

**Essex County Council and Southend-on-Sea Borough Council
Replacement Waste Local Plan: Pre-Submission 2016**

Sustainability Appraisal and Strategic Environmental Assessment

Environmental Report: Annex B – Baseline Information

February 2016

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Glossary of Acronyms

AD	Anaerobic Digestion
ALC	Agricultural Land Classification
AMR	Annual Monitoring Report
ANGSt	Accessible Natural Greenspace Standard
AONB	Areas of Outstanding Natural Beauty
APS	Active People Survey
AQMA	Air Quality Management Area
BAP	Biodiversity Action Plan
BARR	Buildings At Risk Register
BC	Borough Council
CAMS	Catchment Abstraction Management Strategy
CD&E	Construction, Demolition and Excavation Waste
CH&P	Combined Heat and Power
CPZ	Countryside Protection Zone
CWS	County Wildlife Site
dB(A)	Decibel (A-weighted)
DC	District Council
DCLG	Department for Communities and Local Government
DEFRA	Department for Environment, Food and Rural Affairs
DPD	Development Plan Document
EA	Environment Agency
EC	European Community
ECC	Essex County Council
EEC	European Economic Community
EHHER	Essex Historic Environment Record
ELV	End of Life Vehicle
ELWA	East London Waste Authority
EU	European Union
FZ	Flood Zone
GIS	Global Information System
GWh	Giga Watt per hour
ha	Hectare
HARR	Heritage at Risk (in Essex) Register
HEC	Historic Environment Characterisation
HGV	Heavy Goods Vehicle
HLC	Historic Landscape Characterisation
HRA	Habitats Regulations Assessment
ILW	Intermediate Level radioactive Waste
kW	Kilo Watt
LACW	Local Authority Collected Waste
LCA	Landscape Character Areas
LDF	Local Development Framework
LLW	Low Level Waste
LNR	Local Nature Reserves
LoWS	Local Wildlife Sites
MBT	Mechanical Biological Treatment
MGB	Metropolitan Green Belt
MLP	Minerals Local Plan
MRF	Materials Recycling Facility
MSW	Municipal Solid Waste
MW	Mega Watt
NDA	Nuclear Decommissioning Authority
NE	North east
NLWA	North London Waste Authority
NNR	National Nature Reserve
NO2	Nitrogen Dioxide
NPPF	National Planning Policy Framework
ODPM	Office of the Deputy Prime Minister
PAS	Planning Advisory Service
PDL	Previously Developed Land

PM10	Particle Matter
PPS	Planning Policy Statement
PRoW	Public Right of Way
RCHW	Recycling Centres for Household Waste
RO	Renewables Obligation
WLP	Waste Local Plan
SA	Sustainability Appraisal
SAC	Special Areas for Conservation
SARS	Strategic Aggregate Recycling Site
SBC	Southend Borough Council
SEA	Strategic Environmental Assessment
SFRA	Strategic Flood Risk Assessments
SINC	Sites of Importance for Nature Conservation
SM	Scheduled Monuments
SPA	Special Protection Area
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
SW	South west
tpa	Tonnes per annum
TPO	Tree Preservation Order
UKCIP0UK	Climate Change Projections 2009
VLLW	Very Low Level Waste
WCA	Waste Collection Authority
WDA	Waste Disposal Authority
WDD	Waste Development Document
WEEE	Waste Electrical and Electronic Equipment
WPA	Waste Planning Authority
WRMU	Water Resource Management Units

1. Introduction

1.1. Background

Essex County Council (ECC) and Southend-on-Sea Borough Council (SBC) commissioned Place Services to undertake an independent Sustainability Appraisal (SA) incorporating Strategic Environmental Assessment (SEA) on the Replacement Waste Local Plan: Pre-Submission 2016.

This document is Annex B to the Environmental Report and includes the detailed baseline information for the current Plan Area. A summary of has been included within the main Environmental Report.

1.2. Sustainability Baseline Information

The SEA Directive requires the production of the following information:

“the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;” Annex 1(b);

“the environmental characteristics of areas likely to be significantly affected;” Annex 1(c); and

“any existing problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance such as areas designated pursuant to Directives 79/409/EEC and 92/43/ECC” Annex 1(d).

The baseline information identifies current sustainability issues and problems in the Plan Area which should be addressed and provides a basis for predicting and monitoring the effects of implementing the document. The baseline may need to be updated during the SA/SEA process as new information emerges and/or as additional issues come to light.

To ensure the data collected was relevant and captured the full range of sustainability issues it was categorised under several thematic topics. They cover all the topics referred to in Annex 1(f) of the SEA Directive and follow the order of:

- Waste
- Minerals
- Biodiversity
- Landscape
- Population and Social
- Air Quality and Noise
- Climatic Factors
- Transport
- Water
- Flooding
- Cultural Heritage and Townscape
- Economy
- Housing

The summaries of each topic have been included within the main Environmental Report while this annex contains the detailed baseline information.

2. Waste

The Waste Local Plan must implement the waste hierarchy, in accordance with the Revised Waste Framework Directive. In practice, this means promoting waste prevention, material and energy recovery (e.g. direct re-use, recycling and treatment to make new objects) prior to disposal. If plentiful facilities for the processes at the top of the waste hierarchy are provided while fewer for the processes towards the bottom of the hierarchy, movement up the waste hierarchy may be achieved.

2.1. Recycling Centres for Household Waste (RCHWs)

Within Essex there are 21 RCHWs which are run by the local authority and allow the public to dispose of household and recyclable wastes, including green waste, glass and metal. In 2013-14, 137,280 tonnes of waste was collected in the civic amenity sites in Essex.

Fewer residents are using the RCHWs due to improvements in kerbside collections. Therefore, ECC has conducted a resident's survey into the use of existing facilities in early 2014. In addition, a pilot scheme allowed trade waste to be brought on site under a 'pay as you throw' system at two of the facilities. Once results from these have been reviewed, decisions regarding the future of the RCHW facilities will be made.

2.2. Local Authority Collected Waste (LACW)

There is a significant amount of waste collected by the Waste Collection Authorities (the District, Borough and City Authorities) via direct kerbside collections (household waste), litter and street/beach cleaning. Waste is also directly collected by the Waste Disposal Authority (ECC and SBC) through Recycling Centres for Household Waste. In addition, for a fee, local authorities collect some waste from small commercial enterprises. Collectively this is known as Local Authority Collected Waste (LACW).

For 2012/13, the WDA managed approximately 720,000 tonnes of waste. Of this, approximately 30.9% was dry recycling (eg paper and plastics), a total organic element of 21.6% and the remaining 47.5% was residual waste. The organic element consists of 87,000 tonnes of source segregated green waste, 23,000 tonnes of source segregated food waste and 56,000 tonnes of mixed food and garden waste directly from households.

Table 1: Management of Local Authority Collected Waste (tonnes) 2014/2015

Area	Total Arisings (tonnes)	Fate of Total Waste Arisings		
		Incinerated	Recycled / Composted	Landfill
Essex	725,089	7,872 (1.1%)	345,120 (47.6%)	333,354 (46.0%)
Southend-on-Sea	75,708	326 (0.4%)	40,073 (52.9%)	35,309 (46.6%)
Total	800,797	8,198 (1.0%)	385,193 (48.1%)	368,663 (46.0%)

Source: DEFRA 2015

In Essex and Southend, 368,663 tonnes which accounts for 46% of the total household waste was sent to landfill in 2014/15. The Plan Area recycled and composted a total of 385,193 tonnes of household waste which accounts for 48.1% of total waste. ECC has an aspiration to achieve a 60% recycling rate by 2020.

2.3. Transfer Facilities

Six transfer facilities have been granted planning permission within Essex and Southend, to support the Courtauld Road materials recovery facility, in Basildon. These are all operational and accept waste from the Waste Collection Authority vehicles directly from kerbside collection. Here waste will be bulked up, ready for transportation to Courtauld Road. A summary of these transfer facilities is presented in the following table.

Table 2: Local Authority Collected Waste Transfer Facility Status

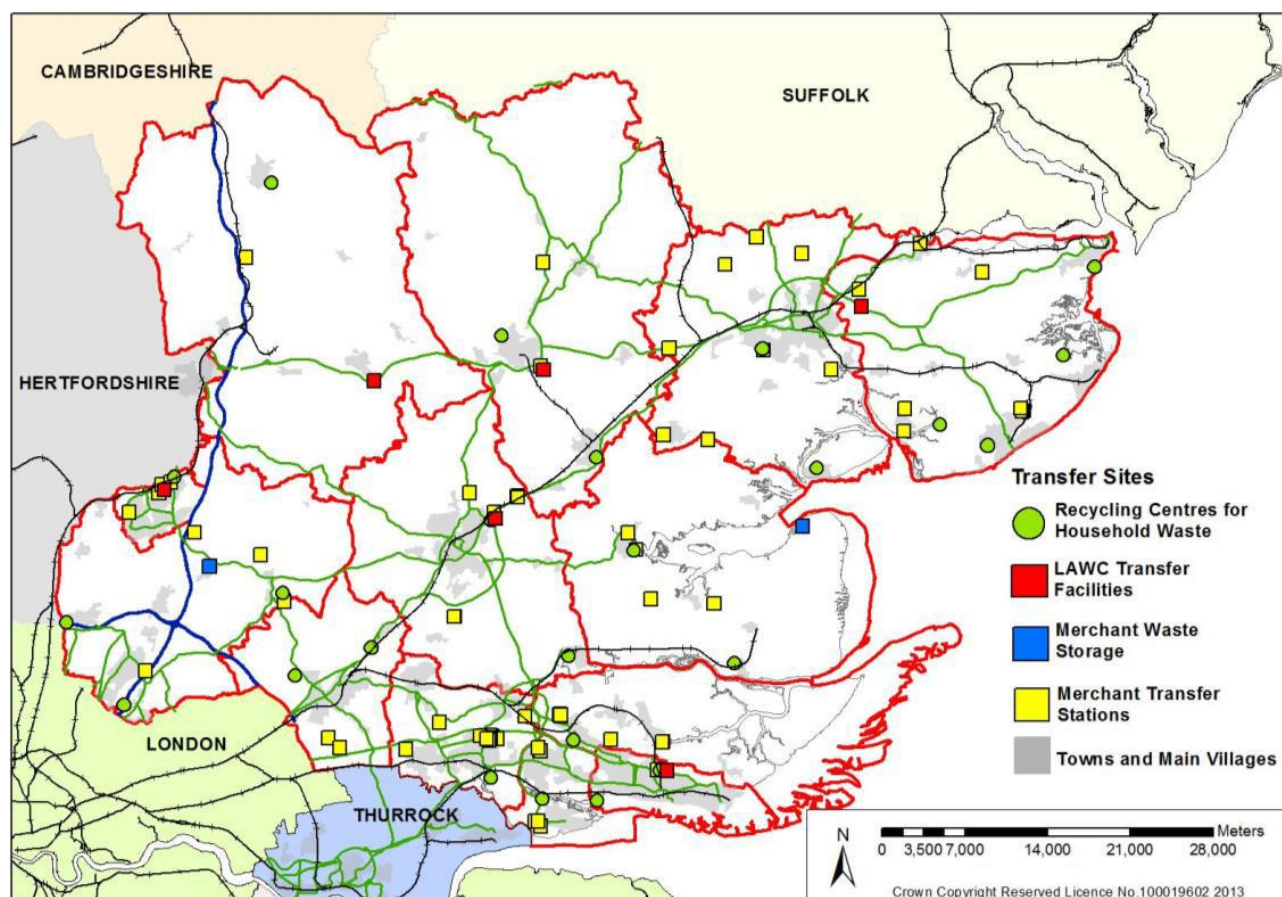
Transfer Facility	Throughput (Tonnes Per Annum)
Harlow - To serve Harlow and Epping Forest	55,000
Gt Dunmow - To serve Uttlesford	29,400
Chelmsford - To serve Chelmsford and Maldon	90,000
Braintree - To serve Braintree	71,250
A120 (west) - To serve Colchester and Tendring	115,000
Southend - To serve Southend	67,900
Total LACW Transfer Throughput	428,550 tpa

Source: Essex County Council 2014

As can be seen, there is a total transfer capacity of just over 428 thousand tonnes per annum.

The Waste Capacity Gap Report supporting the WLP considers that there is no further need for LACW transfer capacity during the plan period.

The following map shows the geographical spread of transfer facilities within the Plan Area.

Figure 1: Transfer facilities in the Plan Area

Source: Essex County Council 2014

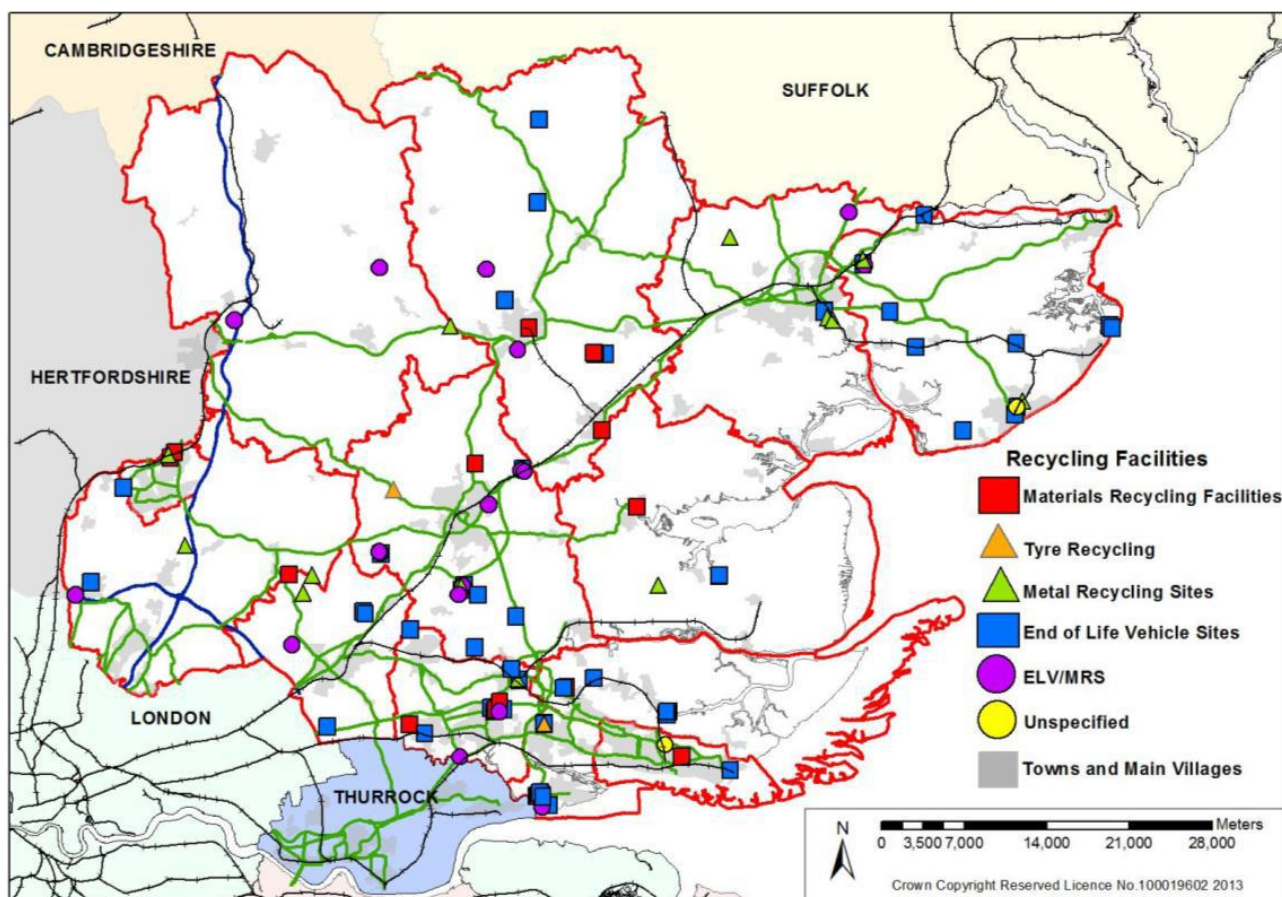
The above map shows geographically that there continues to be a concentration of facilities in key urban parts of the Plan Area, with fewer located in the rural areas of northern parts of the Braintree, Uttlesford and Rochford Districts, and the Eastern part of Maldon District (the Dengie Peninsula). This reflects these areas having low population, and therefore not generating significant quantities of waste.

2.4. Materials Recovery Facilities

A survey of recycling operations (undertaken by ECC in spring 2014) resulted in significant improvement in the knowledge of the number and capacity of materials recovery facilities. However, there remain some facilities that rely on an assumed capacity. This is derived from taking an average of the capacities of all known facilities, as no waste license is required and capacity data is not contained within the planning permission.

The following table shows the geographical spread of MRFs in the Plan Area.

Figure 2: MRFs in the Plan Area



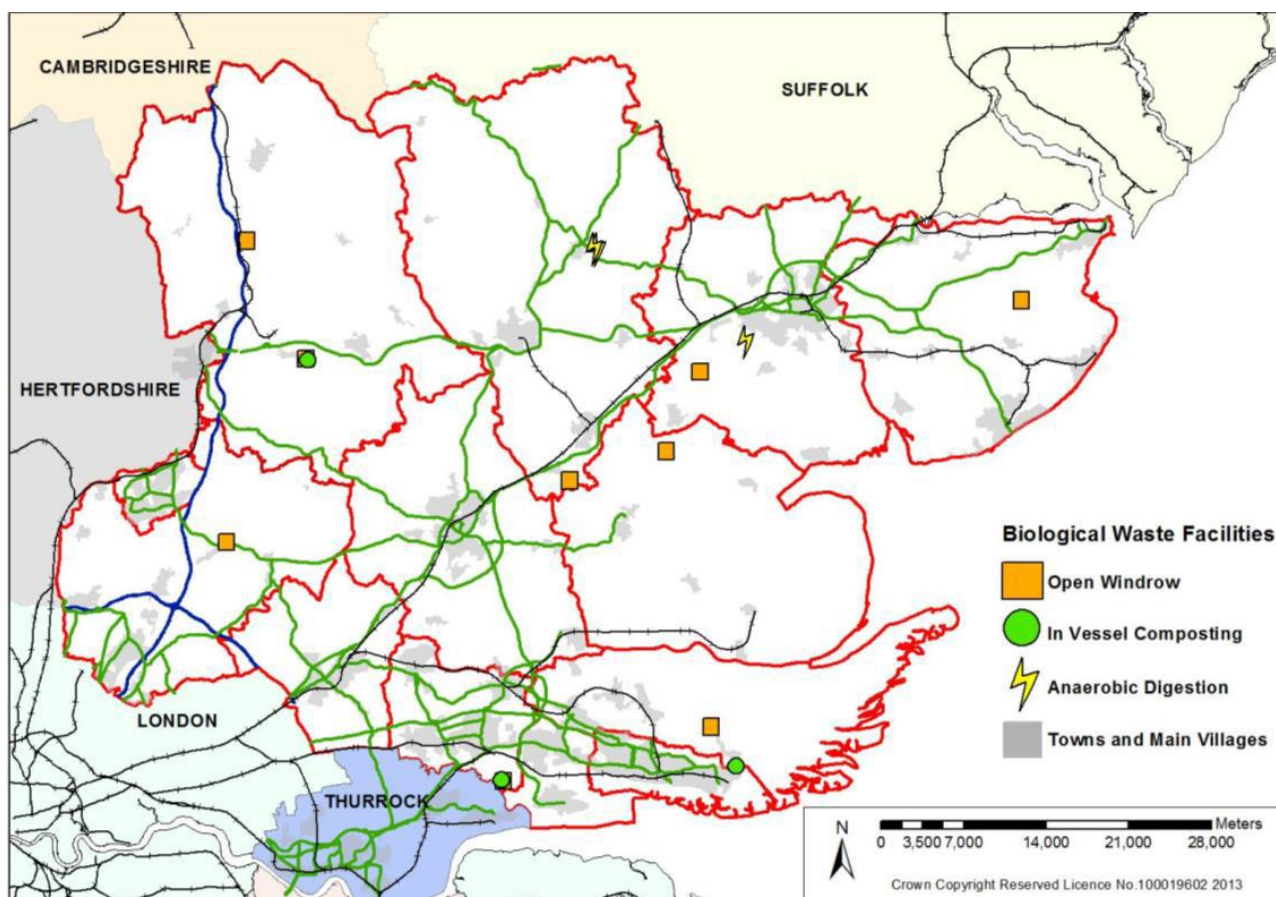
Source: Essex County Council 2014

There is a significant difference between the number and distribution of different materials recovery facilities, i.e. recycling and treatment operations. It can be seen there are significantly more recycling operations within the plan area. In both cases, there is a concentration of sites within the southern, more urbanised area and a good number within the wider Colchester area. This correlates with the greater amount of waste produced in urban areas. Of the sites that are not located within an urban area, the majority are located close to the primary highway routes. There are fewer facilities in the more rural parts of the plan area where there is less waste arising, such as Uttlesford District, the Dengie and north Rochford Peninsulas.

2.5. Biological Treatment Facilities

There are few biological treatment sites within the plan area, as identified in the table and map below, with a corresponding small capacity.

Figure 3: Biological Treatment Facilities in the Plan Area



Source: Essex County Council 2014

In 2014 there were few facilities that managed organic waste arising. However, the limited number of facilities is distributed throughout the plan area. The facilities tend to be located on the urban fringe, and/or on or near the main transport routes.

2.6. Energy from Waste Facilities

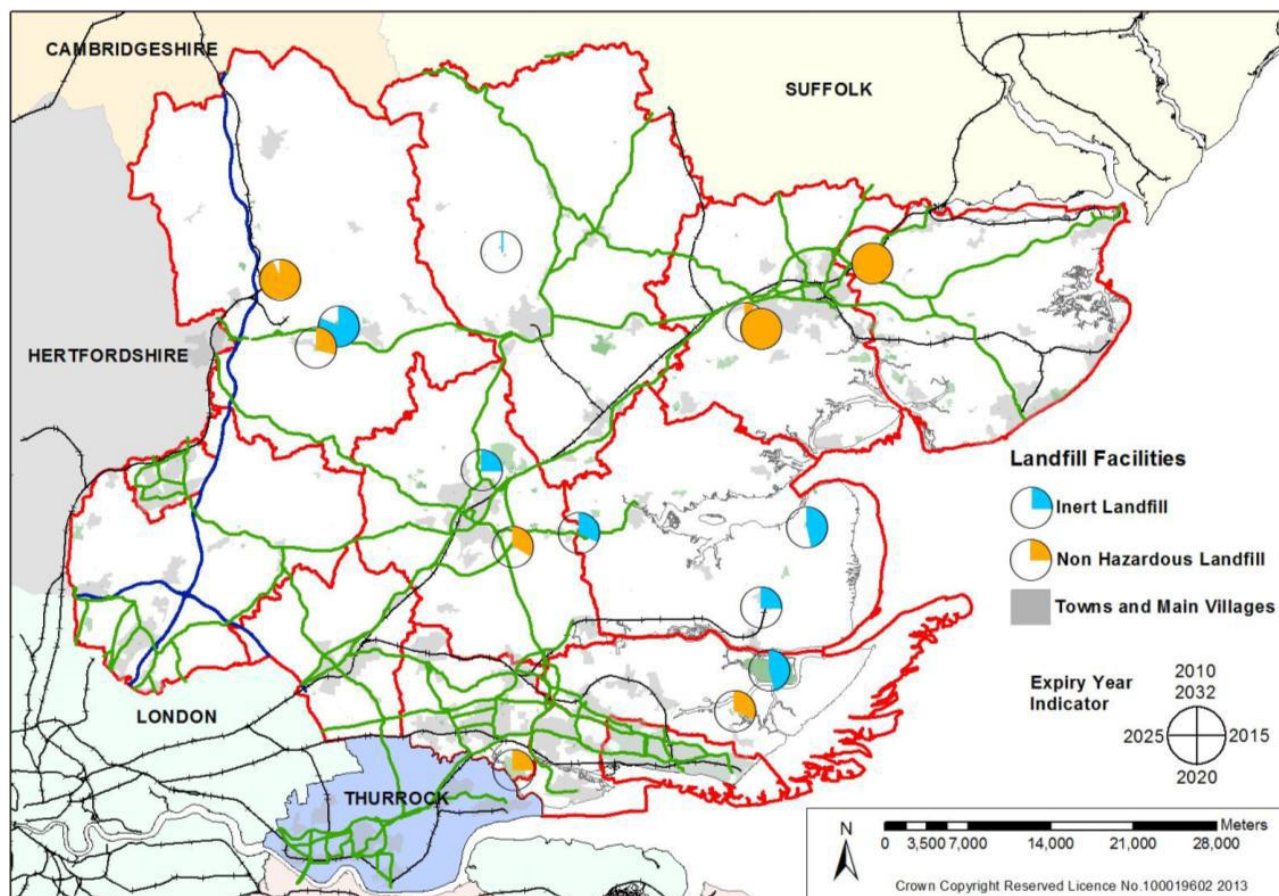
At present, there are no energy recovery facilities either operational or under construction. There is however, one that has planning permission but is not yet under construction, namely:

- Rivenhall II Combined Heat and Power estimated to have a capacity of 297,000tpa, but this will be from the residual waste already managed within the IWMF so would not divert further arisings from landfill

2.7. Landfill / Waste Disposal

Disposal of waste is at the bottom of the waste hierarchy and should only be considered as a last resort, when as much of the material and energy has been recovered as is economically and environmentally practicable. It is likely that there will always be some 'residual' element of waste that must be disposed of once all of the materials and energy has been recovered, but this should be minimal.

Figure 4: Landfill Facilities in the Plan Area



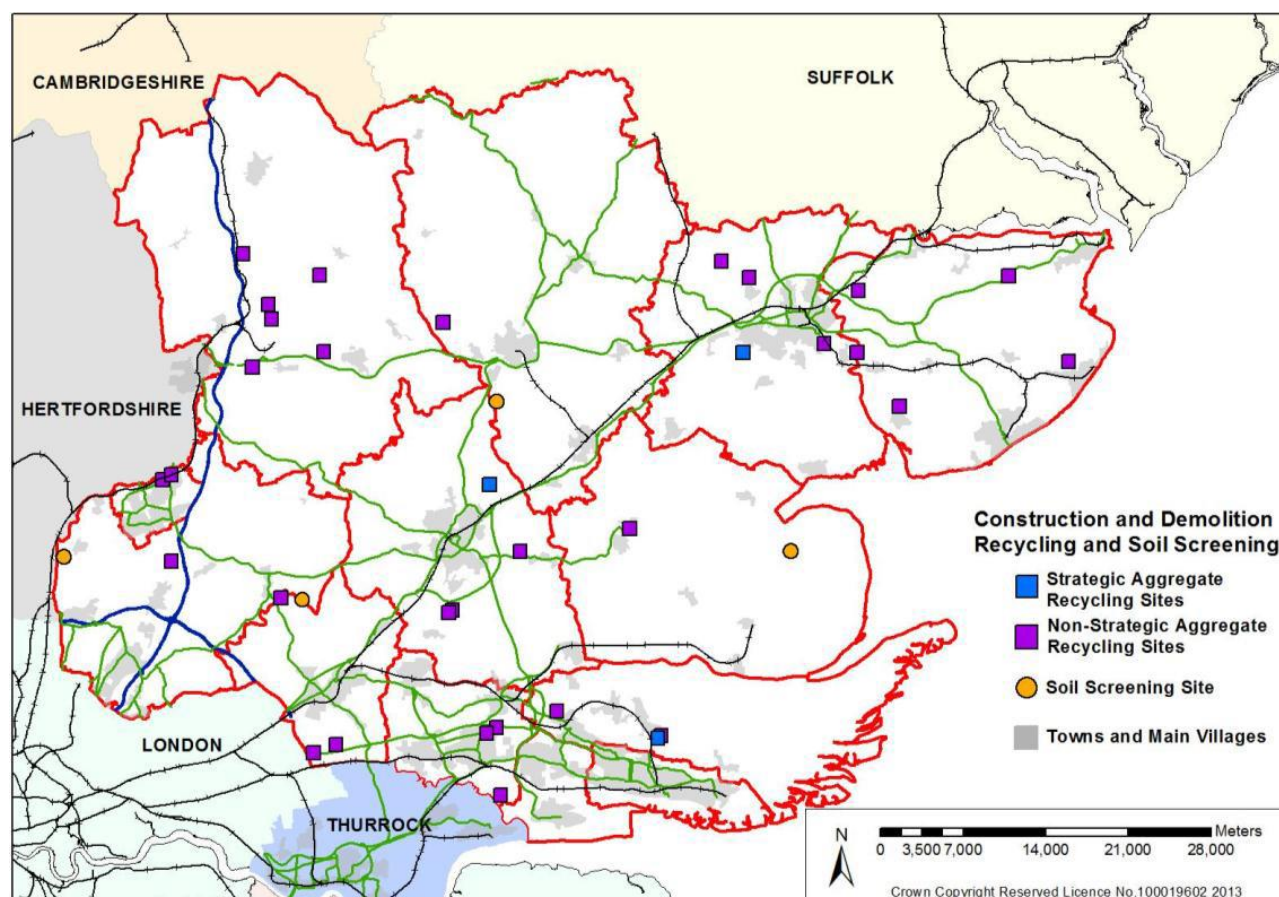
Source: Essex County Council 2014

In line with the predictions of waste management capacity higher up the waste hierarchy, even if no further permissions are granted, there would be a surplus of non-hazardous landfill capacity at 2031/32, if all permissions that have secured planning permission become operational.

2.8. Construction, Demolition and Excavation Waste

The National Waste Management Plan (2013) confirms that the Construction, Demolition and Excavation Waste (CD&E) waste stream is the largest contributing sector to the total amount of waste arising nationally. This is echoed within the plan area as between 2009 to 2012, an average of 43% of total waste arisings within the plan area are within the CD&E waste stream. However, forecasting continues to be problematic due to the lack of information on arisings and management facilities nationally and locally.

There is significant overlap between the Minerals Local Plan (MLP, 2014) and the Waste Local Plan in this area.

Figure 5: CD&E Facilities in the Plan Area

Source: Essex County Council 2014

The map above identifies a strong geographical distribution of CD&E recycling sites. These tend to cluster near urban areas and transport routes (where there is development or re-development), with less facilities in rural areas except for temporary planning permissions co-located on operating minerals and landfill sites.

2.9. Inert Landfill Current Capacity

As of 2014 there were a total of three inert landfills with planning permission within the plan area currently operating and a further facility where prior extraction had commenced although had not yet started accepting waste.

Table 3: Capacity of those facilities solely accepting inert waste (m3) Inert Landfill Facilities

Scenario	Capacity of those facilities solely accepting inert waste (m3)
Currently Operational Facilities	754,958
Currently Operational Facilities and those who have commenced prior extraction	2,554,958
All facilities with planning permission	2,554,958

Source: Essex County Council 2014

It can be seen that in 2014 there was a relatively small amount of dedicated inert landfill space currently in operation within the plan area totalling approximately 755 cubic metres. This is significantly increased where the capacity within the facility at Highwoods is considered, bringing the total capacity to approximately 2.55 million cubic metres.

There is a deficit of inert (CD&E) waste recycling capacity when compared with the estimated plan area arisings. The outlook changes when the estimated amount of inert (CD&E) waste imported from London is added to the potential plan area arisings.

This would result in a significant future requirement for void space to dispose of the remaining CD&E waste, if there were no other management options. An unidentifiable amount may be currently being used for beneficial re-use and involved in on-site recycling activities on redevelopment sites.

2.10. Hazardous Waste

Hazardous waste is a relatively small, but very important waste stream for planning authorities, as this must be managed in a safe and efficient manner.

In 2012 there were 48 facilities (not including the now closed facility at Roxwell) operating in the Plan Area, which processed a total of 37,535 tonnes of hazardous waste, as shown in the table below.

Table 4: Hazardous Waste Facilities at 31st December 2012

Broad Facility Type	Total Number of Facilities	2012 Amount of Waste Accepted
Transfer	13	5,407
Recovery	35 (31 MRS facilities & 4 Treatment facilities)	32,128
Disposal (SNRHW Landfill)	1*	0*
Total	48	37,535

Source: Essex County Council (2012)

The above primarily included facilities that dealt with waste electrical and electronic equipment (WEEE), asbestos or other metal recycling sites involved with vehicle dismantling. This indicates there are few facilities dedicated to hazardous recovery. The vast majority of recovery operations are undertaken at the metal recycling sites involved with vehicle dismantling, which also deals with non-hazardous waste. It also indicates that there are a significant number of hazardous transfer facilities, which enable waste to be exported beyond the plan area boundary for further recovery and treatment activities.

2.11. Healthcare Waste

There is a small proportion of commercial and industrial waste that is classified as 'healthcare' waste, of which 10-25% is classified as hazardous waste. It is defined as waste from natal care, diagnosis, treatment or prevention of disease in humans or animals. Often large hospitals manage their own waste needs on site and as such, this waste is never considered in waste capacity considerations, in much the same ways as CD&E waste that is used beneficially on site, or agricultural waste is not recorded by the Waste Planning Authority. There are however a number of services / facilities, which also generate healthcare waste, such as tattoo parlours and veterinarians.

Within the plan area, there is currently one facility for the treatment of this type of waste although it is specific to veterinary waste. In 2012, this facility managed approximately 205 tonnes of veterinary waste, from Essex and other unknown origins. Additionally Pitsea and Barling landfills accepted a small amount of this type of waste for disposal. A transfer site also handled approximately 417 tonnes of waste but this was destined for treatment beyond the plan area boundary. This is comparable to the 460 tonnes of waste identified within the capacity gap report in 2011.

There are significant numbers of facilities beyond the plan area that treat Essex and Southend's healthcare waste. In total, there are 20 other Waste Planning Authority Areas who accept the plan area's healthcare waste and between them, they accepted a total of 1,703 tonnes of waste in 2012.

2.12. Radioactive Waste

Radioactive wastes are categorised into two categories. Nuclear wastes are from the nuclear power industry while "non-nuclear" wastes are from medical facilities and educational establishments.

2.12.1. Nuclear Waste

Radioactive waste is classified into different categories depending on its level of radioactivity. Low Level Waste (LLW) and Very Low Level Waste (VLLW) are the lowest categories of radioactive waste, but it makes up more than 90% by volume. Data from licensed nuclear sites is relatively good compared to the data from the “non-nuclear industry”.

In summary:

- The main contributor remains the Nuclear Decommissioning Authority (NDA), who is undertaking the decommissioning process at Bradwell Nuclear Power Station. The Government’s National Policy Statement (NPS) for Nuclear Power Generation is considering the Bradwell-on-Sea site, alongside seven other sites nationally, for future nuclear energy development. If the Bradwell-on-Sea site is selected as one of the suitable sites for nuclear energy development, then there would be further arisings of ILW in the Plan area. The fate of these materials ultimately depends upon the progress of the GDF and would need to be considered in the context of future national policy. Given the formative status of this process any potential waste arisings cannot be planned for at this stage. Such a new nuclear power station would be considered an NSIP and therefore outside of the remit of the Plan.
- There remains a planning permission for Intermediate Level radioactive Waste (ILW) to be managed and stored in 600 ‘packages’ as part of the accelerated decommissioning process.
- The future of the Drigg facility (in Cumbria) continues to be uncertain. It is likely (in the early stages of the plan period) that this facility will continue to accept High Level Radioactive Waste, but its life is limited as it is reaching full capacity. However, the long-term solution for the management of this type of waste is being considered at a national level by the Government. The Waste Local Plan will need to be flexible enough to accommodate the outcomes of this national debate and any implications of net self-sufficiency.

2.13. Agricultural Waste & Farm Based Waste Management

Agricultural waste arisings data is not captured in any systematic way, particularly as any waste can often be reused within the agricultural holding it is generated within. This results in many ‘permitted development’ rights afforded to agricultural holdings, which mean they do not need express planning permission from the Waste Planning Authority. It is therefore the case that the knowledge of this waste stream is extremely poor.

2.14. Existing Waste Facilities in Southend

There are a total of 5 waste facilities in Southend. These are highlighted in the following table.

Table 5: Existing Waste Facilities in Southend

Site Name / Operator	Site Address	Specific Facility Type
Imperial Metal Recyclers	63 Vanguard Way, Shoeburyness, Essex. SS3 9QY	End of Live Vehicles
Central Cleansing Depot	Eastern Avenue, Southend On Sea, Essex. SS2 5QX	Materials Recycling / Recovery Facility and Waste Transfer Station
Hadleigh Salvage Ltd	Plot 9, Stock Road, Southend On Sea, Essex. SS2 5QF	Non Hazardous Transfer Stations
Stock Road Civic Amenity Site	Stock Road, Southend On Sea, Essex.	Recycling Centre for Household Waste
Leigh Marsh Civic Amenity Site	Leigh Marsh, Leigh-on-Sea, Essex	Recycling Centre for Household Waste

Source: Southend-on-Sea Borough Council AMR, 2013

2.15. Summary

- The Waste Local Plan must implement the waste hierarchy, in accordance with the Revised Waste Framework Directive. In practice, this means promoting waste prevention, material and energy recovery (e.g. direct re-use, recycling and treatment to make new objects) prior to disposal. If plentiful facilities for the processes at the top of the waste hierarchy are provided while fewer for the processes towards the bottom of the hierarchy, movement up the waste hierarchy may be achieved.
- Within Essex there are 21 RCHWs which are run by the local authority and allow the public to dispose of household and recyclable wastes, including green waste, glass and metal. In 2013-14, 137,280 tonnes of waste was collected in the civic amenity sites in Essex.
- For 2012/13, the WDA managed approximately 720,000 tonnes of waste. Of this, approximately 30.9% was dry recycling (eg paper and plastics), a total organic element of 21.6% and the remaining 47.5% was residual waste. The organic element consists of 87,000 tonnes of source segregated green waste, 23,000 tonnes of source segregated food waste and 56,000 tonnes of mixed food and garden waste directly from households.
- In Essex and Southend, 368,663 tonnes which accounts for 46% of the total household waste was sent to landfill in 2014/15. The Plan Area recycled and composted a total of 385,193 tonnes of household waste which accounts for 48.1% of total waste. ECC has an aspiration to achieve a 60% recycling rate by 2020.
- Six transfer facilities have been granted planning permission within Essex and Southend, to support the Courtauld Road materials recovery facility, in Basildon. These are all operational and accept waste from the Waste Collection Authority vehicles directly from kerbside collection. Here waste will be bulked up, ready for transportation to Courtauld Road. There is a total transfer capacity of just over 428 thousand tonnes per annum. The Waste Capacity Gap Report supporting the WLP considers that there is no further need for LACW transfer capacity during the plan period.
- There are few biological treatment sites within the plan area, with a corresponding small capacity.
- In 2014 there were few facilities that managed organic waste arising. However, the limited number of facilities is distributed throughout the plan area. The facilities tend to be located on the urban fringe, and/or on or near the main transport routes.
- At present, there are no energy recovery facilities either operational or under construction. There is however, one that has planning permission but is not yet under construction, namely Rivenhall II Combined Heat and Power (estimated to have a capacity of 297,000tpa, but this will be from the residual waste already managed within the IWMF so would not divert further arisings from landfill).
- In line with the predictions of waste management capacity higher up the waste hierarchy, even if no further permissions are granted, there would be a surplus of non-hazardous landfill capacity at 2031/32, if all permissions that have secured planning permission become operational.
- The National Waste Management Plan (2013) confirms that the Construction, Demolition and Excavation Waste (CD&E) waste stream is the largest contributing sector to the total amount of waste arising nationally. This is echoed within the plan area as between 2009 to 2012, an average of 43% of total waste arisings within the plan area are within the CD&E waste stream. However, forecasting continues to be problematic due to the lack of information on arisings and management facilities nationally and locally.
- As of 2014 there were a total of three inert landfills with planning permission within the plan area currently operating and a further facility where prior extraction had commenced although had not yet started accepting waste.
- It can be seen that in 2014 there was a relatively small amount of dedicated inert landfill space currently in operation within the plan area totalling approximately 755 cubic metres. This is significantly increased where the capacity within the facility at Highwoods is considered, bringing the total capacity to approximately 2.55 million cubic metres.
- There is a deficit of inert (CD&E) waste recycling capacity when compared with the estimated plan area arisings. The outlook changes when the estimated amount of inert (CD&E) waste imported from London is added to the potential plan area arisings.
- In 2012 there were 48 facilities (not including the now closed facility at Roxwell) operating in the Plan Area to manage hazardous waste, which processed a total of 37,535 tonnes.
- Regarding Nuclear Waste, the future of the Drigg facility (in Cumbria) continues to be uncertain. It is likely (in the early stages of the plan period) that this facility will continue to accept High Level Radioactive Waste, but its life is limited as it is reaching full capacity. However, the long-term solution for the management of this type of waste is being considered at a national level by the Government. The Waste Local Plan will need to be flexible enough to accommodate the outcomes of this national debate and any implications of net self-sufficiency.
- The main contributor of nuclear waste remains the Nuclear Decommissioning Authority (NDA), who is undertaking the decommissioning process at Bradwell Nuclear Power Station. The Government's

National Policy Statement (NPS) for Nuclear Power Generation is considering the Bradwell-on-Sea site, alongside seven other sites nationally, for future nuclear energy development. If the Bradwell-on-Sea site is selected as one of the suitable sites for nuclear energy development, then there would be further arisings of ILW in the Plan area. The fate of these materials ultimately depends upon the progress of the GDF and would need to be considered in the context of future national policy. Given the formative status of this process any potential waste arisings cannot be planned for at this stage. Such a new nuclear power station would be considered an NSIP and therefore outside of the remit of the Waste Local Plan.

3. Minerals

3.1. Links to the Adopted Minerals Local Plan 2014

It is important to note that there is a significant crossover between the Minerals Local Plan (MLP, 2014) and the Waste Local Plan (WLP) in relation to CD&E waste recycling. The MLP is looking to increase capacity and quality of the recovered/recycled aggregate, to promote its increased use, while the WLP is looking to reduce the amount of waste being disposed of in landfill.

The MLP summarises a number of key points regarding the geology and mineral infrastructure of the Plan Area:

- Essex has extensive deposits of sand and gravel.
- There are more localised deposits of silica sand, chalk, brickearth and brick clay.
- Marine dredging takes place in the extraction regions of the Thames Estuary and the East Coast, whilst aggregate is landed at marine wharves located in east London, north Kent, Thurrock, and Suffolk. Essex has no landing wharves of its own.
- There are no hard rock deposits in the County so this material must be imported into Essex. This currently occurs via rail to the existing rail depots at Harlow and Chelmsford.
- Essex is the largest producer and consumer of sand & gravel in the East of England. There are 20 permitted sand & gravel sites, one silica sand site, two brick clay and one chalk site.
- There are two marine wharves and four rail depots capable of handling aggregate. Construction, demolition and excavation waste is also recycled at 29 dedicated and active aggregate recycling sites (2011).
- Aggregate is both imported into Essex (hard rock, and sand and gravel) and exported (sand and gravel, primarily to London). Map 3 shows the movement of aggregate in and out of Essex.

The MLP has accepted there is likely to be the need for at least a further Strategic Aggregate Recycling Site (of at least 100 thousand tonnes capacity per annum) in the west of the county to serve the Harlow area. This area has high levels of development and is not close to an operating or preferred primary extraction site (as proposed within the MLP) or existing Strategic Aggregate Recycling Site.

It is important to highlight that permissions for strategic and non-strategic aggregate recycling facilities will expire when the mineral and/or landfill activity ceases to operate. There is a significant CD&E recycling capacity at Pitsea permitted solely for the restoration of the landfill facility, with some of the material being imported by barge. Whilst this capacity is over the 100,000tpa threshold required for a site to be categorised as a Strategic Aggregate Recycling Site (SARS), it does not meet all of the other criteria required for this designation.

3.2. Sand and Gravel

Essex has extensive Kesgrave formation sand and gravel which was laid down during the Ice Age and in river terraces. The river terrace deposits are found not only along current river valleys, but also in historic river channels that are now dry.

The sand and gravel resources in Essex are:

- Significant in national, sub-national and local terms - Essex is one of the largest producers in the UK,
- Most geographically extensive and significantly mixed within the centre and north of Essex – namely the districts of Uttlesford, Braintree, Chelmsford, Colchester and Tendring,
- Least extensive in south east Essex where deposits appear smallest and least workable, such as in the districts of Maldon and Rochford,
- Present along the River Lea valley terraces adjoining Harlow and Epping Forest districts,
- Mixed deposits capable of being processed to supply a range of construction products including building sand, sharp sands and gravel,

- Used as a raw material to produce concrete, mortar, asphalt and construction fill which is used in the construction industry and for roads.

The majority of the sand and gravel produced in Essex (about 78%) is used within the County itself. This position looks unlikely to change over the long-term. Consequently the main factor influencing production of sand and gravel in the future will be the need to meet the minerals demand for the whole of Essex created by major development and new infrastructure projects within Essex itself.

3.3. Silica Sand

Silica sand is another significant mineral resource found in Essex. It is classified as an 'industrial sand' and its distinction from construction sand is based on its applications/uses and market specification. Silica sand contains a high proportion of silica in the form of quartz and has a narrow grain size distribution compared to other sand in Essex.

The silica sand resources in Essex are:

- Processed for industrial purposes at Ardleigh from a mixed resource, north-east of Colchester. Industrial uses include glassmaking, foundry casting, ceramics, chemicals and water filtration
- Capable of reaching selling prices some 20 times above that of regular construction aggregates, allowing them to serve a wider geographical market as the relatively high price off-sets transport costs.

3.4. Brickearth and Brick Clay

Brick clay is currently used in the small-scale manufacture of bricks, roof tiles and clay materials, at two sites in Essex, namely Bulmer Brickworks in north Essex and Marks Tey, west of Colchester.

Brickearth is found in shallow seams in south east Essex particularly in Rochford District although this is not currently worked. There is however no compelling reason as to why this material should not be extracted economically at some point in the future, so the resource needs continued protection.

The brick clay and brickearth resources in Essex are:

- Capable of economic use in the small-scale manufacture of bricks, roof tiles and clay materials,
- Present in isolated and localised pockets within the County – their geographic presence is very limited to a few key locations,
- Used for specialist uses such as the construction and restoration of buildings and serving markets of a more sub-national and local character,
- Worthy of safeguarding to conserve their continued availability for future generations.

3.5. Chalk

Chalk is one of the mainstays of 'solid geology' under Essex and is the oldest rock exposed at the surface. The chalk resources in Essex are:

- Extensive under the surface but outcrop only in the north west, particularly in Uttlesford District
- Currently extracted at only one site in the form of white chalk at Newport Quarry
- Used mostly for agricultural use, although small quantities are used by the pharmaceutical industry
- Not associated with a landbank in Essex as it is extracted as an industrial mineral rather than as an aggregate

3.6. Summary

- It is important to note that there is a significant crossover between the Minerals Local Plan (MLP, 2014) and the Waste Local Plan (WLP) in relation to CD&E waste recycling. The MLP is looking to increase capacity and quality of the recovered/recycled aggregate, to promote its increased use, while the WLP is looking to reduce the amount of waste being disposed of in landfill.

- Essex has extensive deposits of sand and gravel.
- There are more localised deposits of silica sand, chalk, brickearth and brick clay.
- Essex is the largest producer and consumer of sand & gravel in the East of England. As per the latest Local Aggregate Assessment, there are 20 permitted sand & gravel sites, one silica sand site, two brick clay and one chalk site.
- There is a single marine wharf and three rail depots capable of handling aggregate.
- Aggregate is both imported into Essex (hard rock, and sand and gravel) and exported (sand and gravel, primarily to London).
- The MLP has accepted there is likely to be the need for at least a further Strategic Aggregate Recycling Site (of at least 100 thousand tonnes capacity per annum) in the west of the county to serve the Harlow area. This area has high levels of development and is not close to an operating or preferred primary extraction site (as proposed within the MLP) or existing Strategic Aggregate Recycling Site.
- It is important to highlight that permissions for strategic and non-strategic aggregate recycling facilities will expire when the mineral and/or landfill activity ceases to operate. There is a significant CD&E recycling capacity at Pitsea permitted solely for the restoration of the landfill facility, with some of the material being imported by barge. Whilst this capacity is over the 100,000tpa threshold required for a site to be categorised as a Strategic Aggregate Recycling Site (SARS), it does not meet all of the other criteria required for this designation.
- The sand and gravel resources in Essex are significant in national, sub-national and local terms - Essex is one of the largest producers in the UK; most geographically extensive and significantly mixed within the centre and north of Essex – namely the districts of Uttlesford, Braintree, Chelmsford, Colchester and Tendring; least extensive in south east Essex where deposits appear smallest and least workable, such as in the districts of Maldon and Rochford; and are present along the River Lea valley terraces adjoining Harlow and Epping Forest districts.
- The majority of the sand and gravel produced in Essex (about 78%) is used within the County itself. This position looks unlikely to change over the long-term.

4. Biodiversity

4.1. Flora and Fauna

The 2011 Essex Biodiversity Action Plan (EBAP) has been produced to replace the 1999 EBAP which contained action plans for 25 species and 10 habitats across Essex. The new EBAP contains a set of action plans for 19 priority habitat types, each of which comprise of guidance for biodiversity work and targets. Action plans are already in place for the following priority habitat types:

- Lowland Farmland
- Arable field margins
- Hedgerows
- Traditional Orchards (and Essex Apple Varieties)
- Lowland Dry Acid Grassland
- Lowland Meadows
- Lowland Heathland
- Lakes and Ponds
- Ponds
- Rivers
- Wetlands
- Floodplain and Coastal Grazing Marsh
- Lowland Raised Bog
- Reedbeds
- Coastal
- Coastal Saltmarsh

Source: 2011 Essex Biodiversity Action Plan

Further information on the habitats listed above, their descriptions, status and targets can be found at <http://www.essexbiodiversity.org.uk/>.

4.2. Designated Sites

4.2.1. International Designations – Ramsar Sites

Ramsar sites are wetlands of international importance designated under the Ramsar Convention which have a high degree of protection. They often incorporate Special Protection Areas (SPAs) and Special Areas for Conservation (SACs).

In the Plan Area there are 11 Ramsar sites which include Hamford Water, parts of the Colne and Blackwater estuaries, and the Dengie Marshes which include coastal areas, estuaries, rivers and lakes/reservoirs.

4.2.2. Special Protection Areas (SPAs) and Special Areas for Conservation (SACs)

SPAs are internationally protected sites which are classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (79/409/EEC) also known as the Birds Directive (came into force in April 1979). SPA sites:

- Are classified for rare and vulnerable birds and for regularly occurring migratory species;
- Are often also Ramsar sites and comprise areas of estuaries and coasts;

There are 10 SPA sites in the Plan Area and these match the Ramsar sites. SACs are sites of international importance designated under the EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive).

There are 2 SAC areas in the Plan Area;

- a large coastal area known as Essex Estuaries stretching from Shoeburyness to Jaywick Sands; and
- Epping Forest.

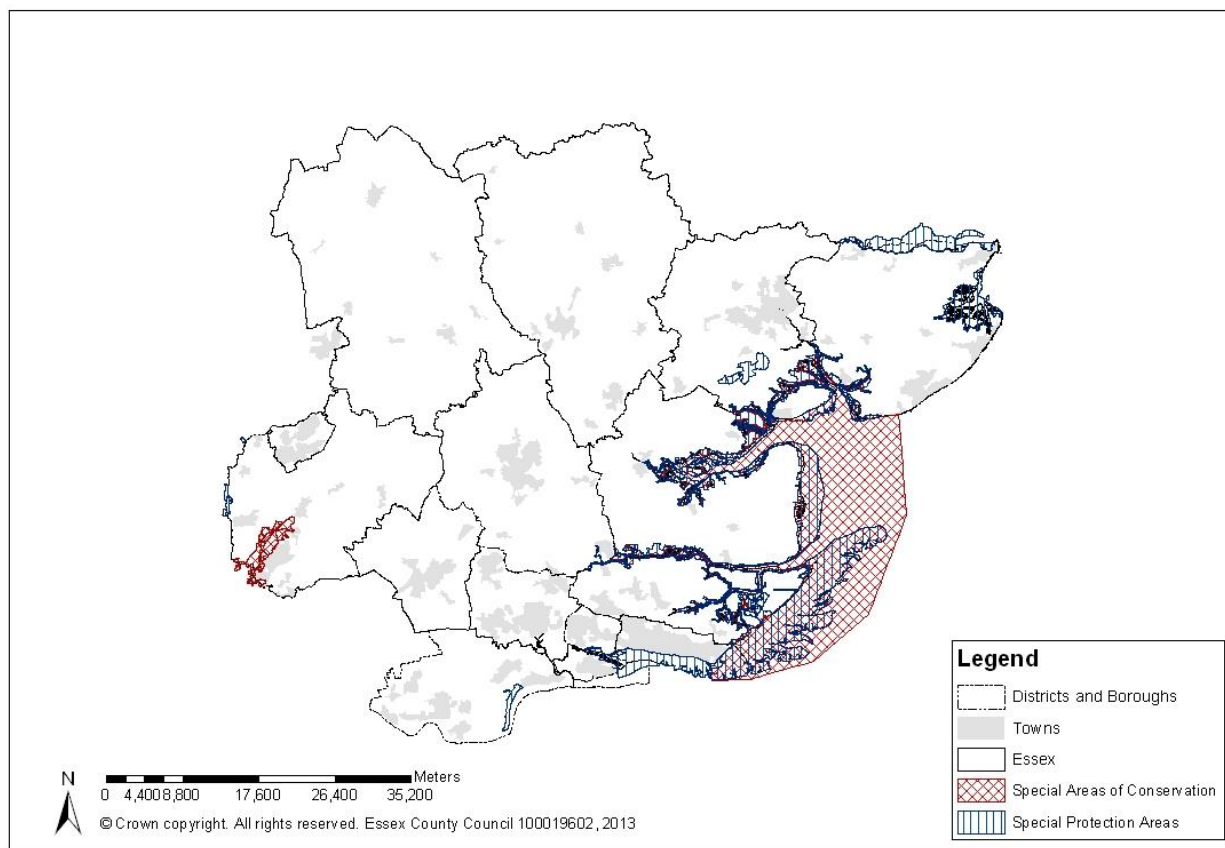
Together SACs and SPAs are collectively known as 'Natura 2000' sites, a European wide network of areas of special nature conservation interest.

Due to the high level of protection that these designations are given, in accordance with the Habitats Directive, appropriate measures to reduce potential adverse impacts arising from development proposals are required.

The designated sites are shown in Figure 2 and further information regarding specific sites can be found at: <http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/sac/default.aspx>

Source: JNCC 2015

Figure 6: Special Protection Areas and Special Areas for Conservation in the Plan Area



Source: Essex County Council, 2016

4.2.3. Sites of Specific Scientific Interest

Sites of Special Scientific Interest (SSSIs) are designated areas of land which are considered to be of special interest due to their fauna, flora, geological and/or physiographical features. There are over 4,000 SSSIs in England. In the Plan Area there are 86 SSSIs covering 37,460.17 ha, the largest proportion of which are along the coastline.

The success of SSSIs is monitored by Public Service Agreement (PSA) targets in which the SSSIs are put in to one of five categories, ranging from favourable to destroyed. A SSSI is deemed to be meeting the PSA target by Natural England, if 95% of the total area is classed as "Favourable" or "Unfavourable Recovering".

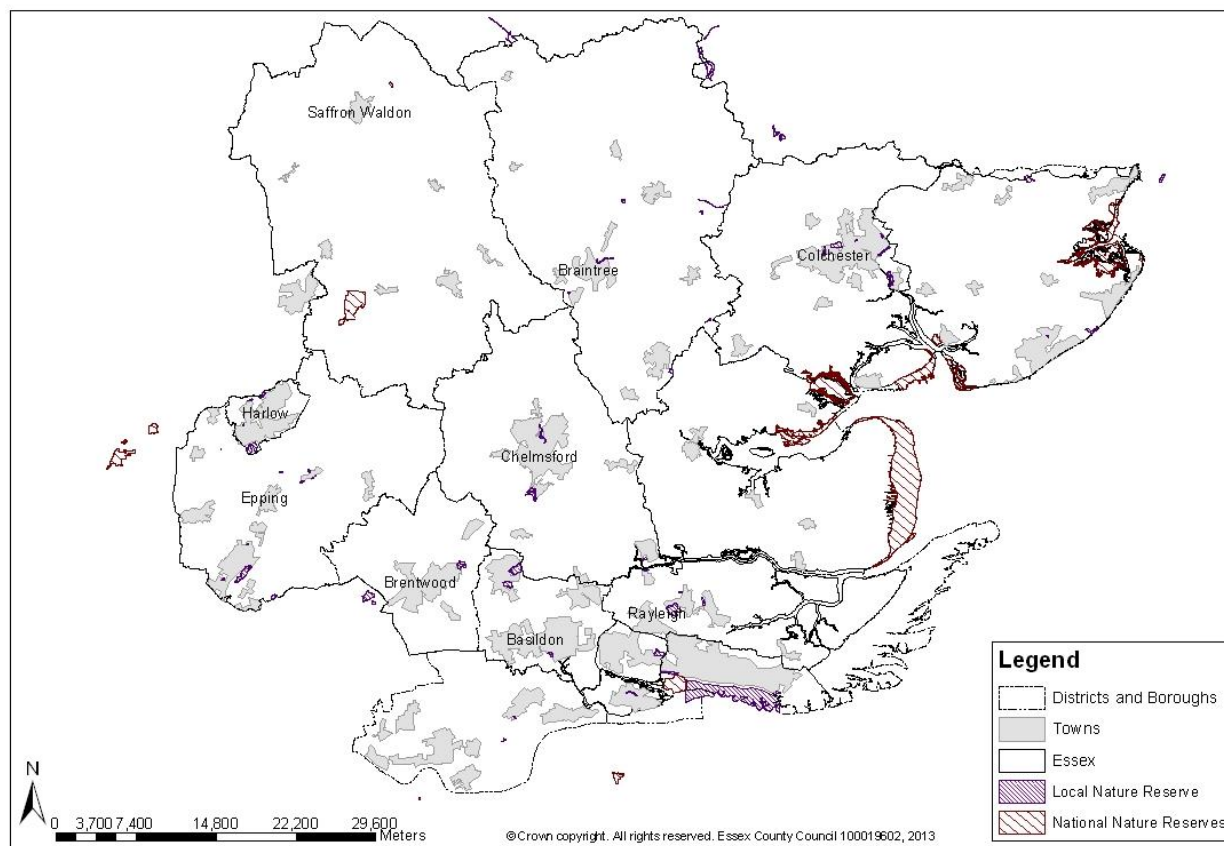
The condition of SSSIs within the Plan Area is reasonable. A total of 97.38% of SSSIs in the Plan Area are meeting the PSA target of qualifying as favourable or unfavourable recovering and 51.25% of SSSIs are deemed favourable by Natural England.

Source: Natural England 2015

4.2.4. National Nature Reserves

There are seven NNRs located in the Plan Area and they are Blackwater Estuary, Colne Estuary, Dengie, Hales Wood, Hamford Water, Hatfield Forest and Leigh as shown in Figure 7.

Figure 7: National Nature Reserves and Local Nature Reserves in the Plan Area



Source: Essex County Council, 2016

Further information regarding specific sites can be found at:

<http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/nnr/regions/east.aspx>

4.2.5. Local Nature Reserves

LNRs are designated by local authorities in conjunction with Natural England in recognition of their high interest in the local context for their wildlife or wildlife education value; or because they offer an important area for informal enjoyment of nature by the public. There are currently 50 LNRs in the Plan Area as shown in Figure 7 along with the designated NNRs.

Source: Natural England 2015

4.2.6. Local Wildlife Sites

Previously known as Sites of Importance for Nature Conservation (SINC) they are now known as Local Wildlife Sites and support both locally and nationally threatened wildlife species and habitats. In the Plan Area there are more than 1600 LoWS in Essex and together with statutorily protected areas they represent the minimum habitat to maintain current levels of wildlife.

Source: Essex Wildlife Trust Biological Records Centre 2015

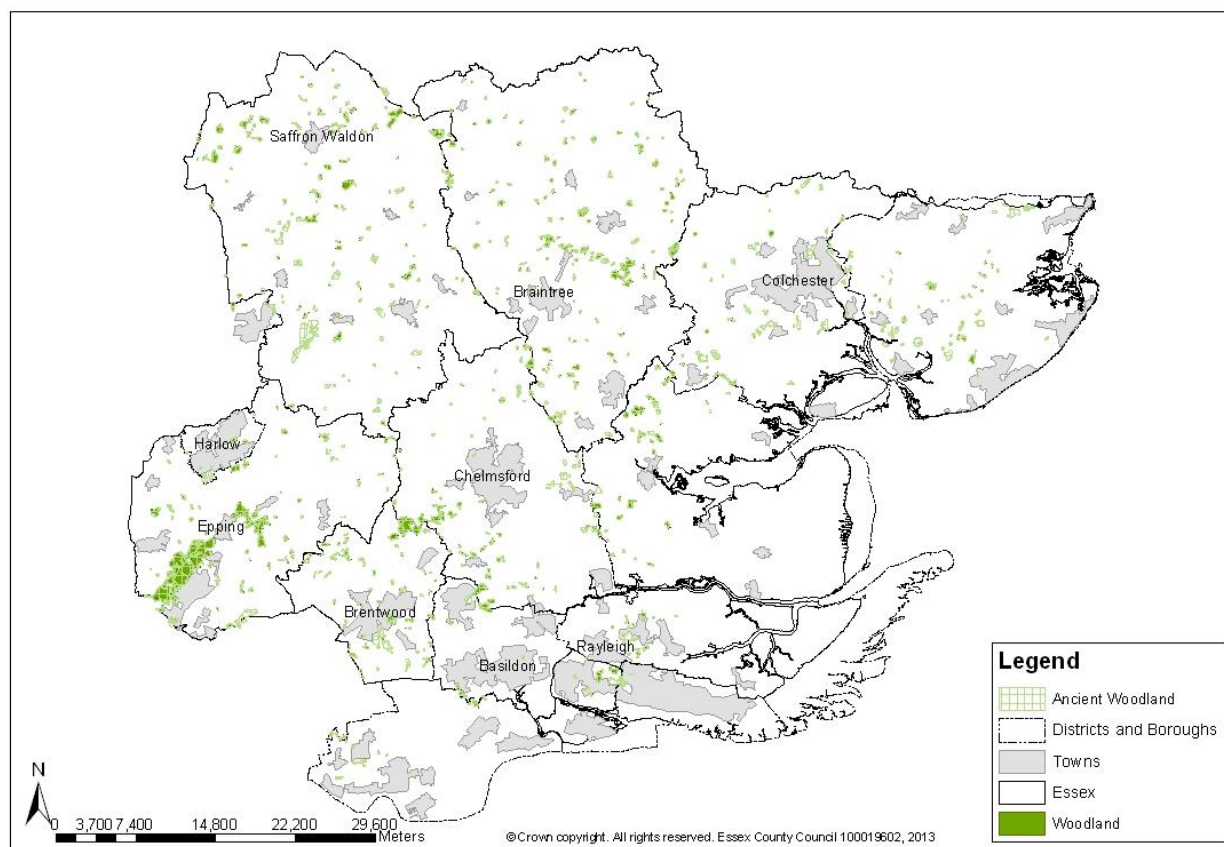
4.2.7. Woodlands

The amount of wooded area has diminished considerably in the Plan Area over time. Three quarters has been lost since the 11th Century. The total wooded area is now 5.3% and this is fragmented and scattered across the Plan Area as shown in Figure 5 below.

Ancient woodlands are wooded areas having been in continuous existence since 1600 AD. Ancient Woodlands in the Plan Area:

- Cover approximately 12,800ha. or 3.5% of the County;
- Include Epping Forest, clusters in the north-west (e.g. Oxlip woodlands), south-east (e.g. Hockley Woods) and heathland and woodlands on the Danbury ridge.

Figure 8: Woodland in Essex



Source: Essex County Council 2013

4.3. Summary

- Ramsar sites are wetlands of international importance designated under the Ramsar Convention which have a high degree of protection. They often incorporate Special Protection Areas (SPAs) and Special Areas for Conservation (SACs). In the Plan Area there are 11 Ramsar sites which include Hamford Water, parts of the Colne and Blackwater estuaries, and the Dengie Marshes which include coastal areas, estuaries, rivers and lakes/reservoirs.
- There are 10 SPA sites in the Plan Area and these match the Ramsar sites. SACs are sites of international importance designated under the EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive). There are 2 SAC areas in the Plan Area; a large coastal area known as Essex Estuaries stretching from Shoeburyness to Jaywick Sands; and Epping Forest.
- Sites of Special Scientific Interest (SSSIs) are designated areas of land which are considered to be of special interest due to their fauna, flora, and geological and/or physiographical features. There are over 4,000 SSSIs in England. In the Plan Area there are 86 SSSIs covering 37,460.17 ha, the largest proportion of which are along the coastline.
- The condition of SSSIs within the Plan Area is reasonable. A total of 97.38% of SSSIs in the Plan Area are meeting the PSA target of qualifying as favourable or unfavourable recovering and 51.25% of SSSIs are deemed favourable by Natural England.

- There are seven NNRs located in the Plan Area and they are Blackwater Estuary, Colne Estuary, Dengie, Hales Wood, Hamford Water, Hatfield Forest and Leigh as shown in Figure 7.
- LNRs are designated by local authorities in conjunction with Natural England in recognition of their high interest in the local context for their wildlife or wildlife education value; or because they offer an important area for informal enjoyment of nature by the public. There are currently 50 LNRs in the Plan Area as shown in Figure 7 along with the designated NNRs.
- Ancient woodlands are wooded areas having been in continuous existence since 1600 AD. Ancient Woodlands in the Plan Area cover approximately 12,800ha. or 3.5% of the County and include Epping Forest, clusters in the north-west (e.g. Oxlip woodlands), south-east (e.g. Hockley Woods) and heathland and woodlands on the Danbury ridge.
- The amount of wooded area has diminished considerably in the Plan Area over time. Three quarters has been lost since the 11th Century. The total wooded area is now 5.7% and this is fragmented and scattered across the Plan Area.
- Local Wildlife Sites and support both locally and nationally threatened wildlife species and habitats. In the Plan Area there are more than 1600 LoWS in Essex and together with statutorily protected areas they represent the minimum habitat to maintain current levels of wildlife.

5. Landscapes

Since the end of the last Ice Age, natural processes and successive human use (especially since the Industrial Revolution) have shaped the Essex and Southend-on-Sea landscape into its present form. The result is a combination of physical components such as landform, visible spatial components (for example, scale and patterns) and even non visible spatial components which can incorporate sound and cultural associations.

It is the particular combination of these aspects that determines an area's distinctive character, which can then be classified into wider character areas, or remain as distinct unique areas. (as described in Essex Landscape Character Assessment, Essex County Council, 2003).

Within the Plan Area's landscape there are many areas of special interest which have been designated and protected from inappropriate development. The main areas of importance are (statutory landscape designations):

- Landscape Character Areas (LCAs)
- Areas of Outstanding Natural Beauty (AONBs)
- Metropolitan Green Belt
- Protected Lanes
- Special Verges

5.1. Landscape Character Areas (LCAs)

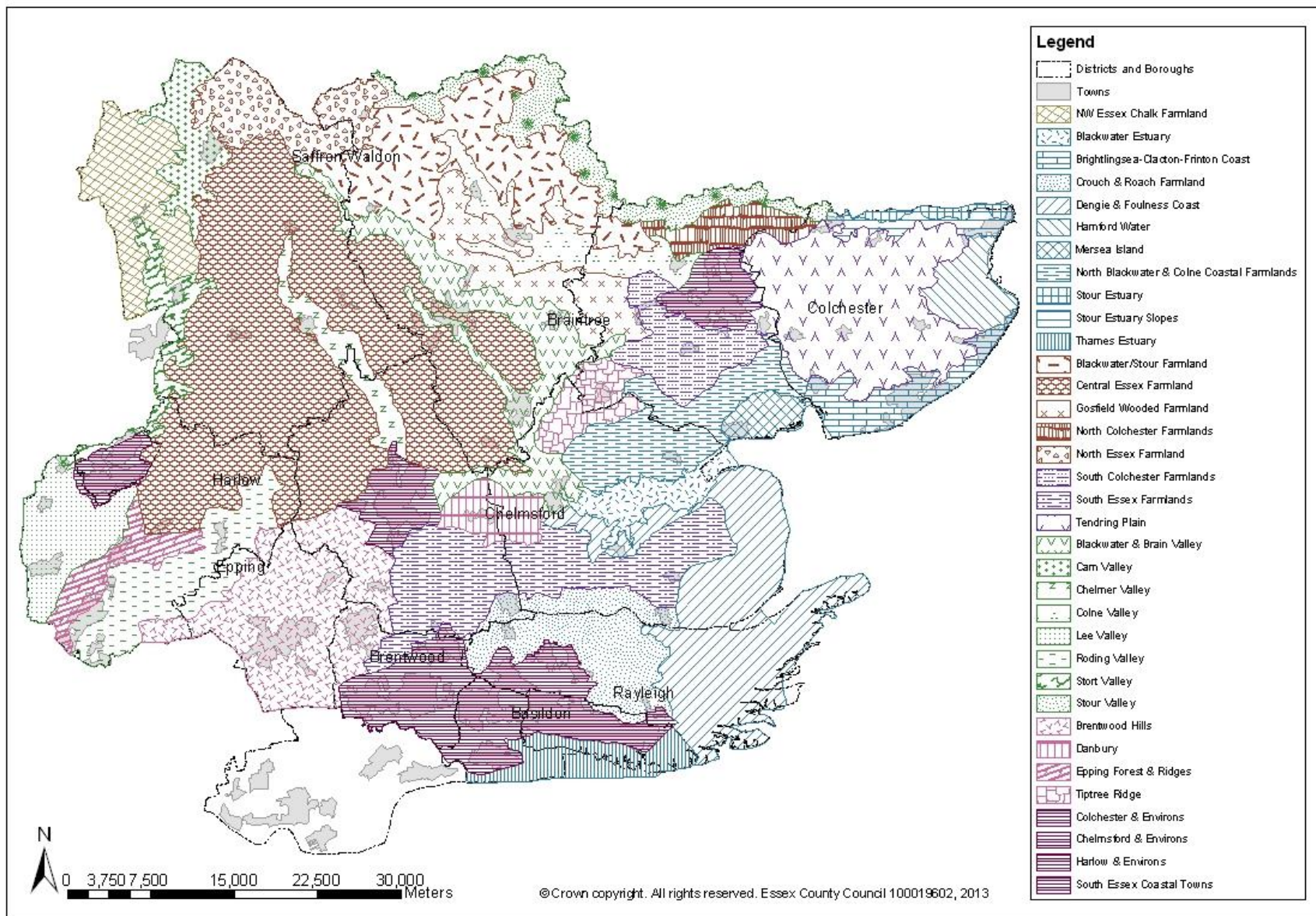
The Essex Landscape Character Assessment (Chris Blandford Associates, 2003) is based on the Countryside Agency's guidance, and establishes a 'baseline' of the existing character of the Essex landscape. The assessment involved a broad review of the landscape identifying 35 'Landscape Character Areas' within Essex (Figure 9). They are areas with a recognisable pattern of landscape characteristics, both physical and experiential, that combine to create a distinct sense of place.

Further to the Landscape Character Assessment carried out in 2003 and the coastal version in 2005, a number of Essex districts, namely Braintree, Brentwood, Chelmsford, Maldon and Uttlesford, underwent a district wide Landscape Character Assessment, also by Chris Blandford Associates in 2006. This report divides the County's Landscape Character Areas into a further twenty-two smaller local Landscape Character Areas.

Further information regarding Essex Landscape Character Areas please refer to:

- The Essex Landscape Character Assessment, 2003;
- Landscape Character Assessment of the Essex Coast, 2005; and
- Braintree, Brentwood, Chelmsford, Maldon and Uttlesford Landscape Character Assessments, 2006

Figure 9: Landscape Character Areas in Essex



Source: Essex County Council, 2016

5.2. Areas of Outstanding Natural Beauty

Areas of Outstanding Natural Beauty (AONBs) are described by Natural England as areas of high scenic quality that have statutory protection in order to conserve and enhance the natural beauty of their landscapes.

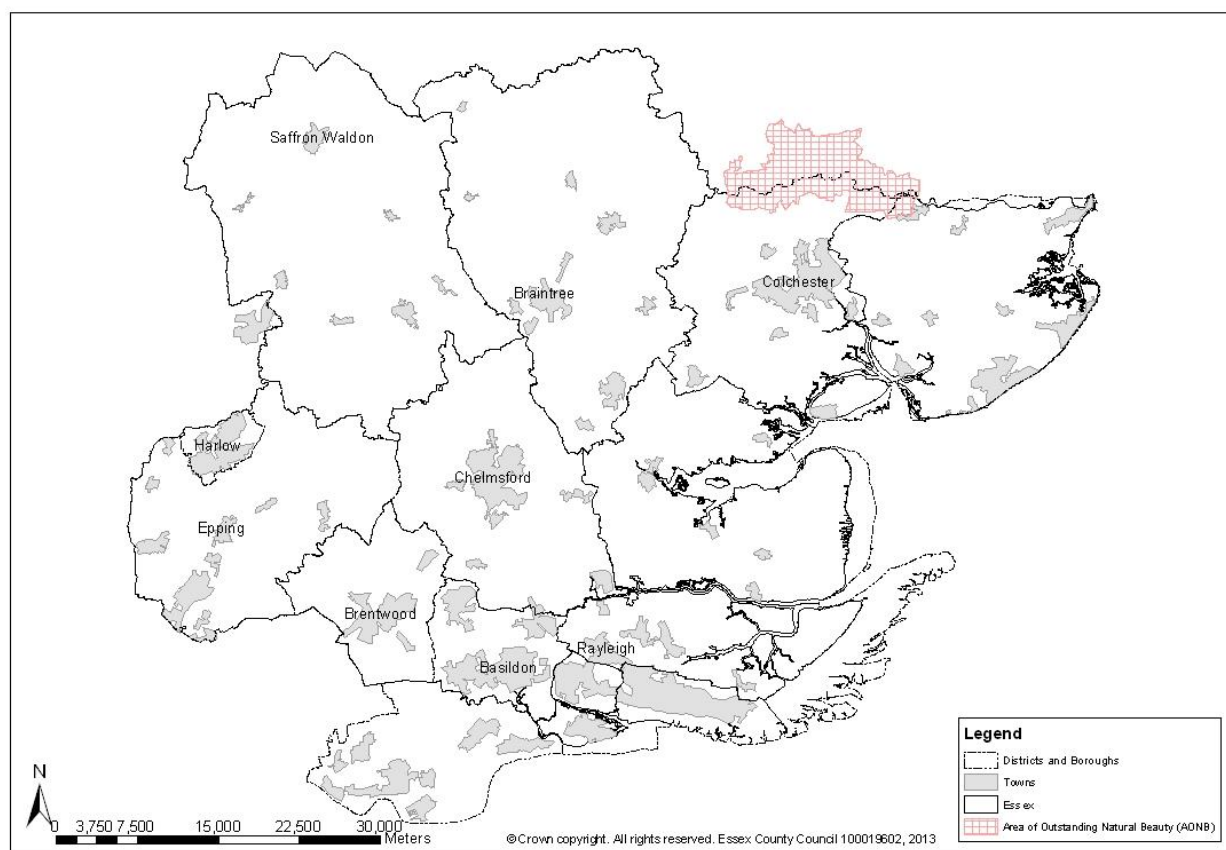
There are 33 AONBs wholly within England covering approximately 18% of the country, which have been designated protection under the Countryside and Rights of Way Act 2000. In the Plan Area there is one AONB, Dedham Vale, which lies on the border of Suffolk and Essex covering an area of 90 sq km. It has been designated such because it is an exceptional example of a lowland river valley.

It has an extraordinary range of different scales and special features giving rise to distinctive landscape characters - rolling fields on the valley slopes, lush and sheltered valley-floor meadows and open marshes and intimate tributary valleys of the River Stour. Figure 10 shows its location.

An extension to this AONB west along the river valley to Sudbury is currently under consideration.

Source: Landscapes for life 2016

Figure 10: Dedham Vale Area of Outstanding Natural Beauty



Source: Essex County Council, 2016

5.3. Green Belt

The largest green belt within the UK is the Metropolitan Green Belt around London which includes a large area of land in the Plan Area. It is protected by planning policies within Local Plans which enforce restrictions on certain development within the designated area.

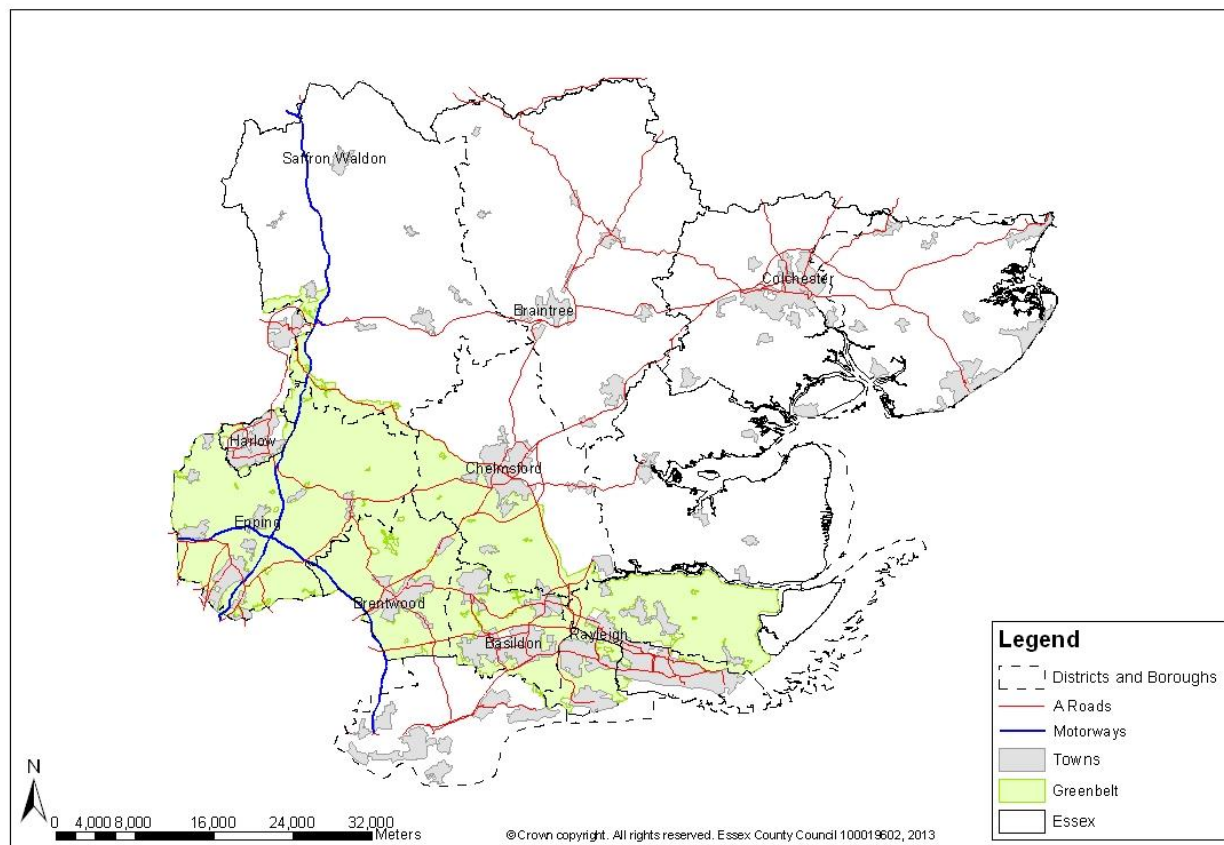
There are five purposes of including land in Green Belts. They are:

- to check the unrestricted sprawl of large built-up areas;
- to prevent neighbouring towns from merging into one another;

- to assist in safeguarding the countryside from encroachment;
- to preserve the setting and special character of historic towns; and
- to assist in urban regeneration, by encouraging the recycling of derelict and other urban land.

Figure 11 shows the coverage of Green Belt as of 2001 in the Plan Area.

Figure 11: Metropolitan Greenbelt Coverage in the Plan Area



Source: Essex County Council, 2016

Table 6: Area of designated Green Belt land by local planning authority as at 31 March 2015

Local Planning Authority	Area (Hectares)	Local Planning Authority	Area (Hectares)
Basildon	6,950	Harlow	640
Brentwood	13,700	Rochford	12,480
Castle Point	2,760	Uttlesford	3,810
Chelmsford	12,850	Southend-on-Sea	610
Epping Forest	31,680	The Plan Area (total)	85,480

Source: DCLG, 2015

There are 9 local authorities in the Plan Area that have land classified as being within the Metropolitan Green Belt. The amount of land designated as Green Belt in Basildon has reduced slightly since 2012 estimates, as has the amount of designated land in Rochford. Castle Point's estimated Green Belt land has increased from 2,740 hectares in 2012 to 2,760 in 2015.

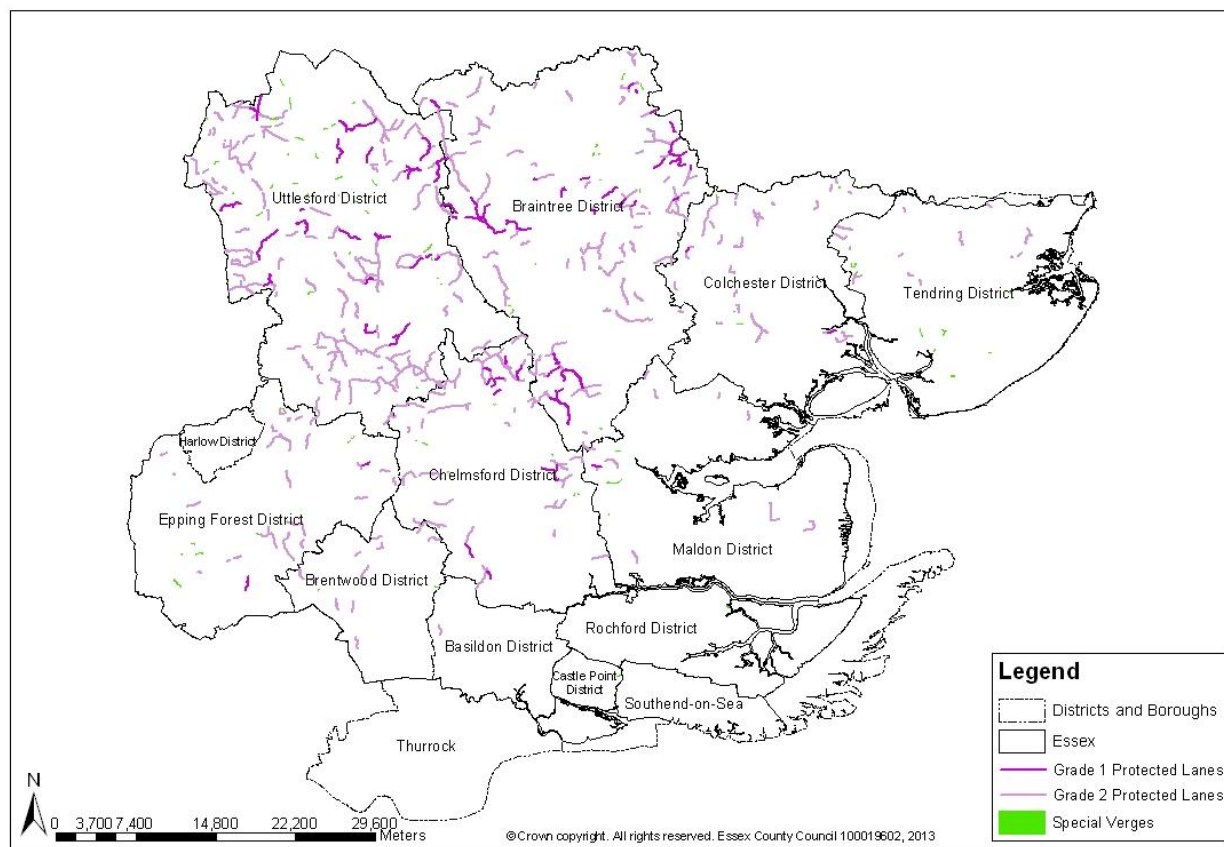
5.4. Protected Lanes

Protected lanes (Figure 12) have significant historic and landscape values. They generally originate from pre-historic track ways, which have been in continual (if lighter) use since. Protected lanes are often narrow,

sunken and enclosed by a combination of mixed deciduous hedges and mature trees, ditches and raised verges that can be indications of great age.

The volume weights and speed of traffic is often limited to preserve the special character and due to their age and use they also have great biological value.

Figure 12: Protected Lanes and Special Verges in The Plan Area



Source: Essex County Council, 2016

5.5. Special Verges

Roadside Verges are important and if sensitively managed they can increase the biodiversity of the verges themselves and from that the surrounding countryside. The reason for this is that verges can act as corridors interlinking fragmented or isolated habitats. In terms of wildlife value, verges can be split into three broad types:

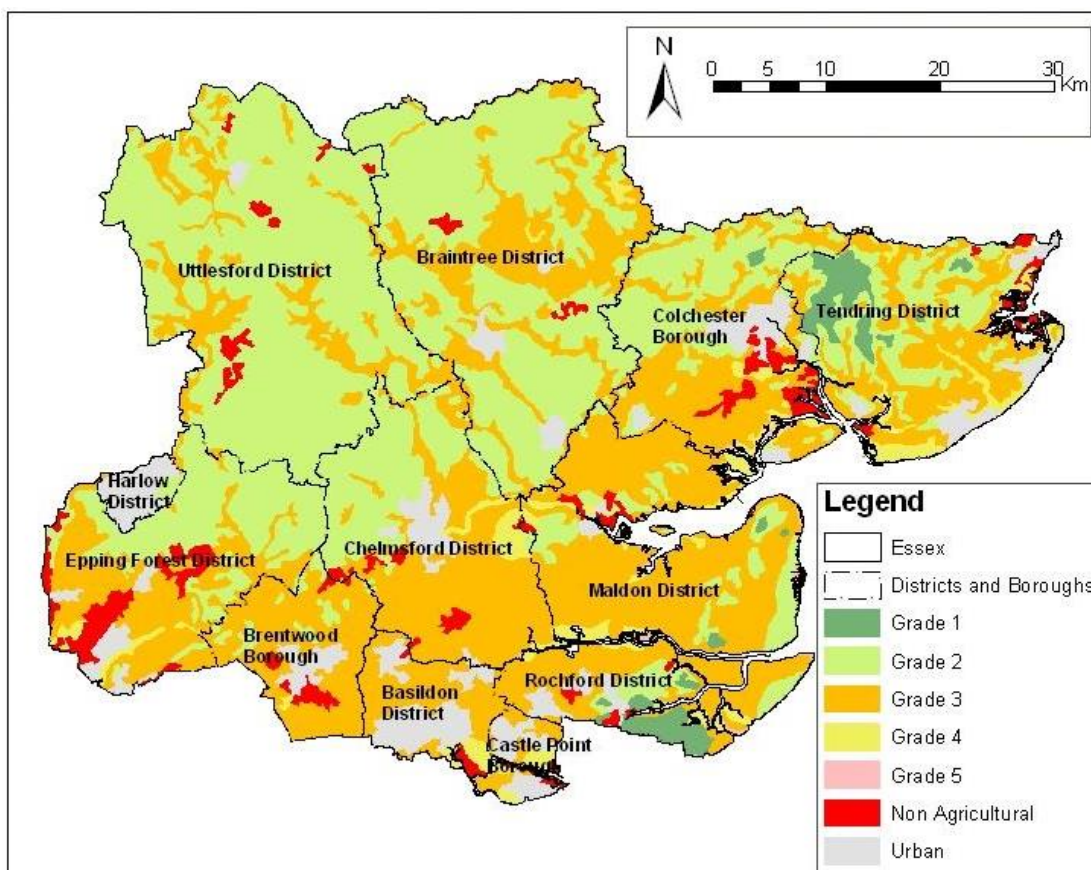
- Landscaped and intensively managed verges: poorest quality.
- Recently created verges left to colonise naturally: vary in ecological value.
- Ancient verges: often of high ecological value.

With this in mind, in the 1970s, Essex County Council Highways Agency, Nature Conservancy Council and Essex Wildlife Trust identified a number of important verges which were subsequently designated as Special Roadside Nature Reserves. They aim to protect the future of rare and uncommon flowers growing on them. There are over 100 special verges designated in the Plan Area as shown in Figure 12.

5.6. Agricultural Land Classification

Soil types have helped to shape the landscape, wildlife and economy of the Plan Area. New waste related activities and sites should not result in a loss of the Plan Area's most fertile land through its location or any potential pollution. Agricultural Land is classified by quality in a grading system with Grade 1 being the highest quality and Grade 5 the lowest.

Figure 13: Agricultural Land Classification in Essex



Source: Essex County Council, 2008

In the Plan Area, approximately 75% of the land area is considered agricultural land and over half of this is of high grade soils as shown in the figure above.

There are significant areas of Grade 1 agricultural land within Tendring and Rochford Districts, and smaller areas within Maldon District and Colchester Borough. Such land would not be suitable for mineral sites and associated facilities and activities.

The majority of agricultural land within the Plan Area can be broadly classified as Grade 2 in the north and Grade 3 to the south. This is related to the location of the Essex till, with better quality land located in the north-west of the County.

Much of Southend and Harlow District are classified as an urban area, and to a lesser degree so too is Basildon District and Castle Point Borough. Lands classified as non-agricultural are located within all districts, with the exception of Harlow. Low grade, undesignated non-agricultural and underused agricultural land would be preferable for the location of new waste management facilities.

5.7. Summary

- Within the Plan Area's landscape there are many areas of special interest which have been designated and protected from inappropriate development. The main areas of importance are (statutory landscape designations) Landscape Character Areas (LCAs), Areas of Outstanding Natural Beauty (AONBs), the Metropolitan Green Belt (MGB), Protected Lanes and Special Verges.
- The Essex Landscape Character Assessment (Chris Blandford Associates, 2003) is based on the Countryside Agency's guidance, and establishes a 'baseline' of the existing character of the Essex landscape. The assessment involved a broad review of the landscape identifying 35 'Landscape Character Areas' within Essex. They are areas with a recognisable pattern of landscape characteristics, both physical and experiential, that combine to create a distinct sense of place.
- There are 33 Areas of Outstanding Natural Beauty (AONBs) in England covering approximately 18% of the country, which have been designated protection under the Countryside and Rights of Way Act 2000. In the Plan Area there is one AONB, Dedham Vale, which lies on the border of Suffolk and

Essex covering an area of 90 sq km. It has been designated such because it is an exceptional example of a lowland river valley.

- The largest green belt within the UK is the Metropolitan Green Belt around London which includes a large area of land in the Plan Area. It is protected by planning policies within Local Plans which enforce restrictions on certain development within the designated area. There are five purposes of including land in Green Belts. They are to check the unrestricted sprawl of large built-up areas; to prevent neighbouring towns from merging into one another; to assist in safeguarding the countryside from encroachment; to preserve the setting and special character of historic towns; and to assist in urban regeneration, by encouraging the recycling of derelict and other urban land.
- There are 9 local authorities in the Plan Area that have land classified as being within the Metropolitan Green Belt. The amount of land designated as Green Belt in Basildon has reduced slightly since 2012 estimates, as has the amount of designated land in Rochford. Castle Point's estimated Green Belt land has increased from 2,740 hectares in 2012 to 2,760 in 2015.
- Protected lanes have significant historic and landscape values. They generally originate from pre-historic track ways, which have been in continual (if lighter) use since. Protected lanes are often narrow, sunken and enclosed by a combination of mixed deciduous hedges and mature trees, ditches and raised verges that can be indications of great age. The volume weights and speed of traffic is often limited to preserve the special character and due to their age and use they also have great biological value.
- With this in mind, in the 1970s, Essex County Council Highways Agency, Nature Conservancy Council and Essex Wildlife Trust identified a number of important verges which were subsequently designated as Special Roadside Nature Reserves. They aim to protect the future of rare and uncommon flowers growing on them. There are over 100 special verges designated in the Plan Area.
- Roadside Verges are important and if sensitively managed they can increase the biodiversity of the verges themselves and from that the surrounding countryside. The reason for this is that verges can act as corridors interlinking fragmented or isolated habitats.
- In the Plan Area, approximately 75% of the land area is considered agricultural land and over half of this is of high grade soils.
- There are significant areas of Grade 1 agricultural land within Tendring and Rochford Districts, and smaller areas within Maldon District and Colchester Borough.

6. Population and Social

The Office for National Statistics (ONS) publishes annual mid-year population estimates and biannual projections which are important in many facets of sustainable planning because they indicate the number of people likely to be living in an area and provide a base for estimating development levels.

6.1. Population

6.1.1. Population Structure

The following table shows the 2014 mid-year estimated population structure of Essex, East of England and England and allows comparisons of the age groups between the different areas to be made.

Table 7: Mid-year estimates of population structure 2014

	Essex & Southend-on-Sea		East of England		England	
	Count	%	Count	%	Count	%
All Ages	1,572,200		5,979,000		53,293,500	
Aged 0-15	265,600	16.9	1,143,100	19.1	10,303,500	19.3
Aged 16-24	161,900	10.3	619,600	10.4	6,019,200	11.3
Aged 25-49	538,100	34.2	2,010,700	33.6	18,285,000	34.3
Aged 50-64	305,300	19.4	1,117,100	18.7	9,614,300	18.0
Aged 65 and Over	301,300	19.2	1,088,500	18.2	9,071,500	17.0
All Persons of Working Age	1,005,300	63.9	3,747,400	62.7	33,918,500	63.6

Source: ONS, 2015.

Note: Data is drawn from the Office for National Statistics (ONS) Annual Population Survey 2008, 2011 and 2014, except for 0 to 13 and 14 to 15 population figures which are from Mid-Year Population estimates.

The Plan Area has the smallest estimated proportion of its population (10.3%) within the age group 16-24 whilst the age group of 25-49 had the largest proportion (34.2%). This is roughly in line with those figures for the region and nationally.

When compared to regional and national figures the Plan Area has a similar percentage of the population who are of working age. This is despite the Plan Area having a slightly larger percentage population of over 65 than regionally and nationally and also a smaller proportion of people aged 16-24.

6.1.2. Population Change

The following table identifies the population change between the 2008 and 2014 mid-year estimates for Essex, the East of England region and England.

Table 8: Population change between 2008 and 2014

	2008	2014	Difference	% Change
Essex CC	1,379,700	1,433,800	54,100	3.8%
Southend-on-Sea	163,200	172,300	9,100	5.3%
East of England	5,650,500	5,979,000	328,500	5.5%
England	50,747,900	53,293,500	2,545,600	4.8%

Source: ONS, 2015.

Note: Data is drawn from the Office for National Statistics (ONS) Annual Population Survey 2008, 2011 and 2014, except for 0 to 13 and 14 to 15 population figures which are from Mid-Year Population estimates.

The figures show that there has been a lower estimated population growth within the county of Essex compared to the national and regional level.

6.1.3. Population Projections by ONS

The ONS projections for 2021 are trend based projections. Generally this means that future populations are based on assumptions that births, deaths and migration will continue observed trends over the previous five years. They show what the future population of an area will be if these trends continue. They do not reflect any future policy intentions. The below population projections are the ONS 2011 mid-year based projections.

Table 9: Revised 2011-Based Population Projections

	2012	2021	Difference	Percentage Change
Basildon	176,099	187,879	11,780	6.27
Braintree	148,929	162,805	13,876	8.52
Brentwood	74,420	80,979	6,559	8.10
Castle Point	88,519	94,288	5,769	6.12
Chelmsford	169,471	180,563	11,092	6.14
Colchester	176,610	200,324	23,714	11.84
Epping Forest	126,077	139,274	13,197	9.48
Harlow	82,897	89,720	6,823	7.60
Maldon	63,744	66,971	3,227	4.82
Rochford	84,063	90,840	6,777	7.46
Tendring	139,806	156,797	16,991	10.84
Uttlesford	81,083	91,569	10,486	11.45
Southend-on-Sea	175,284	186,399	11,115	5.96
Essex	1,410,169	1,542,010	131,841	8.55
East of England	5,919,596	6,457,823	538,227	8.33
England	53,585,452	57,687,784	4,102,332	7.11

Source: ONS, 2014

Essex is scheduled to have a larger percentage population increase between 2012 and 2021 than regionally and nationally. On a district level, the largest percentage increases are projected for Colchester, Uttlesford, Tendring and Epping Forest, showing a broad geographical spread to the east and west of the Plan Area. Southend-on-Sea has the lowest population projected increase between 2012 and 2021 of all the districts and boroughs in the Plan Area.

6.1.4. Household Projections

The following table shows household estimates and projections (per thousand) up to 2024 within the districts and boroughs of Essex, Essex as a whole and national levels.

Table 10: Household projections

	(thousands)										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Basildon	75	76	76	77	78	78	79	80	80	81	81
Braintree	63	64	65	65	66	67	68	68	69	70	70
Brentwood	31	32	32	32	33	33	33	34	34	34	34
Castle Point	37	37	38	38	38	39	39	39	39	40	40
Chelmsford	72	72	73	74	74	75	76	77	77	78	78
Colchester	74	75	76	77	78	79	80	81	82	83	83
Epping Forest	54	54	55	55	56	57	57	58	59	59	60
Harlow	35	36	36	36	37	37	37	38	38	38	39
Maldon	26	27	27	27	27	28	28	28	28	29	29
Rochford	34	35	35	35	35	36	36	36	36	37	37
Tendring	63	64	64	65	65	66	66	67	68	68	69
Uttlesford	33	34	34	35	35	36	36	37	37	38	38
Southend-on-Sea	77	78	78	79	80	81	82	82	83	84	85
Essex	599	605	611	617	623	630	636	642	648	654	660
Essex and Southend-on-Sea	676	683	689	696	703	711	718	724	731	738	745
England	22,718	22,940	23,171	23,396	23,621	23,846	24,068	24,290	24,505	24,719	24,934

Source: Department for Communities and Local Government (DCLG, updated 2015)

The household projections are predicted to increase between 2014 and 2024 for all districts and boroughs within the Plan Area totalling an increase of 69,000 homes.

The most significant comparative increase in household projections is in the east of the Plan Area with Colchester households estimated to increase by 9,000 between 2014 and 2024, and Southend-on-Sea households estimated to increase by 8,000.

6.2. Summary

- The Plan Area has the smallest estimated proportion of its population (10.3%) within the age group 16-24 whilst the age group of 25-49 had the largest proportion (34.2%). This is roughly in line with those figures for the region and nationally.
- When compared to regional and national figures the Plan Area has a similar percentage of the population who are of working age. This is despite the Plan Area having a slightly larger percentage population of over 65 than regionally and nationally and also a smaller proportion of people aged 16-24.
- Essex is scheduled to have a larger percentage population increase between 2012 and 2021 than regionally and nationally. On a district level, the largest percentage increases are projected for Colchester, Uttlesford, Tendring and Epping Forest, showing a broad geographical spread to the east and west of the Plan Area. Southend-on-Sea has the lowest population projected increase between 2012 and 2021 of all the districts and boroughs in the Plan Area.
- The most significant comparative increase in household projections is in the east of the Plan Area.
- The household projections are predicted to increase significantly within the WLP plan period for all districts and boroughs within the Plan Area.

7. Air Quality and Noise

Poor air quality and noise can have associated health impacts. It will be the role of the Waste Local Plan to mitigate any of these impacts that may be associated with waste facilities and waste management throughout the Plan Area.

7.1. National Air Quality Standards

The UK has adopted objectives that are based on the Air Quality Regulations from 2000 and the amended Regulations of 2002. The following table, sourced from the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2000, details the relative objectives for a number of potential air pollutants.

Table 11: National air quality standards

Pollutant	Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25µg/m ³ (5ppb)	Running annual mean	31 December 2003
	5µg/m ³ (1.5ppb)	Annual Average	31 December 2010
1,3-Butadiene	2.25µg/m ³ (1ppb)	Running annual mean	31 December 2003
Carbon monoxide	10mg/m ³ (8.6ppm)	Maximum daily running 8 hour mean	31 December 2003
Ozone*	100µg/m ³ not to be exceeded more than 10 times a year.	8 hour mean.	31 December 2005
(PAH) Poly aromatic hydrocarbons *	0.25ng/m ³	As annual average	31 December 2010
Lead	0.5µg/m ³	Annual mean	31 December 2004
	0.25µg/m ³	Annual mean	31 December 2008
Nitrogen dioxide	200µg/m ³ (105ppb) not to be exceeded more than 18 times a year	1 hour mean	31 December 2005
	40µg/m ³ (21ppb)	Annual mean	31 December 2005
Particles (PM ₁₀) (gravimetric)	50µg/m ³ not to be exceeded more than 35 times a year	24 hour mean	31 December 2004
	40µg/m ³	Annual mean	31 December 2004
Particles (PM _{2.5}) (gravimetric) *	25 µg m ⁻³ (target)	Annual mean	2020
	20% cut in urban background exposure	Annual mean	2010 - 2020
Sulphur dioxide	350µg/m ³ (132ppb) not to be exceeded more than 24 times a year	1 hour mean	31 December 2004
	125µg/m ³ (47ppb) not to be exceeded more than	24 hour mean	31 December 2004

Pollutant	Objective		Date to be achieved by
	Concentration	Measured as	
	3 times a year		
	266µg/m ³ (100ppb) not to be exceeded more than 35 times a year	15 minute mean	31 December 2005

Source: The Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2000. DEFRA in partnership with the Scottish Executive, The National Assembly for Wales and the Department of the Environment for Northern Ireland

* not included in regulations at present

There are additional air quality objectives relating to the protection of vegetation and ecosystems which should also be considered. However at present they are not included in regulation. They are detailed in the table below.

Table 12: UK air quality objectives for protection of vegetation and ecosystems

Pollutant	Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen oxides (for protection of vegetation & ecosystems)	30 µg m ⁻³	Annual mean	19 July 2001
Sulphur dioxide (for protection of vegetation & ecosystems)	20 µg m ⁻³ 20 µg m ⁻³	Annual mean Winter Average (Oct - Mar)	19 July 2001
Ozone	18,000 µg m ⁻³	AOT40 ⁺ , calculated from 1h values May-July. Mean of 5 years, starting 2010	01 January 2010

Source: UK Air Quality Archive, 2009 (updated 2011)

Note: ⁺ AOT 40 is the sum of the differences between hourly concentrations greater than 80 µg m⁻³ (=40ppb) and 80 µg m⁻³, over a given period using only the 1-hour averages measured between 08:00 and 20:00.

Table 13: Location of AQMAs within each district/ borough in the Plan Area

Local Authority	AQMA	Pollutant
Brentwood	The AQMA comprises parts of Nags Head Lane, Brentwood and the M25.	Nitrogen Dioxide (NO ₂)
	The AQMA comprises parts of Brook Street, Brentwood and the A12.	Nitrogen Dioxide (NO ₂)
	The AQMA comprises parts of Greenshaw and Porters Close, Brentwood and the A12.	Nitrogen Dioxide (NO ₂)
	The AQMA comprises parts of Warecot Road, Hurstwood Avenue and Ongar Road, Brentwood and the A12.	Nitrogen Dioxide (NO ₂)
	The AQMA comprises parts of Roman Road and Burnthouse Lane, Mountnessing and the A12.	Nitrogen Dioxide (NO ₂)
	The AQMA comprises parts of Fryerning Lane, Pemberton Avenue and Trimble Close, Ingatestone and the A12.	Nitrogen Dioxide (NO ₂)
	The AQMA comprises parts of Ongar Road, Ingrave Road, High Street and Shenfield Road, Brentwood in proximity to Wilsons Corner (the junction of the A128 and A1203).	Nitrogen Dioxide (NO ₂)
Chelmsford	Incorporating several roads leading into the Army and Navy roundabout and the Baddow Road roundabout in Chelmsford.	Nitrogen Dioxide (NO ₂)
Colchester	High St Colchester, Head St, North Hill, Queen St, St Botolphs St, St Botolphs Circus, Osbourne St, Magdalen St, Military Rd, Mersey Rd, Brook St, East St and St Johns Street.	Nitrogen Dioxide (NO ₂)
	East Street and Ipswich Road	Nitrogen Dioxide (NO ₂)
	St Andrews Avenue and Harwich Rd	Nitrogen Dioxide (NO ₂)
	Lucy Lane North, Stanway	Nitrogen Dioxide (NO ₂)
Epping Forest	Bell Vue Cottage, High Road, Epping Ups and Downs, High Road, Epping	Nitrogen Dioxide (NO ₂)
Rochford	Rayleigh town centre. Exceedance of nitrogen dioxide annual mean due to road vehicle exhaust emissions	Nitrogen Dioxide (NO ₂)
Uttlesford	Circle of radius 1400m radius centred on Elm Grove in Saffron Waldon Town Centre. Revokes and replaces 3 previous Uttlesford AQMAs.	Nitrogen Dioxide (NO ₂)

Source: DEFRA 2015

7.2. Air Quality Management Areas

Each local authority in the UK has been carrying out reviews and assessments of air quality within their area since December 1997. The aim of reviewing and assessing the information is to ensure that future and current air quality objectives can be achieved by the deadlines set. If a local authority has an area with measurements of air pollution that are unlikely to meet the objectives, an Air Quality Management Area

(AQMA) must be declared. The size of this area can vary from a section of one street to a much larger area of the locality.

Air quality in Essex is generally good. Most industrial processes in Essex are concentrated along the Thames Estuary. The air quality in Essex is influenced by its close proximity to mainland Europe. There are currently 15 AQMAs within the Plan Area which are documented in the following table.

Table 14: Number of AQMAs within each district/ borough in Essex

Local Authority	Number of AQMAs	Local Authority	Number of active AQMAs
Basildon	0	Harlow	0
Braintree	0	Maldon	0
Brentwood	7	Rochford	1
Castle Point	0	Tendring	0
Chelmsford	1	Uttlesford	1
Colchester	4	Southend-on-Sea	0
Epping Forest	1	Total	15

Source: DEFRA, 2015

All of the aforementioned AQMAs in the Plan Area have been designated as such due to elevated levels of Nitrogen Dioxide (NO₂). Brentwood has the highest number of designated AQMAs with five of these located along the A12.

Further information on these specific AQMAs including maps can be found on the UK National Air Quality Archive website at: <http://aqma.defra.gov.uk/aqma/home.html>

7.3. Air pollution

Air pollution is monitored on a national level in accordance with the EU Directive 96/62/EC on ambient air quality assessment and management.

The overall air pollution index for a site or region is calculated from the highest concentration of five pollutants which are Nitrogen Dioxide, Sulphur Dioxide, Ozone, Carbon Monoxide and Particles < 10µm (PM10). The concentrations which band these pollutants are in the following table.

Table 15: Air Pollution Bandings and Index

Band	Index	Ozone	Nitrogen Dioxide	Sulphur Dioxide	Carbon Monoxide	PM10 Particles
		Running 8 hourly mean	Hourly mean	15 minute mean	24 hour mean	24 hour mean
		µgm ⁻³	µgm ⁻³	µgm ⁻³	µgm ⁻³	µgm ⁻³
Low						
	1	0-33	0-67	0-88	0-11	0-16
	2	34-66	68-134	89-177	12-23	17-33
	3	67-100	135-200	178-266	24-35	34-50
Moderate						
	4	101-120	201-267	267-354	36-41	51-58
	5	121-140	268-334	355-443	42-47	59-66
	6	141-160	335-400	444-532	48-53	67-75
High						
	7	161-187	401-467	533-170	54-58	76-83
	8	188-213	468-534	711-887	59-64	84-91
	9	214-240	535-600	888-1064	65-70	92-100
Very High						
	10	241 or more	601 or more	1065 or more	71 or more	101 or more

Source: DEFRA, 2013

In the East of England region there are a number of locations which monitor the five pollutants. 3 of these sites, Stanford-le-Hope, Sandy Roadside and Cambridge, are new and therefore have no published data up to 2005. The other sites have been monitoring air pollutants for a number of years, the oldest being the Sibton site which has been monitoring the ozone since 1973.

7.4. Ambient Noise

Ambient or environmental noise is defined as noise which is either unwanted or harmful. It is created by human activities and includes noise emitted by transport including road, rail and air traffic, as well as from sites of industrial activity. Mapping of ambient noise in England was carried out during 2006-07 in line with the Government's work to implement the EU's Environmental Noise Directive DEFRA has now completed a second round of noise mapping in 2012, although this data is yet to be published.

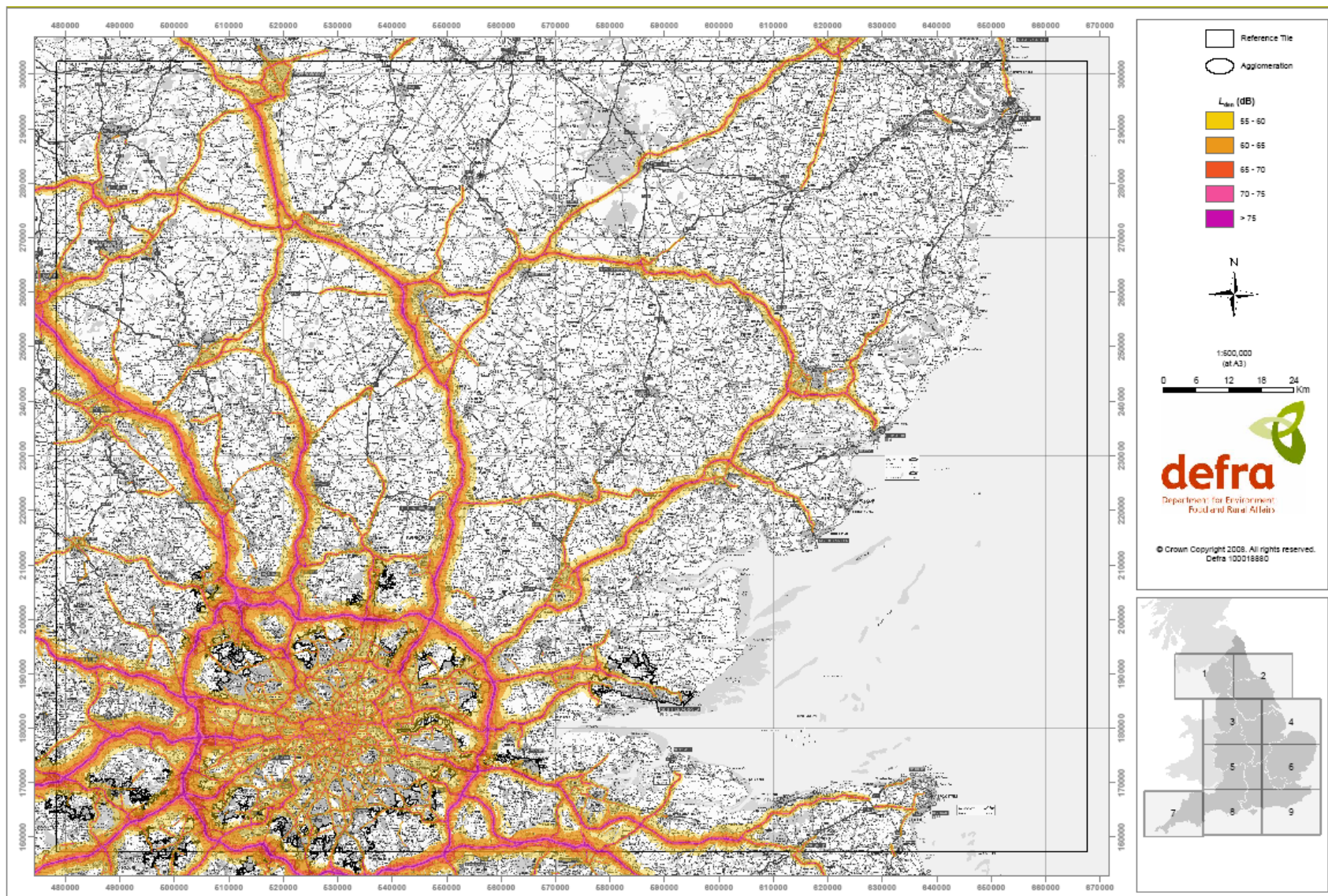
This section will depict results from the air mapping exercise undertaken along the major road network and in towns in the Plan Area and around Stansted Airport. Each area covered has two maps based on the different times of day. This is explained further in the following table:

Table 16: Ambient Noise - Summary of Terms Used

Term	Explanation
dB(A)	A unit of sound pressure level, adjusted in accordance with the A weighting scale, a scale which takes into account the increased sensitivity of the human ear at some frequencies.
Lden	The day, evening and night level. Lden is a logarithmic composite of the Lday, Levening and Lnight levels but with 5dB(A) being added to the Levening value and 10dB(A) being added to the Lnight level.
Lnight	The A-weighted average sound level over the 8 hour night period of 2300 – 0700 hours.

Source: Descriptions taken from DEFRA, 2008

Figure 14: Ambient Noise along Major Roads in the East of England Including the Plan Area, Lden 2006



Source: DEFRA, 2008

Figure 15: Ambient Noise along Major Roads in the East of England Including the Plan Area, Lnight 2006



Source: DEFRA, 2008

The major road maps show that:

- in the Plan Area all major roads experienced some noise levels of over 75dB(A) in the Lden map, in particular the A12, A127, M11 and the M25, and where this was not the case the measurements were mainly between 65 and 70dB(A).
- Lnight map had a lower level of ambient noise along all the major roads than the Lden map with only the M25 and the M11 showing levels of more than 70dB(A) along the whole Essex stretch of both roads

DEFRA have also produced a number of noise maps for major railway lines in order to satisfy the Environmental Noise (England) Regulations 2006. Due to their size they have not been included in this report but can be viewed by following the link: <http://www.defra.gov.uk/environment/noise/mapping/index.htm>

Along the two major railway lines the noise levels reach above 75dB(A) on the Lden map and disperse as distance away from the tracks increased. Noticeably, the greater spread of noise from the railway is where the railway line crosses countryside. In the towns of Chelmsford and Brentwood noise is concentrated closer to the railway line.

There is less ambient noise from the major railway lines during the night between the hours of 23:00 and 07:00 than found in the Lden analysis. This noise level peaks over 70dB(A) but no higher than 75dB(A) along the railway line and has less dispersal away from the track.

7.5. Summary

- Poor air quality and noise can have associated health impacts. It will be the role of the Waste Local Plan to mitigate any of these impacts that may be associated with waste facilities and waste management throughout the Plan Area.
- Air quality in Essex is generally good. Most industrial processes in Essex are concentrated along the Thames Estuary. The air quality in Essex is influenced by its close proximity to mainland Europe. There are currently 15 Air Quality Management Areas within the Plan Area.
- All of the aforementioned AQMAs in the Plan Area have been designated as such due to elevated levels of Nitrogen Dioxide (NO₂). Brentwood has the highest number of designated AQMAs with five of these located along the A12.
- The overall air pollution index for a site or region is calculated from the highest concentration of five pollutants which are Nitrogen Dioxide, Sulphur Dioxide, Ozone, Carbon Monoxide and Particles < 10µm (PM10).
- The levels of air pollution are similar in both rural and urban areas. All sites monitored have seen a significant fluctuation in results with an eventual reduction in 2014, with the exception of Thurrock.
- Ambient or environmental noise is defined as noise which is either unwanted or harmful. It is created by human activities and includes noise emitted by transport including road, rail and air traffic, as well as from sites of industrial activity. Mapping of ambient noise in England was carried out during 2006-07 in line with the Government's work to implement the EU's Environmental Noise Directive DEFRA has now completed a second round of noise mapping in 2012, although this data is yet to be published.

8. Climatic Factors

8.1. Climate Change Projections

The UK Climate Impact Programme has developed the UK Climate Change Projections 2009 (UKCIP09) which models future climate scenarios for the UK.

The key findings from UKCIP09 of how our climate might change in the future are:

- All areas of the UK will get warmer, and the warming is greater in summer than in winter. Across the UK, central estimates of the average regional summer (June, July, August) temperature rise in the 2080s are between 3 and 4°C.
- Across the UK, central estimates of regional average summer precipitation change are projected to be between -17% to -23% in the 2080s.
- Greater sea level rise in the south of the UK than the north. The central estimates for sea level rise (taking into account land movement) show that sea level is projected to rise by 18cm in London by 2040 and 36cm by 2080.
- Across the UK, central estimates of regional average winter precipitation change are projected to be in the region of +14% (NE) to +23% (SW), in the 2080s.
- Reaching a peak in global emissions in 2016 and achieving a 4% decrease per year thereafter, a global temperature rise to 1.8°C by 2050 is expected, which would then stabilise at about 2°C by 2100.

Key findings for the East of England for the 2080s (based on medium (current) emissions scenario) are:

- Under medium emissions, the central estimate of increase in winter mean temperature is 3°C; it is very unlikely to be less than 1.6°C and is very unlikely to be more than 4.7°C.
- Under medium emissions, the central estimate of increase in summer mean temperature is 3.6°C; it is very unlikely to be less than 1.9°C and is very unlikely to be more than 5.9°C.
- Under medium emissions, the central estimate of change in winter mean precipitation is 20%; it is very unlikely to be less than 4% and is very unlikely to be more than 44%.
- Under medium emissions, the central estimate of change in summer mean precipitation is -20%; it is very unlikely to be less than -44% and is very unlikely to be more than 6%.

Sea level rise and subsidence will lead to more frequent flooding of coastal areas. Increased temperatures and greater fluctuation in annual precipitation will further increase pressure on water resources. With this in mind it is possible to determine the potential flood risk that development sites can add to water bodies in areas of concern. Essex is already one of the driest areas in the UK.

8.2. Total Energy Consumption

In the Plan Area the largest proportion of energy consumption in 2013 was within the domestic sector which accounted for 44.6% of the total energy consumed, followed by the industrial and commercial sector which consumed 28.0%. In contrast, the East of England region consumed the greatest proportion of energy within the transport sector (36.6%) followed by the domestic sector (33.4%) and finally the transport sector (30.0%).

Table 17: Total Energy Consumption at Local Authority Level 2013

Local Authority	Industrial and Commercial		Domestic		Transport		Total (GWh)
	GWh	%	GWh	%	GWh	%	
Basildon	904.6	29.4	1,218.4	39.6	951.8	31.0	3,074.8
Braintree	732.8	24.5	1,026.7	34.3	1,231.2	41.2	2,990.7
Brentwood	314.4	16.3	657.5	34.1	953.5	49.5	1,925.4
Castle Point	178.8	14.5	694.9	56.3	361.1	29.2	1,234.8
Chelmsford	894.7	25.7	1,239.2	35.6	1,349.0	38.7	3,482.9
Colchester	862.3	26.2	1,210.8	36.8	1,214.4	36.9	3,287.5
Epping Forest	624.6	16.3	1,079.2	28.2	2,125.8	55.5	3,829.6
Harlow	554.6	38.6	548.0	38.1	334.7	23.3	1,437.3
Maldon	312.5	29.5	455.0	43.0	291.7	27.5	1,059.2
Rochford	247.8	19.9	654.1	52.6	340.7	27.4	1,242.6
Tendring	642.8	25.6	1,044.3	41.6	824.4	32.8	2,511.5
Uttlesford	593.8	20.9	651.1	23.0	1,592.0	56.1	2,836.9
Southend-on-Sea	566.8	22.8	1,359.2	54.6	563.7	22.6	2,489.7
Plan Area	7,430.5	28.0	11,838.4	44.6	7,287.4	27.4	26,556.3
East of England	38,525.8	30.0	42,962.5	33.4	46,997.7	36.6	128,486.0

Source: DECC, updated 2015

Note: Percentages may not total 100% due to rounding.

Epping Forest District consumed the greatest total amount of energy at 3,838.8GWh, of which 2,125.8GWh was consumed in the transport sector, the largest amount compared to the other local authorities in Essex. Basildon consumed the largest amount of energy within the industry and commercial sector at 904.6GWh and Southend-on-Sea registered 1,359.2GWh for domestic sector consumption, which was higher than any other local authority area.

The following shows the amount of energy consumed by road transport, specifically by HGVs. Please note the information is not directly specific to freight associated with waste, but does encompass such movements.

Table 18: Road Transport Energy Consumption (thousands of tonnes of fuel) by HGV in the Plan Area 2005-2013

	HGV - 2005				HGV - 2013				Difference 2005-2013			
	Motorways	A roads	Minor roads	Total consumption	Motorways	A roads	Minor roads	Total consumption	Motorways	A roads	Minor roads	Total consumption
Basildon	-	7.30	4.09	11.39	-	8.27	1.82	10.09	-	0.97	-2.27	-1.3
Braintree	-	18.67	3.62	22.30	-	15.98	3.38	19.63	-	-2.69	-0.24	-2.67
Brentwood	8.72	12.63	1.13	22.48	9.07	11.47	1.02	21.55	0.35	-1.16	-0.11	-0.93
Castle Point	-	2.19	0.98	3.17	-	1.57	0.90	2.47	-	-0.62	-0.08	-0.70
Chelmsford	-	19.69	2.45	22.14	-	18.84	2.26	21.10	-	-0.85	-0.19	-1.04
Colchester	-	17.48	3.13	20.62	-	15.60	3.15	18.75	-	-1.88	0.02	-1.87
Epping Forest	53.10	4.28	2.33	59.71	52.25	3.66	2.17	58.08	-0.85	-0.62	-0.16	-1.63
Harlow	2.04	2.59	0.67	5.31	2.04	1.92	0.61	4.57	0	-0.67	-0.06	-0.74
Maldon	-	0.87	2.09	2.96	-	0.91	2.11	3.02	-	0.04	0.02	0.06
Rochford	-	2.23	1.03	3.25	-	1.74	1.00	2.77	-	-0.49	-0.03	-0.48
Southend-on-Sea	-	2.86	1.75	4.62	-	2.28	1.72	4.00	-	-0.58	-0.03	-0.62
Tendring	-	6.96	3.53	10.48	-	6.21	3.46	9.67	-	-0.75	-0.07	-0.81
Uttlesford	31.08	5.45	3.99	40.52	29.14	5.76	3.89	38.80	-1.94	0.31	-0.10	-1.72
Total Plan Area	94.94	103.20	30.79	228.95	92.50	94.21	27.49	214.50	-2.44	-8.99	-3.30	-14.45

Source: Department of Energy and Climate Change, 2013

There have been reductions on the average energy consumption in the Plan Area on all roads. Similar reductions are apparent across the majority of roads throughout all districts with the exception of the M25 at Brentwood and M11 at Harlow, A roads in Basildon, Maldon and Uttlesford and minor roads in Colchester and Maldon.

8.3. Carbon Dioxide Emissions

The burning of fossil fuels, changes in land use, and various industrial processes are adding heat-trapping gases, particularly carbon dioxide (CO₂), to the atmosphere. There is now roughly 40% more CO₂ in the atmosphere than there was before the industrial revolution. One of the main causes of increased CO₂ in the atmosphere is through the burning of fossil fuels for electricity and transportation.

The Plan Area achieved a 9.0% per capita reduction in CO₂ emissions between 2010 and 2013 which was slightly below the East of England average of 9.5%. All authorities achieved an overall reduction in CO₂ emissions but each did see a slight increase in emissions from 2011 to 2012 with the exception of Uttlesford. Harlow saw the greatest reduction in CO₂ emissions of 12.7%, followed by Uttlesford at 11.2%. The lowest reduction was in Chelmsford at 6.1%.

8.4. Energy Resources

The following tables highlight renewable energy projects in the Plan Area which are either in operation or within the planning system as of 2016. Projects that are undergoing their pre-application stage are not included in the following tables. Off-shore wind projects are also not included as their installation is not a matter for local government.

Table 19: Biomass-using technologies

Council	Project	Capacity	Nature	Developer	Status
Essex County Council (Braintree DC)	Rivenhall Airfield	Not known	Recycling AD and composting facility	Gent Fairhead & Company Ltd	Planning permission granted March 2010, construction is yet to commence as of June 2013.
Essex County Council (Colchester BC)	Stanway Hall Quarry	Not known	MBT with AD and composting	Cory Environmental Ltd	Planning permission granted, however, it has been decided to not go ahead with the project due to a rapid increase in recycling rates.
Essex County Council (Basildon DC)	Courtauld Road, Basildon	3 engines 1.46MW	MRF / MBT facility with AD CHP plant using MSW	Urbaser Balfour Beatty	Under construction as of Spring 2013.

Source: <http://www.renewables-map.co.uk> , 2014

Table 20: Landfill and sewage gas generators accredited for their renewables obligation (RO) in Essex

Generating Station Name	Generator Address	Total Installed Generating Capacity	Date Station Commissioned
Roxwell Landfill Gas Project	Roxwell Quarry, Boyton Crodd, Roxwell, Chelmsford	1.3 MW	April 2004
Bellhouse Farm	Church Lane, Stanway	2.850 MW	May 2004
Bellhouse South	Stanway Pit, Warren Lane, Stanway	4.239 MW	July 2003
Ongar Landfill	Mill Lane, High Ongar	1.77 MW	May 1999
Barling – (NFFO5)	Barling Hall Farm, Little Wakering Road, Great Wakering Farm	2.443 MW	May 1993
Pitsea Methane Conversion Plant	Pitsea, Essex	11.64 MW	October 2005

Source: <http://www.renewables-map.co.uk> , 2014

Table 21: Solar Power in Essex

Generating Station Name	Generator Address	Total Installed Generating Capacity	Date Station Commissioned
Spriggs Farm	Spriggs farm, Thaxted	15 MW	Active June 2013
Gosfield Airfield	Gosfield Airfield, Halstead	12 MW	Under Construction Aug 2014
Cheale Meats	Orchard Farm, Little Warley	0.242 MW	Active 2014

Source: <http://www.renewables-map.co.uk> , 2014

Within the Plan Area there are 18 renewable energy schemes either built or in the planning system. These combine to produce a maximum total of 105.5 MW, with the energy generating capacity for two further biomass facilities and a solar farm yet to be accounted for.

There are currently no completed onshore wind projects capable of generating 50kW of energy within the Plan Area.

8.5. Summary

- In the Plan Area the largest proportion of energy consumption in 2013 was within the domestic sector which accounted for 44.6% of the total energy consumed, followed by the industrial and commercial sector which consumed 28.0%. In contrast, the East of England region consumed the greatest proportion of energy within the transport sector (36.6%) followed by the domestic sector (33.4%) and finally the transport sector (30.0%).
- Epping Forest District consumed the greatest total amount of energy at 3,838.8GWh, of which 2,125.8GWh was consumed in the transport sector, the largest amount compared to the other local authorities in Essex. Basildon consumed the largest amount of energy within the industry and commercial sector at 904.6GWh and Southend-on-Sea registered 1,359.2GWh for domestic sector consumption, which was higher than any other local authority area.
- There have been reductions on the average energy consumption on all roads in the Plan Area. Similar reductions are apparent on the majority of roads throughout all districts with the exception of

the M25 at Brentwood and the M11 at Harlow, A roads in Basildon, Maldon and Uttlesford and minor roads in Colchester and Maldon.

- The Plan Area achieved a 9.0% per capita reduction in CO2 emissions between 2010 and 2013 which was slightly below the East of England average of 9.5%. All authorities achieved an overall reduction in CO2 emissions but each did see a slight increase in emissions from 2011 to 2012 with the exception of Uttlesford. Harlow saw the greatest reduction in CO2 emissions of 12.7%, followed by Uttlesford at 11.2%. The lowest reduction was in Chelmsford at 6.1%.
- There are currently no completed onshore wind projects capable of generating 50kW of energy within the Plan Area.
- Within the Plan Area there are 19 renewable energy schemes either built or in the planning system. These combine to produce a maximum total of 105.75 MW, with the energy generating capacity for two further biomass facilities and a solar farm yet to be accounted for.

9. Transport

The Plan Area is located in the East of England and lies to the north east of London, the nation's capital and major employment centre. As a result of its proximity to London, there is a large commuter population. Essex has a large rural area, similar in size to Suffolk, whilst also being the site of key international gateways such as Stansted and Harwich. The County also has major national routes including the M25 and the M11 running through it. As a result the transport demands faced by the County are uniquely complex.

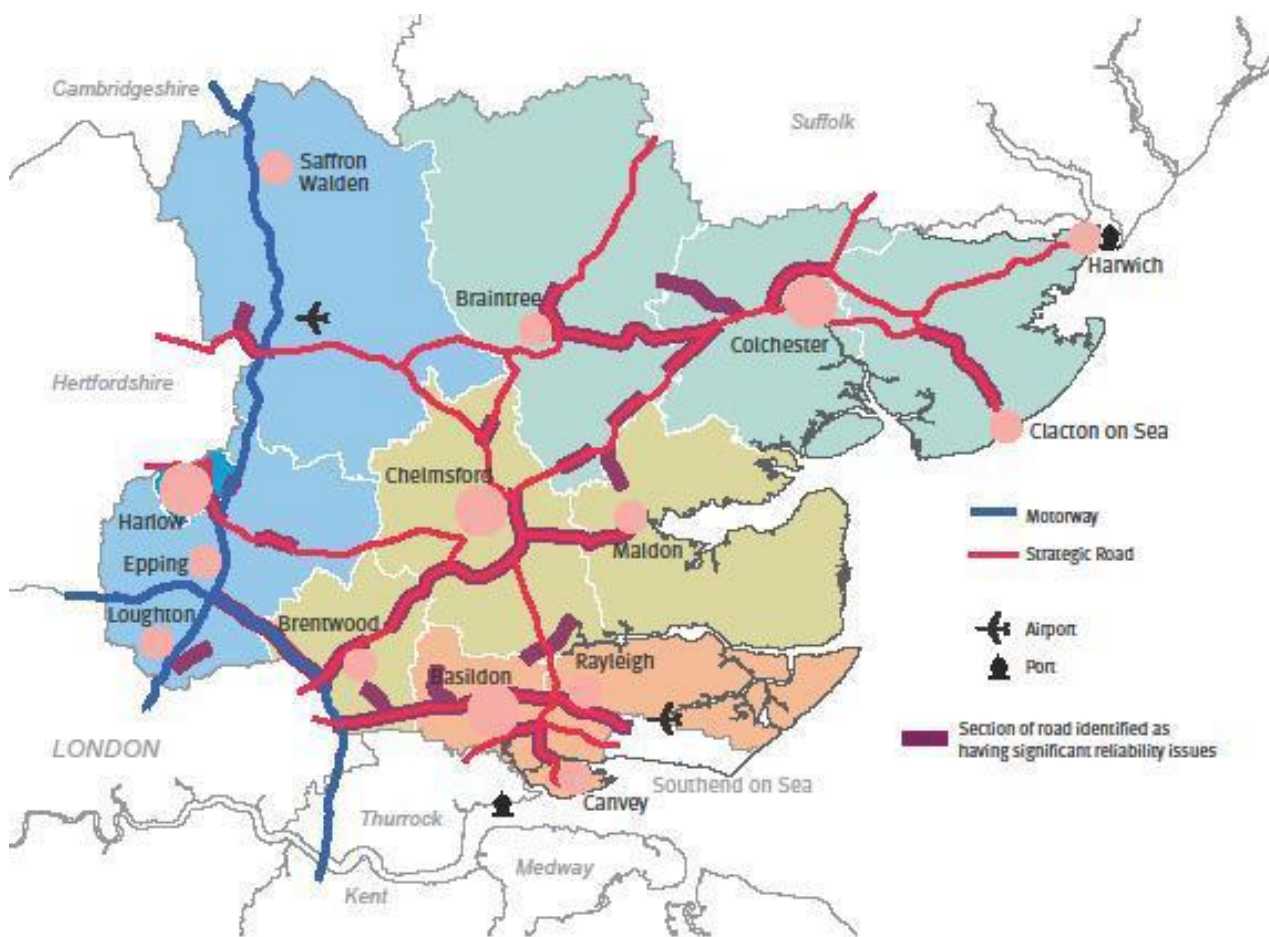
9.1. Road Traffic

9.1.1. Congestion

Tackling congestion is a strategic transport priority and is referred to in one of the broad outcomes that the Essex Transport Strategy seeks to achieve. Congestion is when the hourly traffic demand exceeds the maximum sustainable hourly throughput of the road.

There are persistent network efficiency issues especially on a number of strategic inter-urban routes which are operating at or near to capacity. The Government-managed A12 and M25 and M11 have widely recognised issues with poor reliability and delays. Congestion is common on specific sections of the Council-managed network, including sections of the A127, A130 and A414. The following figure sections of road within Essex considered that have significant reliability issues.

Figure 16: Road Network Performance



Source: Essex Transport Strategy (2011)

9.2. Waste Imports and Exports

There are two distinct types of imports and exports concerning waste, firstly the localised cross boundary movement of waste and the long distance waste travel.

The localised cross boundary movements of waste usually occur between adjacent waste planning authorities because the closest waste facility for the arisings is just over the authority boundary. An example, of this could be waste arising in the Saffron Walden area of Uttlesford in Essex being transported in to a facility in Cambridgeshire, as this represents fewer ‘waste miles’.

Conversely, long distance waste travel can occur, if larger or specialist facilities are required for that waste type. Possibly, the most well-known example of this could be nuclear waste historically being sent to the facility in Cumbria, or specialist newspaper recycling facility at the Aylesford, Kent.

9.2.1. Imports – Greater London’s Waste

Due to the proximity of the Greater London region to the Plan Area, there has been the historic situation where Essex and Southend accept London’s waste for management. This includes all three main waste streams, non-hazardous, construction, demolition and excavation and hazardous wastes.

The waste sent and received is considered to consist of both:

- Localised cross boundary movement of waste that between Essex, the East London Waste Authority (ELWA) and the North London Waste Authority (NLWA);
- Long distance waste travel: Other individual or collaborative waste planning authorities outside the ELWA and NLWA.

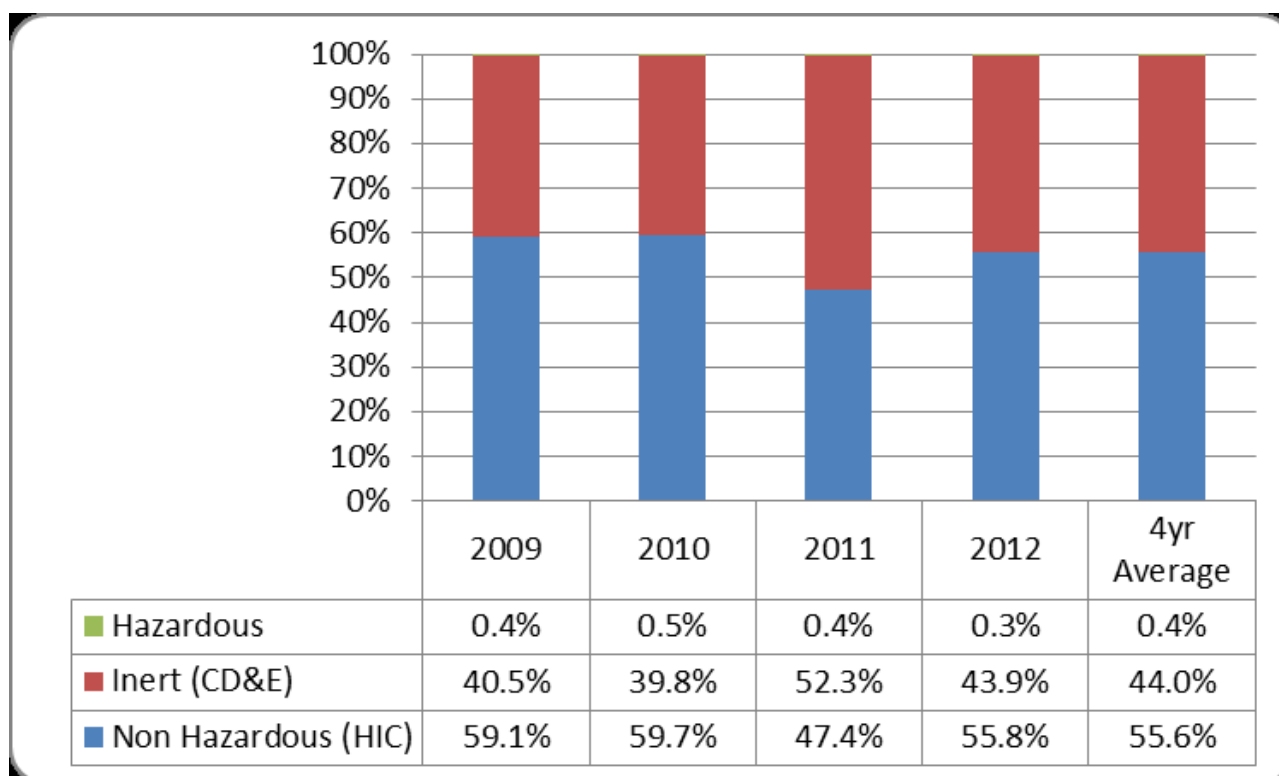
The amount of waste that Greater London exports to the plan area is a long-standing issue. Due to the abolition of the regional tier of planning there is now less certainty for individual ‘receiving’ authorities to plan for a portion of London’s waste.

Previous versions of the Plan Area’s Waste Capacity Gap Report Addendums have either not addressed the issue or looked only at total imports from London, without regard to ‘net self-sufficiency’.

9.2.2. Breakdown of Greater London Waste Importation by Waste Stream

The following identifies the relative amounts of each waste type that is imported in to the Plan Area.

Figure 17: Relative Composition of Greater London Waste Imported



Source: Essex County Council 2014

As can be seen from the above, CD&E (inert) and non-hazardous waste are the predominant waste types imported to the Plan Area from Greater London with on average only 0.4% of all the waste imported being classed as hazardous. The proportions of non-hazardous and CD&E waste varies year to year, but between

2009 to 2012 on average 44% of the total imported waste was CD&E, whilst 55.6% of the total was non-hazardous.

Table 22: Net Movements of Waste between London & the Plan Area

Year	Total Exported from Plan Area to the Greater London 'Region' (Tonnes)	Total Imported from the Greater London 'Region' to the Plan Area (Tonnes)	Net Movements of Waste (All are net importation to the Plan Area [Tonnes])
2012	432,906	867,776	434,870
2011	495,394	749,003	253,609
2010	368,556	744,168	375,797
2009	397,556	845,720	448,164
Total Importation between 2009 and 2012			1,512,440
Average annual net importation in to Plan Area			378,110

Source: Essex County Council (2014) as derived from the EA Waste Interrogators

The above table shows that there has been no specific trend in the amount of waste transported between 2009 and 2012 and neither has been there any kind of correlation in the trends of waste movements from London into the Plan Area and vice versa. It should be noted that the amount of waste imported from London into the Plan Area is significantly higher than exported from the Plan Area into London.

9.3. Summary

- Essex has a large rural area, similar in size to Suffolk, whilst also being the site of key international gateways such as Stansted and Harwich. The County also has major national routes including the M25 and the M11 running through it. As a result the transport demands faced by the County are uniquely complex.
- There are persistent network efficiency issues especially on a number of strategic inter-urban routes which are operating at or near to capacity. The Government-managed A12 and M25 and M11 have widely recognised issues with poor reliability and delays. Congestion is common on specific sections of the Council-managed network, including sections of the A127, A130 and A414.
- There are two distinct types of imports and exports concerning waste, firstly the localised cross boundary movement of waste and the long distance waste travel.
- The localised cross boundary movements of waste usually occur between adjacent waste planning authorities because the closest waste facility for the arisings is just over the authority boundary.
- Conversely, long distance waste travel can occur, if larger or specialist facilities are required for that waste type. Examples of this include nuclear waste historically being sent to the facility in Cumbria, and a specialist newspaper recycling facility at Aylesford, Kent.
- Due to the proximity of the Greater London region to the Plan Area, there has been the historic situation where Essex and Southend accept London's waste for management. This includes all three main waste streams, non-hazardous, construction, demolition and excavation and hazardous wastes.
- CD&E (inert) and non-hazardous waste are the predominant waste types imported to the Plan Area from Greater London with on average only 0.4% of all the waste imported being classed as hazardous. The proportions of non-hazardous and CD&E waste varies year to year, but between 2009 to 2012 on average 44% of the total imported waste was CD&E, whilst 55.6% of the total was non-hazardous.

10. Water

Water policy in England aims to protect both public health and the environment by maintaining and improving the quality of water. In addition to the ever increasing demand from human uses, water contributes to the natural environment and is an influential factor in the protection of wildlife species and sites, especially wetlands and estuaries.

In England, the Department for Environment, Food and Rural Affairs (Defra) oversees water policy. The Environment Agency makes sure that these policies are carried out. The Agency has a responsibility to protect and enhance the environment as a whole, monitoring and enforcing aspects not only of water quality, but of air quality and waste management as well.

10.1. Inland water resources in Essex

Figure 18 shows the location of the main water courses running through the Plan Area. The main rivers in the north of Essex are:

- Stour
- Colne
- Pant / Blackwater and
- Chelmer

The main rivers in the south of Essex are:

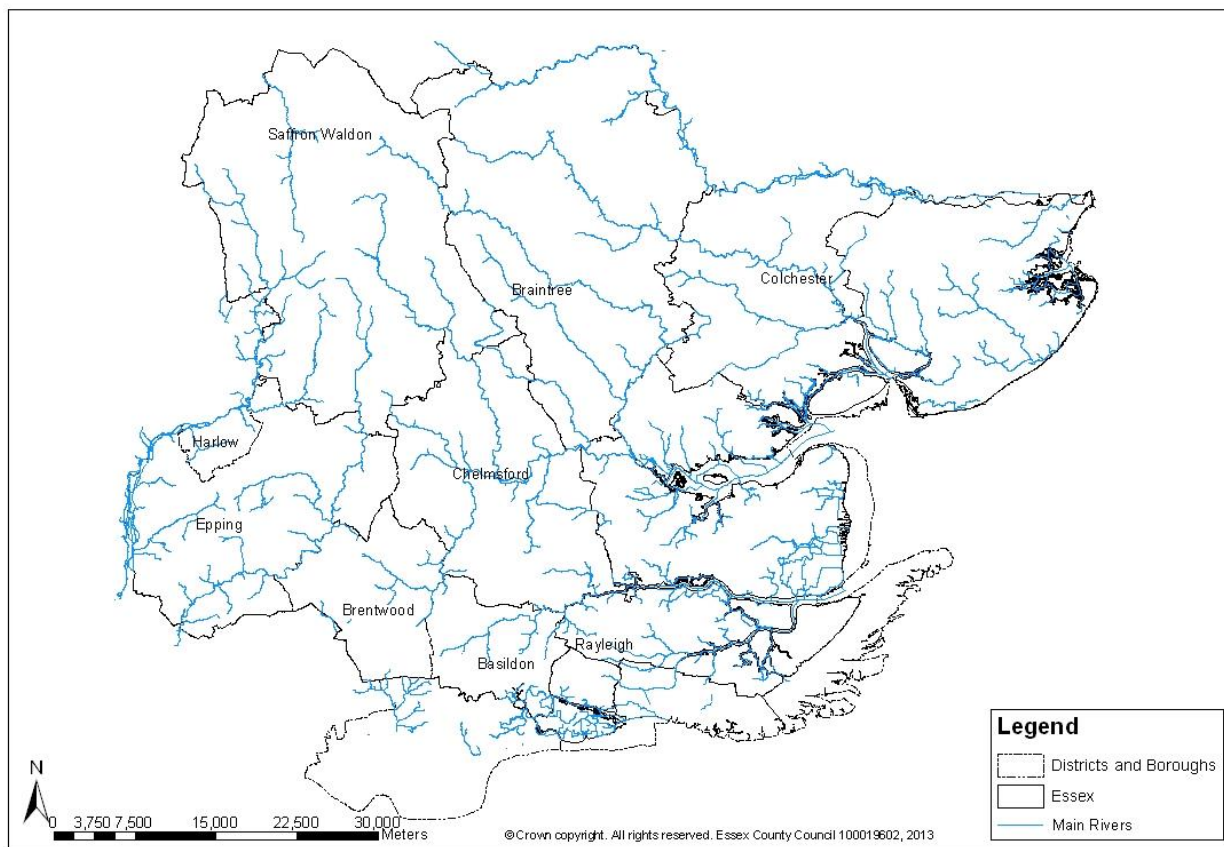
- Mardyke
- Crouch
- Roach
- Asheldham Brook

The main rivers in the west of Essex are:

- Lee
- Roding
- Stort

Essex and Southend are bounded by the River Thames to the South of the County.

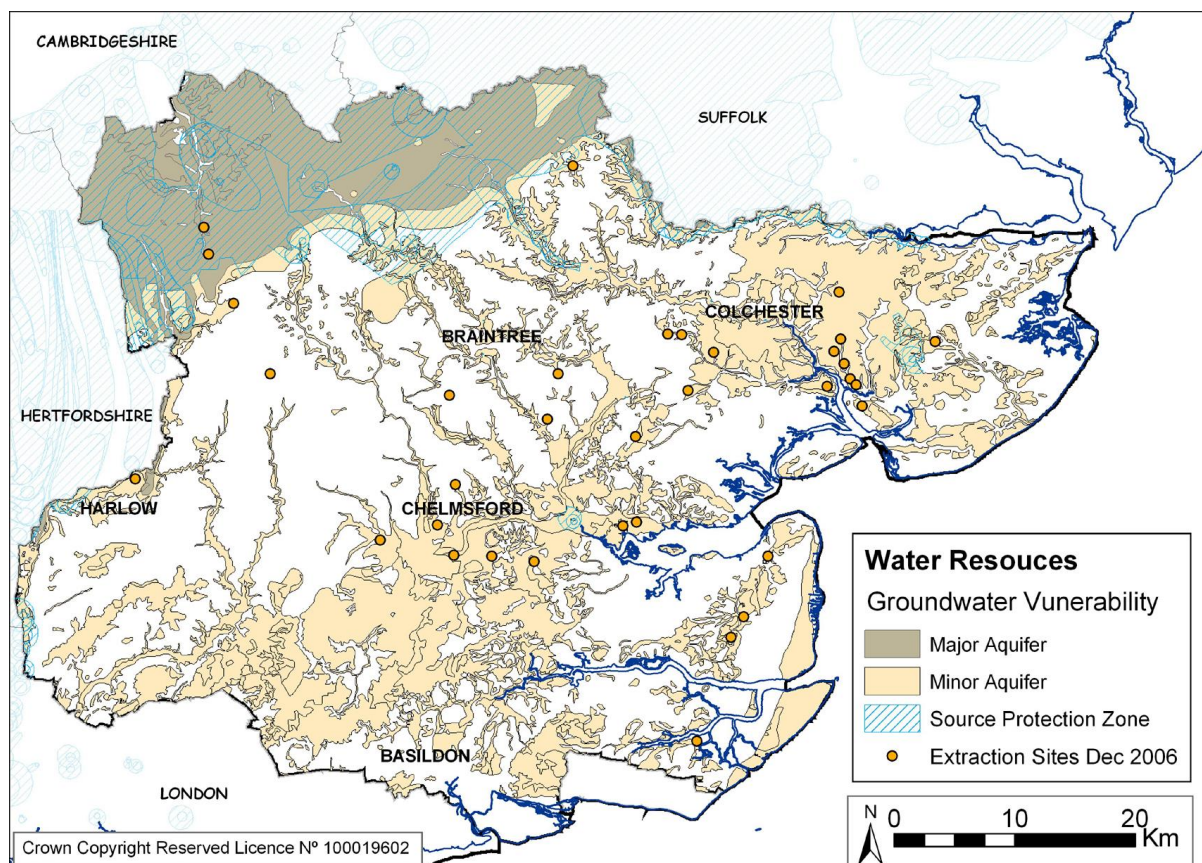
Figure 18: Main Rivers within the Plan Area



Source: Essex County Council, 2016

As well as surface water resources, the north of Essex as outlined in Figure 19, contains Chalk, Crag and Drift aquifers. The Chalk aquifer is the largest and most important type. It is used primarily for public water supply and spray irrigation. The Crag and Drift aquifers are overlain by sands and gravels of varying thickness which are locally important minor aquifers.

Figure 19: Location of Aquifers in Essex



Source: Essex County Council, 2009

10.2. Water Supply in the East of England

The Environment Agency (EA) is responsible for managing water resources in England and Wales. One of the ways that this is done is through licensing water abstraction. The EA developed catchment abstraction management strategies (CAMS) to:

- inform the public on water resources and licensing practice
- provide a consistent approach to local water resources management
- help to balance the needs of water-users and the environment

Following a national review of CAMS boundaries, water resources in the South Essex CAMS (excluding the Mardyke catchment) are now incorporated with the North Essex CAMS into the Combined Essex CAMS. Some of the issues that the Combined Essex CAMS cover include:

- Are existing water resources adequate to meet future demands?
- Is the current level of abstraction having a significant impact on flows?
- How much water is needed to protect the river environment, including the fish?
- What are the most suitable options for managing the rivers?

The Combined Essex CAMS document sets out the issues for the whole of Essex. The document splits the County into Water Resource Management Units (WRMU).

Water management is challenging in the Plan Area given the combination of high development growth and it being one of the driest counties in England. Annual rainfall in Essex is only 65% of the average in England and Wales. In respect of water quantity in Essex:

- A significant portion of the resource is considered to be 'water stressed'.
- The resource availability status of rivers and aquifers show that they are generally over abstracted.

- Essex is not self-sufficient in relation to local sources of water supply and needs to import substantial quantities of water to satisfy existing demand.

10.3. River Basin Management Plan

Water in rivers, estuaries, coasts and aquifers will improve under measures set out in River Basin Management Plans, drawn up for river basin districts across England and Wales under the Water Framework Directive. River Basin Management Plans are the plans for protecting and improving the water environment, containing the main issues for the water environment and the actions to deal with them.

Essex falls within two of these plans

- 1) The Anglian River Basin District. The Anglian River Basin District is subdivided into catchment areas and the Essex Rivers catchment area lies within the counties of Essex and Suffolk as well as a small part of Cambridgeshire. It encompasses the rivers and tributaries of the Stour, Colne, Pant / Blackwater, Chelmer, Crouch and Roach, along with the smaller catchments of Sixpenny, Tenpenny, Holland and Asheldham Brook. There are 125 river water bodies and 5 lakes in the catchment. Over 33 per cent of rivers and lakes (in excess of 280km of river length) currently achieve at least good biological status. The River Basin Management Plan for the Anglian River Basin District is available at: <https://www.gov.uk/government/publications/anglian-district-river-basin-management-plan>
- 2) The Thames River Basin District. This district covers an area of 16,133 sq km from the source of the River Thames in Gloucestershire through London to the North Sea. Dominated by Greater London, the eastern and northern parts of the river basin district (including Canvey and Harlow) are heavily urbanised. There are 483 river bodies and 76 lakes and reservoirs. The total river length covered is 4,925 km. It is one of the driest river basin districts in the UK with rainfall levels below the national average. 28% of assessed water bodies have at least good biological status. The River Thames is an important water source providing two-thirds of London's drinking water. Groundwater is very important providing around 40per cent of public water supplies with chalk forming the predominant aquifer. Current assessments show that groundwater is fully used over much of the Thames River Basin District. Therefore it is essential to maintain and improve the quantity and quality of groundwater. The River Basin Management Plan for the Thame River Basin District is available at: <https://www.gov.uk/government/publications/thames-river-basin-management-plan>

10.4. Summary

- Water policy in England aims to protect both public health and the environment by maintaining and improving the quality of water. In addition to the ever increasing demand from human uses, water contributes to the natural environment and is an influential factor in the protection of wildlife species and sites, especially wetlands and estuaries.
- The main rivers in the Plan Area are the Stour, Colne, Pant/Blackwater, Chelmer, Mardyke Crouch, Roach, Asheldham Brook, Lee, Roding, Stort. Essex is bounded by the River Thames to the South of the County. As well as surface water resources the north of Essex has Chalk, Crag and Drift aquifers. The majority of Essex has a very low contamination vulnerability rating. It is only in the northern part of the county that has a higher vulnerability because of the porosity of the underlying chalk.
- In addition, to natural water bodies there are various artificial water bodies in the county. Hanningfield and Abberton are Essex's largest inland water resources.
- Water management is challenging in the Plan Area given the combination of high development growth and it being one of the driest counties in England. Annual rainfall in the Plan Area is only 65% of the average in England and Wales. In respect of water quantity in Essex; a significant portion of the resource is considered to be 'water stressed; the resource availability status of rivers and aquifers show that they are generally over abstracted; and Essex is not self-sufficient in relation to local sources of water supply and needs to import substantial quantities of water to satisfy existing demand.
- The Plan Area falls within both the Anglian River Basin District and the Thames River Basin District. The Anglian River Basin District has 125 river water bodies and 5 lakes in the catchment whereas the Thames River Basin District has 483 river water bodies and 76 lakes. About 30 per cent of rivers and lakes in both basin districts currently achieve at least good biological status.

11. Flooding

Flooding threatens life and causes substantial damage to property, therefore incurring significant costs. The effects of heavy and/or prolonged rainfall can be increased in severity as a result of planning decisions relating to location, design and land use. Increasingly, flooding is viewed as a potential consequence of future climate change. More frequent surface water flooding is one such likelihood.

Although flooding cannot be completely prevented, its impacts can be avoided and reduced through effective planning and land management. In the Plan Area, all local authorities have completed Strategic Flood Risk Assessments (SFRAs) in order to identify and manage catchment wide flooding issues within their area as part of the planning process. The county council has also produced SFRA for Minerals and Waste planning, a Preliminary Flood Risk Assessment as part of the requirements of the Flood Risk Regulations (2009). Data compiled on this subject is useful to identify whether broad potential future locations for development represent the most appropriate choices.

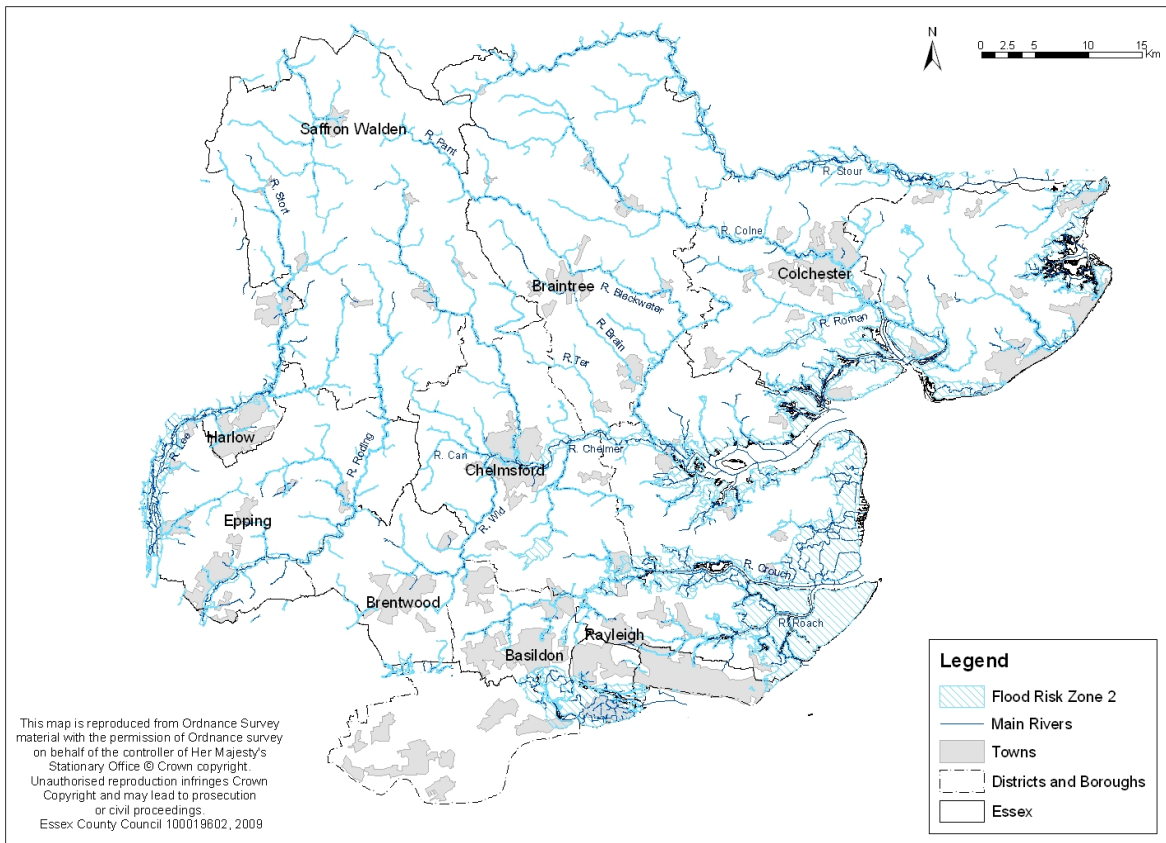
11.1. Flood Zones

The National Planning Policy Framework seeks to avoid inappropriate development in areas at risk of flooding, but where development is necessary, to ensure that it is safe and does not increase flood risk elsewhere. The framework also requires a risk-based Sequential Test to be applied with the aim to steer new development to areas with the lowest probability of flooding. Where this is not possible the Exception test would be required.

A hierarchy of flood zones for application of the sequential test which is set out in the Technical Guidance of National Planning Policy Framework (NPPF) aims to steer new development to areas with the lowest probability of flooding. The zones are explained below:

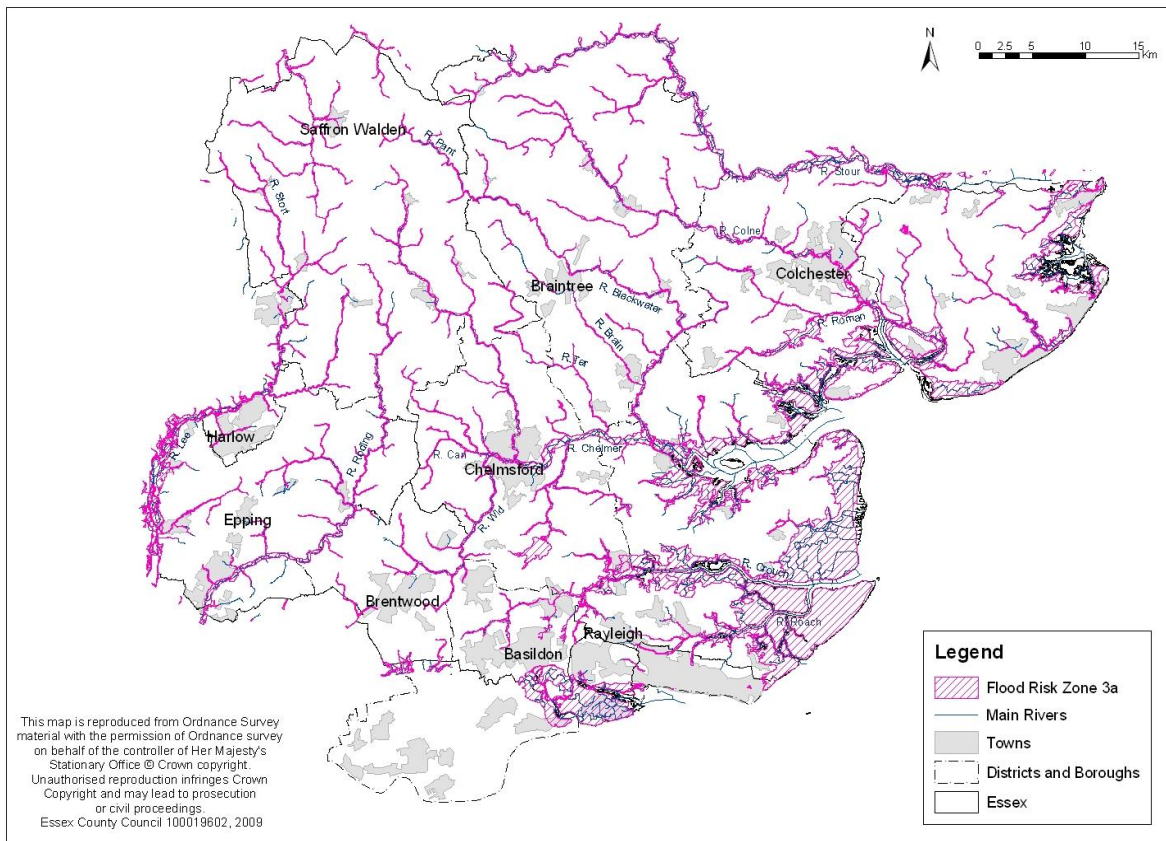
- Zone 1 - Low Probability: Encompasses land assessed as having a less than 1 in 1000 annual probability of flooding in any year (<0.1%).
- Zone 2 - Medium Probability: Comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) or land assessed as having between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%).
- Zone 3a - High Probability: Covers land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or 1 in 200 or greater annual probability of sea flooding (>0.5%).
- Zone 3b - The Functional Floodplain: This zone comprises land where water has to flow or be stored in times of flood and should be identified by local planning authorities in their SFRA in agreement with the Environment Agency. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. But land which would flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood in an extreme (0.1%) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

Figure 20: Flood risk zone 2



Source: Essex County Council, 2014, based on Environment Agency data 2013

Figure 21: Flood risk zone 3a

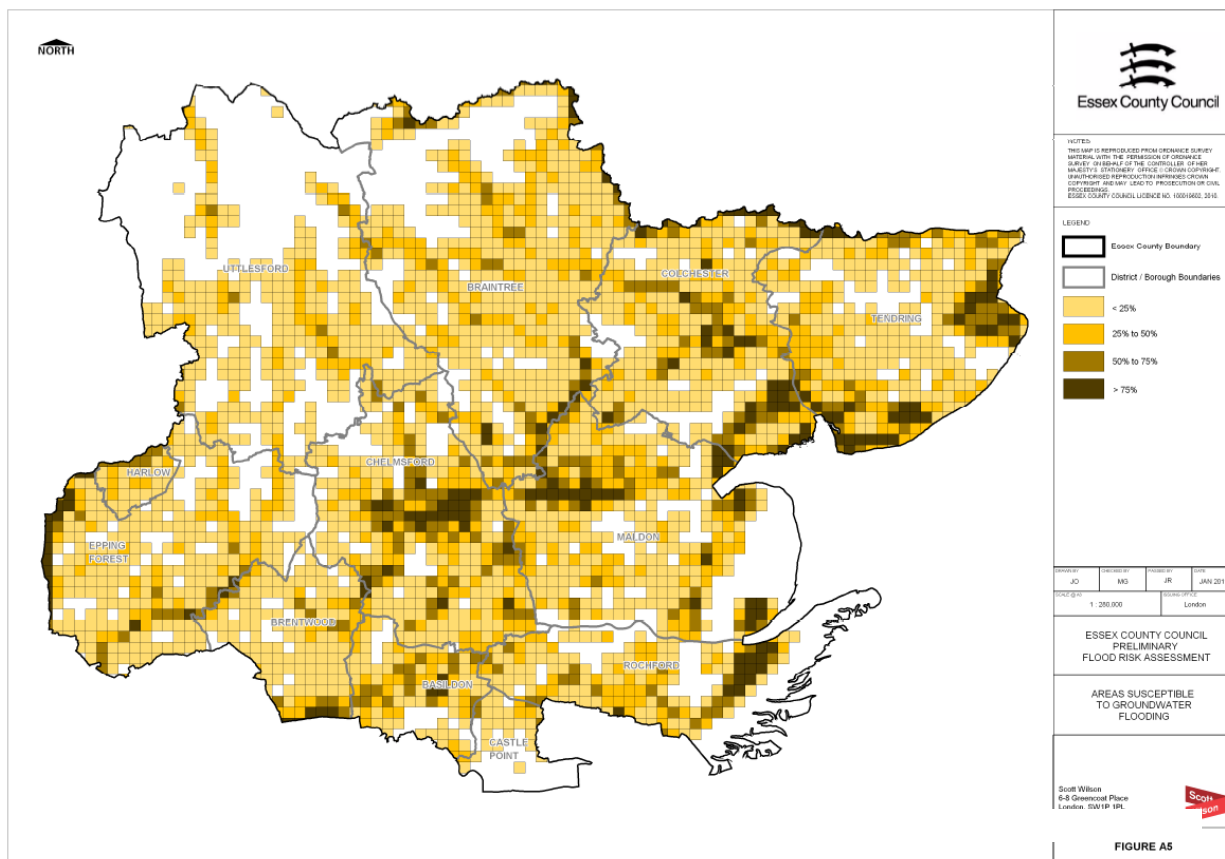


Source: Essex County Council 2014, based on Environment Agency data 2013

11.2. Groundwater Flood Risk

There is no available information on future groundwater flood risk in Essex however the Environment Agency's dataset for areas susceptible to groundwater flooding is shown in Figure 22.

Figure 22: Areas Susceptible to Groundwater Flooding



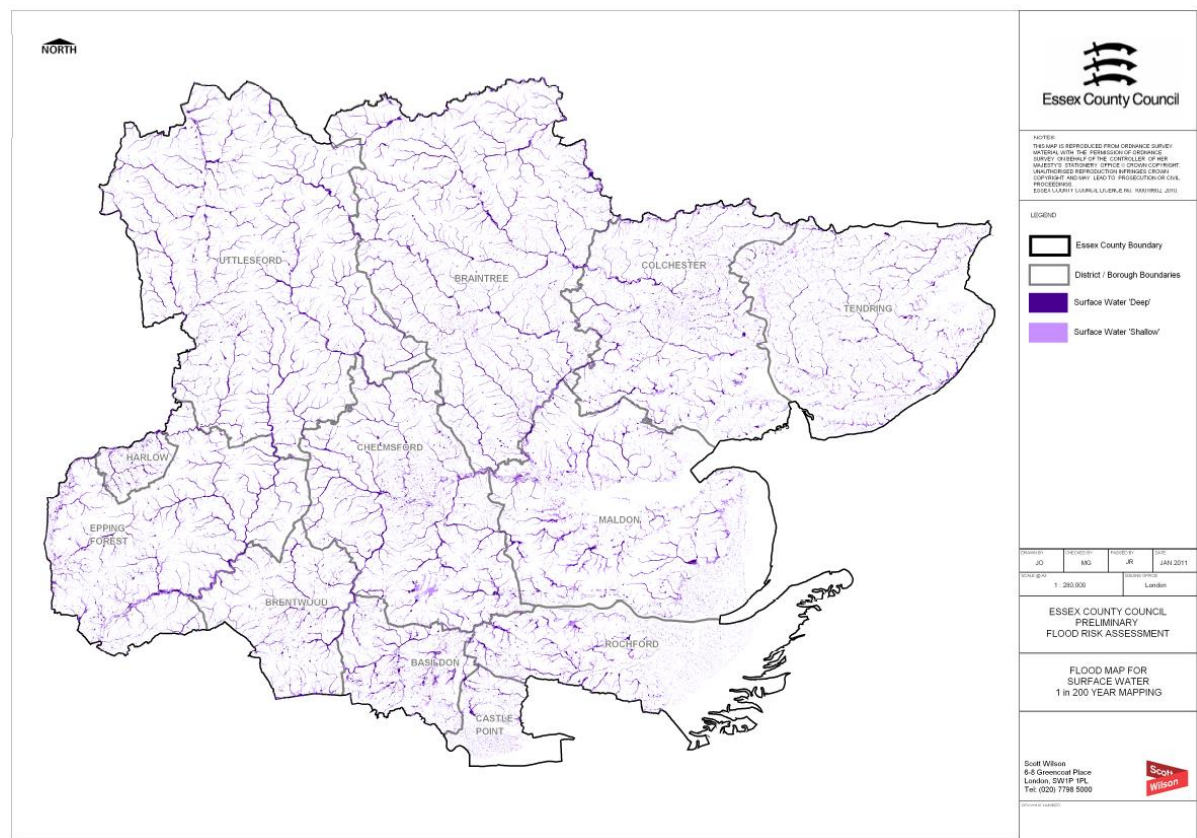
Source: Essex County Council Preliminary Flood Risk Assessment, January 2011

11.3. Surface Water Flood Risk

The Environment Agency has produced a national assessment of surface water flood risk. Figure 28 shows the areas in Essex which are likely to experience surface water flooding in a 1 in 30 year and a 1 in 200 year event.

Surface water flood risk is relatively high in Essex with all main settlements assessed being ranked in the top 1000 settlements most susceptible to surface water flooding. The Preliminary Flood Risk Assessment for Essex (January 2011) suggests that “there are around 27,000 properties at risk of surface water flooding (from a 1 in 200 year event) in the main settlements of Essex alone.

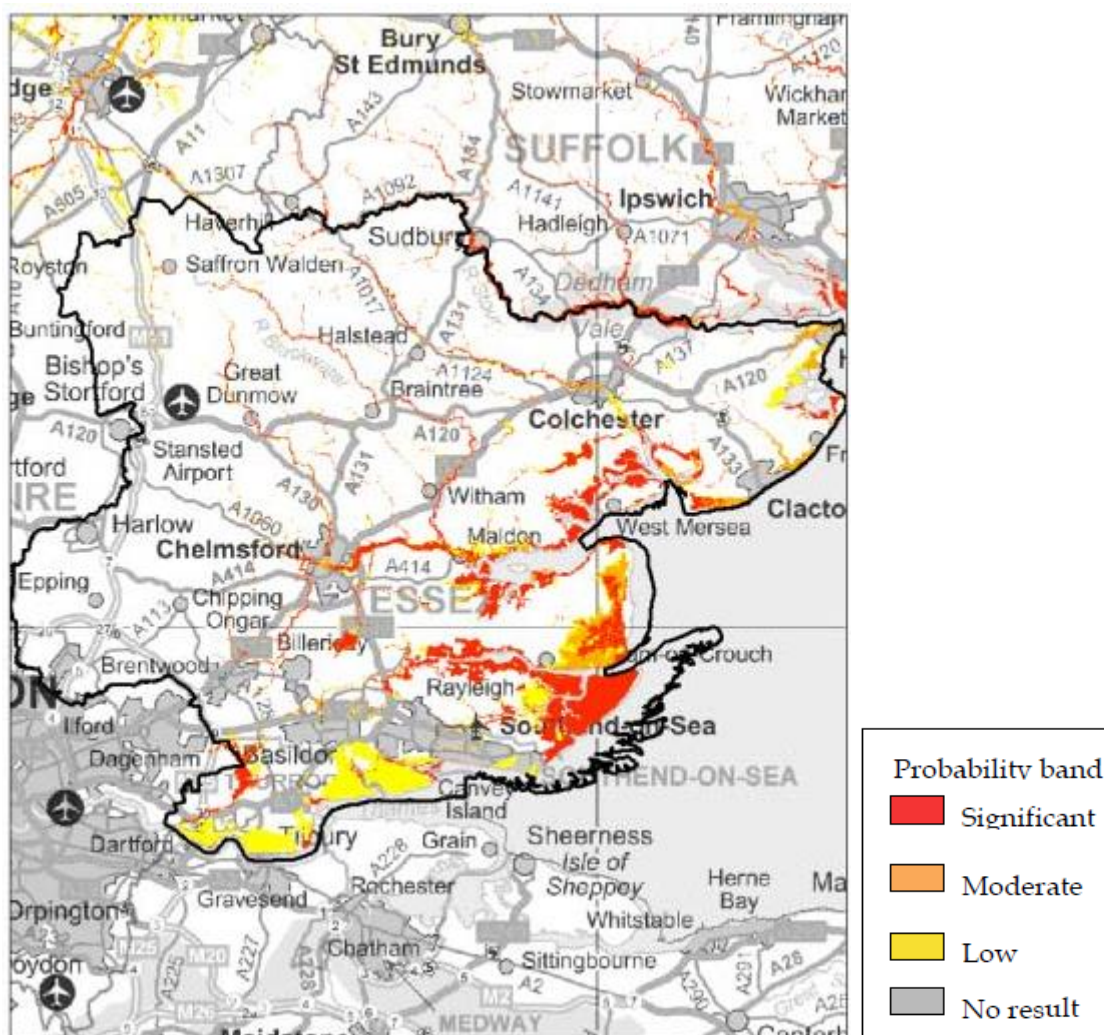
Figure 23: Surface water Flood Map (1 in 200 year mapping)



Source: Essex County Council Preliminary Flood Risk Assessment, January 2011

11.4. Future Flood Risk

Figure 24: Projected risk of flooding in Essex



Source: Essex Trends 2011 – Originally taken from Environment Agency, Internal State of the Environment Report for Essex County, 2010

Note: The chance of flooding is set out in three risk categories.

Low - areas with a flood recurrence interval greater than 1 in 200 years.

Moderate - areas with a flood recurrence interval between 1 in 200 and 1 in 75 years.

Significant - areas with a flood recurrence interval less than 1 in 75 years.

Significant levels of flood risk have been identified along the Essex coast and inland along river stretches. Essex Trends 2011 states "While advances in flood protection have been made since the early 1950s the danger of coastal flooding remains significant, particularly as climate change increases the chance of storms and high tides coinciding. Government projections suggest that the number of people in the UK at risk of flooding could more than double by 2080. The resilience of our communities in these areas must be strengthened, and our populations must plan and adapt their behaviour to prepare for these possible events."

11.5. Flood Risk in Southend

Figure 25: Projected risk of flooding in Southend (Flood Risk Zone Level 3)



Source: Southend-on-Sea Borough Council AMR, 2013 / Environment Agency

The above map shows that large areas of Southend are susceptible to both fluvial and tidal flooding. As a high density part of the Plan Area, certain potential waste management sites would not be suitable in these locations.

11.6. Summary

- Although flooding cannot be completely prevented, its impacts can be avoided and reduced through effective planning and land management. In the Plan Area, all local authorities have completed Strategic Flood Risk Assessments (SFRAs) in order to identify and manage catchment wide flooding issues within their area as part of the planning process. The county council has also produced SFRA for Minerals and Waste planning and a Preliminary Flood Risk Assessment as part of the requirements of the Flood Risk Regulations (2009). Data compiled on this subject is useful to identify whether broad potential future locations for development represent the most appropriate choices.
- The National Planning Policy Framework seeks to avoid inappropriate development in areas at risk of flooding, but where development is necessary, to ensure that it is safe and does not increase flood risk elsewhere.
- Surface water flood risk is relatively high in Essex with all main settlements assessed being ranked in the top 1,000 settlements most susceptible to surface water flooding. The Preliminary Flood Risk Assessment for Essex (January 2011) suggests that “there are around 27,000 properties at risk of surface water flooding (from a 1 in 200 year event) in the main settlements of Essex alone”.
- Significant levels of flood risk have been identified along the Essex coast and inland along river stretches. Essex Trends 2011 states “While advances in flood protection have been made since the early 1950s the danger of coastal flooding remains significant, particularly as climate change increases the chance of storms and high tides coinciding. Government projections suggest that the number of people in the UK at risk of flooding could more than double by 2080. The resilience of our communities in these areas must be strengthened, and our populations must plan and adapt their behaviour to prepare for these possible events.”
- Large areas of Southend are susceptible to both fluvial and tidal flooding. As a high density part of the Plan Area, certain potential waste management sites would not be suitable in these locations.

12. Cultural Heritage and Townscape

The historic environment should be effectively protected and valued for its own sake, as an irreplaceable record which contributes to our understanding of both the present and the past. Cultural heritage adds to the quality of life, by enhancing the local scene and sustaining a sense of local distinctiveness, which is an important aspect of the character and appearance of towns, villages and countryside. It also has an importance for leisure and recreation.

The Essex Historic Environment Record (EHER), maintained by Essex County Council, is a computerised database of all listed, scheduled monuments and other historic buildings and archaeological sites, historic parks and gardens and other historic landscape features in the county and currently holds over 38,000 records.

As highlighted by English Heritage, it is important to recognise the importance of undesignated heritage assets.

12.1. Historic Landscape Characterisation

The county of Essex is subjected to enormous pressures from housing and transport infrastructure developments, but many historic elements can be seen to survive in the landscape, some of which have been described earlier in this report. A Historic Landscape Characterisation (HLC) project was carried out as part of the English Heritage national programme to assess the rural landscape in terms of its historic origins.

The aim of the project in Essex was to characterise the distinctive historic dimension of the current rural landscape. This has been carried out as part of, and using the methodology developed from, the East of England Regional HLC project. Desk-based research using modern and historic mapping sources was carried out to identify and map the historic character of the landscape through the application of defined Historic Landscape Character types. The result of the project is a comprehensive Geographic Information System (GIS) which provides a complete coverage of the county with information on current landscape and its origins, and reports giving the background to the HLC project with an overview of the Essex Landscape and its development; a summary of the results, and a description of the methodology, database and the terminology developed in appendices.

12.2. Historic Environment Characterisation (HEC)

Historic Environment Characterisation is an approach to characterisation which integrates the three main strands which make up the historic environment, historic buildings, historic landscape (urban and rural) and below ground archaeological remains. HEC is a means of incorporating the historic environment into spatial planning particularly at a strategic level, usually used at a sub-regional, county or district level. It is particularly useful since it provides an overview of the historic environment in its entirety, rather than just one aspect such as historic landscape.

The Historic Environment of a large part of Essex has been assessed using character assessments of the urban, landscape and archaeological resource. The results of these studies have been combined to create large Historic Environment Character Areas. These are broken down into more specific and more detailed Historic Environment Character Zones which are suitable for informing strategic planning, and master planning activity.

The characterisation contains an assessment of the sensitivity to change, diversity and value of the historic environment resource. The characterisation should facilitate the development of positive approaches to the integration of historic environment objectives into spatial planning. HEC is available for all of Essex apart from Brentwood, Epping and Harlow Districts.

12.3. Listed Buildings

All buildings built before 1700 which survive in anything like their original condition are listed, as are most of those built between 1700 and 1840. The criteria become tighter with time, so that post-1945 buildings have to be exceptionally important to be listed. A building normally has to be over 30 years old to be eligible for listing.

There are over 398,000 buildings or groups of buildings in England (English Heritage, 2015) and 14,300 in Essex (The National Heritage List for England, English Heritage, 2015). Table 23 outlines the listed building composition for the county.

Table 23: Listed Building Composition for Essex and Southend

Type of Listed Building	Essex – Total Number	Southend – Total Number
Grade I	267	5
Grade II*	756	6
Grade II	12,978	89
Total	14,300	106

Source: The National Heritage List for England (2015)

The majority of listed buildings in the Plan Area are grade II listed. There are 272 listed buildings of exceptional interest (grade I) and 762 which are particularly important buildings of more than special interest (grade II*).

There is a fairly even distribution of listed buildings within the Plan Area; however there is a greater concentration to the north particularly in the districts of Uttlesford and Braintree and also around historic towns such as Colchester.

12.4. Heritage at Risk in Essex Register

The Heritage at Risk in Essex Register (HARR) contains details of heritage assets known to be 'at risk' through neglect and decay, or vulnerable of becoming so. Although the main focus remains on buildings, the whole of the historic environment is now encompassed in the register. The objective of the register is to highlight the plight of heritage assets which are at risk, and initiate action towards securing their long term conservation.

Table 24: Number of buildings on the Heritage at Risk in Essex Register in 2010, 2011 and 2013

Administrative Area	At Risk			No Longer At Risk			Newly At Risk		
	2013	2011	2010	2013	2011	2010	2013	2011	2010
Basildon	2	3	3	1	0	1	0	0	0
Braintree	22	22	19	0	0	2	0	3	0
Brentwood	8	8	9	0	1	0	0	0	0
Castle Point	1	0	0	0	0	0	1	0	0
Chelmsford	20	22	25	6	4	0	4	4	10
Colchester	37	41	48	4	9	2	0	3	1
Epping Forest	24	24	23	0	0	0	0	1	0
Harlow	3	4	4	1	0	0	0	0	2
Maldon	24	12	15	0	2	0	10	1	5
Rochford	9	8	8	0	0	0	1	0	1
Southend-on-Sea	15	16	17	1	3	0	0	2	9

Administrative Area	At Risk			No Longer At Risk			Newly At Risk		
	2013	2011	2010	2013	2011	2010	2013	2011	2010
Tendring	34	35	33	1	0	3	0	2	10
Uttlesford	13	14	18	1	4	0	0	0	2
TOTAL	212	211	222	15	23	8	16	16	40

Source: Heritage at Risk in Essex Register 2014, Essex County Council

The register addresses a 'moving target' where some heritage assets which are repaired are taken off and others which become 'at risk' are added. The success of the HARR may be measured by the number of heritage assets added, furthermore both the success and failure of the conservation measures employed is reflected in the numbers removed. The Register shows that the annual number of heritage assets deemed 'at risk' and 'newly at risk' in the Plan Area has increased slightly over the last two years with 227 in 2011 and 228 in 2013. There has been a significant decrease since 2010 however, when this figure totalled 262.

Of the 212 heritage assets currently at risk, 37 of them are within the Borough of Colchester, which is the highest amount of all the Essex districts while Castle Point Borough has only 1 heritage asset at risk.

12.5. Archaeology, Recorded Sites and Finds in Essex

As with rest of the UK, it is true to say that the majority of archaeological sites and deposits in Essex remain buried, hidden and thus preserved. However, the known archaeological resource in the county is very varied and highly significant.

There are approximately 37,240 records of archaeological sites and finds, recorded on the Essex Historic Environment Record (EHER) for the county. The archaeological deposits range in date from the Palaeolithic, through to structures related to the Cold War. However, it should also be remembered that the EHER represent only the known deposits with many new sites being identified each year. Archaeological sites (and their setting) constitute a finite, non-renewable resource, vulnerable to damage.

12.6. Scheduled Monuments

Scheduled Monuments (SMs) are sites of national importance and protected by the Ancient Monuments and Archaeological Areas Act 1979. The purpose of designating SMs is to preserve the monument for the future and protect it from damage, destruction or any unnecessary interference. Throughout the Plan Area there 304 (298 in Essex and 6 in Southend), ranging from prehistoric burial mounds to unusual examples of World War II and Cold War defensive structures. The locations of the SMs in the district are shown in Figure 26.

12.7. Conservation Areas

Conservation Areas are defined as historical town centres and buildings having 'special architectural or historical interest, the character of which is desirable to preserve or enhance' which are protected under the Listed Buildings and Conservations Areas Act (1990). The objective of the Conservation Area designation is to ensure that the character of the defined area is preserved from developments which do not preserve or enhance its character. The Plan Area currently has 228 designated Conservation Areas. These are separated into local authority level in the following table and the specific locations of these are shown in the following figure.

Table 29: Conservation Areas in the Plan Area 2014

Administrative Area	Number of Conservation Areas
Basildon	4
Braintree	39
Brentwood	13

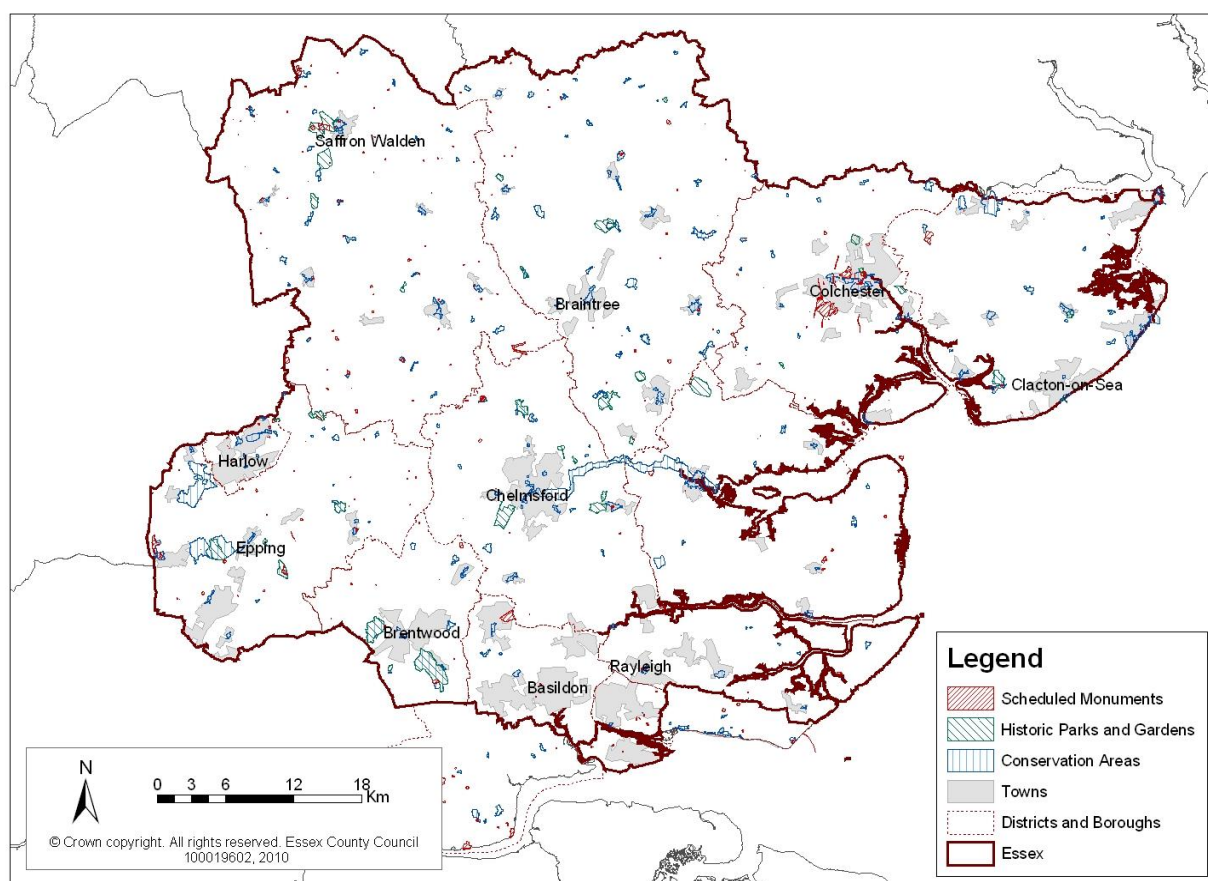
Administrative Area	Number of Conservation Areas
Castle Point	2
Chelmsford	23
Colchester	22
Epping Forest	25
Harlow	9
Maldon	12
Rochford	10
Southend-on-Sea	15
Tendring	20
Uttlesford	34
TOTAL	228

Source: Essex County Council and Southend-on-Sea Borough Council, 2014

12.8. Registered Parks or Gardens

These are designated by English Heritage and defined as “a park or garden of special historic interest”. They are graded I (highest quality), II* or II. There are currently 38 historic parks and gardens in Essex and 0 in Southend as shown in Figure 26. Further information can be obtained from the English Heritage website at: <http://www.english-heritage.org.uk/professional/protection/process/national-heritage-list-for-england/>

Figure 26: Scheduled Monuments, Historic Parks and Gardens and Conservation areas in the Plan Area



Source: Essex County Council 2010

12.9. Historic Battlefields

Essex has one of only 46 Registered Battlefield sites in England. It is the oldest battlefield on the register and is the site of the Battle of Maldon, between the Saxons and the Vikings, in 991 AD located on Northey Island in the Blackwater Estuary.

The battlefield site is situated within a number of designations: the Coastal Protection Belt, Special Landscape Area and a SSSI.

12.10. Summary

- The historic environment should be effectively protected and valued for its own sake, as an irreplaceable record which contributes to our understanding of both the present and the past.
- Historic Environment Characterisation (HEC) is an approach to characterisation which integrates the three main strands which make up the historic environment; historic buildings, historic landscape (urban and rural) and below ground archaeological remains. HEC is a means of incorporating the historic environment into spatial planning particularly at a strategic level, usually used at a sub-regional, county or district level. It is particularly useful since it provides an overview of the historic environment in its entirety, rather than just one aspect such as historic landscape.
- There are over 398,000 listed buildings or groups of buildings in England (English Heritage, August 2015) and 14,300 in Essex (The National Heritage List for England, English Heritage, 2015).
- The majority of listed buildings in the Plan Area are grade II listed. There are 272 listed buildings of exceptional interest (grade I) and 762 which are particularly important buildings of more than special interest (grade II*).

- There is a fairly even distribution of listed buildings within the Plan Area; however there is a greater concentration to the north particularly in the districts of Uttlesford and Braintree and also around historic towns such as Colchester.
- The Heritage at Risk in Essex Register (HARR) contains details of heritage assets known to be 'at risk' through neglect and decay, or vulnerable of becoming so. Although the main focus remains on buildings, the whole of the historic environment is now encompassed in the register. The objective of the register is to highlight the plight of heritage assets which are at risk, and initiate action towards securing their long term conservation.
- The Register shows that the annual number of heritage assets deemed 'at risk' and 'newly at risk' in the Plan Area has increased slightly over the last two years with 227 in 2011 and 228 in 2013. There has been a significant decrease since 2010 however, when this figure totalled 262.
- Of the 212 heritage assets currently at risk, 37 of them are within the Borough of Colchester, which is the highest amount of all the Essex districts while Castle Point Borough has only 1 heritage asset at risk.
- As with rest of the UK, it is true to say that the majority of archaeological sites and deposits in Essex remain buried, hidden and thus preserved. However, the known archaeological resource in the county is very varied and highly significant. There are approximately 37,240 records of archaeological sites and finds, recorded on the Essex Historic Environment Record (EHER) for the county.
- Scheduled Monuments (SMs) are sites of national importance and protected by the Ancient Monuments and Archaeological Areas Act 1979. The purpose of designating SMs is to preserve the monument for the future and protect it from damage, destruction or any unnecessary interference. Throughout the Plan Area there 304 (298 in Essex and 6 in Southend), ranging from prehistoric burial mounds to unusual examples of World War II and Cold War defensive structures.
- Conservation Areas are defined as historical town centres and buildings having 'special architectural or historical interest, the character of which is desirable to preserve or enhance' which are protected under the Listed Buildings and Conservations Areas Act (1990). The objective of the Conservation Area designation is to ensure that the character of the defined area is preserved from developments which do not preserve or enhance its character. The Plan Area currently has 228 designated Conservation Areas. These are separated into local authority level in the following table and the specific locations of these are shown in the following figure.
- Registered Parks and Gardens are designated by English Heritage and defined as "a park or garden of special historic interest". They are graded I (highest quality), II* or II. There are currently 38 historic parks and gardens in Essex and 0 in Southend.
- Essex has one of only 46 Registered Battlefield sites in England. It is the oldest battlefield on the register and is the site of the Battle of Maldon, between the Saxons and the Vikings, in 991 AD located on Northey Island in the Blackwater Estuary.

13. Economy

13.1. Labour Supply

Table 25: Labour Supply (Apr 2013 – March 2014)

	Essex	Southend	Essex (%)	Southend (%)	East (%)	GB (%)
All People						
Economically active	732,800	88,700	80.3	77.9	80.1	77.5
In employment	697,000	84,200	76.2	73.7	76.3	73.1
Employees	590,000	71,100	65.3	63.0	65.6	62.5
Self employed	105,500	12,600	10.8	10.4	10.3	10.1
Unemployed (model based)	35,900	5,000	4.9	5.6	4.6	5.7
Males						
Economically active	394,500	48,600	88.1	85.4	86.3	83.1
In employment	375,100	46,200	83.6	81.0	82.0	78.2
Employees	303,100	38,100	68.9	67.7	67.5	64.0
Self employed	71,700	8,000	14.7	13.3	14.1	13.7
Unemployed (model based)	19,400	2,400	4.9	5.0	5.0	5.8
Females						
Economically active	338,300	40,100	72.7	70.3	73.9	72.0
In employment	321,900	38,000	69.0	66.5	70.7	68.0
Employees	286,900	33,000	61.8	58.4	63.8	61.1
Self employed	33,800	4,600	7.0	7.5	6.6	6.5
Unemployed (model based)	16,500	2,100	4.9	5.3	4.2	5.4

Source: ONS, Nomis July 2014 - June 2015

The percentage of Essex's population that are economically active at 80.3% is higher than the national average and slightly higher than the regional average. Southend at 77.9% is more in line with the national average. The percentage of Essex residents in employment is also higher than the national average but is slightly below the average for the East of England. The Southend average again is similar to the national average.

13.2. Employment by Industry Class and Occupation

Table 26: Employment by Industry Class 2014

	Essex		Southend		East of England	Great Britain
Total employee jobs	540,200	-	64,700	-	-	-
Full-time	352,200	65.2%	39,800	61.4%	66.1%	68.3%
Part-time	188,100	34.8%	25,000	38.6%	33.9%	31.7%
Primary Services (agriculture and mining)	1,200	0.2%	100	0.2%	0.3%	0.4%
Energy and Water	4,700	0.9%	400	0.5%	0.9%	1.1%
Manufacturing	43,500	8.1%	4,400	6.8%	8.5%	8.5%
Construction	37,100	6.9%	2,800	4.3%	5.4%	4.5%
Services	453,700	84.0%	57,100	88.2%	84.8%	85.6%
Wholesale and retail, including motor trades	95,900	17.8%	10,100	15.6%	17.7%	15.9%
Transport storage	25,800	4.8%	1,500	2.4%	4.4%	4.5%
Accommodation and food services	38,500	7.1%	4,900	7.5%	6.9%	7.1%
Information and communication	21,200	3.9%	1,700	2.6%	4.1%	4.1%
Financial and other business services	111,300	20.6%	13,600	21.0%	22.8%	22.2%
Public admin, education and health	139,100	25.8%	21,700	33.6%	24.8%	27.4%
Other Services	21,900	4.1%	3,600	5.5%	4.1%	4.4%

Source: Nomis 2014

Notes: 1. Data excludes farm-based agriculture.

The above table has split employment into 5 main categories, namely 'Primary Services', 'Energy and Water', 'Manufacturing', 'Construction' and 'Services'. Essex can be seen to have an above average proportion of people employed in the 'Construction' and 'Transport' sectors and a deficit in 'Finance, IT and other business activities' and 'Services' sectors.

The largest proportion of people across all geographical areas work in the 'Services' industry. A smaller proportion of people are employed in the sector in Essex than the East of England, and this figure is further below the national average of 85.6%. Southend with an average of 88.2% is higher than the national average.

Table 27: Employment by Occupation July 2014 – June 2015

Occupation	Essex	Essex %	Southend	Southend %	East of England	Great Britain
Major Groups 1-3	303,900	43.7	39,300	46.8	44.7	44.3
1 Managers, Directors & Senior Officials	73,400	10.5	10,400	12.3	10.6	10.3
2 Professional Occupations	128,300	18.4	17,100	20.3	19.8	19.7
3 Associate Professional & Technical	102,200	14.7	11,900	14.1	14.2	14.0
Major Groups 4-5	177,400	25.5	18,400	22.0	22.6	21.5
4 Administrative & Secretarial	87,200	12.5	8,900	10.6	11.1	10.6
5 Skilled Trades Occupations	90,200	12.9	9,500	11.3	11.5	10.7
Major Groups 6-7	111,000	15.9	12,000	14.3	16.0	17.1
6 Caring, Leisure and Other Service Occupations	67,100	9.6	7,100	8.4	8.9	9.2
7 Sales & Customer Service Occupations	43,900	6.3	4,900	5.8	7.1	7.7
Major Groups 8-9	103,800	14.9	14,300	17.0	16.6	17.2
8 Process Plant & Machine Operatives	41,100	5.9	5,400	6.4	6.1	6.3
9 Elementary Occupations	62,600	9.0	8,900	10.6	10.4	10.8

Source: Nomis 2015

13.3. Summary

- The percentage of Essex's population that are economically active at 80.3% is higher than the national average and slightly higher than the regional average. Southend at 77.9% is more in line with the national average. The percentage of Essex residents in employment is also higher than the national average but is slightly below the average for the East of England. The Southend average again is similar to the national average.
- The largest proportion of people across all geographical areas work in the 'Services' industry. A smaller proportion of people are employed in the sector in Essex than the East of England, and this figure is further below the national average of 85.6%. Southend with an average of 88.2% is higher than the national average.

- The above table has split employment into 5 main categories, namely 'Primary Services', 'Energy and Water', 'Manufacturing', 'Construction' and 'Services'. Essex can be seen to have an above average proportion of people employed in the 'Construction' and 'Transport' sectors and a deficit in 'Finance, IT and other business activities' and 'Services' sectors.

14. Housing

The latest population trend data shows that the population in the Plan Area is growing annually. This has important implications for the management of waste, and the requirement for new waste management facilities.

Table 28: Net additional dwellings in Essex

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Basildon	360	520	510	210	650	650	120	680
Braintree	770	480	570	590	300	180	180	410
Brentwood	260	280	180	410	130	210	110	160
Castle Point	120	120	130	450	60	120	170	210
Chelmsford	700	580	140	140	210	250	470	830
Colchester	1,210	1,000	480	640	1,070	620	720	730
Epping Forest	140	160	270	390	290	120	310	230
Harlow	180	290	140	140	380	150	120	200
Maldon	220	230	170	100	90	120	70	70
Rochford	180	110	100	50	90	30	240	330
Southend	370	450	280	230	330	250	110	190
Tendring	310	190	150	40	230	240	200	270
Uttlesford	580	480	570	350	520	550	390	470
Plan Area	5,400	4,890	3,690	3,740	4,350	3,490	3,210	4,780

Source: DCLG, 2015

- Note: Cells highlighted contain imputed data - this data should not be seen as an estimate for the individual authority but is given on an authority basis to allow custom totals to be constructed.

The total number of net additional dwellings in the Plan Area for 2007 to 2015 was 32,940. Chelmsford Borough and Colchester Borough recorded the highest number for 2014/15 of 830 and 730 buildings respectively. The number of additional dwellings in Colchester and Basildon over this period accounted for approximately 33% of the total number of new dwellings added in the Plan Area.

Many of the local authorities in Essex are currently developing their Local Plans and accompanying evidence base so future projections are not yet available. It is therefore not possible to gain an accurate account of future housing supply across the county.

14.1. Existing Housing Stock

Table 29: Dwelling Stock by District 2014

Local Authority	Total Dwelling Stock
Basildon	75,450
Braintree	63,360
Brentwood	32,520
Castle Point	38,020
Chelmsford	72,180
Colchester	76,940
Epping Forest	55,130
Harlow	36,370
Maldon	27,490
Rochford	34,810
Southend	79,300
Tendring	67,610
Uttlesford	34,310
Plan Area	659,180

Source: DCLG, 2015

As of 2014, there was a total dwelling stock within Essex County of 659,180. This has significant implications on waste management and the capacities of various waste management facilities in the Plan Area.

14.2. Summary

- The latest population trend data shows that the population in the Plan Area is growing annually. This has important implications for the management of waste, and the requirement for new waste management facilities.
- The total number of net additional dwellings in the Plan Area for 2007 to 2015 was 32,940. Chelmsford Borough and Colchester Borough recorded the highest number for 2014/15 of 830 and 730 buildings respectively. The number of additional dwellings in Colchester and Basildon over this period accounted for approximately 33% of the total number of new dwellings added in the Plan Area.
- Many of the local authorities in Essex are currently developing their Local Plans and accompanying evidence base so future projections are not yet available. It is therefore not possible to gain an accurate account of future housing supply across the county.
- As of 2014, there was a total dwelling stock within Essex County of 659,180. This has significant implications on waste management and the capacities of various waste management facilities in the Plan Area.

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