harlow, meaning the town will be facing new problems and issues that it must overcome in order to turn its fortunes around. The ability of the town to deliver housing and economic growth has been severely constrained in recent years by the current transport infrastructure.

Figure 4.1 – Strategic Transport Map of Harlow



East of England Plan

4.5 The East of England Plan (EEP) was published in May 2008 and provides guidance on planning and development throughout the region until 2021. The plan highlights Harlow and the surrounding area as in need of regeneration and outlines some of the priority transport schemes to support growth. The EEP proposes 16,000 new homes built by 2021 in Harlow and deliver a share of the 56,000 new jobs within the 'Rest of Essex' area (Policy E1: Job Growth - EEP).

4.6 Policy HA1: Harlow Key Centre for Development and Change, sets out a framework for the growth and regeneration of Harlow. The policy sets the transportation priorities for Harlow as being:

- Achieving a major increase in the use of public transport, walking and cycling;
- Enhancing access between Harlow and London, Stansted and Cambridge;
- Addressing traffic congestion for movements within and across the town without encouraging increased car use; and,
- Measures to support the town's regeneration and growth and improve access to the strategic highway network from key employment sites.

Existing Transport Network & Characteristics

Strategic and Local Highway Structure

4.7 As already mentioned Harlow is situated within close proximity to the strategic road network with direct connections to the M11 to the east and the A10 to the west. Both the M11 and A10 provide onward access to the M25 (London Orbital) and east and north London respectively.

4.8 Junction 7 of the M11 is Harlow's principal access to the strategic motorway network, via the A414 towards Chelmsford. The A414 is a busy, major intra-regional highway route, serving both local traffic and longer distance through traffic connecting to the motorway network. This road is high quality two lane dual carriageway in a westerly direction to from Harlow to the junction with the A10 at Stansted St Margret, but is a single carriageway from south eastern corner of the town southward towards Chelmsford, via J7 of M11.

4.9 The urban structure of Harlow is constructed upon a framework of high specification highway routes. The A414 bounds the east and majority of the north of the town, with the A1139 encircling the town to the south, west and remaining northern side of the urban area. The A1025 and A1069 penetrate the urban areas and link to these other highway routes. These routes are particularly vital for the connectivity of the town linking the residential areas with the town centre and major employment areas. The structure of this movement network is important as 61% of the resident population work within in Harlow.

4.10 In addition to the highway network and connections the town is also served by rail with two stations on the London Liverpool Street line of the West Anglia Network. This provides direct access to London, Stansted Airport and Cambridge (with onward connections to the East Coast Mainline, Norwich and Kings Lynn).

Traffic Patterns and Congestion

4.11 The M11 and the A414 carry the greatest volumes of traffic and have a direct influence upon the daily traffic patterns and conditions in Harlow and on the immediately adjacent highway network. The most notable area of congestion is on the routes and links to Junction 7 of the M11, but primarily on the A414. A Ratio of Flow to Capacity (RFC) in excess of 1.20 (120% of theoretical road capacity) on the circulatory links and entry arms to the junction have been observed. In the AM Peak there is also congestion on the north and southbound approaches to Junction 7 of the M11 caused by traffic queuing back down the off-slips onto the live carriageway.

4.12 Harlow also experiences regular instances of traffic congestion at key points along its internal highway network, particularly during the weekday and weekend peak hours. As already noted the A414 experiences heavy traffic flows and resulting congestion along its entire length. Other notable areas of regular congestion and delay are the main distributor routes through Harlow that are carrying in excess of their capacity, particularly during peak periods include:

- Fifth Avenue;
- Velizy Avenue;
- Southern Way; and
- Second Avenue.

4.13 This congestion occurs due to high demand for movements both within Harlow from the residential areas to the main employment areas, town centre and the railway stations. These flows are also mixed with traffic accessing and egress the town, as described above.

4.14 The main highway links and junctions throughout Harlow regularly experience congestion and delay, and this is likely to get worse as car ownership continues to rise and the delivery of the planned major new housing and employment within and around the town. There are a number of key factors and characteristics of the highway and transportation network that contribute towards the level and pattern of congestion that is briefly described above. These are:

1. Limited access to the strategic road network;
2. Limited options for traffic distribution within/through the town;
3. Concentration traffic onto only a few key junctions; and,
4. High dependence on the private car for trip making.

4.15 Each of these factors combines, particularly during the peak periods, and result in the operational characteristics of the town's highway network.

Limited Access to Strategic Road Network

4.16 As already described early in this section Harlow only has one direct access onto the Strategic Road Network via Junction 7 of the M11. The reliance on only one junction is unusual for a town of the size and character of Harlow, and this is a crucial factor in the traffic distribution patterns and resulting congestion experienced on the highway network.

4.17 The congestion experienced at the Junction 7, and through the town is further exacerbated by its location and lack of route choices for surrounding settlements to access the strategic road network, for example Sawbridgeworth and Epping/North Weald. The alternative opportunity for these settlements to enter the motorway network

is either via Junction 8 of the M11 at Bishops Stortford/Stansted Airport to the north of Harlow, or via Junction 26 of the M25 at Waltham Abbey located to the south.

Limited Options for Traffic Distribution

4.18 Northwest to southeast through traffic on the A414 has to navigate through the town along the same routes and junctions used for traffic traversing the town from residential areas to the employment areas. The dual carriageway around the town as a result of highway upgrading has created an orbital 'collar' which reduces permeability and creates a barrier to more sustainable travel patterns. The pattern of the existing highway network creates only two main highway routes into, out of, and around the town. Local traffic traversing the town has the only alternative to avoid congestion by diverting onto central spine roads in the town placing these under greater strain.

Concentration of Traffic onto Few Key Junctions

4.19 The structure of the highway network and the layout of the main spine roads within the town quickly funnel all traffic onto them at limited points along the routes. These routes then all converge onto a small number of critical intersections, predominantly roundabouts, resulting in congestion during the peak periods. It is the convergence of the traffic at these points that results in the level and pattern of congestion observed in Harlow.

High Dependence on the Private Car

4.20 Whilst Harlow does have a reasonable level of infrastructure provision to facilitate travel by sustainable modes there is still a high dependency upon the use of the private motor car. Initial observations would suggest that the primary reasons for the high use of the private motor car are; good highway network; availability of parking at the trip end (town centre and employment areas); perceived distance from residential areas to trip ends; and, lack of public transport alternatives, particularly for external trips from Harlow other than along the rail corridor.

Car Parking

4.21 The availability of car parking within the town centre and at the out of town retail and employment zones are a factor in the level and location of congestion that has been briefly described above.

4.22 The Harlow Town Centre Health Check July 2007 shows that there are 3,800 public car parking spaces available within the town centre, each of which area accessible from the inner-ring road. The provision of car parking was significantly increased in 2004 with the 1,200 space multi-level car park for the Water Gardens development.

4.23 There are no figures available for the quantum of car parking provision for the out of town retail units or the major employment areas. However, on site observations across the town revealed large areas of surface car parking associated with every retail or employment unit. In the majority of cases surface car parking provision accounts for up to approximately 50% of the site area.

Public Transport – Rail & Bus

Rail

4.24 Harlow is located on the West Anglia Mainline, providing key services to London (approximately six services per hour during the AM peak and four/five services per hour for the remainder of the day), Stansted Airport (approximately five services per hour

during the Am peak and two/three services per hour for the remainder of the day) and Cambridge (approximately 2 services per hour).

4.25 Harlow is served by two railway stations, Harlow Town and Harlow Mill. Harlow Town is the primary train station that and has relatively high passenger capacity with the greatest frequency of services. The station is located 1km north of the town centre, but whilst there are pedestrian, cycle and vehicular links the station feels distant and there are barriers to pedestrian movement from the highway infrastructure. The main entrance to the station forecourt for buses, taxi's, kiss-&-ride and car parking is from the Burnt Mill Roundabout, although a second access to the car park has been created from Edinburgh Way approximately 400m east of the roundabout. During peak periods egress from the station is problematic given the high flows on all arms of the roundabout, particularly traffic from the A414 (Fifth Ave/Allende Ave).

4.26 Harlow Mill train station is an intermediate station that serves the northern residential areas and provides access to the employment areas on the eastern stretch of Edinburgh Way. The station has very limited car parking and has no facilities of interchange and drop-off/pick-up.

Buses

4.27 Harlow has a reasonably comprehensive bus network that radiates out from the refurbished bus station on Terminus Street in the town centre. The existing highway network, both in terms of connectivity and scale of routes, lends itself to providing ease of movement of buses. However, during peak periods services can experience delays due to congestion. Along the principal highway routes and at certain key junctions bus priority measures have been provided, although there is evidence in certain areas where these have been removed. An example of this is the section of dual-carriageway outside the entrance to the car park for the Asda/Water Gardens development.

4.28 Essex County Council is currently in the process of delivering a major bus lane scheme on First Avenue between Gilden Way roundabout in the east, and Velizy Avenue in the west. This will provide priority for the existing 14 services that use First Avenue. This scheme will particularly benefit the Newhall development, providing reliable and high speed connection to the town centre and on to the train station.

4.29 The number of services in the urban area is quite high for a town of Harlow's size; approximately 60 per hour from the bus station to destinations within Harlow (excluding the train station). National Express runs a coach service along the M11, and services to London Victoria, Stratford, Stansted and London Heathrow are also available. The dominant Bus Operating Company is Arriva, but Myalls, S.M.Coaches, Trustline Buses, Excel, Stansted Transit, Greenline, Olympian, and Imperial also operate services.

Future of Transportation in Harlow

4.30 A significant investment in new transport infrastructure is required to support the planned growth of Harlow. Upgrading of the road network alone cannot support all future development in and around the town and there will be a need to enhance the use of more sustainable modes. Future master planning for Harlow must integrate the highest possible levels of public transport, as well as encouraging cycling and walking.

4.31 Subject to further studies, one of the transport priorities outlined is an outer bypass to the north of the existing urban area of Harlow. This will link the existing A414 to the north of Harlow with the M11 via a new grade separated junction. The proposed new connection will accommodate the existing east / west traffic movement on the A414, and improve access into the existing built up area of Harlow, the town centre. The new

route will also assist in redistributing traffic, in particular that associated with the planned new housing, way from already congested routes.

4.32 The provision of a Park and Ride facility to Harlow Town station has also been outlined, in order to reduce car usage to Harlow Town train station and the town itself. This potential scheme will assist in reducing the volume of traffic demand on Harlow's internal highway network. Linking with this scheme are proposals to enhance the public transport interchange within the town.

4.33 The Highways Agency undertook an investigation into the predicted operation of the M11 from the M25 north to Junction 8 in the year 2021. This stretch of the M11 has 3 lanes plus hard shoulder per direction. The predicted link capacity in 2021 is 0.9 – 1 (90-100%) for junctions 7 and 8, and 1 (100% just south of junction 7 – this was assuming all of the schemes of the Regional Transport Strategy are put in place by this time. The Highways Agency has begun consultation on a project to widen the M11 between Junctions 6 and 8 to 4 lanes in each direction. Most of the widening would occur symmetrically, however in key areas, such as in proximity to Epping Forest, asymmetrical widening would occur in order to reduce the environmental impacts of the project. A public inquiry will take place in late 2008, and with the proposed start date of works during 2015. This project will be combined with technology improvements such as CCTV and Variable Message Signs to improve the flow of traffic and reduce congestion. Other techniques for improving capacity without widening will be looked at too, such as hard shoulder running whilst reducing speed and providing alternative refuges for breakdowns.

4.34 Improvements are also being looked at for Junctions 7 and 8 of the M11, which will be particularly important with the recently approved plans for the Stansted Airport 2nd runway.

4.35 The Harlow Area Rapid Transit (HART) scheme is not being progressed by Essex County Council at this point of time. The focus has been redirected towards the provision of a network of bus lanes and priority measures throughout the town with the objective of avoiding congested sections and junctions.

5. UTILITY SERVICES

Introduction

5.1 The primary objective of this study has been to examine the existing baseline characteristics of the statutory utility infrastructure to determine the availability of supplies and if there are deficiencies in the infrastructure to serve the proposed development sites.

5.2 The utility companies have been contacted to provide information regarding service availability and an indication of the scale of the upgrade works needed which follows on from a previous infrastructure study that was carried out in 2003. Meetings have taken place with some of the utility companies.

Assessment Methodology

Previous Studies/Strategies

5.3 In 2005 Atkins provided technical support into a feasibility study for the future development of a 275 ha (680ha) site southeast of Harlow, Essex and was referred to as Project Parmesan. The site had the potential for the construction of 6,000 dwellings. The development has not yet progressed. The discharge of the wastewater from the site was investigated and the options were to discharge to one of the smaller wastewater treatment works in close proximity or to the major works at Rye Meads.

5.4 Investigations of the small wastewater treatment works at North Weald and Thornwood confirmed that the discharge of developments of the size proposed would have detrimental environmental impact on the water quality and potential flooding issues. It was concluded that the flows would have an environmental impact on the water quality and could create potential flooding issues.

5.5 A Harlow Infrastructure Study (5012965) was carried out in January 2003 by Atkins and was commissioned by Essex County Council which was intended to be part of a larger study looking at all the constraints and opportunities for accommodating and predicting expansion of the population in the Harlow sub-region

5.6 The Environment Agency have now released the Final Strategy Document for the Upper Lee Catchment Abstraction Management Strategy (CAMS). This document takes a strategic look at the water resources in the catchment that covers Harlow and the sub-region. It assesses how much water can be abstracted to meet the many economic uses such as agriculture, industry and drinking water supply while leaving sufficient water to meet ecological needs.

5.7 Three Valleys Water have produced a draft Water Resources Management Plan for consultation with stakeholders and customers as required under the Water Act 2003. This Act sets out a statutory framework for providing safe and wholesome water in sufficient quantities to meet customer needs.

Methodology of this Study

5.8 Demand for potable water, sewerage, domestic gas and electricity supplies have been estimated using industry standard figures. The relevant utility companies have been consulted regarding the necessary reinforcements required to the existing utility infrastructure.

5.9 Despite the pace of telecommunications innovation, unique duties imposed upon British Telecom assure the supply of this utility and, therefore, no in depth consideration is required in this respect.

Utility Information

5.10 Existing utility infrastructure information for the site has been requested from the relevant utility companies to date no responses have been received.

5.11 Utility costs can be broken down in to 4 main elements:-

- Off-site reinforcement and connection works
- On-site diversions
- On-site primary infrastructure
- On-site local infrastructure.

5.12 The utility companies have been asked to provide a price based on an indicative costs for a connection to the developments. The prices will be based on the assumption that the developer will carry out the excavation and backfill during the site construction.

5.13 Strategic Planning and Local Context

Water Supply

Key Issues

5.14 The key issues relating to water demand and supply within the sub-region are as follows:

- The geology underlying the site includes a Chalk Aquifer categorised as being over-licenced;
- The Environment Agency judge that water demands can be met by implementing ‘twin track’ measures;
- Three Valleys Water have a statutory obligation to provide water on request;
- Three Valleys Water state that they have made allowance for growth commensurate with the East of England Regional Spatial Strategy;
- Existing infrastructure is likely to require upgrade and expansion to support Harlow growth;
- Three Valleys Water will carry out demand management policies. They will continue to reduce leakage in the network. They will try to reduce demand by installing water meters. They are looking to look at water transfer schemes as a long term strategy.
- There is the likelihood of regulation to target a reduction in per capita consumption of water.
- In preparing the draft Water Resources Plan Three Valleys Water have taken into account the possible impact of climate change which may affect the strategy. They have allowed for a reduction in water availability of around five per cent by 2030 as a direct result of climate change. Further information on climate change can be found in Appendix B.
- Three Valleys Water have followed the advice from the Environment Agency that there should be no changes in the abstracted water licences form the environment. However, they are concerned that this approach does not take into account the EA strategy and in turn the River Basin Plans to meet the targets set under the Water

Framework Directive. Further information on the Water Framework Directive can be found in Appendix B.

Availability of water in the East of England Region

5.15 Groundwater boreholes provide the principal water resources in south Essex. Geology beneath the area is London clay overlying a Chalk Aquifer. The Upper Lee Catchment Abstraction Management Strategy (CAMS) document Final Strategy Document (June 2006) categorises the zone has being over-licenced. However, although ground water is a relatively secure supply, it is not inexhaustible and the Environment Agency have decided that a limit should be placed on its availability of abstraction.

5.16 Three Valleys Water supply the area in the Harlow region and have a statutory duty to supply domestic housing on request. Three Valleys Water have made allowances in their Water Resources Plan for growth commensurate with the levels outlined in the East of England Plan.

5.17 On 19 July 2005, the Environment Agency presented their assessment of the impacts of household growth proposals on the water resources for the East of England. As co-auditors with Ofwat of the water resource plans submitted by the various water companies, the Environment Agency have compared the available water resources against the expected demand to analyse current and future demand deficits. They advised that water supplies in the East of England are, in practical terms, fully utilised at present. If no action is taken the level of development planned within Regional Spatial Strategy RSS 14 would cause a deficit of water across the majority of the region within 5 years.

5.18 The Environment Agency concluded that the development proposed in the Regional Spatial Strategy (RSS14) could be sustained as long as the water companies undertook 'twin track' measures of implementing a small number of strategic investment projects. Furthermore such measures would need to be in accordance with Office of the Deputy Prime Minister (ODPM) targets to reduce Per Capita Consumption (PCC) of water by 25 percent throughout the region. Both the Environment Agency and Three Valleys Water endorse the incorporation of water efficiency targets with the Regional Spatial Strategy.

5.19 The water industry normally recovers much of the cost of distribution system upgrades and expansion from developers. Further to this, Three Valleys Water is seeking recognition of the costs for the strategic investment projects to be incorporated within the Regional Spatial Strategy. If successful it is assumed that this would lead to recovery of the costs through some apportionment with in Local Area Plans.

Water Demand Management

5.20 Reduction of PCC by 25 per cent needs a step change in the public's use of water. It seems unrealistic to assume, as the Environment Agency have, that widespread retrofitting of water efficient appliances will take place within existing housing. Consequently, it seems likely that new building housing will be required in the future to incorporate measures to achieve the required level of water efficiency.

5.21 The Environment Agency have highlighted an impending water shortage if water efficiency measures are not implemented and it seems fair to assume that in the future there will be an increasing focus on ensuring the supply/demand deficit is closely controlled and maximum use is made of water through conservation, efficiency and re-use. The main factors of this are:

- Supply Factors
  - Control of abstraction;

  - Minimisation of leakage;
  - Control of pollution.
- Demand Factors
  - Management of rainwater;
  - Efficient use of water in homes and gardens.

5.22 In principle only the demand factors are within the scope of developers to influence. The management of rainwater, combined with the efficient use of water in homes and gardens, is already widely promoted by water companies and trials have shown that reductions of water consumption of up to 50 per cent can be achieved.

5.23 The Environment Agency are pushing for new regulation and direction to support the delivery of increases in demand management and water efficiency along with the extended use of existing standards such as Ecohomes and the British Research Establishment Environmental Assessment Method (BREEAM). These objectives seem to be achievable and, as such, it can be expected that Local Planning Authorities will seek to ensure that new developments achieve high/maximum credits within these systems in relation to water.

5.24 The reduction of PCC is not exact, however, trials have been undertaken that have demonstrated that, by incorporating rainwater harvesting to supply non-potable water for homes and the fitting of water efficient appliances to reduce demand on potable water for homes and the fitting of water efficient appliances to reduce demand on potable water, further reductions in demand of up to 50 per cent can be achieved. The PCC 25 per cent target should be achievable through the incorporation of water efficient appliances (such as: low flush WC's, aerated taps, low capacity baths and low flow showers)

Implications for Development

5.25 Given the perception of future water shortages and high level promotion by the Environment Agency of the need to reduce water consumption it is likely that concepts of rain-water harvesting and the use of efficient appliances will need to be incorporated into planned developments.

5.26 In summary there is a general perception that the East of England Region is likely to experience a shortage of water in the medium term future. However, Three Valleys Water support the East of England Regional Spatial Strategy and state that they have made allowance for the predicted growth over the Plan period. However, the Environment Agency considers future shortages could occur unless water efficiency measures and demand management are implemented in new developments in the Region.

Water Supply Existing Infrastructure

5.27 The water supply company for the Harlow region is Three Valleys Water Company which is one of three water companies owned by Veolia Water.

5.28 The Environment Agency are responsible for the water environment and they produce a Catchment Abstraction Management Plan Strategy (CAMS) which assesses how much water can be abstracted and this determines the licencing policy for the six year period after the publication of the document (June 2006).

5.29 The Upper Lees surface water and ground water sources (Water Resources Management Units) are classified as over-licenced in low flow conditions and no new licences will be considered. Of the 200 licenced abstractions in the units 80% are from ground water of which 90% of the volume extracted is for public water supply.

5.30 Discharges form an important resource in the Upper Lee catchment, augmenting flows and supporting abstractions further downstream. Of the 178 Ml/d consented to discharge into the catchment 101 Ml/d (57%) is from the various sewage treatment works within the catchment. The Rye Meads STW discharges into the River Lee just outside of the Upper Lee catchment into the London CAMS.

5.31 The Upper Lees CAMS area contains a diverse range of habitats and species including wildlife and landscape features that are dependant on water. The Lee Valley Special Protection Area (SPA) falls partly in the Upper Lees CAMS. There are 14 water dependent Sites of Special Scientific Interest (SSI's) in the catchment including rivers, wet woodland, ponds, wet grassland and marsh.

5.32 The majority of the Upper Lee catchment is designated under the European Freshwater Directive (78/659/EEC) as either salmonid or cyprinid fisheries which sets water quality standards that protect fish populations.

5.33 River Quality Objectives (RQO's) provide targets for maintaining current quality standards and for planning water quality improvements. Water quality in the catchment is generally good with the River Ash having a target of RE1 (water of very good quality suitable for all fish species).

5.34 The EA Thames Region water resources strategy sets out a framework for the way the Agency plans to manage water resources in the region over the next 25 years. The strategy is based on:-

- Promoting efficient water use by all stakeholders
- Making the best use of water resources
- Take into account potential impact of climate change
- Encouraging the sharing of resources between areas of surplus and deficit.

5.35 Three Valleys Water have produced a draft Water Resources Management Plan in April 2008. This sets out the water companies long-term plans that look 25 years ahead and sets out actions that are needed to manage the supply and demand. These actions include reducing and controlling leakage, managing demand and developing new resources.

5.36 Three Valleys Water are aware of the future growth including the large developments planned for Harlow and that demand may have to be met from outside the catchment.

5.37 Three Valleys Water are looking to increase the number of households with water meters to 90% by 2020. The water companies envisage that the resultant water reduction will ensure that no new water resource will be required until after 2030. It is likely that the reduction in water use will be balanced by the proposed increase in new dwellings.

Wastewater Collection, Treatment and Discharge

5.38 The collection, treatment and discharge of foul water from dwellings is usually undertaken by the water company. New sewers and connections to existing systems can be requisitioned from the water company under Section 98 of The Water Industry Act 1991. It should be noted that developers requisition only the new sewer and sewer

connection. It is the duty of the water company to then convey, treat and discharge the flows and they may charge the developer for the capital cost associated with this. The choice of pipeline routes, design and treatment location is entirely with the water company.

5.39 In general (and definitely in the case of a large development such as Harlow) the treated water will be discharged to an existing watercourse. In England and Wales, discharges to controlled waters are subject to the Water Resources Act 1991 (as amended).The Environment Agency is the regulatory authority responsible for protecting controlled waters under this legislation.

5.40 The water company must satisfy all regulations in relation to the discharges and facilities for treatment. In order to ensure that new developments do not exceed the available treatment and discharge capacities, the water company can reasonably request that phasing restrictions be applied to new developments whilst they undertake infrastructure reinforcement/expansion works. The Local Planning Authority may (if it so chooses) incorporate these phasing restrictions into any Planning Approvals.

5.41 It should be noted that, in accordance with PPG25,a flood risk assessment would be required for any new development. This would need to include the potential consequences of discharging treated effluent into watercourses.

Wastewater Network/Treatment Existing Infrastructure

5.42 All foul drainage in the region is under the control of Thames Water. Foul water in Harlow is collected by local networks and drains by gravity to a trunk sewer in the River Stort valley north of Harlow where it in turn drains by gravity to Rye Meads STW.

5.43 Rye Meads STW is a large sewage treatment works serving a wide catchment area includes the whole of Harlow, Stevenage & Welwyn Garden City. The sewage works discharges to the River Lee.

5.44 Thames Water aim to have spare capacity at Rye Meads STW available to accommodate future growth subject to consent limitation that the EA apply to the works.

5.45 There are two smaller sewage works, Thornwood STW (4km southeast of Harlow) serving a population of 700 and North Weald STW (8km southeast of Harlow) serving a population of 5,000. There is little spare capacity for additional developments at these works.

5.46 Rye Meads STW has problems with poor hydraulics and as such is unable to fully utilise the existing capacity. Funding is being sought in next round of capital funding (AMP 5) to upgrade the works to provide an elevated inlet to improve the hydraulics and to provide a new process stream to provide additional biological treatment. The proposals will ensure adequate treatment for the future growth equivalent of up to 50,000 population which should ensure a design horizon to 2026. The plans and costings are being submitted to OFWAT for approval as part of Thames' Strategic Business Plan for 2010 – 2015. There is, of course, no guarantee that OFWAT will approve the proposals.

5.47 Thames Water have indicated that there is little spare capacity in the drainage system to cater for the new developments. Thames Water are aware that there is a bottleneck in the trunk sewer system and are looking to increase the flows. This could be achieved by the construction of a secondary trunk sewer would look to seek funding from the developers in order to cater for the flows from the proposed housing growth.

5.48 If the existing infrastructure is unable to cope with the additional flows it is likely that strategic pumping stations will be needed that will discharge via a rising main either directly to the works or to the sewer system downstream of Harlow.

5.49 The size of the developments proposed will require a capacity study to be carried out by the Water Company to determine the need for network reinforcement and to determine the effect on the sewage works. Any reinforcement works as well as the study costs will be charged to the developer in full. Reinforcement works will take up to 10 years to complete.

5.50 It is envisaged that the developments east of Harlow bounded by the M11 would need to drain via a new tunnel sewer across Harlow at a cost of approximately £10m. Developments to the North of Harlow could be drained by gravity under the River Lee to the trunk sewer that follow the river to Rye Meads STW. Developments to the south would require the existing sewers to be upgraded or pumped to the trunk sewer. The most appropriate solution to serving the future developments will be determined in the forthcoming water cycle study.

Water Cycle Study

5.51 A water cycle study commissioned by Stevenage Borough Council and being carried out by the consultants Hyder has now commenced, the purpose of which is to understand the impact of the proposed developments that would drain to the Rye Meads STW. It will examine a wide range of alternative options, from upgrading existing treatment works to the construction of new local works.

5.52 The study will cover the whole of the water cycle from water resources, supply and treatment, sewer collection and treatment, fluvial flooding and land drainage issues. We understand that the study has now been delayed and it is envisaged that the draft will not be complete until December 2008 with the final scheduled for early January 2009.

5.53 Stevenage Borough Council and North Hertfordshire District Council are working together to prepare the Stevenage and North Hertfordshire Action Plan (SNAP). The final version will set out the planning policies and proposals to the area around Stevenage. As part of the East Of England Plan large scale developments are planned in and around Stevenage which includes land in North Hertfordshire.

5.54 The East of England Plan states that 16,000 dwellings are to be built in and around Stevenage by 2021 although a small proportion of this figure have already been constructed. Although not agreed yet it is likely that much of this development will be to the west and north west of Stevenage. The water cycle study will inform the planning process regarding the most suitable point of discharge for the wastewater. One option is to take this flow westwards to an existing or new wastewater treatment works rather than take the flows via the existing or new sewer systems to Rye Meads STW. If it is agreed that the flows are to drain eastwards to Rye Meads there will be an issue with capacity due to the developments planned to the east in particular from Harlow. An agreed phasing of the developments will be needed to ensure that the capacity at Rye Meads can be met.

Gas and Electricity

Ofgem (The office of Gas and Electricity Markets)

5.55 Ofgem has an Environmental Action Plan which sets out a programme of work to help promote renewable energy and energy efficiency. This includes:

- Energy Efficiency Commitment which requires all suppliers to run schemes aiming at improving the energy efficiency of customers homes;
- Renewables Obligation which sets a target for electricity suppliers to source at least part of their electricity from renewable generation.

- Climate Change Levy exemption for renewable generators; and
- Climate Change Levy exemption for good quality CHP.

5.56 Ofgem is also working to encourage electricity distribution companies to strengthen their networks to allow for inclusion of Distributed Generation (also known as 'Embedded Generation').This is electricity generation which is connected to the distribution network rather than the high voltage transmission network. It is often small scale, but seen as crucial to expanding the use of renewable power (wind and solar power) and combined heat and power.

Distributed Generation

5.57 Today's distribution networks have been built to deliver power from the national transmission network to the end customer. Distributed generation, however, requires more active distribution networks which allow electricity to flow in two directions-to the electricity user for consumption in homes or businesses, and also to export surplus energy back to the transmission network. Consequently, to date, renewable generators have found it difficult and expensive to connect. However, if planned for in advance, there will be the opportunity to include such systems in future large scale developments, such as those being considered for the M11-corridor.

5.58 Ofgem aim to increase the use of Distributed Generation and are proposing regulatory measures whose objectives are:

- To allow generators the option of spreading the cost of connecting to the distribution network
- making it easier for domestic combined heat and power generators(customers who have heating systems which can generate electricity)to connect to the networks by establishing a standard connections procedure
- and reimburse distributed generators some of the initial connection fee when subsequent generators are connected.

5.59 Types of Distributed Generation are:

- Wind Power-experiencing growth and becoming more efficient;
- Combined heat and power-local power stations, from which excess heat is recovered for local heating systems;
- Central heating boilers (domestic CHP) - although not yet commercially available, they are highly energy efficient;
- Photovoltaic solar cells-which can be built in to the roofs of homes;

5.60 It is envisaged that in the near future use of Distributed Generation will become the subject of Local Development Framework (LDF) policies and may well become planning requirements.

Electricity Supply

5.61 De-regulation of the electricity industry has seen the introduction of competition to supply electricity to consumers. This service provision overlays the distribution network operators and electricity generation companies.

5.62 In the south-east of England EDF Energy is the Distribution Network Operator (DNO).They are obliged to provide and install assets necessary for the connection of premises to its distribution network, and they are entitled to make a charge for doing so.

Electricity Existing Infrastructure

5.63 All electrical power for Harlow and the rest of the region comes from the supergrid station at Rye House, Hoddesdon. This is on a national grid route (overhead cables on large electricity pylons) running in a North South direction. Another national grid line runs along the south edge of the study area above the M25 route. These routes do not prevent development from occurring around them but will put constraints on the location of the buildings, land value and construction equipment used with in 50m of the lines. Transmission lines from the Rye Meads Power Station supply a grid station on the western edge of town which in turn supplies four primary station with 33kV supply. From these primary sub-stations underground mains feed numerous sub-stations around the area.

5.64 To ensure that power to customers is uninterrupted the network has to allow for lines down for maintenance plus a fault occurring at the same time. This result in a network that is tree like from source to multi-end user but also has cross links between branches to give back up routes for the supply.

5.65 The supply is split between industry and housing on a 65 to 35 ratio.

5.66 A recent meeting with a representative of EDF Energy highlighted issues with the networks in the Harlow area. Rye House has recently been upgraded with a third supergrid. All the transformers in this station need to operate in tandem.

5.67 EDF are looking to carry out the following upgrades in the Harlow region:-

- Install a third cable from Rye House to Harlow to improve the network supply;
- Installation of new switchgear at Rye House;
- Install another transformer north of Harlow;
- Possible inter-connection between systems;
- Installation of third 90mm cable between Rye House and Harlow; and
- Upgrade cables to Glaxo Smith Kline development in the west of Harlow and Rye House.

5.68 The primary sub-station in the Pinnacles Industrial area is located off Elizabeth Way and the 132kV supply is co-located with the 33kV to 11kV supply. EDF are proposing to carry out some refurbishment works to the station which will replace the old switchgear with new equipment. The old bus bars are presently located outside in the compound and these will be replaced with new ones that will be positioned inside the building. This will free up space on-site and an additional grid transformer which will be installed in the compound to provide additional power. Glaxo one of the main users in the area are proposing an expansion to their site which will require an additional supply. The capital works required to upgrade the station to supply their site are being funded by Glaxo. The proposed improvements works have not yet commenced on-site.

5.69 In summary the networks capacity in this region at present is as follows:

- Supply to Harlow town and adjacent town of Sawbridgeworth is at capacity.
- Supply to Epping has capacity to expand.
- Supply to the North-South corridor of existing development from Ware in the north to Cheshunt in the south is also running at capacity.
- Supply to Chipping Ongar has capacity to expand.

5.70 EDF are looking at installing another primary sub-station to the east of Harlow in the Church Langley area. The purpose of this is to help reduce the load on the north, south and west sub-stations. The station will be sized to take into account possible future development in the east. As the developments progress EDF would look to claw back some of the capital costs from the developers. EDF are working with the Harlow District Council to agree a proposed position for the sub-station.

5.71 There is generally little spare available capacity in the system to take a substantial increase in load in most of the sub-stations to serve the new developments. Additional sub-stations and new network cable supplies will be required to provide the necessary reinforcement needed to serve the proposed developments. All costs including design fees in association with the necessary reinforcement works will be charged back to the developers. If an upgrade is needed to the national grid system this will be borne by the National Grid and will not be charged to the developers. The likely timescales to construct new sub-stations will be in the region of two to three years.

Gas Supply

5.72 De-regulation of the gas industry has also been introduced to reflect the systems introduced to reflect the systems introduced for the electricity industry. For the gas industry it is licenced gas suppliers who provide the front-line service to consumers and gas transporters who are licenced to transport through pipes. Gas transporters also have duty to provide connections to premises where it is economical to do so. In the South East Transco is the licenced gas transporter.

5.73 The Gas Act 1986 (as amended) places further obligations upon gas transporters (GT):

- For domestic premises within 23 metres of a relevant main a GT is obliged to connect premises and provide and install assets necessary for the connection of the premises. The GT is entitled to make a charge for providing this service although it will pay the cost of installing the first 10 metres of pipe in the public highway. These obligations are varied in the following circumstances:
- Infills - this is where existing premises in an area are connected to a new main laid under regulations allowing the GT to determine connection charges at the beginning of the scheme and to apply similar charge to all connection requests in respect of that main for a maximum period of the subsequent twenty years;
- Supplemental connection charge areas - this is where the GT has been authorised by Ofgem to recover the cost of connecting premises in a specified area from gas shippers to those premises in a specified area from gas shippers to those premises, over a fixed period of time, rather than directly from the owner/occupier of the premises.
- For premises beyond 23 metres (or high consumers) the GT, whilst still under a duty to supply, may quote and charge for connection.
- Gas consumption is set to rise with population growth. However, tighter regulations on energy efficiency for new build properties will undoubtedly see consumption per household reduce.

Gas Existing Infrastructure

5.74 The study area is supplied from a new 42" nominal 70 bar National Transmission System (NTS) Pipeline, which runs from Cambridge 'Compressor' to Matching Green 'Offtake' in the South. This pipeline was constructed in 2002 to reinforce supplies to the South of England. At Matching Green the NTS pipeline continues in 36" to Stapleford

Tawney, a dedicated 24" spur nominal 70 bar supply to Rye House Gas Fired Power Station also emanates from this site.

5.75 The Offtake at Matching Green is one of three sites that supply gas to a 42" local diurnal (daily demand) storage pipeline, which runs between Yeleverton (Norwich) and Whitwell (Stevenage). This pipeline cycles between 20 and 42 bar and provides the bulk of the daily storage, for the whole gas network in East Anglia. Connected to this Local Transmission System (LTS) Pipeline is a former NTS 36" pipeline, which was replaced by the new Cambridge to Matching NTS pipeline, mentioned above. Although this pipeline currently operates between 20 and 42 bar, ultimately it is planned that this pipeline will resume operating at pressures of up to 70 bar. The supply to Stansted Airport also emanates from the LTS system at Matching Green, and comprises of an 18" pipeline, which again cycles between 20 and 42 bar.

5.76 The LTS network in turn supplies the below 7 bar (Distribution) network, which provides gas to local towns and villages, such as Harlow, Bishops Stortford, Hoddesdon and Epping.

5.77 The below 7 bar network may provide a cost effective method of providing gas to initial phases of development. For the scale of development considered they do not have sufficient capacity and consequently significant reinforcement will be necessary. Although it is feasible that by reinforcing these local Distribution Networks the proposed expansion could be supplied, it is likely that a dedicated supply strategy will offer a more cost effective and less disruptive solution. Again to keep costs to a minimum we would prefer to use existing facilities, if at all possible

5.78 It is unlikely that any reinforcement work will be required to the NTS. If reinforcement is required then the costs will not be passed onto developers. For the LTS, diversions of existing plant, new pipelines and equipment will be fully rechargeable. Depending on the extent and timing of the work any reinforcement or diversion of the LTS pipe network would be subject to lead in time of between 2 and 4 years. Lead times for installations, i.e. Offtakes maybe slightly less due to potentially less complicated land issues. The spur to Rye House Power Station is a private supply and consequently the owners would need consulting before any additional demand was taken from this line.

Telecommunications

5.79 Information Communications Technology (ICT) is probably the most rapidly developing global sector and it would be difficult for anyone to make useful predictions regarding the demand and use of ICT beyond a five year horizon.

5.80 There are widespread plans for development and housing across the whole of the South East. As such the sustainability of any development will depend on its ability to meet the demands of its residents. It is anticipated that these demands will include first class telecommunications services, using current best practice and technology.

5.81 Some commentators see the ability to home-work via broadband circuits as one solution to combat increasing levels of traffic congestion on roads, workplace stress and the need for more flexible working arrangements (e.g. - to address the challenges faced by those with child care responsibilities).They see the provision of broadband telecommunications services to homes as a necessary precursor for developing a better work/life balance for many people.

5.82 Furthermore, despite public anxiety over safety, recent advances and growth in the popularity of mobile technology have occurred at a tremendous pace. Matching these demands against public perceptions will require careful planning.

5.83 It seems certain that the demand for these telecommunication services will be met in near future. It also expected that there will be an increase in the use of fibre optic connections direct to the users, which are expected to have adequate capacity for the foreseeable requirements of industry as well as domestic markets.

5.84 The use of high quality ICT systems for security of public and private property is also expected to be amongst the feel good factors for producing sustainable developments in the future. Monitored intruder systems on premises, together with public area CCTV systems can all be easily accommodated in today's technology. Whilst their inclusion in future developments will be cost dependant, if planned for, these costs can be minimised.

Digital Convergence

5.85 Traditionally markets such as telephony, internet and television are changing fast and are converging. The widespread change for analogue to digital technologies is radically changing the communications industry.

5.86 Technology has especially changed some parameters of the e-communication industry with digital convergence bringing together the world of audio, video, data and voice communications. The next generation of upgraded networks (known as NGN's) are likely to be based on Internet Protocol (IP) leaving the historical differences between network infrastructure far behind.

Local Loop Unbundling (LLU)

5.87 Historically consumers would only get their broadband and landline telephone service from British Telecom (BT) who controlled both the telephone exchange and the connection to the consumers property. In recognition of this bottleneck to access and connection to the network systems Ofcom introduced LLU.

5.88 This is where competitors install their own equipment in local exchanges which allow them a direct connection between the exchange and home. This has significantly reduced BT's dominant share of the market particularly in the wholesale business.

Telecoms General

5.89 Mobile communications use continues to grow and BT's revenue which has now exceed the total revenue of fixed, internet and corporate services.

5.90 Although still growing the take up of broadband is slowing with 58% of the UK households having broadband connection. Mobile broadband is continuing to grow and has moved from the niche market of business to mainstream consumers market.

5.91 The proportion of premises connected to unbundled local exchanges increased to 80% with the number of LLU broadband connections almost trebling to 3.7 Million consumers.

5.92 The market is moving towards the availability of super-fast broadband networks with both BT and Virgin having announced super speed broadband availability in the near future.

5.93 BT have been contacted to determine if there are any issues or constraints in the Harlow area and we are awaiting their response.

5.94 In general it is considered that given the pace of new technology and the demand for the services that provides will drive the necessary capital expenditure to ensure that the infrastructure will be available when the proposed growth occurs.

6. Solid Waste

6.1 Policy and legislation, including the EU Landfill Directive, is changing the way waste is handled in Essex. In the context of the 'waste hierarchy', increasing quantities of waste must be recovered and/or recycled. Traditionally, municipal waste has been diverted, predominantly to one of the 7 landfills in the County. However, Harlow along with the other 11 constituent waste collection authorities in the Essex and Southend Waste Plan area has committed itself to pursuing a waste hierarchal compatible strategy. This represents a cultural and technological shift requiring new contractual arrangements and processing infrastructure.

6.2 Detailed quantitative need, reliant on underpinning data and waste arisings and apportionment forecasts is provided by other sources, including the recent 'Waste Arisings, Capacity and Future Requirements Study, 2007', Regional Waste Management Strategy (RWMS) for the East of England, and the EERA Technical Note relating to the apportionment of London's waste (2006). Each of these sources was used to inform the waste management targets contained within the Regional Spatial Strategy for the East of England. It is clear however, that there is a demonstrable need for additional waste processing capacity across the County.

6.3 The RSS makes it clear that local waste planning authorities will need to plan for self sufficiency through the provision of processing capacity equivalent to the quantity of waste arising in their respective areas. It is recognised that authorities may need to explore alternative technological and management approaches to achieve the ambitious targets set out in the strategy. In addition the strategy encourages authorities to explore the selective use of source segregated biodegradable waste.

6.4 Policy WM3 states that the East of England should plan for a progressive reduction in imported waste.

6.5 Policy WM4: Regional Waste Apportionment states that 'in developing policies in their waste Local Development Documents, and when considering proposals for waste management facilities, waste planning authorities should take responsibility for waste arising within their own administrative areas'.

6.6 The draft Essex Joint Municipal Waste Management Strategy was developed by the waste management authority to consider how waste should be managed in Essex and Southend (the combined waste authority) in the period 2005-2030. The spatial and technological approach outlined in the strategy was endorsed by each of the Essex Authorities, including Harlow, in 2005.

6.7 Following a number of technical studies, the waste authority made a commitment to delivering Mechanical Biological Treatment (MBT) orientated waste treatment technologies. Under PFI arrangements, contractors would be responsible for making their own disposal arrangements. They will also be encouraged to use the existing network of windrow composting sites. There will be a strong presumption for the County to be self-sufficient in respect of the full range of waste and the proximity principle, managing waste close to source, will be promoted.

6.8 In the development of the strategy, the Waste Management Advisory Board agreed that consideration should be given to the introduction of an area approach to the delivery of waste management infrastructure and services. The combined waste authority, from a waste management perspective, is split into three distinct geographic areas (west, east and south/Thames Gateway) due to the size and diversity of the area. It is likely that the

adjacent Unitary Authority of Thurrock may eventually combine with the South Authority Area to form an expanded Thames Gateway area.

6.9 Harlow Waste Collection Authority is situated within the west authority area.

6.10 It was eventually agreed by the Advisory Board that two major waste processing facilities would be capable of managing the combined waste arising in the three geographic areas, supported by a smaller network of transfer and recycling facilities.

6.11 There are six “preferred” waste management sites identified in the current Essex and Southend Waste Local Plan. These are spread across the three areas, two are in the west area, one is in the south area and three are in the east area. However, no large allocated waste management sites are located within Harlow district. Nor are there likely to be any reasonably available land use compatible (B2 or B8 – employment) sites available to accommodate such a large facility in Harlow district. This means that waste will be exported out of the district for processing under the emerging arrangement. The ‘self sufficiency’ principle, which is to be enforced by Essex County Council and enshrined in Planning Policy Statement 10 and the national waste strategy, will ensure that there will be no new cross border (into Hertfordshire or London) exportation of waste will be supported.

6.12 Essex County Council, in conjunction with Integra Developments Limited are currently proposing the development of a large (400,000 + tonnes per annum) facility at Courtauld Road Basildon. Should it be consented, this facility will address the sub regional ‘need’ that has arisen due to consumption and generation of waste in the administrative areas to the south of the County. It is unlikely that this facility will process waste arising in Harlow.

6.13 A second proposed facility (c500, 000 tonnes per annum) at Rivenhall near Braintree will address the northern area sub regional need. A related planning application made on behalf of the site owner Gent Fairhead Ltd was approved in 2007. In accordance with the waste management strategy, it is to this facility that future waste arising in the district of Harlow will likely be directed. We are currently seeking confirmation from Essex County Council.

6.14 Together these two facilities will address a regional, or countywide need for recovery processing capacity.

6.15 Any waste arising in the proposed growth area to Harlow north, located in East Herts, will be directed to waste processing facilities in Hertfordshire County. It is likely that any waste arising in the potential growth areas situated in Epping Forest district would be directed to the new processing facility at Courtauld Road, Basildon.

6.16 Once the upper tier of municipal waste processing capacity is in place, each WCA, including Harlow, will be able to deposit waste, in whatever form it is collected, into a transfer station within its area or close to its border where it is practicable for 2 or more districts (in Essex) to share a facility. As they are situated in the same County, there may be opportunities for Epping and Harlow to share facilities. An appointed waste contractor would then be responsible for transporting the waste to the appropriate waste facility. Where appropriate, deliveries will be made directly to the new processing facility.

6.17 Currently, there are 23 civic amenity/waste & recycling centres in Essex. These facilities process a range of bulky waste and general garden waste. Only one of these facilities is located in Harlow district (River Way, Temple Bank). This facility is capable of managing glass, cans, paper, textiles, plastics, cardboard, green garden waste, timber, batteries, engine oil, household appliances, hardcore and soil.

6.18 It is understood that unsorted residual municipal waste arising in Harlow is currently diverted to one of the seven landfill facilities located within Essex. It is the bulk of this waste that will eventually be diverted to the new facility at Rivenhall.

6.19 Essex County Council is currently funding a multi million pound civic amenity site upgrading programme and establishing several new facilities. Harlow also has a number of local recycling banks at car parks and supermarkets across the town. Weekly kerbside collection of waste is undertaken by the Waste Collection Authority. The WCA also organises the kerbside collection of garden waste, paper and textiles on a fortnightly basis.

6.20 It is acknowledged that a supporting network of transfer stations will need to be developed. We are investigating whether new transfer station capacity is needed in the Harlow area in conjunction with Essex County Council. It has not yet been determined whether the existing facility at River Way has the capacity to support the onward transfer of sorted waste to the new MBT.

6.21 It was originally intended that the chosen technological solution would be operating by 2009. This is the first target year of the Landfill Directive, in respect of the treatment and diversion of biodegradable municipal waste, and the year when most of the County Council's existing contracts expire. It was the intention of the Combined Authorities to review and monitor the action plan set out at the end of Section 5 of the strategy. The action plan covers the implementation of the infrastructure required to deliver the combined authorities targets for 2009/10 and later years. Progress in the further development of recycling for earlier years will be agreed and monitored through its annual business plans.

6.22 It is now unlikely that either of the proposed major waste treatment plants in Essex will be fully operational until early 2010.

6.23 As the recently published Waste Strategy for England (2007) reinforces the hierarchal approach to waste management, the technological solution proposed for the two proposed facilities remains appropriate. PPS 10 also endorses the use of single site integrated facilities. The proposed facility at Rivenhall has been consented but the second proposed facility at Courtauld Road has not yet achieved planning consent. However approval is expected shortly.

6.24 Notwithstanding, the waste authorities are still committed to the development of the two integrated waste management facilities to service the entire County.

Appendix A Social and Community Infrastructure in Harlow

Harlow Arts and Libraries

Ref	Venue/Facility	Address
	Harlow Arts	
A1	Gibberd Gallery	Civic Centre, The Water Gardens, Harlow, CM20 1WG
A2	Parndon Mill	Parndon Mill, Harlow, Essex. CM20 2HP
A3	The Playhouse	Playhouse Square, Harlow, Essex CM20 1LS
A4	The Square	The Square, Fourth Avenue, Harlow, Essex CM20 1DW
A5	St John's Arts and Recreation Centre	St Johns ARC, St Johns Walk, Market Street, Old Harlow CM17 0AJ
A6	Victoria Hall Theatre	Bury Road, Old Harlow, CM17 0ED
	Harlow Libraries	
L1	Harlow Library	The High, Harlow CM20 1HA
L2	Great Parndon	Staple Tye, Harlow, CM18 7LZ
L3	Mark Hall Library	The Stow, Harlow CM20 3AP
L4	Old Harlow Library	30 High St, Old Harlow, CM17 0DW
L5	Tye Green Library	Tilegate Road, Bush Fair, Harlow CM18 6LU

Harlow Community Centres

Ref	Name	Address
CC1	Coppice Hatch Common Room	Partridge Road, Harlow, Essex CM18 6TD
CC2	Harlow Sporting Club	Hammarskjold Road, Harlow, Essex CM20 2JF
CC3	Mark Hall & Netteswell Community Association	Moot House, The Stow, Harlow, Essex CM20 3AG
CC4	Netteswell Work Centre	Netteswell Hall Annexe, Park Lane, Harlow, Essex CM20 2QH
CC5	Aneurin Bevan Centre	Garden Terrace Road, Harlow, Essex CM17 0AT
CC6	Church Langley Community Association	Church Langley Way, Harlow, Essex CM17 9TH
CC7	Dashes Family Resources Centre	Maddox Road, Harlow, Essex CM20 3RL
CC8	Great Parndon Community Association	Abercrombie Way, Harlow, Essex CM18 6YJ
CC9	Katherines & Sumners Community Association	Broadley Road, Harlow, Essex CM19 5RD
CC10	Merefield Day Centre	Partridge Road, Harlow, Essex CM18 6TD
CC11	Our Lady Fatima Church Hall	Howard Way, Harlow, Essex CM20 2NS
CC12	Blackbush Springs Common Room	Blackbush Springs, Harlow
CC13	Churchfield Common Room	Harlow
CC14	Latton Bush Centre	Southern Way, Harlow
CC15	New Hall	Adjacent to Moot House, The Stow, Harlow
CC16	Potter Street Community Association	96, Potter St, Harlow, Essex CM17 9AQ
CC17	The Link	Parsloe Road, Harlow CM19 4RT
CC18	Tye Green Comminity Centre	Tilegate Rd, Harlow, Essex CM18 6LU

Education

Ref	Name	Address	Age Range	Pupil No.s	Capacity	Surplus /Deficit
	Nurseries					
N1	Colourbox Montessori Nursery	Gilston Village Hall, Pye Corner, Gilston,Harlow, Essex CM20 2RB	2.5-5yrs	60		
N2	Smiles Montessori Pre-School	Unit 1 The Fair Way, Bush Fair, Harlow, Essex CM18 6LY	3m - 5yrs	66		
N3	The Nursery Rooms	Warwick House, Perry Road, Harlow, Essex CM18 7NF	3m - 5yrs	46		
N4	Griffon Day Nursery Ltd	The Latton Bush Centre, Southern Way, Harlow, Essex CM18 7BL	4m - 5yrs	60		
N5	The Gateway Nurseries	The Gateway Centre, Perry Road, Harlow, Essex CM18 7NR	0-5 yrs	57		
N6	Rum Tum Tuggers Nursery	Riddings Lane, Harlow, Essex CM18 7HT	0-8 yrs	26		
N7	Jack and Jill's Nursery	Sydenham House, Monkswick Road, Harlow, CM20 3NU	2-5 yrs	100		
N8	Kiddi Caru Day Nursery	Kiln Lane, Church Langley, Harlow, CM17 9LW	0-5 yrs	121		
N9	Leapfrog Day Nursery	Harlow Business Park, Green Way, Harlow, CM19 5QE	0-5 yrs	20		
N10	Rainbow Day Nursery	Oslo House, Princess Alexandra Hospital, Harlow, CM20 1QX	2-5 yrs	65		
N11	Raindrops Day Nursery	Hare Street Children's Centre, Little Grove Field, Harlow, CM19 4BU	0-5 yrs	26		
N12	Schoolgate Nursery	Medway Block, Carters Mead, Harlow, CM17 9EU	2-5 yrs	60		
	Primary (inc Nursery)					
PS1	Broadfields Primary School	Freshwaters, Harlow, Essex CM20 3QA	3-11	236	280	44
PS2	Hare Street Community Primary School and Nursery	Little Grove Field, Harlow, Essex CM19 4BU	3-11	357	378	21
PS3	Katherines Primary School	Brookside, Katherines, Harlow, Essex CM19 5NJ	3-11	227	308	81
PS4	Milwards Primary School and Nursery	Paringdon Road, Harlow, Essex CM19 4QX	3-11	161	210	49
PS5	Pear Tree Mead Primary and Nursery School	Pear Tree Mead, Harlow, Essex CM18 7BY	3-11	261	315	54

PS6	Potter Street Primary School	Carters Mead, Potter Street, Harlow, Essex CM17 9EU	3-11	126	210	84
PS7	Tany's Dell Community Primary School and Nursery	Tany's Dell, Mowbray Road, Harlow, Essex CM20 2LS	3-11	185	210	25
PS8	The Downs Primary School and Nursery	The Hides, Harlow, Essex CM20 3RB	3-11	191	210	19
PS9	Fawbert and Barnard's Primary School	London Road, Old Harlow, Essex CM17 0DA	4-11	209	210	1
PS10	Harlowbury Primary School	Off Watlington Road, Old Harlow, Essex CM17 0DX	4-11	154	210	56
PS11	Kingsmoor Primary School	Ployters Road, Harlow, Essex CM18 7PS	4-11	188	210	22
PS12	Little Parndon School	Park Mead, Harlow, Essex CM20 1PU	4-11	322	420	98
PS13	St Alban's Catholic Primary School	First Avenue, Harlow, Essex CM20 2NP	4-11	209	210	1
PS14	Water Lane Primary School	Broadley Road, Harlow, Essex CM19 5RD	4-11	152	189	37
PS15	Abbotsweld Primary School	Partridge Road, Harlow, Essex, CM18 6TE	5-11	216	315	99
PS16	Church Langley Community Primary School	Church Langley Way, Church Langley, Harlow, Essex CM17 9TH	5-11	439	432	-7
PS17	Churchgate Church of England Voluntary Aided Primary School, Harlow	Hobbs Cross Road, Harlow, Essex CM17 0LB	5-11	201	210	9
PS18	Holy Cross Catholic Primary School	Tracyes Road, Harlow, Essex CM18 6JJ	5-11	204	210	6
PS19	Latton Green Primary School	Riddings Lane, Harlow, Essex CM18 7HT	5-11	197	210	13
PS20	Matching Green Church of England Voluntary Controlled Primary School	Little Laver Road, Matching Green, Harlow, Essex, CM17 0QB	5-11	65	70	5
PS21	St James' Church of England Voluntary Aided Primary School, Harlow	Paringdon Road, Harlow, Essex CM18 7RH	5-11	217	208	-9
PS22	St Luke's Catholic Primary School	Pyenest Road, Harlow, Essex CM19 4LU	5-11	206	210	4
PS23	The Henry Moore Primary School	Kiln Lane, Church Langley, Harlow, Essex CM17 9LW	5-11	492	513	21
PS23	Jerounds Infants School	Pyenest Road, Harlow, Essex CM19 4PH	7-11	161	180	19
PS24	Jerounds Junior School	Pyenest Road, Harlow, Essex CM19 4PH		215	240	25
PS25	Paringdon Junior School	Paringdon Road, Harlow, Essex CM18 7RQ	7-11	135	216	81
PS26	Purford Green Junior School	Purford Green, Harlow, Essex CM18 6HP	7-11	214	315	101

PS27	Spinney Infant School			138	210	72
PS27	Spinney Junior School	Cook's Spinney, Harlow, Essex CM20 3BW	7-11	251	300	49
PS28	William Martin Church of England Voluntary Controlled Junior School, Harlow			235	243	8
PS28	William Martin Church of England Voluntary Controlled Infant and Nursery School, Harlow	Tawneys Road, Harlow, Essex CM18 6PW	7-11	172	180	8
PS35	Peterswood Infant School and Nursery			103	150	47
	Primary Schools Adjacent to Harlow					
	Epping Forest					
PS29	Epping Upland Cof E Primary	Carters Lane, Epping, Essex CM16 6QJ				
PS30	Nazeing County Primary School	Hyde Mead, Nazeing, Essex EN9 2HS				
PS31	Roydon Primary School	Epping Road, Roydon, Essex, CM19 5HN	4-11	197		
	E Herts					
PS32	Hunsdon JMI					
PS33	High Wych C of E	High Wych, Sawbridgeworth, Herts, CM21 0JB	3-11	220		
PS34	St Andrews C of E Stanstead Abbotts					
	Secondary					
SS1	Burnt Mill Comprehensive School	First Avenue, Harlow, Essex CM20 2NR	11-16	1,109	1,200	91
SS2	Mark Hall School	First Avenue, Harlow, Essex, CM17 9LR	11-16	1,095	1,200	105
SS3	Passmores School and Technology College	Tendring Road, Harlow, Essex CM18 6RW	11-16	731	936	205
SS4	St Mark's West Essex Catholic School	Tripton Road, Harlow, Essex CM18 6AA	11-18	952	901	-51
SS5	Stewards School	Parnall Road, Harlow, Essex CM18 7NQ	11-16	954	1,035	81
	Special					
Spec S1	Harlow Fields School	Tendring Road, Harlow, Essex CM18 6RN	3-19	122		
	Private					

	St Nicholas School	Hillingdon House, Hobbs Cross Road, Old Harlow, Essex, CM17 0NJ	4-16	362
	FE			
Ref	Name	Address	Other information	
FE1	Harlow College	Velizy Avenue, Harlow, Essex, CM20 3LH		
	Nearest College outside Harlow			
FE2	Epping Forest College	Borders La, Loughton, IG10 3SA	May not need to map	
	Adult Community Learning Centres			
ACL1	Rivermill	Holdings Road, Harlow, Essex CM20 1NW		
ACL2	Northbrooks House	Northbrooks, Harlow, CM19 4DS		

Emergency Services

Ref	Name	Address
	Police	
POL1	Harlow Police Station	The High, Harlow CM20 1HG
POL2	Old Harlow police station	The Old Police House, Old Harlow
POL3	Orchard Croft	Orchard Croft, Harlow
	Fire Station	
Fire 1	Harlow Fire Station	Fourth Avenue, Harlow, CM20 1DU
Fire 2	Old Harlow Fire Station	82 High Street Harlow CM17 0DR
	Ambulance	
	see under Health	

Health

Ref	Name	Address
	HHCT Health Centres	
HC1	Addison House	Hamstel Road, Harlow, Essex, CM20 1DS
HC2	Florence Nightingale Health Centre	Minton Lane, Church Langley, Harlow, CM17 9TG
HC3	Keats House	Keats House, Bush Fair, Harlow, Essex CM18 6NE
HC4	Lister Medical Centre	Lister House, Staple Tye, Harlow, Essex CM18 7LU
HC5	Nuffield House Health Centre	Nuffield House, The Stow, Harlow, Essex, CM20 3AX
HC6	Osler House	Prentice Place, Harlow CM17 9BG
HC7	Sydenham House	Monkswick Road, Long Ley, Harlow, Essex CM20 3NT
	Other Health Centres and GP Practices	
See above	Addison House Surgery	Hamstel Road, Harlow, Essex, CM20 1DS
HC8	Barbara Castle Health Centre	Broadley Road, Harlow, Essex CM19 5SJ
HC9	Church Langley Medical Practice	Church Langley Way, Harlow, Essex CM17 9TG
See above	The Hamilton Practice	Keats House, Bush Fair, Harlow, Essex CM18 6NE
HC10	Jenner House (Old Harlow Health Centre)	Jenner House, Garden Terrace Road, Harlow, Essex CM17 0AX
See above	Lister Medical Centre	Lister House, Staple Tye, Harlow, Essex CM18 7LU
See above	The Ross Practice	Keats House, Bush Fair, Harlow, Essex CM18 6NE
See above	Dr K Singh & Partner	Sydenham House, Monkswick Road, Harlow, Essex, CM20 3NT
HC11	Hailey View Surgery	67 High Street, Roydon, Harlow, Essex, CM195EE
See above	Osler House Surgery	Prentice Place, Harlow CM17 9BG
See above	Dr A Yadava	Minton Lane, Church Langley, Harlow, CM17 9TG
See Ambulance Station	**Harlow Walk-in Centre**	1a Whych Elm, Harlow, CM20 1QP
	Day Hospitals	
See Day Centres	Williams Day Hospital	Leah Manning Centre - see Day Centres
	District General Hospital	

PAH	Princess Alexandra Hospital	Hamstel Road Harlow CM20 1QX
	Ambulance	
AMB	Harlow Ambulance Station	1 Whych Elm, Harlow, CM20 1QP
	Hospice	
HOSP	St Clare's Hospice	Stone Barton, Hastingwood, Harlow CM17 9JX

Social Services

Ref	Name	Address
	Day Centres	
DC1	Merefield Day Centre	Goldsmiths, Partridge Road, HARLOW, CM18 6TD
DC2	Kingsmoor House Family Resource Centre	Paringdon Road, HARLOW, CM19 4QT
DC3	Harlow Work Skills Development Centre	Netteswell Hall Annexe, Park Lane, Harlow, Essex CM20 2QH
DC4	Barn Mead Resource Centre	Barn Mead Centre, Partridge Rd, Harlow, Essex CM18 6TT
DC5	Abercrombie Centre	Abercrombie Way, Harlow, Essex CM18 6YF
DC6		
DC7	Leah Manning Centre	Park Lane, Harlow CM20 2QJ
	Residential Homes	
RH1	Ashlyn	Vicarage Wood, Harlow, Essex CM20 3HD
RH2	Berecroft	317 Berecroft, Harlow, Essex CM18 7SG
RH3	Keefield	Keefield Close, Harlow, Essex CM19 5SW
RH4	Livingstone House	11 Potter Street, Harlow, Essex CM17 9AE
RH5	Mencap	49, Little Cattins, Harlow CM19 5RL
RH6	Netteswell Rectory	Manston Road, Harlow, Essex CM20 3PA
RH7	Tye Green Lodge	Tye Green Village, Harlow, Essex CM18 6QR
	Children's Centres	
CC	The Tree House Children's Centre	Parnall Road, Harlow, Essex CM18 7NG

Appendix B
Climate Change

B.1 Climate Change

Introduction

B.1.1 There is little doubt that climate change is a reality and that it will pervade all areas of life. While there are impacts that are no longer avoidable, there is still time to develop adaptation techniques to cope with a changing climate, and mitigation strategies to limit further damage in the 21st century.

B.1.2 The Earth's climate is dynamic; the planet alternates between periods of glacial (cold) and interglacial (warm) conditions as part of its natural cycle Intergovernmental Panel on Government Change (IPCC, 2001). While this is often altered by such events as large volcanic eruptions, the cycle is consistent. For the past 10,000 years the Earth has been in an interglacial period, which has provided a comfortable 15°C average surface temperature for mankind. However, there is substantial evidence that the impact of human activities has caused, and will continue to cause, a steady but significant increase in this average surface temperature.

B.1.3 The Earth is kept warm by certain gases in its atmosphere; gases such as water vapour, carbon dioxide (CO2) and methane absorb outgoing radiation and re-emit it back to the Earth's surface. This has been described as the 'greenhouse effect', without which the Earth's surface would be approximately 33°C colder. Since the industrial revolution, mankind has consistently been adding to the greenhouse gases already in the atmosphere. Through burning of fossil fuels and changes in land use, the volume of greenhouse gases has increased from 270 parts per million volume (ppmv) in pre-industrial times to 379 ppmv in 2005 (IPCC, 2007). This far exceeds the natural range of the past 650,000 years (180 to 300 ppmv) as determined by ice cores (IPCC, 2007). This has caused an intensification of the greenhouse effect and a gradual warming of the Earth.

Climate change in the East of England

B.1.4 There is now a substantial consensus amongst scientists that human activities are altering the Earth's climate. The recently released Intergovernmental Panel on Climate Change (IPCC) fourth Assessment Report (AR4) report concludes that climate change is 'very likely' to have a human cause (IPCC, 2007).

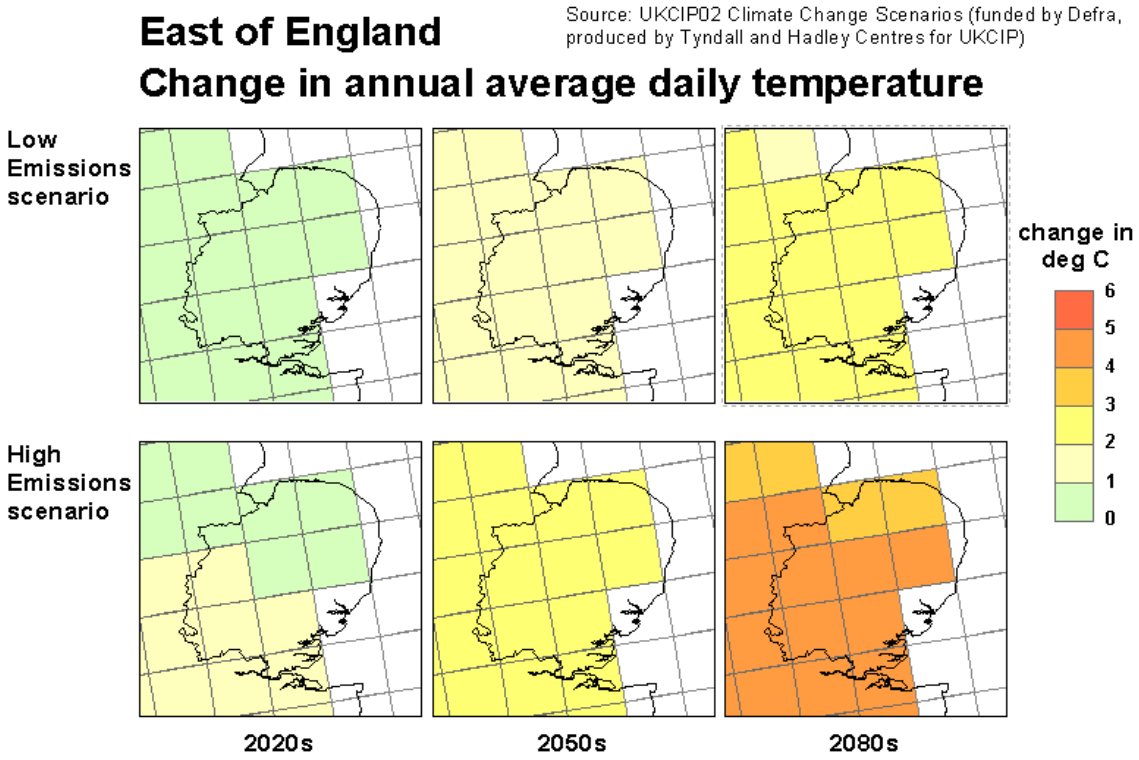
B.1.5 The United Kingdom Climate Impact (UKCIP02) scenarios project the impacts of climate change under a range of emissions scenarios for the UK (Hulme et al., 2002). Scenarios for three different timeslices are presented, representing the average climate over 30 year periods centred on the 2020s, 2050s and 2080s. The climate changes projected to the 2020s are similar across all scenarios; this is because changes in the short term are dictated by past GHG emissions in recent decades. Climate changes beyond the next few decades depend on future emissions, but even the low emissions scenario indicates an acceleration of climate change when compared to changes that have occurred in the 20th century The scenarios are based on a UK Met Office General Circulation Model (GCM), coupled to a Regional Climate Model (RCM) which allows impacts to be assessed on a local to regional scale.

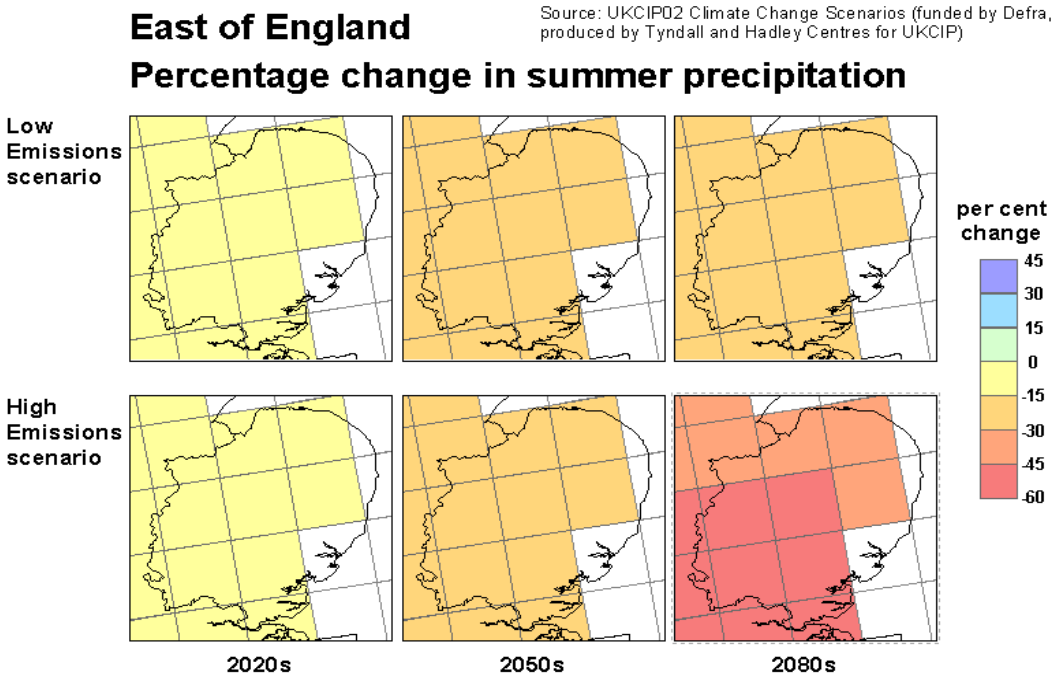
B.1.6 A summary of the major climate changes expected in the East of England is provided in the table overleaf, with supporting maps for rainfall and temperature provided in maps shown. All figures are derived from the UKCIP02 scenarios (Hulme et al., 2002) and are expressed relative to the 1961-1990 mean climate. Where a range is given this relates to the low emissions and high emissions scenarios, but also reflects grid-scale geographical variation within the Region. Spring represents the average for March, April and May; summer the average for June, July and August; autumn the average for September, October and November; winter the average for December, January and February.

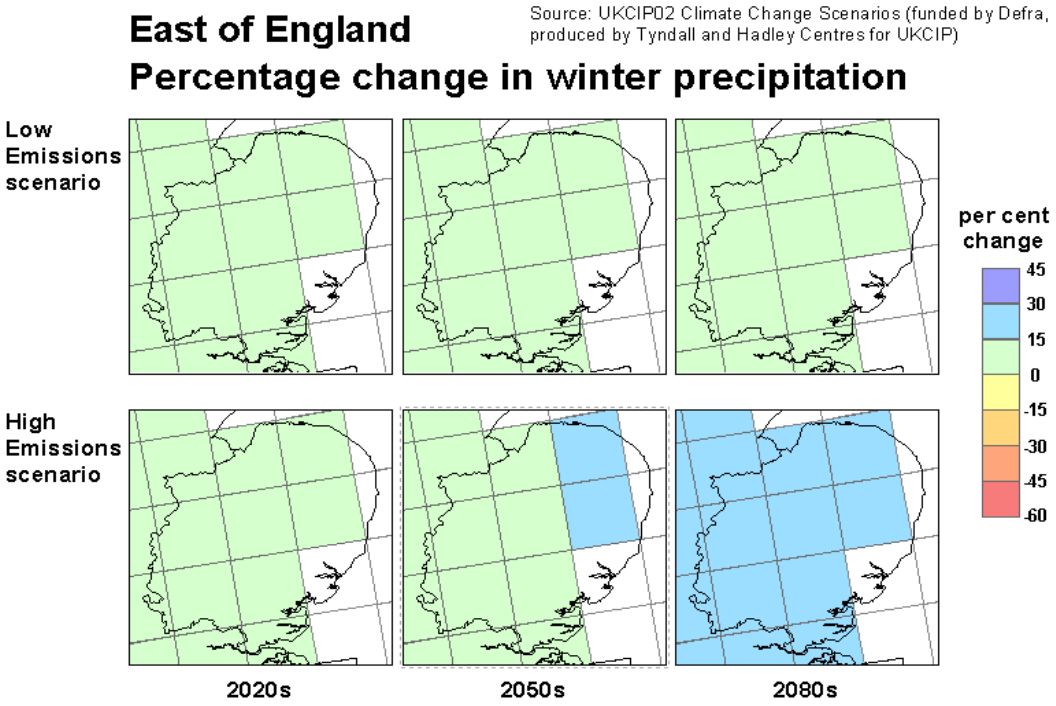
Climate variable		2020s	2050s	2080s
Temperature	Annual mean	+1.0 to +1.5°C	+2.0 to +2.5°C	+2.5 to +4.5°C
	Spring mean	+1°C	+1.5 to +2.0°C	+2.0 to +3.5°C
	Summer mean	+1.0 to +1.5°C	+2.0 to +3.0°C	+3.0 to +5.0°C
	Autumn mean	+1.0 to +1.5°C	+2.0 to +3.0°C	+2.5 to +5.0°C
	Winter mean	+1.0°C	+1.5 to +2.0°C	+2.0 to +3.5°C
	IAV[1]	Annual IAV change is WNV[2]		
	Diurnal range	Decrease in diurnal range in winter, increase in summer. Annual diurnal range change is+0.2 – +0.8°C		
	Extremes	Extremely warm days will become more frequent; extremely warm days will become hotter. Heat waves will be more likely. The number of cold days will decline.		
	Sea temp	Up to +0.5°C	+0.5 -+2.5°C	+1.5 - +3.5°C
Precipitation	Annual mean	Up to -10%	Up to -10%	Up to -10%
	Spring mean	Up to -10%	Up to -10%	-10% to +10%
	Summer mean	Up to -20%	-20% to -40%	-30% to -60%
	Autumn mean	Up to +10%	Up to +10%	+10% to -20%
	Winter mean	Up to +10%	+15% to +25%	+20% to +40%
	IAV[1]	Annual precipitation variability will decline in the range 0 to -15% Increase in winter precipitation variability. Decrease in summer precipitation variability.		
	Snow	Average winter snowfall is likely to decline by between –50% and –100% (i.e. no snow on average) by the 2080s		
	Extremes	More intense rainfall days in winter and spring. Greater probability that an extreme rainfall event will occur on any given winter day. Evidence that intense summer storms may also increase (but limited by spatial resolution of model). Seasonally, there is an increased likelihood of very dry summers and very wet winters		
Cloud cover		Annual change in cloud cover of -6% to -9%. Large decreases in summer cloud cover, -9% to -20%. Slight increase of up to 3% in winter.		
Relative humidity		Relative humidity will reduce annually and in all seasons, especially in summer to -15%		
Soil moisture content		Soils will become drier overall, with soil moisture content declining by as much as 50% in some areas by the 2080s (high emissions). Soil moisture content will actually increase marginally in winter, but this is		

Climate variable	2020s	2050s	2080s
	offset by significant reductions in summer and autumn.		
Wind speed	Average wind speeds over land are likely to increase in winter and spring up to +9% but may decline in summer and autumn up to -5%. However, changes in wind speed are only predicted with low confidence		
Sea level	Global mean sea level is expected to rise by between 9 and 69 cm by the 2080s (the range represents emissions and scientific uncertainty). Regional figures incorporating isostatic uplift suggest a relative mean sea level of between 8 and 77cm by the 2080's. Storm surge heights in the Wash are anticipated to increase up to 1.2m. However, changes in storm surge heights are only predicted with low – medium confidence		

[1] IAV = Inter annual variability. A measure of variation in climate from year to year. Based on model output for 2080s across the four UKCIP02 scenarios.
[2] WNV = within a measure of Natural Variability i.e. no trend detected.







B.1.7 A new set of climate change scenarios is due to be published by UKCIP in late 2008. The UKCIP08 scenarios will provide users with a greater range of outputs. In addition, the scenarios will be presented as a probability density function, rather than a single number, with the probability representing some of the uncertainties inherent in climate modelling, downscaling and in relation to natural variability. However, the outputs will still be subject to uncertainty related to elements of the climate system poorly represented by climate models and uncertainties beyond the modelling process will not be captured. In particular this will still mean that separate emissions scenarios are required for the 2050s and 2080s timeslices. Nonetheless, the new scenarios will represent a significant development and will be particularly useful for risk assessments

Adaptation and mitigation

B.1.8 Addressing the challenges associated with climate change requires a 'two-pronged' approach; mitigation to limit the magnitude and rate of change and adaptation to deal with the residual impacts and opportunities. The Intergovernmental Panel on Climate Change (IPCC) define mitigation as 'an anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases' (IPCC, 2001).

B.1.9 However, irrespective of the success of mitigation efforts, there will still be some degree of unavoidable climate change due to historic emissions of greenhouse gases (GHGs). Responding to the impacts of climate change therefore requires adaptation. With respect to climate change, adaptation is thought of as 'an adjustment in natural or human systems to actual or expected climatic stimuli (variability, extremes and changes) or their effects, which moderates harm or exploits beneficial opportunities' (UKCIP 2007; 4). Adaptation requires effective measures directed at enhancing our capacity to adapt and at minimising, adjusting to and taking advantage of the consequences of climatic change.

Climate change and water cycle strategies

B.1.10 Climate change is likely to impact on all stages of the water cycle see table overleaf. Adaptation to climate change will thus be considered at a number of points in the Harlow Infrastructure Study.

Stage in the water cycle	Impacts of climate change
Water Supply	Decreased summer rainfall may result in lower water levels in reservoirs. Potential opportunity for increased storage in winter when rainfall will be higher. Increased intensity and frequency of storm events may lead to capacity constraints and increased sewer flooding. Change to soil conditions affecting slope stability and increased storm intensity may affect capacity of spillways.
Water treatment works	Increase in flood risk to water treatment works, particularly during winter.
Water distribution network	Changes to leakage level because of altered soil conditions (water table level, heave, greater extremes in soil moisture).
Housing developments	Increased winter rain may lead to increased runoff and water reaching drains. Changes to infiltration because of altered soil conditions and water table heights. Greater risk of sewer flooding. Potential change in 'return to sewer' as proportion of water demand because of higher evaporative use (e.g. garden watering). Potential impact on the water supply demand balance.
Sewage treatment works	Increase in flood risk to water treatment works, particularly during winter. Decrease in receiving water levels in summer may require effluent to be treated to a higher standard. Effectiveness of current treatment methods may decrease under higher temperatures.

	Lower summer flows (lower water tables) and warmer temperatures leading to sewer odour issues, requiring jetting, etc. Increased algae risk (e.g. settlement tanks) because of lower summer flows, higher temperature, solar incidence, leading to consent risk, higher OPEX and potentially capital solutions.
River	Potential for decrease in water quality due to decreased dilution as rainfall decreases. Increase in algal blooms due to higher water temperature.

Climate change impact on water cycle

Climate change uncertainties

B.1.11 There are several uncertainties associated with future climate change scenarios resulting mainly from uncertainty about future socio-economic developments and different representations of physical processes within climate models. These uncertainties need to be considered in the water cycle strategy when assessing climate change impacts and risks, and when defining strategies and options for adaptation. Climate change adaptation strategies should be designed to be as flexible as possible in order that they take account of these multiple sources of uncertainty. Adaptation actions that are no or low-regrets options and which do not prevent future adaptation can allow uncertainties to be dealt with. Adaptive management (altering an existing process or policy to take account of climate change) can also be useful in dealing with uncertainties as the outcomes can be monitored and the process or policy further modified in response.

Water Framework Directive

B.1.12 The Water Framework Directive (2000) is a major piece of legislation, which aims to rationalise the myriad of historic EU water legislation to achieve an integrated system of water protection, improvement and sustainable use. As such it could potentially have significant implications for land-use planning and development control. The WFD was transposed into law in England and Wales by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003. The Environment Agency is identified as the Competent Authority for implementing the Directive and ensuring its delivery.

B.1.13 Unlike previous Directives, the WFD applies to all water bodies, both surface and groundwater. It is set up to govern water management and activities affecting water ‘status’, where status is a measure of ecological, chemical, hydrological and morphological quality in surface waters, and quantity and chemistry in groundwaters. The Directive has the following broad objectives.

- preventing deterioration in water status;
- restoring surface waters to good ecological and chemical status by 2015;
- reducing pollution from priority substances and phasing out certain priority hazardous substances;
- achieving objectives for EU protected areas;
- contributing to mitigating the effects of floods and droughts;
- preventing and/or limiting pollution input into groundwater; and
- balancing abstraction and recharge.

B.1.14 Whilst it sets quality targets for all water bodies, the WFD recognises that certain water bodies are ‘heavily modified’ (i.e. they have been physically modified in order to support specified types of

human use) or ‘artificial’ (i.e. excavated from land), and lower ecological targets are set accordingly. Economic factors are also considered in WFD decision making. For example, provision is made for extended deadlines or lower targets where achieving the required objectives would be disproportionately costly or is otherwise not feasible.

B.1.15 The Directive will also potentially directly affect many development control decisions as Article 4(7) of the WFD sets out a range of criteria, which must be applied when determining whether or not new developments or modifications, which affect water status, should be permitted. These criteria include taking all practical mitigation measures; demonstrating overriding public interest or equivalent; and confirming that there are no technically viable, environmentally better options that are not disproportionately costly. In this regard, Article 4(7) therefore, provides a defence in certain circumstances, where there is likely to be, or has been, a failure to achieve good status or prevent deterioration in status to the environmental objectives of the WFD due to new modifications or new sustainable human development activities

B.1.16 Article 14 of the WFD requires the active participation of all stakeholders in the interpretation and implementation of the Directive underpinning the integration of planning for the water environment. The water cycle strategy for Lea Valley can be seen as a method for implementing this integrated approach and in this respect, all aspects of the WFD must be acknowledged and complied with.