Essex Green Infrastructure Strategy

A strategy that champions for high quality green space and green infrastructure in Essex

2020

Aerial view of Hardingham Castle © Place Services

GREEN ESSEX | Essex County Council

This Strategy has been prepared on behalf of the Essex Green Infrastructure Partnership (Steering Group & Partners), consisting of the following functions and organisations:

Steering Group: Essex County Council
- Culture & Green Spaces
- Environment (Commercial Development)
- Highways Active Travel
- Highways Network Development
- Place Services
- Planning
- Sustainability & Resilience
- Wellbeing & Public Health
- Housing Growth

Green Infrastructure Strategy Partnership:
Basildon Borough Council
Chelmsford City Council
Colchester Borough Council
Epping Forest District Council
Harlow Council
Maldon District Council
Rochford District Council
Tendring District Council
Southend-on-Sea Borough Council
- Essex Planning Officers' Association

Professor Alister Scott
- Natural Environment research Council (NERC) Green Infrastructure Exchange Fellow - Green Infrastructure Planning Policy Assessment
- Northumbria University

AONB
Suffolk Coast & Heaths AONB

Environment Agency
- Sustainable Places, Covering East Anglia Area of Norfolk, Suffolk & Essex

Essex Bridleways Association/British Horse Society
Bridleways Development, Essex

Essex Wildlife Trust
Landscape Conservation Planning

Friends of Flitch Way
Flitch Way, Blackwater Rail Trail and associated woodlands under Flitch Way range services.

Green Arc
- http://www.greenarc.org/ - Covering South East Hertfordshire, South West Essex and North East London

Forestry Commission
- Representing East and East Midlands Area

Hertfordshire County Council
- Landscape and Planning (Hertfordshire Green Infrastructure Strategy)

Natural England
- Local Partnership covering Essex Area

RSPB
- Essex, Bedfordshire & Hertfordshire

Rural Community Council of Essex

Sustrans
- Network Development covering East Anglian Area

Thames Chase Trust
- Forest Development; Thames Chase Community Forest

The Tree Council
- Science & Research

University of East Anglia
- School of Environmental Sciences: Centre for Social and Economic Research on the Global Environment (CSERGE)

University of Essex
- ESRC Business & Local Government Data Research Centre

Woodlands Trust
- Regional External Affairs

Essex County Council
- Active Essex
- Adult Social Services
- Economic Growth & Regeneration
- Flood Water Management
- Spatial Planning
- Sustainable Travel Planning
- Waste & Environment

Foreword

On the 8th October 2019 the Leader of Essex County Council announced he was setting up an independent, cross party commission to help the Council in defining how it can play its part in tackling climate change.

The Climate Commission will set out a road map to net zero carbon for Essex. The Commission will review key areas where changes are needed to drive down emissions, manage increasing risks from an already changing climate and open opportunity for a new green economy. The Green Infrastructure Strategy will be presented to the Commission at its very first meeting in September 2020 with a detailed Action Plan, setting out how we can protect, create, improve and connect Green Infrastructure to combat Climate Change and improve the environment of Essex. This is only the first of a number of areas where Essex will need to take action to move to a sustainable future.

The Green Infrastructure Strategy, steered by the Essex Green Infrastructure Partnership, describes the need for green infrastructure in the county and sets a vision and objectives for the delivery of green infrastructure. This strategy provides a clear plan to guide the future planning and delivery of green infrastructure in Essex in light of increased development and population growth. Delivering the strategy, vision and objectives will be a complex and challenging task. Success will be dependent on strong working relationships with our partners across specialisms and between sectors and the local community and will require multi-agency cooperation and cross boundary working.

A carefully planned Green Infrastructure network is crucial for the environment, our health and well-being and will help support a thriving, sustainable economy. Green Infrastructure can deliver multiple functions and benefits. It provides recreation with opportunities to encourage people to be physically active and connects people to nature. It provides and creates green corridors for our wildlife thereby making our biodiversity more robust, particularly in the face of the challenges presented by Climate Change. It can alleviate flooding and improve air quality. We need to make sure that the Essex environment is maintained and enhanced so that it continues to support quality of life for existing and future communities.

Councillor Simon Walsh
Cabinet Member for Environment and Climate Change Action

Credit 1: Canvey Hole Haven Creek; Pixelwork

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Chapter 1

What is Green Infrastructure?

Image: Essex County Council

Green infrastructure can be defined as a carefully planned network of high quality natural and semi-natural assets and habitat types, of green and blue spaces, and other strategical planned environmental features that maintain and delivers our ecosystem services[1]. It provides multi-functional benefits integral to the health and wellbeing of our communities and to the ecology and economy of the county. Green infrastructure is often referred to as a network of these natural and semi-natural assets and spaces, which are joined together connecting urban and rural areas and are habitually strategically planned. Green infrastructure provision is therefore an important solution to delivering the Lawton principles[2] of "more, bigger, better and joined.

Green infrastructure for this strategy includes the following assets:

- Parks and gardens
- Natural and semi-natural green spaces
- Designated sites (SPAs, SACs, Ramsars, SSSIs, AONBs)
- Reservoirs, lakes and ponds
- Coastal features
- Waterways (watercourses)
- Greenways (Public Rights of Way, footpaths, cycleways and tracks, bridleways, towpath)
- Outdoor Sport Facilities (Sport pitches)
- Amenity green space (provision for play facilities etc.)
- Green spaces around premises (Educational premises open space and play grounds)
- Cemeteries and churchyards
- Allotments, community gardens and city farms
- Public Realm/Civic spaces (urban greening – Urban and street trees, road verges, green walls, green roofs, Sustainable Drainage Systems and Natural Flood Management)
- Productive spaces (agricultural land and meadows)
- Green corridors (verges, green wedges and green fingers)

[1]See Appendix B1 glossary for the definition of ecosystem services and natural capital.
The term green infrastructure is closely related to and an important part of the natural capital concept, the resources through ecosystem services that nature provides for us and on which our economy and our lives depend. Green infrastructure delivered at many different scales can have many functions and that these functions providing a range of environmental, social and economic benefits are often also known as natural capital ecosystem services.
[2]Lawton Principles advocates a landscape-scale approach to conservation, to create "a coherent and resilient ecological network", guided by 4 key principles, summarised as "more, bigger, better and joined".

Chapter 2

Introduction

Image: Essex County Council

The purpose of this strategy is to take a positive approach to enhance, protect and create an inclusive and integrated network of high-quality green infrastructure in Greater Essex, to create a county-wide understanding of green infrastructure – its functions and values, and to identify opportunities for delivering green infrastructure. The aim is to guide and shape planning and other services through setting principles that can inform plans and strategies, that will enable a coherent approach and partner collaboration in the delivery and long-term management of multi-functional natural assets, which will provide environmental, social and economic benefits for Greater Essex. When referring to Greater Essex, this includes the 12 Districts, Boroughs and City and the two unitary authorities.

High quality green infrastructure is an essential part of a successful and liveable county. Our green infrastructure attracts residents and families, creates the setting for businesses to invest and it is part of the package that draws in visitors from the surrounding area and around the world.

By integrating high quality, well-maintained green infrastructure as part of wider plans for residential growth, improving health and wellbeing, attracting businesses and increasing tourism, green infrastructure will provide the following benefits through:

- Facilitating the delivery of multiple objectives
- Providing a multi-functional network of open spaces and ecological networks at all scales, from regional to neighbourhood scale.
- Shaping the growth of sustainable communities- social and economic.
- Forming an integral part of the planning system; and
- Planning to meet the existing and future needs of our communities.

Consultation

Green infrastructure cuts across a wide range of agendas and responsibilities of many organisations. Successful outcomes are dependent on a collaborative approach. Consultation with both internal and external stakeholders has been important in the preparation of the Strategy, through the online group Essex Green Infrastructure Strategy Partnership and one-to-one stakeholder meetings.

In creating this strategy:

- Local and national green infrastructure policy and Local Planning Authorities Green Infrastructure Strategies were reviewed;
- Green infrastructure mapping was undertaken and updated to form the evidence base for the strategy; which included an area of 10km buffer around the County to capture cross-boundary opportunities;
- Continued engagement with key stakeholders.

A consultation document was launched in May 2019. This involved an online county wide public consultation for a period of 9 weeks (while hard copies of the strategy and questionnaire were made available at the 12 Strategic Essex libraries) and a stakeholder workshop was held on 16 May 2019 to review the draft strategy with a focus on the vision, objectives and proposals.

A mix of media channels was used including copy for newsletters, placed features and content, news articles, social media, bloggers, chat rooms, internal newsletters and online content, such as newspapers, communicate the Essex Green Infrastructure Strategy. A further policy strengthening workshop was held on 7 November, in lieu of the Mainstreaming Green Infrastructure Project's Green Infrastructure Planning Policy Matrix assessment to strengthen the strategy (NERC, 2019).

The consultation indicated that many people use green spaces daily for health reasons, for dog walking and horse riding. However, both residents and organisations and community groups felt easier access and feeling safe are important factors in encouraging people to use green spaces more. While, fragmentation of habitats, loss of biodiversity due to increase in housing and transport development and deficiencies in green spaces provision as population grows and recreational disturbance to wildlife, especially at protected sites were believed to be the main pressures and threats to green infrastructure.
Other areas of concern raised were the:

- Insufficient funding and resourcing available to deliver new or manage and maintain existing green infrastructure.
- Need to raise awareness, communicate, and advertise what we already have.
- Need to work collaboratively with landowners, businesses and communities, whilst finding a balance between providing access for people and protecting wildlife.
- Need to improve and utilise existing green spaces and paths better before investing in new green spaces.

The majority were supportive of the vision and objectives and felt the proposals were deliverable. A more detailed summary of the consultation is in Appendix A.

The strategy reflects the consultation feedback and a consideration of national and local evidence, to set out a shared understanding of green infrastructure. Successful delivery will depend on continued collaboration with an even wider set of partners including the community, through development of the action plan and progressing priority projects.

Investment into green infrastructure has continued to change, especially with further budget reduction, driving the need for new funding and delivery models. While, understanding of the environmental, social and economic value of green infrastructure has continued to develop, underpinned by new research and government's policy developments (i.e. The 25 Year Environment Plan). These factors have all provided key inputs to the strategy's development and are reflected in the following chapters and appendices with further supporting evidence and guidance. We have set out the key elements of the strategy below, that needs to be considered to understand the whole Strategy. Key summary chapter actions have been identified for the Evidence, Delivery and Implementation chapters, which sets out actions to guide the delivery, maintenance and protection of green infrastructure across Essex.

Key Elements of the Strategy

		Chapters
Vision	Describes what we would like to accomplish in order to deliver a high-quality green infrastructure network in the mid to long-term future	3
Objectives	What we would like to achieve in Essex	
Evidence	The evidence of the green infrastructure in Essex, understanding the drivers and context for why we should invest in green infrastructure	4 5
Delivery	Types of green space (both publicly accessible and non-accessible in Greater Essex	6 7 8
Implementation, Action Plan and Monitoring	The delivery mechanisms to deliver the actions from the strategy	9 10 11

Chapter 3

Objectives of the Strategy

Image: Essex County Council

3.1 Vision

The following vision reflects the Essex Green Infrastructure Partnership's (Steering Group and Partners) position regarding the important future role of green infrastructure within Greater Essex:

We will protect, develop and enhance a high quality connected green infrastructure network that extends from our city and town centres, and urban areas to the countryside and coast and which is self-sustaining[3] and is designed for people and wildlife.

The vision and objectives set out what this strategy is aiming to achieve, recognising that good infrastructure is not an end, but an enabler of better social, economic and environmental outcomes. There is the potential to deliver green infrastructure through a wide range of activities including new provision within developments and effective land management and maintenance of existing areas and assets, utilising natural flood management techniques and coordinating with other projects to deliver multiple benefits. Working in a more joined-up approach with partners and the local communities will enable pulling together of limited resources to secure the greatest gains for both the environment and the sustainable economy.

[3]See Appendices B1 glossary for self-sustaining definition – To maintain and continue in a health state independently.

3.2 Green Infrastructure Objectives

The Green Infrastructure Strategy aims to deliver the vision through the seven objectives specified below:

Place

Protect

Protect existing green infrastructure, especially designated sites

Improve

Improve existing green infrastructure so it is better functioning for people and wildlife

Create

Create more high-quality multi-functional green infrastructure, especially in areas of deficiency

Connectivity

Improve the ***connectivity*** of green infrastructure for people and wildlife

People

Inclusivity

Increase use and ***inclusivity*** of green infrastructure across all user groups, social groups and abilities

Health

Provide green infrastructure facilities to promote ***health*** and wellbeing

Funding

Sustainability

Working with partners to build and secure funding, effective governance and stewardship for new and existing green infrastructure to ensure their long-term ***sustainability***

Chapter 4

Evidence of the Green Infrastructure in Essex and Understanding the Key Drivers

Image: Essex County Council

4.1 Green Infrastructure Assets of Greater Essex

In 2017, key spatial environmental data held by Essex County Council (ECC) and its partners - both national and local - was collated and captured within the Essex Natural Capital Asset Check to establish a county level baseline of Essex's Natural Capital resources (ECC/Place Services, 2017). As part of the Asset Check, it was recognised that green infrastructure is an important mechanism to deliver ecosystem services and an integral way to manage our natural capital stock, so the University of East Anglia (UEA) developed a countywide Geographic Information System (GIS) data mapping layer on the distribution of green infrastructure. This was through the integration of spatial data sets (particularly open source information such as OpenStreetMap). Building upon this green infrastructure layer UEA developed a green infrastructure GIS mapping model.

The green infrastructure data layer of the model shown in Figure 1 provides several insights into the distribution of such natural assets within Greater Essex. Overall, the data indicates that there is 782km^2 of green infrastructure in Greater Essex (21% of the total county area) (BLGDRC 2016 & 2019). It highlights that Greater Essex already benefits from a wide range of green infrastructure resources, made up of many types of green assets within our landscape, natural and historical environment, green spaces, blue infrastructure (water) and greenways (i.e. Public Rights of Way, cycle network, bridleways towpaths, waterways and byways).

(Productive spaces which include graded agricultural land and meadows as green infrastructure was not included for the purpose of this map due to the landscape scale of coverage would make it difficult to see the other green infrastructure assets and can be found in separate map in Figure 2 and further details in Appendix B2).

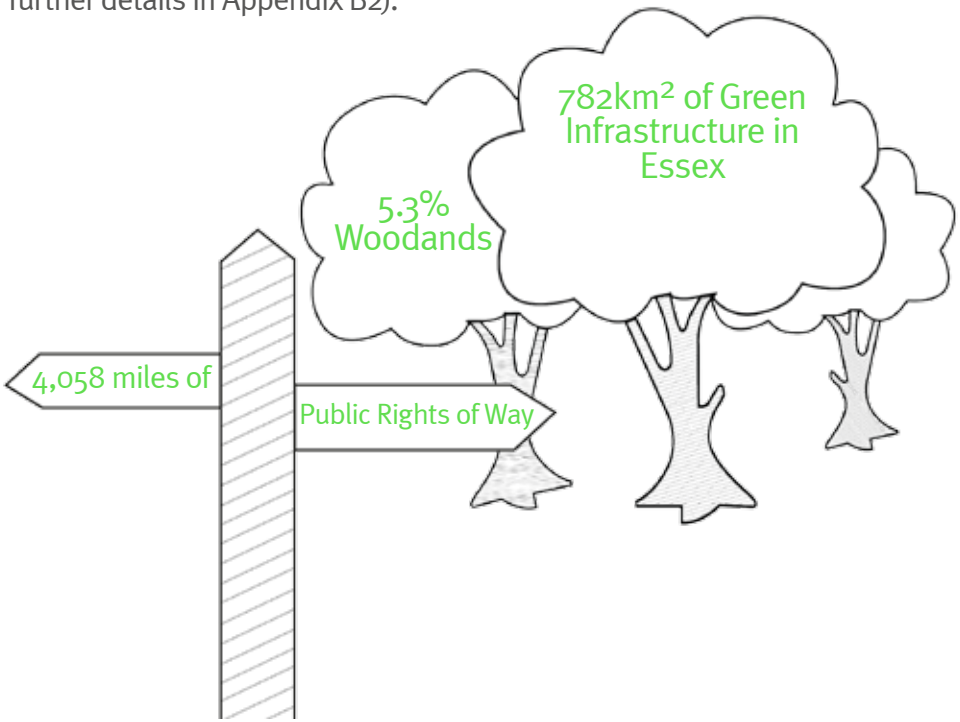


Figure 1: Green infrastructure map of Essex by School of Environmental Sciences, University of East Anglia (2019) (Table 6 in Appendix B7 lists the green infrastructure assets identified within each category. Appendix B2- Figure 1 shows graded agricultural land).

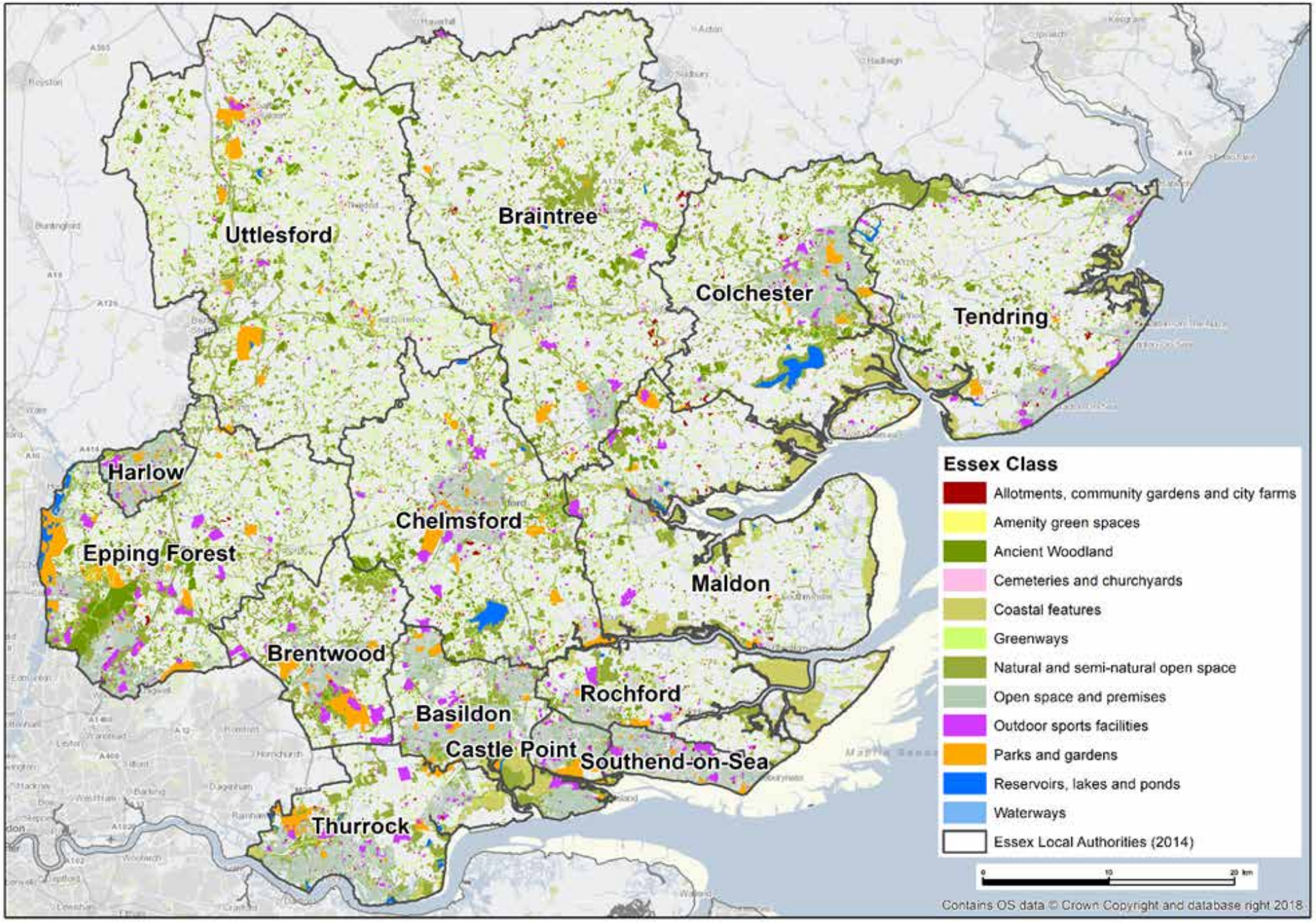
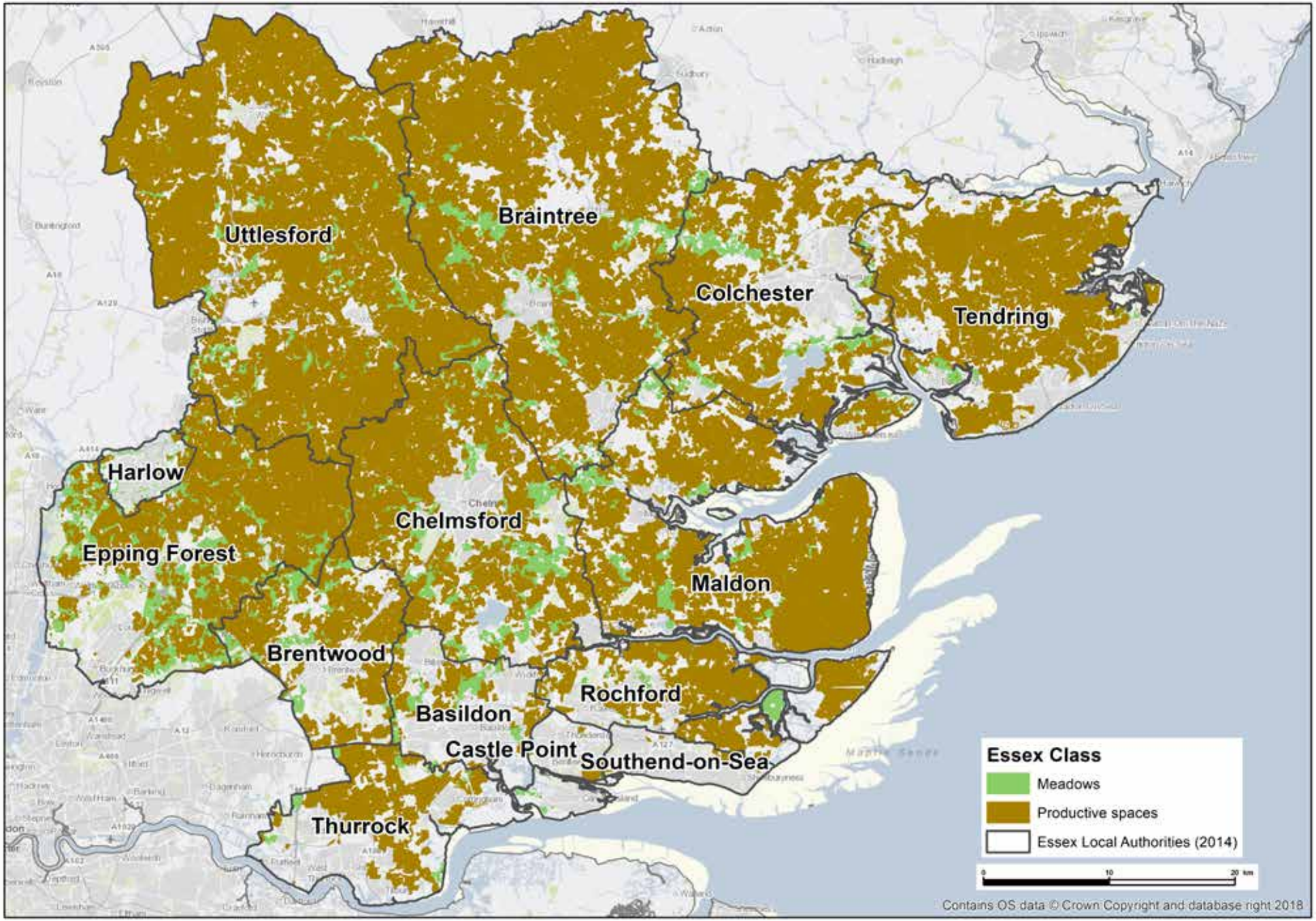


Figure 2: Productive spaces map layer



Key Elements of Essex's Green Infrastructure

This section outlines the green infrastructure and environmental character of Greater Essex, with further details set out in Appendix B3.

Landscape

Greater Essex has a rich and varied historic landscape of expansive plateaus, wooded hills and one of the longest coastlines in the country, much of which is of international significance for wildlife. The landscape is subtle in its landform and usually comprises of gradual changes in its character. Its highest point is about 420 feet and sections of it are beneath sea level. Rural in character and shaped by a long history of settlement and farming; over 61% of the county is graded agricultural land, as mapped in Appendix B2, Figure 1. The geology and soils of Essex are very complex. This variety of chalk, clay, sand and gravel has played an important role in shaping the landscape, wildlife and economy of the County. Table 1 summarises the composition of the land area in Greater Essex.

Table 1: Summary of the total land area composition in Greater Essex

	Km^2	Percent
Total Area of Productive Spaces (e.g. Agricultural Land)	2.240	61
Total Area of all other Green Infrastructure	782	21
Remaining Land (e.g. Built-Up Areas)	655	18
Total Land Area in Greater Essex	**3,677**	**100**

There are 4 Natural England's National Character Areas in Essex, each of which is distinctive with a unique 'sense of place'. These broad divisions of landscape form the basic units of cohesive countryside character, on which strategies for both ecological and landscape issues can be based along with each local authority own local level Landscape Character Assessment. The Essex National Character Areas are:

- Greater Thames Estuary
- Suffolk Coast & Heath includes parts of Essex which is about to be designated as part of the Area of Outstanding Natural Beauty (AONB)
- South Suffolk and North Essex Clayland
- Northern Thames Basin.

Natural Environment

Greater Essex hosts a variety of important habitats, of which 13.4% ($496km^2$) receive some level of protection through national and international designations and tree preservation orders. There are 1,978 designations, which include:

- 1 AONB (and 1 additional AONB to be designated - Suffolk Coast and Heath includes part of Essex)
- 12 Special Protected Areas
- 86 sites of Special Scientific Interests
- 11 Ramsars
- 3 Special Areas of Conservation
- 7 National Nature Reserves
- 1,707 Local Wildlife Sites
- 49 Local Nature Reserves
- 1 Community Forest
- 100 Special Roadside Verges

Trees and Ancient Woodlands

The Forestry Commission's Inventory of Trees and Woodlands (2002) estimates the woodland cover of Greater Essex is 5.3% (195km^2) of total land area, of which 3.5 % (128km^2) is defined as ancient woodlands over 2 hectares in size, of which 73km^2 is Ancient Semi Natural Woodlands (ASNW)[4]. There are over 5 million trees in Essex (BlueSky, 2017), and is believed that of just over 1.5 million of these are outside woodlands in rural Essex and as trees planted along streets. Street trees help to define and frame the streetscape giving visual identity and enhancing the street scene. There is also a total of around 12,500 km of hedgerow in Essex. Hedgerow removal, woodland loss, field size increase, and agricultural intensification and set aside are current concerns.

Historic Environment

The historic environment has played an important role in shaping the landscape, wildlife and economy of the county. It has developed through a history of human activity spanning over 450,000 years with some resource lying hidden beneath the ground in the form of archaeological deposits. Other elements, such as the area's historic landscape, the pattern of fields, hedges, grazing marsh, woodlands, and tracks, which are of ancient origin, are a highly visible record of past human activity. The 'built' part of the historic environment is equally rich, with the character of towns, villages, hamlets, farms, roads and ports having been shaped by their historic buildings.

Green Spaces

There is a wide and varied amount of green space in Greater Essex (as shown in Figures 3 and 4) that represents a green infrastructure network of green, blue and sometimes brown components that lie within and between towns and villages and can cross local authority areas. Green Spaces are any vegetated areas of land or water within or adjoining an urban area.

4. See Appendix B1 glossary for the definition of ancient woodland and Ancient Semi Natural. The total figure for ancient woodland cover may be an underestimation due to woodlands under 2 ha in size not registered as woodlands on the historic maps used within the ancient woodland inventory study.

Figure 3: Types of green space (both publicly accessible and non-accessible) in local authority areas
(Detailed figures of types of green space for each local authority area can be found in table 3 of Appendix B4)

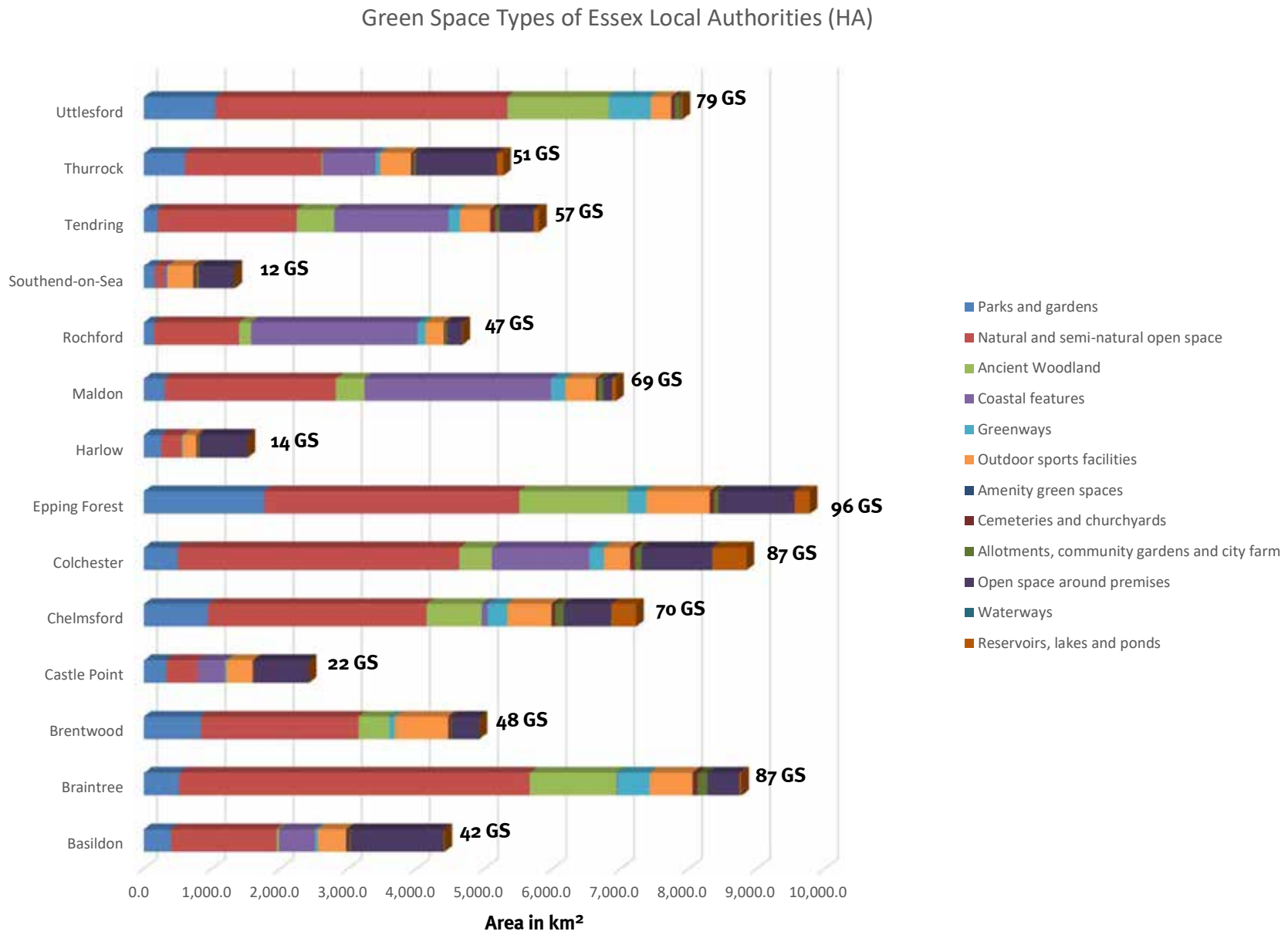
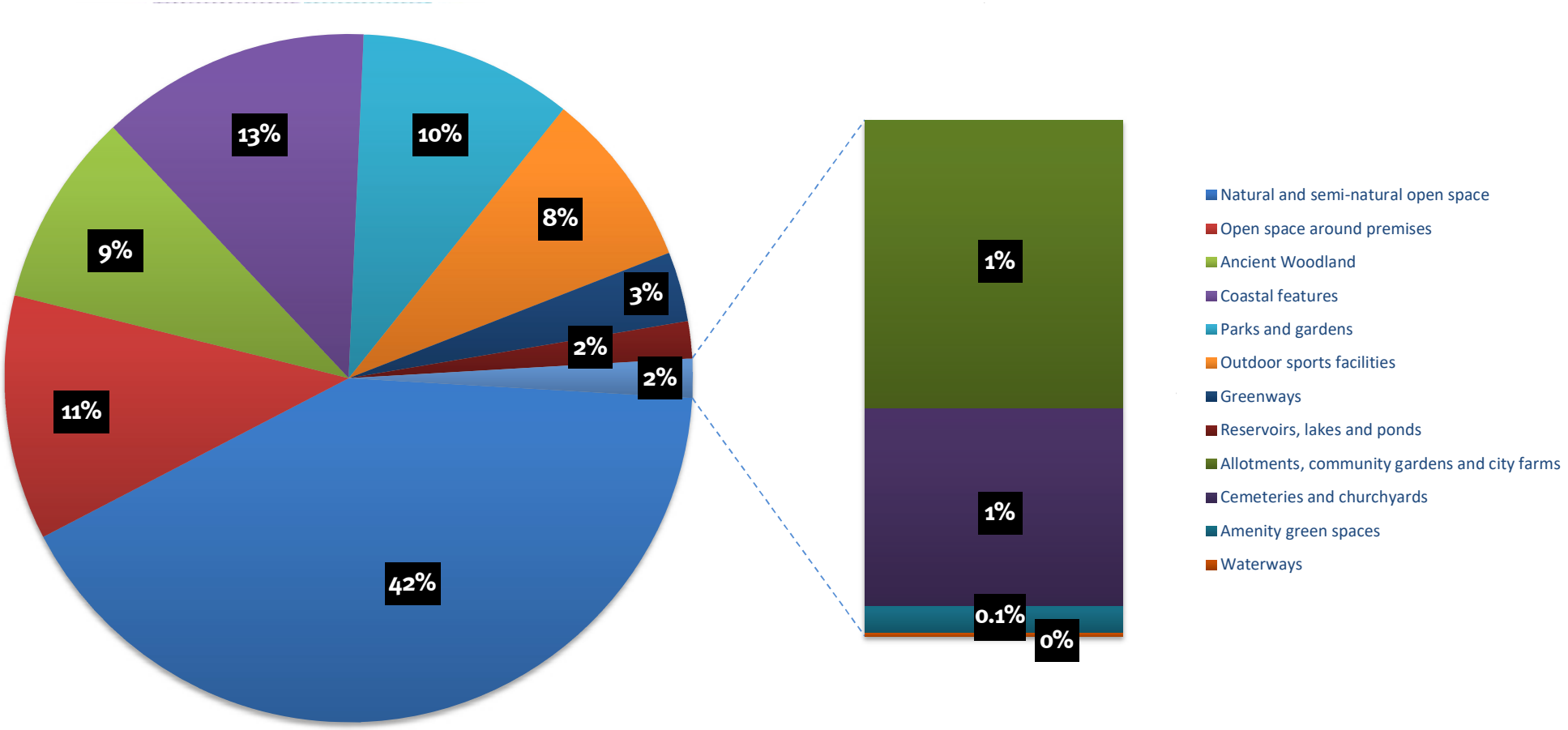


Figure 4: Types of green space (both publicly accessible and non-accessible space) in Greater Essex



Essex County Council manages seven of its own country parks and over 25 woodlands. It also plays an active role in the Thames Chase Community Forest, Lee Valley Regional Park, and Dedham Vale and Suffolk Coast and Heath AONB areas and works in partnership with the Woodland Trust at Hainault Forest. There are also country parks and nature reserves in most districts, owned and managed by the local authority or conservation charities such as the Essex Wildlife Trust, RSPB, National Trust, the Land Trust and Woodland Trust.

Water

Essex has five river catchments and three coastal streams, which are complicated and vulnerable catchments because of the low-lying land and coastal squeeze issues, combined with the development needs and protection of Natura 2000 sites[5] and SSSI's. The floodplains of the principal estuaries have extensive expanses of alluvial marshland, which are increasingly managed for nature conservation and contain large wetland areas.

Essex also has three significant reservoirs, which serve millions of households and also provide habitats for wetland wildlife, two of which are successfully managed by the Essex Wildlife Trust. Namely, Abberton and Hanningfield reservoirs. There are also agricultural reservoirs that have been developed all over the eastern part of the county and that have the added commercial use benefit of fishing lake provision .

Much of the Essex coast is also particularly vulnerable to the effects of climate change including the sea level rise, loss of salt marsh (which is itself, a natural form of coastal sea defence) and the increased risk of coastal erosion and flooding to numerous communities and landowners.

Public Rights of Way (PRoW)

The Public Rights of Way network in Essex comprises approximately 6,531km of footpaths (84%), bridleways (12%), restricted byways (0.01%) and byways (4%) which provide access to the countryside and links between green spaces, towns, villages and places of employment.

Image: Essex County Council

5. The network of terrestrial and marine protected areas in Europe

4.2 Understanding Our Drivers

4.2.1 National

The National Planning Policy Framework (NPPF) February 2019 requires local planning authorities to make sufficient provision for conserving and enhancing the natural, built and historic environment, including landscapes and green infrastructure, through sustainable development and strategic policies within the local development plans (see 4.2.2 Local and Regional below) and neighbourhood plans. The NPPF promotes the use of green infrastructure to delivery multiple functions and benefits, for example adapting to climate change; to improve air quality and pollution; and to enable healthy lifestyles and the creation of inclusive and safe places.

It recognises the importance for people to be able to access high-quality open spaces and be provided with opportunities for sport and recreation (including playing fields) and for the protection, enhancement of existing and creation of new public rights of way to improve public access to the countryside and coast. Valued landscapes and the intrinsic character and beauty of the countryside as features to be protected. It allows opportunities to be taken to secure biodiversity and environmental net gains, through new habitat creation, protection for ancient woodland and veteran trees and establishing ecological networks. It recognises the wider benefits from natural capital and ecosystem services and that green infrastructure is an important part of the landscape setting of the built environment that can play an important part in achieving sustainable development and determinants of health and wellbeing.

In line with the Department for Communities and Local Government (DCLG) guidelines, March 2016, and growing population, garden communities (including city, towns and villages) represent a significant change in the traditional approach to delivery of major and strategic larger scale development. They may form an extension to an existing town and/or a new settlement and are built to Town and Country Palling Association Garden City Principles that form an indivisible and interlocking framework for the delivery of high-quality places. Including development that enhances the natural environment, providing a comprehensive green infrastructure network and net biodiversity gains, and that uses zero-carbon and energy-positive technology to ensure climate resilience (TCPA, 2019).

The Natural Environment White Paper, 'The Natural Choice: Securing the value of nature' (2011) highlighted *'the importance of green spaces to the health and happiness of local communities'*. The White Paper sets out a framework to protect and enhance the natural environment and to support coherent and resilient ecological networks that reflect the value of ecosystems.

It refers to the role of planning and the role of urban green infrastructure as providing linkages to the ecological network and as an effective tool to managing environmental risks such as flooding and heat waves. It advocates that green spaces should be factored into the development of all communities. The White Paper seeks to encourage local action, guided by local knowledge and statutory powers of local authorities, to work in a more integrated way to achieve multiple benefits (Defra, 2011).

The 25 Year Environment Plan,'A Green Future: Our 25 Year Plan to Improve the Environment' was published in 2018 and sets out a framework to maintain and improve the environment for the next generation. The following six key areas have been identified around which action will be focused:

- Clean air
- Clean and plentiful water
- Thriving plants and wildlife
- A reduced risk of harm from environmental hazards such as drought and flooding
- Using resources from nature more sustainably and efficiently
- Enhanced beauty, heritage and engagement with the natural environment

The key topics include: using and managing land more sustainably; recovering nature and enhancing the beauty of landscapes; connecting people with the environment to improve health and wellbeing; mitigating and adapting to climate change; minimising waste and air pollution; tree planting and woodland creation; and embedding the principle of 'environmental net gain' and upgrading green infrastructure standard in the planning system, with the aim of also developing a Nature Recovery Network.

The emerging Environment Bill will put the 25-year Environment Plan into law and create a statutory framework for environmental principles. By creating long-term environmental governance and accountability. The Bill will include ambitious legislative measures to take direct action to address the biggest environmental priorities: biodiversity net gain, restore and enhance nature, improve air quality, tackle climate change, waste and resource efficiency, and water resource management.

The Marine and Coastal Access Act 2009 provided an opportunity for the development of England Coast Path (ECP) led by Natural England. This will provide a new record-breaking long-distance trail that allow people to walk around the whole English coast. It will be important in providing access to the coast as a natural resource with wider benefits.

Healthy Lives, Healthy People: Our Strategy for Public Health in England White Paper sets out the Government's long-term vision for the future of public health in England and recognises the relationship between the environment and good public health along with other factors such as education and employment to tackle health inequalities. The strategy states that the tackling of health inequalities can be achieved through empowering local government and communities, who will have new resources, rights and powers to shape their environments and tackle local problems (Government, 2010).

4.2.2 Local and Regional

An Essex Growth Infrastructure Framework (GIF) was prepared to provide a view of emerging development and infrastructure requirements to support growth across Essex. The GIF provides a strategic framework across the county, for identifying and prioritising investment across a range of infrastructure, for planned growth up to 2036. It presents an overview of growth patterns and the infrastructure projects needed to support such growth, their costs, how much funding has already been secured or is expected towards their delivery and the funding gap. The framework estimated that new development will generate a demand for 16km^2 of green infrastructure, which will cost £251,860,000 including ongoing management. It identified a funding gap of £241,990,000 (ECC, 2017). Each Local Planning Authority has produced a Local Infrastructure Delivery Plan that provides a schedule of infrastructure requirements to help support new development growth planned as set out in the GIF.

One of the four strategic aims in ECC's Essex Organisation Strategy is to "help create great places to grow up, live and work". The Strategic Priority: 'Help secure sustainable development and protect the Environment' (Part B of Priority 2) states that we will aim to *"Improve the quality of life for Essex residents, by continuing to improve our open green space and making the most of the Essex countryside for the wider benefit of all"*

This will enable an opportunity to unlock our green assets to deliver multiple benefits, including support to health and wellbeing of our communities and aim to deliver a consistent policy approach for green infrastructure planning and investment to be applied across Essex, ensuring that opportunities are not missed to delivering inclusive growth (Essex County Council (2017)).

The Joint Health and Wellbeing Strategy for Essex 2018-2022 details how 'developing the use of community spaces and green space to support activity and connect people' is vital to improve health and wellbeing outcomes and a reduction in health inequalities.

The Essex Rights of Way Improvement Plan (RoWIP) 2009, is a statutory document for improving the provision of access to the countryside through a Rights of Way network. The planning system will be used wherever possible to improve Public Rights of Way and pedestrian environments which is also reflected in the Local Transport Plan (2011) Policy 15 -Walking and Public Rights of Way, that encourages a move towards sustainable travel and healthier lifestyles.

The Active Essex Strategy (2017-2021) is focused on increasing and sustaining 1,000,000 people's participation in and enjoyment of activities that benefit their physical and mental health and wellbeing. This Strategy promotes physical activity across all age groups and abilities, including the provision of a sustainable network of safe and accessible facilities, open spaces and active travel routes to get more people using open green spaces for exercise and health reasons.

Similarly, Southend-On-Sea has an Active Southend which is a community activity network that incorporates both a Strategic Network Group and a wider Delivery Group. The network works collaboratively with sports clubs, sports facilities and both local and Essex wide partners, including other boroughs and districts, in order to promote and improve physical activity and to maximise the opportunities and resources available to increase the key health and wellbeing priorities of our residents. A Southend Physical Activity Strategic Partnership report on the progress to deliver actions from the Physical Activity Strategy (2016 – 2021) to the Active Southend Network.

Minerals and Waste Local Plans aim to plan positively for the co-ordination and delivery of new green infrastructure within the restoration of the mineral and waste development areas.

Local Plans in Essex take a strategic approach to planning for the creation, protection, enhancement and management of biodiversity and green infrastructure networks as required by NPPF. There are direct and indirect references to the role of green infrastructure in delivering the aspirations of the Local Plan through policies and/or guidance, which need to be followed when a planning application is submitted.

Each of the Local Authorities has taken a different approach to managing, protecting and enhancing their green infrastructure network. Some have a specific green infrastructure strategy, while others either incorporate green infrastructure within their Infrastructure Delivery Plans, Open Spaces, Sport and Recreation strategy or Recreational Access Management Strategy or have predominantly undertaken an audit and assessment of need identifying the green infrastructure deficiencies. Some have detailed action targeting specific areas, while others have more general recommendations or set local provision standards and actions across their administrative area. A few Local Planning Authorities such as Epping Forest District Council and Uttlesford District Council have made commitments to produce a district wide green infrastructure strategy to help deliver Suitable Alternative Natural Greenspace (SANGS) to address recreational pressure impacts (including from housing developments) on protected sites, for example, Epping Forest Special Area of Conservation (SAC) and Hatfield Forest.

The key priorities coming out of all the local authority green infrastructure strategies and equivalent planning documents, for the functions provided by green infrastructure are:

- Access
- Health and Wellbeing
- Protect, maintain and enhance existing green infrastructure.
- Balance the creation of new green infrastructure to address any deficiencies and gaps where required
- Protect and enhance:
  - Biodiversity
  - Landscape character and designated protected sites (i.e. SSSI)
- Mitigate and adapt to a changing climate (i.e. flood management
- Economy, with an emphasis on better promotion of existing green and open spaces

4.2.3 Other Drivers

The drivers outlined above are examples of the key national, regional and local policies, strategies and plans that influence action to protecting, managing and enhancing our green infrastructure network. There are several other national and local plans and strategies that also have an influence on planning for green infrastructure, such as Biodiversity Action Plans, 'Respecting our Past, Embracing our Future: A Strategy for Rural Essex-A new strategy for 2016-2020', Thames Chase Plan and Essex Walking Strategy. Figure 54 below illustrates the relationship between the green infrastructure strategy and other plans and strategies in Essex not covered in this section.

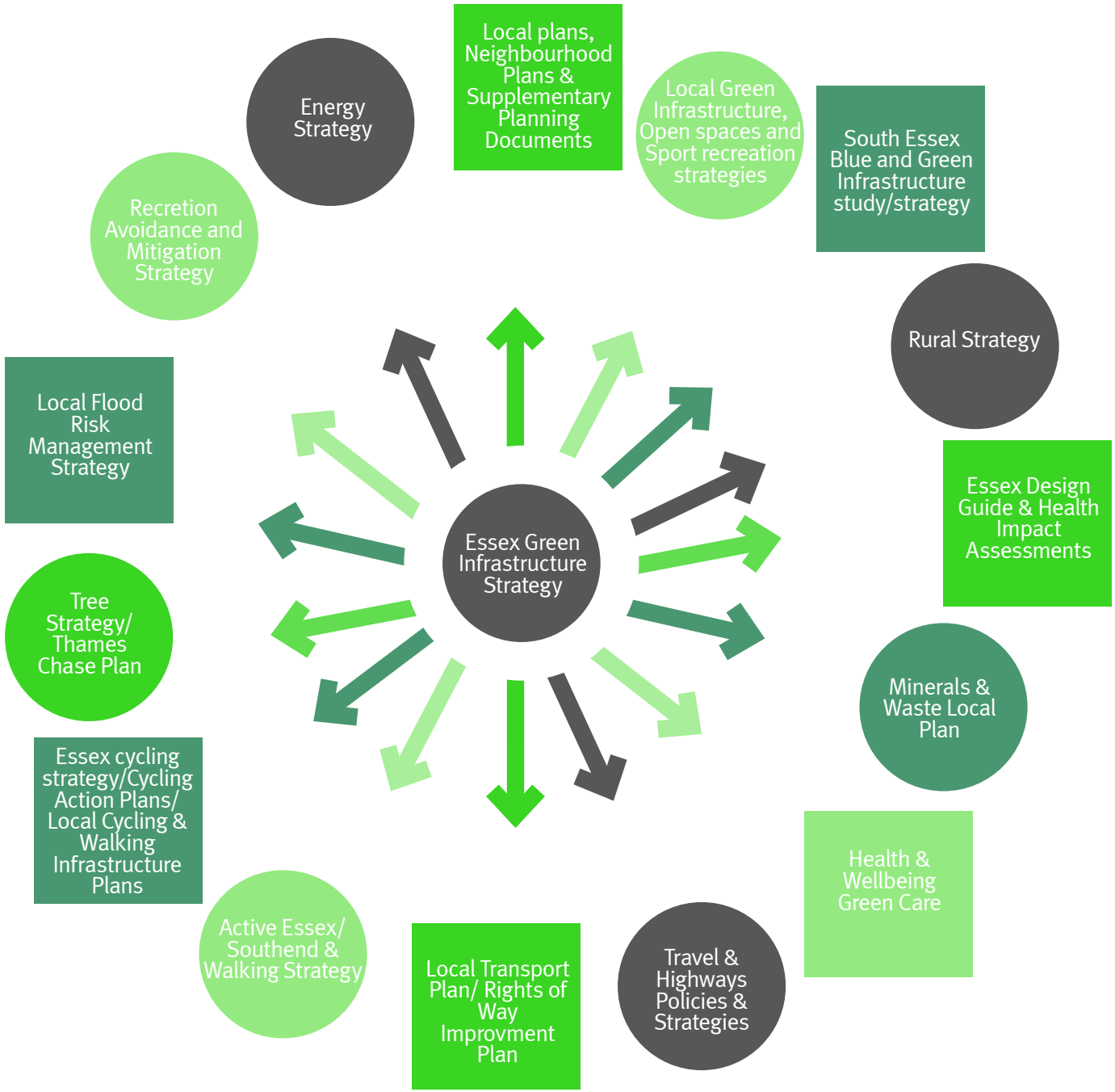


Figure 5: The relationship between green infrastructure and other strategies in Essex

4.3 Summary of the Essex Demographic Context

Essex is a large and varied county where the majority is rural in character, covering approximately 3,676km^2. It also has significant urban settlements. It borders to the north the counties of Suffolk and Cambridgeshire, to the west the county of Hertfordshire and the Greater London area to the South-west.

4.3.1 Summary of the Essex Demographic Context

More detail of the Greater Essex demographic context is set out in Appendix B5.

People and Projections

1,820,900 people in 2017 for Greater Essex. The county's population is expected to increase to **2,133,100** by 2041. With the greatest increases currently projected in Colchester, Basildon and Chelmsford. [a]

Development Growth

In 2016 there's approximately **784,000** households across Greater Essex local authorities. **179,657** homes needed across Greater Essex by 2036. [b]

Economic Growth

Greater Essex generates **£36bn** Gross Value Added (GVA) and supports over **816,000** jobs.
79,000 additional jobs needed forecasted by the East of England Forecasting model by 2036 (2016 run). [b]

Social and Health

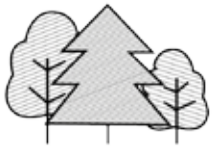
In Essex, **two-thirds (66.3%)** of adults aged 16+ are either overweight or obese (2013-15). While **20.9%** of children in reception and **31.8%** of children in year 6 are obese. [c] The projected annual increase in obesity rate is **2%** in adults and **0.5%** in children. [d]

Over **150,000** Essex residents are expected to be living with a mental health illness, with almost **50%** of them having developed this condition in their early teens.

In Essex in 2014, **57.9%** of people had the recommended amount of physical activity (2.5hours a week). [d] Although fewer women take physical activity, at least **33.3%** of females are active once a week compared to **38.3%** of males.

Data Source: a: From an ONS 2016-based subnational population projections; b: Greater Essex Growth Infrastructure Framework (2017); c: Public Health Outcomes Framework: Wider Determinants of Health Tool, d: Joint Strategic Needs Assessment (2016) & Joint Health & Wellbeing Strategy for Essex; e: Sports & Physical Activity Profile: Greater Essex (2017); f: Essex Natural Capital Essex Check (2017); g: UK Climate Projections 2009; h: Space for people (2017). I: Public Health Profile & ONS 2018 Deaths registered by area of usual residence, UK

The Active Lives Survey (2017) highlighted that **65%** of people are active with **22.1%** of people are inactive. The total cost of physical inactivity in Essex to NHS was **£58,213,764** per year. [e] **13,832** of Greater Essex population live in Air Quality Management Areas in 2017. [l] The mortality rate of Greater Essex attributable to particulate air pollution in 2017 is **1,009** people. [l]



Environment

In 2017, **18 %** of population in Essex has accessible woodlands, whilst **36%** of the population lived within 500m of inaccessible woodlands (of at least 0.02km^2 (2ha) in size). [h]

- **2** Areas of Outstanding Natural Beauty (AONBs):
- **86** Sites of Special Scientific Interest (SSSI)
- **12** Special Protection Areas
- **3** Special Areas of Conservation
- **11** Ramsar Sites
- **7** National Nature Reserves
- **1,707** Local Wildlife Sites
- **49** Local Nature Reserves
- **1** Community Forest
- **100** Special Roadside Verges

There are also:

- **117km2** of land managed/owned for conservation
- **40** registered parks and gardens of Special Historic Interest
- **3** of the best-preserved medieval forests in Britain (Hatfield, Epping and Writtle). [f]
- Essex Wildlife Trust own **87** nature reserves
- RSPB manage **10** reserves

Climate Change and Flood Risk

Essex is one of the top 10 areas at risk of surface water flooding in UK. The number of houses in Essex at risk from:

- Surface water is approx. **36,000** homes
- Rivers is approx. **10,000** homes
- Sea is approx. **50,000** homes

Essex can generally expect more frequent extreme weather events (such as storms, extreme cold weather); milder and wetter winters; and hotter drier summers by 2080 [e]

With the opportunities and challenges Essex faces from continued development and population growth, it is vital that the purpose of our green infrastructure is reconsidered so that it is better able to provide the benefits needed by our residents. There is a need to successfully integrate new and existing green infrastructure into new development such as housing, industrial premises and the transport infrastructure as well as from the other pressures Essex faces including the projected impacts of climate change on the county and its economy, and the growing demand on the health services. A well-planned and managed green infrastructure can help Essex meet these challenges.

Data Source: a: From an ONS 2016-based subnational population projections; b: Greater Essex Growth Infrastructure Framework (2017); c: Public Health Outcomes Framework: Wider Determinants of Health Tool, d: Joint Strategic Needs Assessment (2016) & Joint Health & Wellbeing Strategy for Essex; e: Sports & Physical Activity Profile: Greater Essex (2017); f: Essex Natural Capital Essex Check (2017); g: UK Climate Projections 2009; h: Space for people (2017). I: Public Health Profile & ONS 2018 Deaths registered by area of usual residence, UK

Chapter 5

Why Invest in Green Infrastructure?

Image: Essex County Council

A major challenge for Essex is to maintain a healthy natural environment in line with the development and population growth in Essex and the creation of a green infrastructure network, while allowing for meaningful connections between people and nature – particularly in urban areas. A spatial analysis of the green infrastructure undertaken by UEA as part of the GIS green infrastructure data layer mapping found that there is a tendency for areas of green infrastructure to be higher in the south of the county (as mapped in Figure 3 in Appendix B6), suggesting that investment of green infrastructure could be focused in areas of lower green infrastructure value in the north. Nonetheless, where areas within this study may show a low total percentage value of green infrastructure it does not necessarily mean the local authority area has no green infrastructure, but maybe they are not accessible and open to the public. For instance, there is more agricultural land in the north than south of Greater Essex. Different local authority areas have different strengths and weaknesses in terms of their green infrastructure provision and will need to take into consideration their assessment of green infrastructure assets and features within District, City and Borough Councils green infrastructure strategies or equivalent policies and plans.

Historically grey infrastructure of pipes and power lines have been the characteristic of the built environment as it is tried and tested but only serves one purpose, while green infrastructure usually has more than one function. At its best green infrastructure can be designed to get the most benefit out of what nature provides us for free and therefore reduces what needs to be done by expensive technology and grey infrastructure alleviating social, environmental and budgetary pressures, to deliver better outcomes for residents and reduce dependency on strained public sector services.

By investing in the green infrastructure in Essex it can deliver a broad range of benefits in terms of environmental (i.e. improved air quality), social (i.e. recreation and improved health) and economic (i.e. attract business) values and benefit outcomes. Foregoing these values and benefit outcomes results in welfare losses and increased costs to society through increased environmental, social, and health services costs. To identify the benefits requires an assessment of our current green infrastructure provision (as summarised in chapter 4, 4.1) and an understanding of our current position and challenges that green infrastructure face in Essex (as summarised in chapter 4, 4.3) to identify potential opportunities.

5.1 Multi-functions and Benefits from our Green Infrastructure Assets

Green infrastructure delivered at many different scales can have many functions (such as flood management, improved air quality, or recreation) which provide a range of environmental, social and economic benefits. It is important that the diversity of these functions and benefits is recognised in policy and decision-making.

Building upon UEA's green infrastructure GIS data layer, a comprehensive mapping of green infrastructure of Essex was carried out by the university to improve our understanding of the types of green infrastructure, its distribution, what it can do (how it functions) and the benefits it provides. Using a GIS computer programme (BLGDRC, Lovett & Günnenberg, 2019) , they were able to categorise the green infrastructure assets in Essex utilising the UK Habitat Classification (2018) into a green infrastructure typology and identify a range of green infrastructure functions they each perform as listed in Table 5 of Appendix B7.

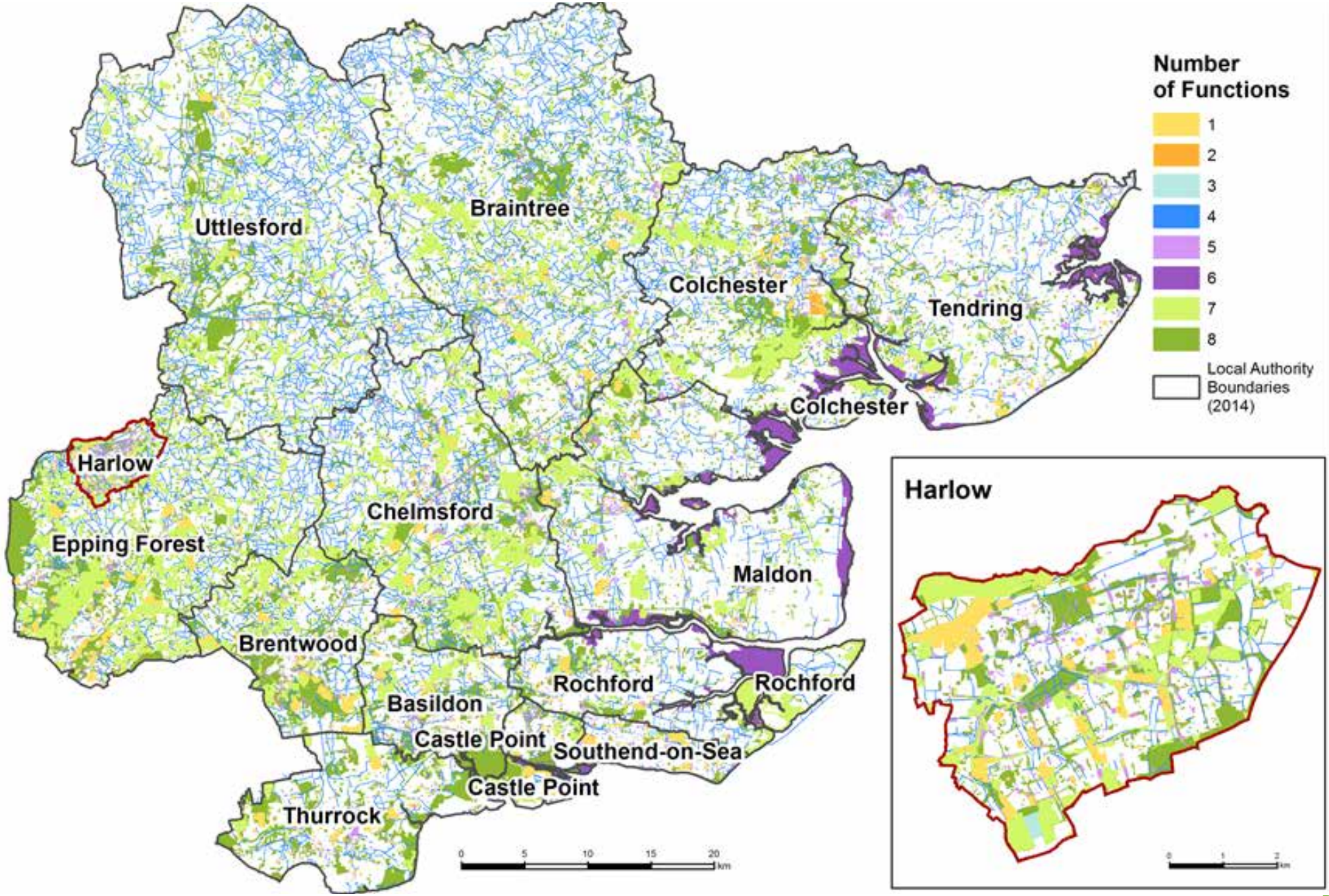
Image: Essex County Council

Each category in the green infrastructure typology can perform multiple functions, taken from the following list:

- Recreational and active-living that support healthy lifestyles, both physical and mental well-being
- Green travel route
- Habitat provision - conservation and enhancement of biodiversity;
- Heritage and cultural assets - providing landscape, place quality and amenity
- Food production and productive landscapes
- Pollution absorption and removal
- Flood attenuation and water resource management
- Coastal Storm protection
- Cooling effect
- Access to nature

Once each type of green infrastructure typology had been determined, the total number of functions listed above for each was calculated, giving a map of multi-functionality as shown in Figure 5. This figure also gives an example of the number of functions performed by a range of green infrastructure asset in Harlow.

Figure 6: Mapping by UEA showing the multi-functionality of green infrastructure in Essex and an insert of Harlow



These 10 functions were then assessed against the range of green infrastructure benefits they provide directly and indirectly (as shown in Table 5 of Appendix B7). Green infrastructure not only provides multi-functionality, but also supplies multiple environmental, economic and social benefits for example:.

Environment Benefits	Economic Benefits	Social Benefits
• Maintains/Restores habitat • Improves watershed health/water quality • Improves air quality • Enhances biodiversity • Flood alleviation and water management mitigates storm water/flooding • Regulates climate i.e. reduce heat in urban areas • Sequesters carbon • Improves more sustainable modes of transport and transport links • Increasing environmental quality and aesthetics • Heritage preservation • Increasing habitat area • Increasing populations of some protected species • Increasing species movement • Landscape • Intrinsic character and beauty	• Attracts businesses and workers • Generates revenue • Provides access to local businesses • Increases land and property values • Lowers energy costs through helping to maintain internal building temperatures • Lowers health care costs • Promotes sustainable renewable energy, through bio products and bio-solar farms. • Increases local food production & other products from land i.e. biofuel, timber, chip board and sources of raw materials such as lignin and cellulose. • Increased tourism • Attracts inward investment • Promotes local economic regeneration • Enables regeneration of previously developed land • Noise/visual screening • Passive benefits to building (e.g. shading) • Sustainable travel opportunities	• Enhances the sense of the place • Enables recreation and leisure – relaxation/ play benefits • Improves public health • Promotes equity and access • Fosters stronger communities: social interaction, inclusion and cohesion • Connects people with nature, heritage, culture and landscape • Educates people about nature's role and the heritage, culture and landscape of a place. • Climate change mitigation and adaptation – community resilience • Increasing life expectancy and reducing health inequality • Improving levels of physical activity and health • Improving psychological health and mental well-being - eco therapy • Boosts educational abilities

(Appendix B8 provides more detailed evidence of the benefits from green infrastructure in line with the Essex context in chapter 4, 4.3).

The number of benefits for each function against each green infrastructure typology were mapped (in Figure 4 of Appendix B7), with the results showing a potential correlation between the number of functions and the number of benefits provided by the green infrastructure. In the example of Harlow, the green infrastructure providing one function would tend to only provide the maximum of five benefits. What Figures 6 (above) and 4 (in Appendix B7) show is there are several areas in Harlow where, for example, the green infrastructure only provides one function, but through an on-site investigation and benefits mapping the potential could exist to highlight these areas for enhancement, improvement and re-purposing, so that green infrastructure can provide multiple functions and benefits. Likewise, areas scoring in high numbers of green infrastructure functions and benefits could be identified as areas to protect from development.

There are a number of green infrastructure sites across Essex that provide six or more functions and greater than twelve benefits listed in Appendix B7 as demonstrated in the two case studies in Figure 7:

Image: Essex County Council

Case Study: Abberton Reservoir, an Essex Wildlife Trust Nature Reserve

Figure 7: Evidence to action case study examples of the green infrastructure functions and benefits accessible in Essex http://www.essexwt.org.uk/reserves/abberton-reservoir; http://hadleigh-park.co.uk/; *Images* Essex Wildlife Trust

GREEN INFRASTRUCTURE TYPES

Grassland, meadow, ponds, lakes, wetland, woodland, scrub, natural and semi-natural green space

GREEN INFRASTRUCTURE FUNCTIONS

Flood attenuation and water resource management, habitat provision, access to nature, recreation, access, heritage and culture asset

GREEN INFRASTRUCTURE BENEFITS

Environmental Benefits

Directly: Flood alleviation and water management, environmental quality and aesthetics, biodiversity
Indirectly: Climate change adaptation and mitigation, heritage preservation

Social Benefits

Directly: Recreation and leisure, sense of place, education
Indirectly: Health and well-being

Economic Benefits

Directly: Tourism
Indirectly: Quality of place, economic growth and investment, economic benefits

Case Study: Hadleigh Park

GREEN INFRASTRUCTURE TYPES

Accessible woodland; grassland, scrub, hedges, hay meadow (natural and semi-natural green space), grazing marsh, saltmarsh, ditches and ponds (wetland), park, sea wall (coastal).

GREEN INFRASTRUCTURE FUNCTIONS

Recreation, habitat provsion, access to nature, heritage and culture asset, flood attenuation and water resource management, coastal storm protection, food production and productive landscape, green travel route, pollution absorption and removal.

GREEN INFRASTRUCTURE BENEFITS

Environmental Benefits

Directly: Climate change adaptation and mitigation, landscape, envrironmental quality and aesthetics, biodiversity, heritage preservation.
Indirectly: Flood alleviation and water, sustainable travel.

Social Benefits

Directly: Health and well-being, recreation and leisure, sense of place.
Indirectly: Community resilience, education, encouraging sustainable travel.

Economic Benefits

Directly: Quality of place, tourism.
Indirectly: Economic growth and investment, land and property values, labour productivity, products from the land, inward investment.

Key Summary Chapter Action

The evidence gathered in the development of this strategy can provide us with confidence that green infrastructure is already an important component of the character and success of the County. Ensuring that this continues - **we will build upon the current evidence base and undertake a gap analysis for any deficits in the data (i.e. accessible and non-accessible green spaces) and green infrastructure provision.**

Chapter 6

Delivery of Strategy's Objectives

Image: Essex County Council

Based on the evidence from the previous chapters, the following proposals in Table 2 have been identified in response to the issues for each objective and are targeted at areas or activities where "need" is greatest, or relatively simple and cost effective to deliver. These proposals form the basis for getting agreement and support to take forward actions, as they will require partner collaboration to successfully implement. They are examples of how green infrastructure can be delivered at the district and county scale over the short and medium term that will have the greatest impact to people's lives. The proposals can sit within targeted areas or in other parts of strategic areas or may cross-cut several areas in Essex (hence why some actions are repeated meeting multiple objectives).

Table 2: Essex Green Infrastructure Action Plan - Project Delivery of the objectives

Focus	Objective	Proposal
PLACE	**Protect** existing green infrastructure, especially designated sites 	• Highlight green infrastructure in Essex in terms of their multi-functionality and benefits – through rebranding Essex as Green Essex with 1,978 designations. • Encourage and support the review of existing designations and local landscape designations to ensure their currency and maintain the accuracy of site information. • Support the recognition and appropriate designation of new green infrastructure, e.g. Local Wildlife Site, Local Nature Reserve. • Embed an **'environmental net gain'** principle for development, including housing and infrastructure. • Coordinate the protection of internationally designated green infrastructure through Essex Coast Recreational disturbance Avoidance and Mitigation Strategies (RAMS).
PLACE	**Improve** existing green infrastructure so it is better functioning for people and wildlife 	• Create a Green Essex Network to develop, improve and promote Green Essex. • Support the development of new Visitor Centres and facilities • Better marketing & promotion of green infrastructure to increase use and income. • Public realm green infrastructure improved to reduce pollution and improve character and sense of place. • Create water gardens, green roofs and bio retention areas to absorb urban water. • Continue creating green spaces which also function as natural flood management and Sustainable Drainage System (SuDS) schemes. • Encourage better management of green infrastructure to benefit locally native species, focussing on recognised nature conservation priorities.
PLACE	**Create** more high-quality multi-functional green infrastructure, especially in areas of deficiency 	• Develop the coast path in Essex. • Increase access to the Outdoor Pursuits Centres. • Create green infrastructure in new developments such as Garden Communities. • Establish green infrastructure as part of Minerals and Waste restorations e.g. Pitsea Landfill. • Create town or village circular walks especially in areas of green infrastructure deficiency. • Strategically identify priority areas for the creation or improvement of green infrastructure that could provide most benefit for locally native species of recognised nature conservation priority. • Use planning policy to secure multi-functional green spaces within and beyond development site boundaries through the application of biodiversity net gain, biodiversity off-setting and the creation of compensation habitat and other green infrastructure promotion schemes. • Strategically identify priority areas for the creation or improvement of green infrastructure to enhance local landscape character.

Focus	Objective	Proposal
PLACE	**Connectivity** improvements connecting green infrastructure, people and wildlife. 	• Use new green infrastructure provision to buffer or extend existing designated sites. • Develop the coast path in Essex in a sustainable manner. • Establish inter connecting paths between green infrastructure; that provides access for all. • Restore and Promote Essex promoted paths: 1. The Forest Way 2. The St Peter's Way 3. The Essex Way 4. The Roach Valley Way 5. The Coast Path (once designated as National Trail) 6. The Stour Valley Path 7. The Thames Estuary Path 8. The Flitch Way 9. The Saffron Way 10. Blackwater Rail Trail 11. John Ray Walk
PEOPLE	Increase use and **inclusivity** of green infrastructure across all user groups, social groups and abilities 	• Explore environmental therapies and challenges across all social, demographic, ethnic and diversity groups and promote activities in green spaces e.g. mountain biking, Go Ape, Geocaching, orienteering, historic tours, arts and crafts, etc. • Promote activities to raise awareness of green infrastructure and its benefits across all social, demographic, ethnic and diversity groups.
PEOPLE	Provide green infrastructure facilities to promote **health** and wellbeing 	• Explore environmental therapies delivered through mental health services. • Develop and promote Healthcare and wellbeing through green infrastructure activities.
ECONOMY	Working with partners to build and secure funding, effective governance and stewardship for new and existing green infrastructure to ensure their long-term **sustainability.** 	• Develop new facilities that will generate revenues. • Create a Green Essex Fund for endowments, fund-raising bids, donations etc. in conjunction with the development of a Green Essex Network. • Create a distinct Green Essex identity through the development of a Green Essex Network to encourage a strong community engagement.

Chapter 7

Delivering the Green Infrastructure Themes

Image: Essex County Council

Broadly, these proposals set out in Table 2 in chapter 6 can be categorised into the following key project themes:

- Marketing, branding and promotion (MBP).
- Re-designation of green infrastructure (Rd).
- Environment net gain and offsetting (ENG).
- Improve, repurpose and create new multi-functional green infrastructure (IRC).
- Natural flood management techniques (NFM).
- Connect people to green infrastructure through active travel (CPAT).
- Delivering environmental therapies and activities (ETA).

This chapter will look at how the opportunities from these themes could be delivered and each theme will have a table listing the proposals that relate to that theme.

Image: Essex County Council

7.1 Marketing, branding and promotion (MBP)

Proposal	
Highlight the most valuable green infrastructure in Essex in terms of their multi-functionality and benefits – through rebranding Essex as Green Essex with 1,978 designations.	
Create a Green Essex Network to develop, improve and promote Green Essex.	
Better marketing & promotion of green infrastructure to increase use and income	
Develop the coast path in Essex in a sustainable manner.	 
Promote activities to raise awareness of green infrastructure and its benefits across all social, demographic, ethnic and diversity groups.	
Develop and promote Healthcare and wellbeing through green infrastructure activities.	
Create a distinct Green Essex identity through the development of a Green Essex Network to encourage a strong community engagement.	

There are several green spaces in Essex, where a considerable amount of time, effort and funding have been allocated to the running of these sites. All this effort would go to waste if these green spaces were not effectively promoted. Historically, there has been a widespread lack of awareness locally and nationally of the green infrastructure assets and facilities Essex has to offer and a lack of a coordinated promotion of these assets. There is, therefore a need to develop a marketing strategy which maximises existing marketing resources to their full potential and deliver a coordinate approach, promoting local identities and a recognisable pan Essex branding to successfully promote and raise awareness of our green infrastructure across Essex. This should include our most valuable green infrastructure such as the coast and ancient woodlands of Epping and Hatfield Forest and Hockley woods. Whilst taking into consideration the monitoring, management and mitigation of visitor impacts to these protected areas.

Establish a Green Essex web-based brand and tool where local authorities, third parties and other partners can form local partnerships and explore funding, the best practice, national policy and guidance.

Sharing and rewarding best practice via the website with both a members section for local authorities, stakeholder partners e.g. Essex Wildlife Trust and a public-facing pages for the public living among or visiting the Green Essex resources.

Better marketing and promotion of our existing and new green infrastructure and their facilities such as our visitor centres, promoted paths (e.g. Essex Way and Flitch Way), the new coast path in Essex, and activities available (especially activities for various social groups and green therapies) will encourage more people to use green infrastructure and connect with nature. This will also increase their income to enable these sites to continue to be managed, enhanced and maintained, providing environment net gains and significant economic opportunities to other businesses through sustainable natural tourism and green industries. This can only be achieved by better links and joined up working through the creation of a Green Essex network with key sectors, stakeholders and partners, such as Visit Essex, Culture and Green Spaces, Local Authority communications, PROW and Public Health teams. Although a big campaign may prove costly, current resources could be better utilised and over time the increase in visitor spend could be re-invested into marketing, promoting and enhancing our green infrastructure.

Ensuring the visibility of our green space will make a significant difference to the interpretation of accessibility and provide opportunities for people to discover and explore a transformed green space or new greenway route and engage with nature. Making physical changes to our green spaces and woodlands through habitat management and maintenance, creating good paths to and through green spaces, and the installation of benches is often not enough to encourage people to use them. It will require good signage, interpretation, raising awareness and educating (i.e. Bird awareness) and promotion of these sites and their management and those changes made through a range of information resources.

These resources could include:

- New interpretation boards;
- Artworks;
- Maps (including trails & orienteering routes etc);
- Trail guides;
- Signage;
- Leaflets;
- Press articles;
- Websites (including a Green Essex information portal with information such as Essex promoted paths);
- Social media pages;
- Mobile applications like geocaching, GPS guided tours[6];
- Hold an opening ceremony or organised guided walks or activities (such as orienteering induction or school events, green therapies, and physical and cultural activities);
- Develop events on the coast increasing the cultural offer of the coast;
- Engage local people in active care of the natural environment, who will then inform others about the site.

Care will need to be taken to ensure we do not “urbanise” natural and semi natural open spaces with too many signs and interpretation boards. These are some things that could continue to be developed over time with the input of our communities, Green Essex network partners and businesses. Local communities will need opportunities to contribute their ideas and to be made aware of plans and progress, which along with good communication is vital for successfully improving the quality, access, inclusivity and provision of our green infrastructure.

[6]. For example - geocaching (https://www.geocaching.com/play) or GPS guided tours like Thames Estuary Path - www.thamesestuarypath.co.uk or Wildlife app like High Woods Country Park Wildlife tour - https://play.google.com/store/apps/details?id=com.smartne.wai2go.highwoods&hl=en_GB

7.2 Re-designation of Green Infrastructure (Rd)

Proposal	
Encourage and support the review of existing designations and local landscape designations to ensure their currency and maintain the accuracy of site information. Support the recognition and appropriate designation of new green infrastructure, e.g. Local Wildlife Site, Local Nature Reserve.	

It is important to recognise the value of our green infrastructure in delivering environmental, social and economic benefits, and that they will themselves require protection to ensure these benefits continue to be provided for future generations. Further opportunities should be explored to enhance existing and new green infrastructure to potentially re-designate them as nature reserves, transforming them into wildlife and people friendly green spaces, whilst protecting them from future development.

There is the opportunity to discuss with Local Planning Authorities, Natural England, Place Services (environmental consultancy in the public sector) and other key partners developing clear guidance on reviewing and re-designating protected areas; to include other new and existing green infrastructure as new designations based on a standard process and sound criteria such as size of the green infrastructure and its value in terms of the functions and benefits it provides, including high biodiversity value, recreational access, flood prevention etc. The UEA green infrastructure GIS mapping model analysis on the access to green infrastructure provision, and the functions and benefits (5.1 of chapter 5) mapping could be used as part of the assessment to measure against the re-designation criteria to seek to ensure that the selection for re-designation is as objective as possible.

The testing of this guidance could be applied to support the review of existing designations and the recognition and appropriate designation of new green infrastructure, such as the following as case study examples:

- Wallasea Island managed by RSPB is a landmark conservation and engineering scheme covering more than 740ha, with two-thirds of the reserve now transformed to salt marsh, mudflats, lagoons and grazing marsh. Areas of the site have been designated as SSSI and Local Wildlife Site.
- South Essex Marshes is a dynamic landscape of grazing marsh, creeks and saltmarsh with farmland and settlements on the higher ground. The marshes are of international importance for nature and of outstanding heritage, with the vision of unifying the South Essex Marshes areas as a single destination.
- Thames Chase Community Forest within Havering, Thurrock, Barking and Dagenham and Brentwood areas covers 40 square miles of countryside around the London/Essex borders managed by the Thames Chase Trust.

Regular review of Local Wildlife Sites and local landscape character assessment within each Local Planning Authority area will ensure that newly created or enhanced green spaces that meet selection criteria as a result of their habitats or species populations can be recognised and protected within the planning system. Designation of green space as a Local Wildlife Site should be seen by developers as an aspiration, adding value to the communities that they establish. In order to achieve this, the focus of green space design and creation should be on habitats that complement those of biodiversity value in the surrounding landscape, focussed on recognised nature conservation priorities, including the Priority Habitats listed under section 41 of the Natural Environment and Rural Communities Act 2006. Landscape character assessments are used to underpin local policies around landscape and countryside conservation and enhancement in Local Plans and so are of vital importance in the conservation of rural green infrastructure networks and historic and productive landscapes outside of designated wildlife sites.

7.3 Environment net gain off-setting (ENG)

Proposal	
Embed an 'environmental net gain' principle for development, including housing and infrastructure.	
Use planning policy to secure multi-functional green spaces within and beyond development site boundaries through the application of biodiversity net gain, biodiversity off-setting and the creation of compensation habitat and other green infrastructure promotion schemes.	

Embedding an 'environmental net gain' principle for all housing, commercial and other development, including infrastructure (such as utilities and highways), with the limited exceptions of householder development and permitted development only is an action in the Government's 25 Year Environment Plan. The role of local plans and planning decisions in identifying and encouraging opportunities for net gains in biodiversity in and around developments is set out in paragraphs 174 and 175 of the NPPF. While, the Environment Bill is legislating to mandate biodiversity net gain. This means development proposals must demonstrate that they will leave the natural environment in a measurably better state. However, the ambition is to expand the net gain approaches used for biodiversity to include wider natural capital benefits, such as flood protection, recreation and improved water and air quality. The biodiversity net gain will be implemented through the planning system (i.e. Local Plans) with a consistent approach for developers to follow and a role for local planning authorities in relation to both strategic planning and development management. There is therefore, a need to recognise the role planning and the public realm (i.e. highways) has in the protection and improvement of existing and creation of new green infrastructure to enhance the character, quality and create a sense of place. It is also important to ensure that lost or degraded environmental features are compensated for by restoring or creating environmental features that are of greater value to wildlife and people. Through moving towards an environmental net gain and offsetting approach local planning authorities will be able to target environmental enhancements to areas of most need and give flexibility to developers in providing them.
CIEEM, CIRIA and IEMA have produced good practice guidance on biodiversity net gain for developers, along with a practical guide and case studies[7].

[7.] Documents available at: https://cieem.net/biodiversity-net-gain-guidance-published/

Within each local plan area, there is a strategic need to identify the areas where off-setting could have the most benefit for biodiversity and to consider what habitat types and ecological features would provide the greatest value in a sustainable way.

Image: Essex County Council

Essex already requires all planning applications to Essex County Council to complete the 'Essex Biodiversity Validation Checklist'[8] , which also offers guidance on how to submit the appropriate level of information about biodiversity, and further evidence that may be required, when making a planning application. Further work is needed to develop this into an environmental net gain principle for Essex.

By working with Place Services and partners to create the methodology of the environmental net gain principle in line with the Government's proposals to address the key issues of:

- Defining and understanding the difference between 'biodiversity' & 'environmental' net gains;
- Ensuring the net gains meet the National Planning Policy Framework requirements;
- Establish a mechanism for net gains, biodiversity off-setting, and developer contributions;
- Developing local policies to promote environmental net gains;
- Provide net gains and good practice development principles;
- Identify an effective monitoring mechanism to ensure projects deliver high quality green infrastructure and that the net gain methodology is viable.

8. Essex Biodiversity Validation Checklist -https://www.placeservices.co.uk/resources/natural-environment/essex-biodiversity-validation-checklist/

Government is proposing as part of the methodology, to assess potential development sites, to use habitat surveys to identify habitat condition along with any opportunities and constraints for enhancement as part of green infrastructure. Then using a standard biodiversity metric utilising biodiversity loss and gain figures, to inform the development design. This metric will be populated with habitat information from the site assessment and landscape plans to demonstrate at an early stage that harm has been avoided as far as possible (especially for protected sites) and that new green infrastructure will be of good environmental quality. It could also help to estimate the costs of achieving net gain and establish a tariff rate for off-setting and compensation costs. If net gain cannot be achieved on site, the metric would provide the right information to discuss habitat enhancement or creation during pre-application negotiations.

Image: Essex County Council

As part of this methodology, Essex can use the Local Nature Recovery Strategies (which identify priorities and opportunities to conserve and enhance nature) and the green infrastructure asset map from the green infrastructure GIS mapping model produced by UEA, as part of the baseline. As well as, the functions and benefits analysis (discussed in 5.1 of chapter 5), to assess the losses and gains of functions and benefits from the development proposals. This approach will enable decisions over whether a planning application is supported or to identify opportunities to avoid harm, mitigate and enhance environmental features on site. If net gains cannot be provided on site, the opportunities to provide compensatory off-setting either on site or towards other environmental habitat projects in line with local and national priorities should be explored and delivered. Net gain should only apply to developments that do not have an impact on protected habitats (for example, sites protected under the Birds and Habitats Directives, Ramsar sites, SSSIs) to which more robust planning regulations already apply. Also, the approach should not be applied to irreplaceable habitats such as ancient woodlands or blanket bogs. The mitigation hierarchy of avoidance, mitigation and compensation, must always be applied and enforced, in accordance with the national planning policies.

Useful Guidance Documents

The guidance documents below are available and recommended for planners, urban designers, developers and communities to use when submitting a planning application in Essex, to minimise the adverse effects on the natural environment, people's health and wellbeing and how to deliver green infrastructure through good design.

Essex Design Guide[9]

The Essex Design Guide (EDG) has pioneered local design, creating space for innovation and encouraging high-quality development. The EDG aims to create distinctive places where people want to live, build communities and make sure that the infrastructure and facilities are in place at the right time. This includes the important role landscape and green spaces play in our lives and explores how to deliver beneficial landscapes and green infrastructure through good design.

A number of Essex local authorities have their own Design Guide and green infrastructure strategies as a supplementary planning document, which sets out their expectations for the design of new development, design of streets and parking standards in their area.

Health Impact Assessment as part of Essex Planning Officers' Association (EPOA) Healthy places guidance notes

Guidance on how to prepare a Health Impact Assessment has been developed and is an Appendix to the EDG. Health Impact Assessments are gradually becoming part of both developers' and planners' toolkits to ensure that adequate attention is paid to the role green infrastructure plays in improving the long-term health of people.

The Essex Biodiversity Validation Checklist (as mentioned above).

This checklist can be further developed to promote and provide guidance on the environmental net gain principle methodology in Essex and how to embed the use of the methodology within in the following plans:

- Highways plans
- Local Development and Neighbourhood Plans
- Garden Communities and Villages proposals

It is recommended that the environment net gain principle is reflected in 'Local' validation checklists.

Homes for People and Wildlife

This guidance published by The Wildlife Trusts show how new housing developments can be built in a way that provides people with greener, inspirational homes which help to reverse decades of wildlife and habitat decline.

9. Essex Design Guide - www.essexdesignguide.co.uk/

7.4 Improve, repurpose and create new multi-functional green infrastructure (IRC)

Proposal	
Coordinate the protection of internationally designated green infrastructure through Essex Coast Recreational disturbance Avoidance and Mitigation Strategies (RAMS).	
Support the development of new Visitor Centres and facilities.	
Public realm green infrastructure improved to reduce pollution and improve character and sense of place.	
Encourage better management of green infrastructure to benefit locally native species, focussing on recognised nature conservation priorities.	
Increase access to the Outdoor Pursuits Centres.	
Create green infrastructure in new developments such as Garden Communities, with best practice guidance on its design and management for multiple benefits.	
Develop green infrastructure as part of Minerals and Waste restorations with reference to nature conservation priorities e.g. Pitsea Landfill.	
Strategically identify priority areas for the creation or improvement of green infrastructure that could provide most benefit for locally native species of recognised nature conservation priority.	
Use planning policy to secure multi-functional green spaces within and beyond development site boundaries through the application of biodiversity net gain, biodiversity off-setting and the creation of compensation habitat and other green infrastructure promotion schemes.	
Strategically identify priority areas for the creation or improvement of green infrastructure to enhance local landscape character.	
Use new green infrastructure provision to buffer or extend existing designated sites.	
Develop new facilities that will generate revenues.	
Create a Green Essex Fund for endowments, fund-raising bids, donations etc. in conjunction with the development of a Green Essex Network.	

7.4.1 Coastal Green Infrastructure Protection (RAMS)

The Essex Coast Recreational disturbance Avoidance and Mitigation Strategy project (RAMS) aims to collect funds from the development of new homes in order to protect the internationally important sites on the Essex coast from recreational disturbance. New housing growth will bring in new residents to an area potentially increasing recreational pressure on sensitive sites which may result in the disturbance of nesting or feeding birds. Developers within identified areas of risk are expected to make on-site provision for recreation within the development site as well as contributing a sum determined by the number of new dwellings to off-site measures used to mitigate the impacts of visitors to the sensitive coastal areas through site specific projects.

Off-site measures could include:

- staff resources (i.e. wardens);
- awareness raising;
- re-routing or screening paths;
- signage;
- interpretation;
- promoting alternative, less sensitive routes or car park locations, and
- creation of coastal coastline habitats.

Bird Aware Essex Coast (2019) has been established by 12 Local Planning Authorities, Essex County Council and Natural England. It is an initiative that engages with visitors and communities along the coast to raise awareness of bird species that feed and breed on the Essex coast and the impact of bird disturbance. So, people can access and learn how to enjoy the coast without disturbing the birds.

These measures are costed in the Essex Coast RAMS Strategy and will be delivered by Local Planning Authorities and partners to coordinate the protection of important coastal nature conservation sites in Essex and other coastal green infrastructure.

RAMS primarily deals with Site Access Management and Monitoring (SAMMs) measures which are needed on the protected sites and it doesn't include any provision of additional green infrastructure. However, there is an opportunity to consider complimentary measures in addition to the RAMS Strategy which could take place off-site, such as the provision of a new country park or other high quality strategic SANG to attract visitors and the creation of high-quality green spaces within the boundary of new development.

7.4.2 Green spaces facilities improvement and creation

Most communities, even small rural ones, have at least one public park or green space and some other community facilities, such as a library, or community centre. Improving those facilities, especially green spaces can mean different things for different communities. For some, the issue may be that adequate parks and green spaces facilities simply don't exist and need to be created. Others might find themselves with community facilities and green spaces that are adequate in some ways but need to be revitalised. A less obvious situation is one in which green spaces and facilities are in good shape and seem to be adequate, but are not being used, therefore require further investigation.

People are more likely to use green spaces and other green infrastructure, if they are well maintained. Once an under-used site is cleared of litter, graffiti, damage to any benches and signages/wayfinding repaired and opened up through cutting back overgrown areas (whilst leaving some natural areas for wildlife) to become accessible, (for example see Figure 8 case study example of Oakwood Pond in Harlow), sites can be improved in a number of ways, for example through planting or introduction of new plants and trees, the creation of new habitats and signage. As sites became easier to access, more visible, better used and more widely owned by local communities, it will contribute to local people's sense of civic pride, encourage onging involvement (i.e. volunteering and formation of 'Friends Of' groups) and reduce levels of reports of littering, vandalism and fly-tipping will decrease. There will need to be a balance to ensure that usage doesn't go beyond the carrying capacity of the green space, resulting in deterioration if maintenance and management of the green spaces becomes overwhelmed.

Oakwood Pond, Harlow

Figure 8: Evidence to action case study example of benefits to invest in improving existing green infrastructure. Images: Floods Team at ECC

Oakwood Pond and the surrounding wooded area in Harlow lie to the west of Princess Alexandra Hospital. The pond and surrounding area have a rich history, dating back as far as the 1100s as a stew pond for the Canons Brook monastery and later forming part of the grounds of Upper House in the 1700s. Unfortunately, over recent years, the area had been neglected, had fallen into a state of disrepair and was plagued with problems from unsociable behaviour. This coupled with the loss of the pond's spring water inlet led to severe silting, dropping water levels and loss of aquatic life. The woodland characterised by many mature trees and scrub, surrounding the pond had also become overgrown, with scrub and weeds taking hold of the less trafficked areas. Many local people avoided it.

HOW WAS THE GREEN SPACE IMPROVED?

The pond and the surrounding area were transformed by a combination of efforts by Essex County Council, Harlow District Council and local volunteers who have helped to unearth this beautiful area once again. The improvements to the ponds involved;

- Clearing the silt and reinstating entirely lost areas of the pond for local flood prevention for homes downhill from the site.
- Reintroducing the water supply to the pond by reconnecting the spring water source.
- Introducing and creating a diverse range of water, vegetation- and wood-based habitats to add to the biodiversity and filter the incoming water supply.
- Clearing scrub, brambles and excess trees which opened up the area.
- Installation of a new accessible fishing platform, paths, boardwalk, benches and interpretation panels around the pond. Creation of disabled access points and circular routes.

All improved access for the local community to and through the site to the town centre and the hospital and the general environment for both wildlife and local people.

IMPACT OF IMPROVEMENTS

This project has revitalised a forgotten and dilapidated area of Harlow. It is now a much-improved and loved amenity for the local community. Providing flood alleviation, educational and recreational benefits to the local area and has enhanced the biodiversity of the site. The water quality has improved through the restoration of aquatic plants and reinstating the pond thereby creating a popular fishing facility for the local community. The pond and surrounding areas have become more inclusive by ensuring disabled access and providing a safe space for the local community to use to walk, sit and reflect, fish and observe wildlife. Therefore, creating an identify for the area and fostering a sense of place.

Improving our Country Parks, green spaces, open access land, woodland and other facilities often takes a community effort. In some cases, it may take volunteers and/or donated labour and materials. In others, it may take an initiative that encourages the community, or even the local government to make changes. It generally requires both through participatory process liaising with the Country Parks teams, Outdoor Pursuits Centres, landowners and partners to support new visitor centre improvements and facilities and explore extending the outdoor pursuits offer to increase access to these sites.

Actual users are tremendously important, and if a Country Park for instance is going to be used by youths, seniors, families, and for activities like school trips and horse riding then ideally all these user groups should be represented in the planning, so that the park will speak to all their needs, as well as integrating them where feasible. Nevertheless, improving and developing new visitor centre, facilities and/or expanding the experience on offer will require financial sustainability for their ongoing management and maintenance. Not only are funds needed to develop new facilities, but it takes money and effort to maintain it as well. It is, therefore, important that these new facilities and outdoor pursuits generate revenue. To achieve this will require liaison with those responsible for the green space management, to identify potential income generating facilities and relevant funding streams developing a fiscal plan which can enable the new facilities to be created. The aim of the plan is first to raise the funds to plan, design, and build or restore the facility which may involve applying for grants, seeking donations from businesses and individuals, crowd funding and fundraising events. Following this, a strategy for generating regular income over the life of the facility and to be able to invest in the development of new facilities would be developed. Chapter 9 (9.2. Funding) goes into more detail of the potential funding sources and opportunities that will be explored.

An idea to be investigated is the potential creation of a Green Discovery Park. The aim of the Park would be to demonstrate self-sustaining environmental best practice and to showcase this to a wider audience. The Park would showcase green infrastructure, solar energy, sustainable drainage systems and natural flood management techniques, climate resilient plants, examples of natural habitats designed to maximise biodiversity, waste and recycling and electric vehicle charging points. A sustainable multi-functional visitor centre would also provide an inspirational, interactive and educational experience. This will require working with wide range of partners such as Country Parks, Minerals and Waste Planners, Land Operations, Essex Wildlife Trust and other Partners to identify an appropriate location which could be a country park or a minerals and waste restoration site, and then to coordinate the delivery and implementation.

Image: Essex County Council

There are also opportunities through the creation or improvement of green infrastructure to strategically identify priority areas that could provide most benefit for locally native species of recognised nature conservation priority, such as great created newts. To aim to protect, enhance and create diverse, species-rich, ecologically functional habitats that benefit the widest range of species possible. To encourage better management of the green infrastructure and to take into consideration the mitigation of recreational and development disturbance to these areas. Where possible, the provision of new green infrastructure can act as a buffer or extend existing designated sites and contribute to the development of a Nature Recovery Network (NRN), working with Natural England, Essex Wildlife Trust and RSPB. NRNs are spatial planning frameworks which will deliver nature recovery and restoration outcomes. This will ensure biodiversity is planned for at the landscape scale and for the long term and may help identify opportunities for habitat creation to address such issues as coastal squeeze and managed realignment. For example, the approach could consider the best locations for the establishment/creation of wetlands (freshwater) to off-set the possible loss of grazing marsh behind seawalls due to sea level rise. Identify areas along watercourses that would benefit from river restoration work (reinstating meanders, reprofiling banks, leaky dams, woody debris) to improve flood attenuation.

In 2012 the Independent Panel on Forestry recommended that the government should commit to increase woodland cover in England from 10% to 15% by 2060. Recognising the importance of trees, contributing significantly to the quality of life in both rural and urban areas. They enhance the local environment and biodiversity, support economic growth through regeneration, help mitigate the impact of climate change, assist in reducing air pollution and provide important health and educational benefits. The first tree of the Essex Forest Initiative was planted in Great Notley Country Park on 28 November 2019 and over the next five years (2019-2025) 375,000 trees will be planted across Essex, creating a total of 1.5KM2 (150 hectares) of green infrastructure. This initiative will be coordinated with the Local Planning Authorities tree planting schemes[10] , pooling best practice and resources and working together with other partners such as Parish Councils and Voluntary Sectors (i.e. RSPB, Essex Wildlife Trust and Woodland Trust) through the Essex Forestry Initiative Partnership to deliver the Essex Forest Initiative.

[10]. Coordinating with Colchester Borough Council, Chelmsford City Council, Brentwood Borough Council, Harlow Council, Tendring District Council and Uttlesford District Council tree planting schemes.

7.4.3 Public Realm Green Infrastructure Improvements

There are further opportunities to enhance and improve green infrastructure and create a sense of place within the public realm. By reviewing the highways policies and maintenance plans along with developing and coordinating cycling and walking strategies, and referring to Local Planning Authorities Design Guides provide opportunities to increase access to green spaces, secure environmental net gain and to improve sustainable transport connections between green spaces can lead to a reduction of air pollution. Measures could include (but not exhaustive):

- More street and urban planting (i.e. trees, hedges, green walls and roofs);
- Retention of trees, and develop local targets for increasing tree and woodland cover;
- Street furniture (i.e. benches, signage), whilst not contributing to cluttering of an area;
- Incorporating natural flood management techniques and Sustainable Drainage Systems (SuDS) for storm water management, to maximise biodiversity potential and increase public access;
- Soft landscaping with a variety and quality of other habitat types that are both viable and appropriate, to create an overall lush green aesthetic and provide significant wildlife habitat and other ecosystem services;
- Adjust cutting times of verges and hedgerows accordingly dependent on species type (i.e. short, flower-rich grassy verges to stop cutting during the summer) and allow for nesting birds and wildlife;
- Creating accessible and attractive routes for all, making it easier to walk and cycle, but provide opportunities for horse riding with better links to new developments, town centres, rural communities and green spaces;
- Manage the greenways to provide a quality, cross boundary, multi-user and multi-functional green corridor to benefit people and wildlife;
- Better connecting public transport with green spaces and transport hubs (i.e. situating new bus stops next to open space entrances and connecting multi-user greenways between green infrastructure);
- Explore opportunities to work with key landowners to increase benefits from publicly accessible land;
- Undertake research into the environmental impacts from our maintenance work to adjust our practices for ecological benefits where possible;
- Explore and implement an Essex Green Permit scheme to actively engage people to adopt, green up and manage land within the public realm (excluding private owned land), similar to the Paris Scheme in Figure 9.

“Vegetalisons Paris!” The Greening Permit of Paris

Figure 9: Evidence to action case study of the Greening Permit of Paris
https://vegetalisons.paris.fr/vegetalisons/

Paris has turned to its citizens with an invitation to green up their city to address air pollution and inadequate green space.

Locals are encouraged to be “gardeners of the Parisian public space”. Upon receiving a 3-year permit (that can be renewed), gardeners receive a starter pack of seeds and materials and can be creative, as long as they use sustainable methods, avoiding pesticides and promoting biodiversity in the city.

The aim is to create urban gardens, green roofs, mini orchards, keyhole gardens, living walls, and other green spaces adding up to a total of 1km^2 of new greenery by 2020.

By greening the area and making streets more attractive and biodiverse, the initiative builds community and sense of place. It gives people a role in public space, enhancing a sense of ownership and pride.

Since 2015 achievements include:

- 1,489 projects realised
- 0.3 additional km^2 of accessible green space
- 1km^2 of vegetation on walls and roofs, one third of which is dedicated to urban agriculture
- 20,000 new trees planted
- Renovation of parks and gardens

Highway Authorities are responsible for the construction and maintenance of non-trunk roads, cycle ways, Public Rights of Way, street lighting, bridges and structures and other highway assets. It is therefore important that in the delivery of capital and maintenance programmes, increasing resilience to extreme weather and flooding should be part of the green infrastructure network where this is cost effective. Working with Essex Highways, Flood and Water Management and health partners to identify funding to create a pilot green infrastructure project within the public realm. This project could take a strategic approach in planning and delivering natural flood management and SuDS schemes within the public realm - such as permeable surfaces, swales, wetlands and ponds (see 7.5 for Natural Flood Management) and to support people to lead healthier lives, through reduced air pollution and more attractive environment for active travel. Grass-cutting/mowing is one activity that could be significantly improved to target areas where wildflowers are allowed to flourish (such as Special Roadside Verges, edges of playing fields/sports pitches/amenity areas), or riparian bankside vegetation is left to grow longer to provide better wildlife habitat.

Image: Essex County Council

7.4.4 Create Green Infrastructure as part of new developments

Green infrastructure provision in new developments can be varied and can include informal space, footpaths, bridleways, cycleways, SuDS, natural habitats, gardens and street trees. Whilst quality green infrastructure such as pedestrian, bridleways and cycle routes contribute to the attractiveness of a development, particularly where sustainable transport routes are well linked to wider networks. The integration of green infrastructure into new developments closely reflects the principles of sustainable development identified in national planning policy. Local planning policies, Supplementary Planning Documents and green infrastructure strategies, therefore, will play an integral role in the delivery of quality green infrastructure through new development with best practice guidance on its design and management for multiple benefits. As well as these developments complying with the local standards within the Green and Open Space Strategies produced by the Local Planning Authorities required for the administrative area.

Local Plans and policies can provide detail on the vision and standards for green infrastructure in terms of quantity, accessibility and quality, the protection and improvement to existing, and the provision of new green infrastructure, to ensure it can be factored in from the beginning of all development proposals. The following planning documents have opportunities to embed green infrastructure planning within their plans:

- Strategic Development Plans can identify the strategic project areas which can embed the wider concept of green infrastructure and networks and designate and protect strategic routes for active travel.
- Local Plans set out the spatial strategy which can identify detailed locations of green infrastructure, identify areas where actions could strengthen the green infrastructure network and links, and policies that support the incorporation of green infrastructure in the design of a new place or regeneration of an existing area.
- Supplementary Planning Documents and Guidance support the Local Plan and can set out more detailed design principles for place-making and ways in which green infrastructure can be included in the design of a new place and provide a guide to the delivery of high-quality, well managed green infrastructure network.
- Masterplans for larger development sites, provide designs for specific spaces within a site and seek multifunctional benefits which can be served with green infrastructure and may identify likely management and maintenance costs at the outset and potential designing solutions to suit the budget.
- Green infrastructure, green and open spaces strategies by each Local Planning Authority will have identified actions that are based on the open space standards and meet their accessibility, quality and quantity needs and designate and protect strategic routes for active travel.

Local Plan preparation or review should include policies to support green infrastructure, in line with the NPPF. These policies can provide for biodiversity net gains and off-setting, as well as expanding this approach to include wider natural capital ecosystem services benefits, such as flood protection, recreation and improved air quality within development proposals designs. Through the application of biodiversity net gain and off-setting and the creation of compensation habitat, planning policy can secure multi-functional green spaces within and beyond development site boundaries.

The following plans and guidance will also continue to be reviewed as and when required to improve and develop their green infrastructure policies and guidance:

- Neighbourhood Plans
- Essex Design Guide
- Highways Plans
- Garden Communities and villages proposals
- Health Impact Assessment
- Walking Strategy
- Cycling Action Plan
- Cycling and Walking Improvement Plans
- Rights of Way Improvement Plans

7.4.5 Minerals and Waste Green Infrastructure Restoration

Minerals and waste development can have a long-term impact on the character of an area, but is only a temporary operation. Once the minerals have been extracted or the landfill filled, the land must be 'restored' to an appropriate after-use. In some cases, this can involve restoring the land to its previous use, but restoration of minerals and waste workings can provide significant opportunities for habitat creation, climate change mitigation and recreation through green infrastructure.

The key to planning and managing green infrastructure in minerals and waste restoration is to consider the site in its context. This includes:

- Considering the features of the site and the networks of habitats, sustainable transport and greenway routes and water courses that surround it, which could be safeguarded or enhanced.
- Then identify the strategic green infrastructure needs and green corridors required to deliver green infrastructure functions and benefits linking to off-site green infrastructure and strengthening the green infrastructure network.
- Considering all user groups, social groups and abilities to provide accessibility and inclusivity.
- With an agreement on the proposed long-term maintenance of the green infrastructure.

This will require liaising with the Minerals and Waste Planners to consult on the use of green infrastructure within restoration programmes. As well as during the delivery of the restoration to minerals and waste sites, such as Pitsea Landfill, to ensure maximum green infrastructure value is being realised, consideration of nature conservation priorities and the potential to explore the opportunity for a Green Discovery Park. There is significant opportunity to further embed green infrastructure into policy and guidance on mineral and waste restoration. If this opportunity is to be fully embraced, will require providing green infrastructure training for Minerals and Waste Planners and other partners (such as Flood and Water management and Spatial Planners).

7.5 Natural flood management (NFM)

Proposal

Create water gardens, green roofs and bio retention areas to absorb urban water.

Continue creating green spaces which also function as natural flood management and Sustainable Drainage System (SuDS) schemes.

Essex is predicted to experience an increase in winter flooding events and summer droughts through climate change. Green infrastructure provides significant opportunities to deliver space for water and natural options for water resource and flood management. Sustainable Drainage Systems (SuDS) are the preferred approach to managing surface water. There are different SuDS features available to suit the constraints of a site. These include green roofs, permeable paving, ponds, wetlands and shallow ditches called swales. The main purpose of sustainable drainage systems is to mimic the natural drainage conditions of a site before development. This is achieved by capturing water and allowing as much as possible to evaporate or soak into the ground close to where it originated at a controlled rate that does not increase flood risk.

Delivery of strategic flooding solutions through SuDS, incorporating more natural flood management techniques could provide clear opportunities to deliver benefits including creation and restoration of wetland habitat, contribute to the overall visual amenity and the wider environmental performance of new and existing developments and public realm. This will entail further work and liaison with Essex Highways, Developers and the Flood Water Management teams to seek funding for the provision, maintenance and management of green infrastructure and SuDS using natural flood management techniques providing multiple functions and benefits in line with the guidance in the SuDs Design Guide for Essex and Local Plans. However, its long-term management should be fully integrated with the management of other aspects of green infrastructure.

Natural flood management involves techniques that aim to work with natural features and characteristics to manage the sources and pathways of flood waters, rather than through engineered process. Techniques could include for example[11]:

- The creation of water gardens
- Green roofs and walls
- Bio retention areas
- Coastal and estuary management (i.e. saltmarshes)
- Woodland creations and leaky dams
- River restoration (natural meanders and bank profiles)

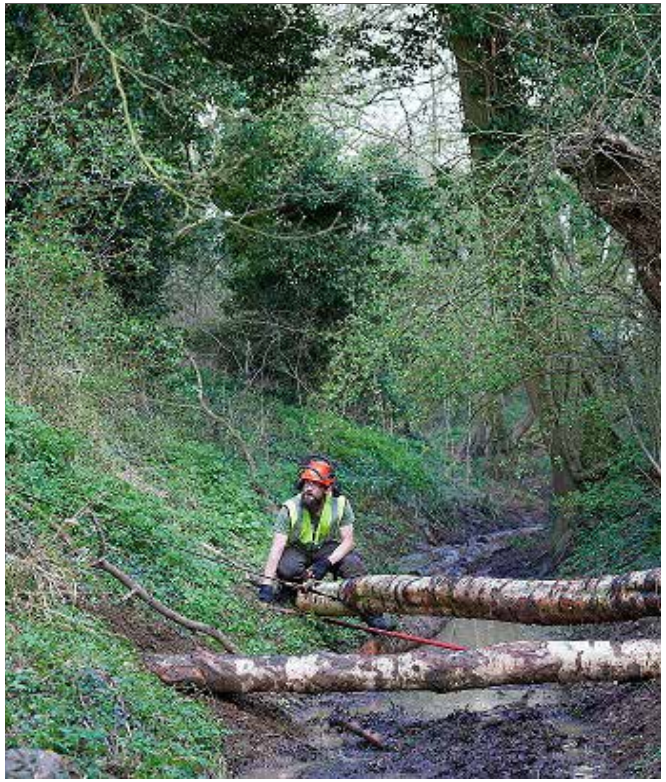
Using green infrastructure as part of the natural flood management solutions rather than hard landscaping and grey infrastructure of piping to attenuate flooding provides savings on the cost of hard infrastructure solutions and multiple benefits can be reaped from the same green infrastructure. Essex has been exploring the implementation of natural flood management solutions and in the first project of its kind in Essex, a series of 'leaky dams' have been built into a Thaxted watercourse in Uttlesford and Kingsmoor area of Harlow to help reduce the risk of surface water flooding to a number of local properties whilst improving wildlife habitats. The leaky dams in figure 10 are an excellent example of financial and sustainable land management, with conservation of an important ancient woodland helping to deliver innovative flood alleviation measures.

Image: Essex County Council

[11] for details on Natural Flood Management visit: https://www.gov.uk/government/news/natural-flood-management-part-of-the-nations-flood-resilience

Thaxted, Uttlesford & Kingsmoor, Harlow

Figure 10: Evidence to action case study of leaky dams in Essex. Images from Floods Team at ECC.



Properties in both these areas were prone to surface water flooding and roads were often cut off. Through investigation of the the areas a proposed scheme to reduce local flood risk was put forward. However, the woodland areas of these sites were ancient woodlands and in the case of Parndon and Risden Woods were SSSIs so it was essential that the proposals minimised ecological impacts.

Place Services worked in partnership with Essex County Council's Floods Services, Harlow District Council, the Environment Agency and Thames Water to devise and construct the leaky dams and pond de-silting works within local woods. The dams were constructed by hand from logs sourced directly from the wood (or for Thaxted, felled trees were extracted from Garnetts Wood, Dunmow) as part of its ongoing management plan. The felled timber and woody debris were sustainably harvested as part of Place Services' Essex Woodland Project. These were moved across the woodlands and into position using heavy horses (known as Suffolk Punch) traditional to logging to minimise the impact on the trees and local wildlife and negate the need for heavy machinery.

Felled trees and other woody debris were pinned into the river bank allowing water to flow freely when levels are normal. In times of flooding, the flow of water is slowed, reducing pressure on the dam by still allowing water through. Leaky dams also prevent flood water from washing away soil and silt from eroded river banks. An earth bund was created in a playing field directly upstream of the residential area in Kingsmoor to provide larger floodwater storage. Over time the leaky dams will improve local biodiversity by creating new and diverse habitats and restoring pond flora and fauna, such as newts. Kingsmoor scheme in October 2018 won 'Small Project of the Year' at the British Construction Industry Awards.

7.6 Connect people to green infrastructure through active travel (CPAT)

Proposal	
Create town or village circular routes especially in areas of green infrastructure deficiency.	
Develop the coast path in Essex in a sustainable manner.	
Establish inter connecting paths between green infrastructure, that provides access for all.	
Restore and Promote Essex promoted paths.	

To ensure that access to green spaces is as easy as possible for all and to improve the character and sense of place, it is essential that greater connection with public realm, developments and transport planning is established. An analysis undertaken by UEA to map the provision of green infrastructure using the Natural England, the Accessible Natural Greenspace Standard (ANGSt)[12] in Appendix B9 found most areas have sufficient natural and semi-natural green space, parks and gardens, except for Braintree, Tendring and areas of Chelmsford and Uttlesford with over 40% of residents living in places achieving no more than a single benchmark, which supports elements of the findings in the Essex Growth Infrastructure Framework (2017)[13] . In some areas the percentage of accessible green spaces was low due to deficiency of green spaces in the first place. However, in many instances the provision of green spaces may appear sufficient, but they remain inaccessible or access maybe limited. Rural communities were identified as being particularly affected by lack of access despite being in close proximity to more natural areas (ECC, 2017) (EWT, 2009).

Some areas may not always be well served due to settlement evolution and the presence of barriers to access, such as roads and people's perception of accessibility and its inclusivity. Certain groups in society that are particularly vulnerable to social exclusion[14] found specific barriers to access a green space were the cost to travel and any fees on site, fear for their safety, fear of segregation, accessibility due to lack of facilities and that they would not be welcome to use the site. These issues are particularly relevant to many parts of Essex. More details on the ANGSt provision and inclusivity review in Essex in Appendix B9.

The needs of a wide range of users will be considered when planning improvements to greenways, green wedges, green fingers, sustainable travel routes, green spaces and public realm to encourage more people to connect with nature and foster a sense of place. Assessing whether there are enough benches, level paths, good signposting, clear sightlines and good management and maintenance all will help to make areas more attractive

[12] ANGSt sets out benchmarks aiming to ensure there is adequate accessible green space provision near to where people live.
[12] Most of the local authorities in Essex that have developed green infrastructure strategies or equivalent had set out the provision requirement standards for new developments captured in the Framework (2017).
[14] These include people with disabilities, ethnic minorities, young people, older people and those at an economic disadvantage.

and welcoming places, encouraging more use by a wide range of different people. Car parking will also need to be considered alongside other site facilities and services.

Image: Essex County Council

Through placemaking public realm initiatives, such as planting street trees, hedges and verges within the design, will not only improve air quality, but act as a green corridor and greenway connecting people and wildlife. Along with improvements to existing green infrastructure assets, including improved connectivity with the Public Rights of Way, bridleways, waterways and cycle network. These will provide a wide range of opportunities to explore the outdoors in both urban and rural areas and encourage the take-up of active travel with a shift towards walking and cycling for everyday travel.

There are ten Public Rights of Way routes in Essex (i.e. Essex Way, Flitch Way) that are promoted along with certain cycle networks and bridleways. More active use of these routes could be encouraged through opportunities to add to and improve them, as well as the wider rights of way, bridleway and cycling network, working with Highway Authorities, Country Parks, Active Essex, Active Southend, Local Health and Wellbeing teams, Essex Bridleways Association, Parish Councils, District, City and Borough Councils and Village/ Community groups and other key Partners through:

- targeted physical improvements and restoration to routes that can also be promoted for local and visitor use, including the development of the coast path in Essex[15];
- provide and promote circular routes around towns and villages;
- seek sponsorship for a pilot circular walk(s) competition;
- utilising the UEA green Infrastructure GIS mapping model to identify new routes which provide multiple functions and benefits by inter connecting paths between green infrastructure;
- manage existing and new greenways to benefit people and wildlife providing environment net gains;
- new green infrastructure should aim to connect areas of biodiversity value to provide wildlife corridors and/or create larger areas of natural and semi-natural habitat;
- targeted promotion;
- improved signage;
- improve entrances and pathways to and within sites for multi- users by applying the principle of least restrictive access;
- open the first sections of the coast path in Essex, including improved access using links to sustainable transport;
- identifying and agreeing proposals for the long-term maintenance of these routes and any new green infrastructure along these greenways;
- seek and utilise innovative funds such as Coastal Communities Fund to create, connect, improve and promote these paths and other greenways (See Chapter 9, 9.2 Funding for more detail on funding sources).

[15] There are restrictions in using the PRoWs on sea walls as a bridleway, due to structural issues.

7.7 Delivering environmental therapies and activities (ETA)

Proposal	
Explore environmental therapies and challenges across all social, demographic, ethnic and diversity groups and promote activities in green spaces. Explore environmental therapies delivered through mental health services.	

The evidence strongly suggests that high quality green spaces can help reduce health and social inequalities and can be a cost-effective way of addressing many social and wellbeing needs. Improving access and raising awareness of the green spaces, facilities and activities available has a role to play in encouraging people to incorporate more green exercise and nature contact into daily routines helping to improve wellbeing and social inclusion through nature-based solutions. As a result, high quality green space and nature-based solutions could be used to a greater extent as a treatment for mental and physical health through referrals to environmental therapy such as green exercise programme run by Active Essex, Active Southend and High Woods Big Garden in Colchester. There is, therefore, a need to continue to create opportunities for community participation and volunteering to actively engage and benefit people, especially those that ordinarily face barriers to visiting green spaces.

Through liaising with Public Health to assess health deficiency areas and coordinating work with Active Essex and Active Southend on their projects will help identify green physical activities utilising green spaces to encourage more people to be active.

Whilst also working with:

- Mental Health Agencies;
- Wider health partners;
- District/Borough and City Health and Wellbeing Boards;
- Country Parks;
- Outdoor Pursuit;
- Active Essex and Active Southend partners;
- Wildlife Trusts;
- Community voluntary sector, and
- Educational and children's services.

To help build upon existing and develop, promote and deliver environmental therapy activities and programmes to a wide audience. It will require targeted marketing and promotion of events including conservation activities, environmental therapy and green exercise such as those listed below to be carried out as part of the marketing strategy in 7.1:

- Green gyms
- Eco-therapies (formal type of therapeutic treatment which involves doing outdoor activities in nature)
- Mountain biking
- Geocaching
- Orienteering events
- Historic tours and walks
- Learn new skills courses
- Arts and crafts
- Volunteering

It is important to find a way of making the natural environment relevant and of interest to people, especially those who had little in the way of a track record of engaging with it. By providing opportunities for people to take part and enjoy activities through the provision of new green spaces and improving existing accessible green infrastructure for the benefit of nature.

If these green spaces provide what local people want, they will be better used and offer a far better return on investment. Our green infrastructure should, therefore, be secure, accessible, inclusive, connected, easy to maintain and incorporate the highest quality design. For this to be achieved will require working with a wide range of stakeholders within the public, private and third sectors, including the local communities. There are opportunities to tighten working procedures with the planning authorities and other key sectors to improve our green infrastructure network.

Key Summary Chapter Action

We will conserve and enhance a multi-functional green infrastructure network, by maximising opportunities for the protection, enhancement, creation and connection of our green infrastructure network to maximise the collective social, economic and environmental benefits working in partnership with stakeholders (private, public and third sectors and community groups).

Chapter 8

Implementation of the Green Infrastructure Strategy by Sector

Image: Essex County Council

It is the intention of this strategy to embed green infrastructure requirements within new development and for green infrastructure to become an integral part of the day-to-day considerations in other key sectors and services to ensure that future planning, design, management and maintenance is coherent, structured and focused. In that the strategic decisions taken over the long-term looks to advance the case for green infrastructure and its importance in place making across Essex.

There is the potential to deliver green infrastructure through a wide range of actions and projects including new development and effective land management practices. Although, the development and planning system will have a key role to play, the following sectors also have the potential to make a significant contribution to protect, improve, create and sustain our green infrastructure:

- Housing
- Minerals and Waste
- Highways and Transport
- Flood and Coastal Management
- Energy
- Health and Wellbeing
- Education
- Agriculture

The challenge for Essex is twofold: firstly, to ensure that green infrastructure is planned, designed, implemented and managed in the same coherent, integrated and strategic way as transport, telecommunications, energy and grey infrastructure; and, secondly, to bring the multifunctional benefits of green infrastructure to our communities and workplaces.

The main opportunities to plan, deliver and manage green infrastructure in Essex will be from integrating green infrastructure priorities and principles into other proposals and decision-making processes, such as new developments, land management initiatives (e.g. woodland grant schemes) and infrastructure development. This section outlines the main opportunities likely to come forward from the eight sectors, the rationale for delivering green infrastructure through these opportunities and the principles that should be applied. Other opportunities may be identified as the strategy is delivered, therefore this section is by no means an exhaustive list.

The following sections relates to majority of the green infrastructure objectives:

8.1 Planning

Context

The planning system is one of the most important means of delivering green infrastructure. It can ensure that development respects, enhances and expands the existing green infrastructure network. While the quality of green infrastructure has the potential to improve and enhance most developments, it should also be a key consideration for any other sector such as highways and utilities. Especially since, Essex expects to face a continued period of steady growth and if this growth is to be positive and sustainable it is important that the planning is guided by a parallel emphasis on green infrastructure. Green infrastructure therefore, should also be considered at every scale of planning, from the strategic framework (allowing cross boundary issues to be considered) right down through the city, towns and villages and within streets to the individual home.

Practical Measures to Promote Green Infrastructure Through the Planning System

The role of the planning system could be influenced to improve the benefits of green spaces and green infrastructure through:

- Influencing the content, promoting best practice and continued assessment of green space and green infrastructure policies in Local Plans, Neighbourhood Plans and supporting planning documents, including a sound evidence base.
- Ensuring evidenced local green infrastructure needs are reflected in Infrastructure Delivery Plans (IDPs).
- Reviewing, updating and signposting to the Essex Design Guide, ECC Developer's Guide to Infrastructure Contributions, and LPA guidance for Planning Obligations.
- The role of the existing green infrastructure strategies and projects in Essex including Thames Chase Community Forest, South Essex Blue and Green Infrastructure strategy, the Green Arc, the Eastern Claylands Treescape project (Woodland Trust), Essex Wildlife Trust Living Landscapes, Essex Coast RAMS 2018-2038 etc.
- Local Authority Green Infrastructure, Open Spaces Strategies and Design Guides.
- Implementing the assessment of Access to Natural Green space standard (ANGSt) and other local open space standards to ensure appropriate provision of green spaces.
- Providing advice on taking green infrastructure proposals forward through planning and practical delivery.
- Embed the environment-net gain principle[16].

[16] See: https://www.gov.uk/government/news/gove-sets-out-proposals-for-greener-developments

Key Green Infrastructure Planning Principles

The following planning principles model can help protect and improve our existing and create new green infrastructure. All developments should follow these principles:

- Development is directed to the most sustainable and least sensitive locations.
- Planning and design of green infrastructure results in a coherent, meaningful and practical network of open green spaces.
- Combine green and grey infrastructure through planning the integration and coordination of urban green spaces with other infrastructure, such as highways and utilities, to facilitate the establishment of a well-designed and maintainable public realm.
- Greater awareness is achieved on the important contribution in responding to the impacts from climate change.
- Create connectivity to ensure there are good accessible links for all between urban, rural areas and green infrastructure widening the green infrastructure network.
- Deliver and enhance multifunctionality to provide multiple benefits (i.e. recreation, flood management), creating synergies, while reducing conflicts and trade-offs.
- The benefits of Green Infrastructure can be improved through the recognition of the value of ecosystem services.
- Once the impacts of development on biodiversity have first been avoided, mitigated and compensated, provides opportunities for biodiversity net gain.
- By locating developments in the right place and ensuring good early design, much biodiversity loss and damage through development could be avoided.
- Green infrastructure is designed to enhance, create and protect local landscape character and heritage.
- Deliver social inclusive processes that are open to all and incorporate the knowledge and needs of diverse parties. That results in safe and accessible green spaces designed to respond to changing population needs.
- Comply with the national and/or local open spaces standards set by Local Authorities for the quantity, accessibility and quality provision for their administrative area.
- Green infrastructure is at the heart of decision making at every stage in the planning and design process for all developments from the outset, thus green infrastructure is integral to place-shaping.
- Site management plans and funding for any development proposals should incorporate the long-term management and maintenance of green infrastructure and that these arrangements are agreed and secured alongside planning permissions to ensure that assets maintain their functions and benefits.

Consideration for strategic planning and development management policies and decisions should seek to achieve the recommendations set out in Appendix B10 (10.1) as a matter of good practice, or mitigation.

8.1.1 Supporting and Shaping Large and Small Developments

Context

Local Plans preparation work has identified the need for housing and employment growth in Essex to be delivered through small and large developments, including new 'Garden Community' settlements. The allocation and delivery of these sites and developments is strictly regulated through the planning process under the NPPF and local planning policy. If high quality, sustainable and multifunctional green infrastructure is considered early in the design process and master planning of development sites it will not only provide enjoyable and healthy environments for its future residents/ employees but can improve developers financial return. For example, it can:

- Make construction easier and more cost effective.
- Provide high returns on properties.
- Lead to financial saving from the fact that one green infrastructure solution on a single piece of land can provide multiple benefits, such as flood attenuation through SuDs, biodiversity enhancement, aesthetic and amenity value, public open spaces, etc.
- Reduce the costs of installing conventional grey infrastructure structures such as pipes and tanks for flood management - whilst still providing for other priorities on the site through innovative solutions.
- Stimulate business growth and improving quality of life and health and well-being of its residents.
- Closely reflect the principles of sustainable development identified in the NPPF.
- Where green infrastructure has been considered as aspect of the design, planning permission may be granted with fewer conditions.

Green infrastructure can be incorporated on any scale and should be integral to planning the layout and design of new buildings and developments from the outset, the important aspect is determining the right design. It is a common perception that requirements for development sites to protect and enhance biodiversity, protect local landscapes, provide for informal recreation and facilitate sustainable drainage are separate issues, each incurring additional costs. Providing these functions does not mean "doubling up" the costs. By combining these issues together and using a multi-functional approach, developers can reduce their costs, whilst at the same time delivering a high-quality development that is a key contributor to placemaking and the enhancement of local distinctiveness. Placemaking is central to enhancing the environmental and economic quality of Essex, and perceptions of the area among investors, potential employees and visitors.

Benefits of Green Infrastructure for Development Delivery and Viability

There are some general principles which, if carefully followed, could increase the viability of green infrastructure:

- Early assessment of existing green infrastructure on a site and incorporation of green infrastructure into master planning, design, demolition and construction of a new development is crucial and can avoid costs of retrofitting at a later stage. It should be considered how these assets can provide various green infrastructure functions and deliver integrated benefits on the development site, including SuDs, off road walking, horse riding and cycling routes, linkages to sustainable travel (i.e. buses), landscape and biodiversity enhancements.
- Alternatives to traditional infrastructure and design should be investigated.
- Understanding what types of green infrastructure are specifically required for an individual site and its context helps to avoid either over or under-provision of green infrastructure.
- Therefore, the quantity (amount/area of open space per 1,000 population), accessibility (distance from households and location of entrances) and quality (type, design, inclusivity and management) of green infrastructure should be informed by the appropriate national and local standards, including the Accessible Natural Greenspace Standard from Natural England and the national allotment provision and local provision standards set within the Local Planning Authorities Green Space and green infrastructure strategy for their administrative area.
- The location and design of new development should be based on an understanding of what green infrastructure is already there – such an approach can provide an opportunity to strengthen networks of green infrastructure or improve the quality of individual elements.
- Developments should take account of and retain wherever possible existing trees and hedgerow, in addition to Public Rights of Way. Where hedgerows have adjacent footpaths, such paths should continue to exist as green paths (i.e. not be 'improved' as hard-surfaced paths).
- Identification of green corridors required to deliver green infrastructure functions, ensuring that on site green infrastructure links to off-site green infrastructure and that networks benefits are strengthened.
- Design of site to incorporate identified green corridors and enhancement opportunities within the built environment, including urban greening such as green roofs and street trees, and the inclusion of in-fabric opportunities for nesting birds and bats.
- Long-term management and maintenance of green infrastructure also needs to be considered at an early stage in planning for development to ensure it is taken into account in the viability assessment of the site. This includes consideration by the local planning authority and the developers during the planning process on how the green infrastructure will be funded, managed and maintained in perpetuity.
- Timely engagement with bodies responsible for various elements of green infrastructure can help to address some of the issues and identify the opportunities to incorporate wider green infrastructure networks on the site.

- Viability assessments also need to consider all the multi-functional characteristics of green infrastructure. For example, a new road introduced on a site will have to deal with run-off, and therefore a sustainable drainage scheme will be introduced as part of this. The sustainable drainage could benefit habitat enhancement through planting road verges with biodiversity-rich grasses.
- New developments should increase biodiversity and implement an environmental net gain principle within the design of all green and blue infrastructure, utilising locally native species or those with a proven value to wildlife wherever possible. Careful design of green space can also reduce the cost of ongoing management, by focussing on low nutrient status habitats that have a greater benefit for biodiversity.
- When new places are planned, the quantity, quality, accessibility for all user groups and distribution of green infrastructure should be carefully considered.
- Care should be taken to avoid costing various green infrastructure assets multiple times for each individual function they fulfil. For example, if a green corridor on a single piece of open land delivers benefits to flood risk management, biodiversity enhancements, landscape, etc. this can all be delivered through the same investment. *(Worcestershire County Council, 2015).*
- Green infrastructure should be monitored and evaluated to see whether it is providing the benefits intended.

Green Infrastructure Implications for Key Essex Developments

There are a significant number of proposed development sites in Essex, mapped in Figure 7 of Appendix B11. Integrating green infrastructure into the development of these sites offers significant opportunities for green infrastructure delivery in the county. Local planning authorities through their Local Development Plans, Supplementary Planning Documents, green infrastructure strategies or equivalent and the Essex Design Guide set out what they expect in terms of the quantity and quality of green infrastructure in new developments so that the cost of providing it can be factored into the price that the developer pays for the land. Other consideration for strategic planning and development management policies and decisions should seek to achieve the recommendations set out in Appendix B10 (10.1.1) as a matter of good practice, or mitigation.

8.1.2 Green Infrastructure in Cities, Towns and Villages

Local Context

One of the key issues facing Essex is the relationship between its urban environment, settlements and with the wider natural and man-made landscape. For the larger settlements, such as Southend-on-Sea, Thurrock, Colchester, Chelmsford and Basildon issues to do with the boundary between settlements and the wider landscape have become important. Outside of these settlements, the majority of Essex is rural although there are towns and a number of rural villages and hamlets throughout the County. Harlow and Castle Point have been identified as having a having large proportion of green infrastructure in district. As population increases there is a need for developments to utilise every space better. Green infrastructure is widely known as a sustainable and cost-effective way of managing key environmental issues in our settlements. Therefore, more imaginative use and adaptation of space within the layers of existing city, towns and villages with green infrastructure to cater for the present and future needs of society will be necessary.

Reviews of existing spaces and green infrastructure within our settlements creates the potential to improve the overall sustainability and performance of places;

- to make them more resilient to the effects of climate change;
- to renew tired and single function open space, and
- to provide for a wider range of uses with multiple benefits for people and wildlife, enhancing the quality of life and overall sustainability performance of communities in the future.

Case Studies and Local Actions

There are also important opportunities to re-establish missing links and to create new linkages in the surrounding areas to enhance and develop the existing green infrastructure networks in our towns, city and villages. Especially, in some settlements and surrounding areas the rights of way network are fragmented. Creating multi-user greenways and/or links to Green spaces and green infrastructure is vital, therefore, gaps and missing links in the rights of way and other routes (including bridleways, waterways and towpaths) within the greenways network around towns and villages should be targeted to create good local access for all user groups to green spaces, the countryside and coast and explore the potential for circular routes. There is a need to take into consideration the opportunities presented within the Walking strategy, Cycling and Walking Improvement Plans, Rights of Way Improvement Plans and Cycling Action Plans.

There may also be significant possibilities for green infrastructure within areas of former industrial or brownfield land, or areas proposed for re-development or neighbourhood renewal, recognising the high biodiversity value (such as Thames Terrace invertebrates), that such habitats can develop in some situations. At a domestic level retro-fitting green spaces around housing which have been lost to driveways (e.g. through permeable paving and green grass driveways) can help alleviate local flood risks. In fact, size doesn't matter – green infrastructure can be introduced on any site, even if it's a small rain garden, or a green roof on an outbuilding.

As shown in the case study in Figure 11, where the internal courtyards within the Essex Cardiothoracic Centre at Basildon University Hospital has been redesigned and refurbished as a rain garden. Any action to slow down rainwater or introduce biodiversity can reduce pressure on over stretched traditional systems such as our drainage network and generate an opportunity for nature.

Nevertheless, there are parts of our cities and towns that need to remain grey for their primary function like seawalls, pavements and bridges. These grey infrastructure features can also be "greened" to improve their economic, social and ecological value through for instance:

- Green bridges
- Enhancing railway embankments for wildlife
- Installing green screens along guard rails and around schools
- Green railway walls
- Green roofs / roof gardens
- Green walls
- Green (grass or permeable) driveways
- Sustainable drainage systems (NERC, 2017)

Green infrastructure must not be seen in isolation from 'grey' infrastructure, but as a means to improve its performance and benefits (NENW, 2009).

The recommendations in Appendix B10 (10.1.3) summaries what planners, landscape architects, developers and others involved in shaping our built and green environments should consider as a matter of good practice.

Sponge 2020 - Hospital Rehabilitation Rain Garden

Figure 11: Evidence to action case study Sponge 2020 Basildon Hospital Essex, Images provided by Floods Team at ECC

Basildon University Hospital is located in a Critical Drainage Area within South Essex, an area within the top 10 at risk from pluvial flooding nationally. In order to increase the resilience to surface water flooding Basildon and Thurrock University Hospital worked with Essex County Council and other stakeholders to retrofit Sustainable Drainage Systems (SuDS) in the hospital as part of the EU Interreg 2 Seas project Sponge 2020, which is part-financed by the European Regional Development Fund.

The installation of SuDS allows areas to be adapted to slow down the rate of water entering conventional drainage systems and reducing the flood risk. However, by incorporating more natural flood management techniques through the use of green infrastructure within the design and delivery of SuDS enabled the creation of a rain garden on the grounds of the hospital. This rain garden provides multiple functions and benefits of not only alleviating flooding, but a place for staff, visitors and patients to enjoy and relax, improve recovery rates, promote nature and adapt to climate change.

This project provides a great example of how green infrastructure can be implemented alongside other infrastructure such as SuDS and demonstrates:

- Adaptation of critical infrastructure to utilise existing space to improve the overall sustainability and performance of a place to provide a wider range of uses with multiple benefits for people and wildlife.
- Retrofitting of SuDs and green infrastructure in an urban environment.
- Size doesn't matter – green infrastructure can be introduced on any site to alleviate flooding and encourage biodiversity.
- Co-benefits and duel functionality of SuDs.

8.1.3 Mineral Extraction and Waste Restoration

Context

Mineral and waste development and mineral extraction are a temporary operation; however, it can have a long-term impact on the character of an area. Once the extraction or waste operations have been completed, the land needs to be restored to an appropriate after-use - either to its former use or an alternative use. Site restoration provides opportunities for a range of benefits, including:

- Enhanced biodiversity through the provision of new and restored habitats and habitat linkages enabling species to migrate, disperse and colonise, and supporting and consolidating important designated sites.
- Reduced flood risk to communities, together with improvements to water quality and the ecological function of watercourses.
- Restoration and enhancement of landscape character.
- Productive agricultural land and forestry.
- Provision of informal and formal recreational and sports facilities.

After Uses of Minerals and Waste Sites

Historically most end-use of restored mineral and waste sites would include agriculture, open water or recreation. However, an increasing proportion of mineral workings and some ancillary waste sites (i.e. landfilling) are now being restored to amenity use and habitats of high nature conservation value. They also provide valuable opportunities for linking to habitats and features in adjacent or surrounding areas. Due to their scale and the significance of landscape and habitat change often involved with these sites, there is usually opportunity to integrate the delivery of green infrastructure assets into restoration schemes. Such a method can help to provide a sustainable approach to mineral extraction and restoration and helps to support and offset impacts relating to climate change. Although mineral sites offer the greatest opportunities due to the large expanse of land areas such developments cover, smaller waste uses can also provide significant opportunities for mitigation and connection between sites, even if they are permanent development.

When planning and managing green infrastructure in minerals extraction, waste operations and their restoration it is important to consider the site in its context. This includes considering the features of the site and the networks of habitats, biodiversity, sustainable transport and greenway

routes and water courses that surround it. Restoration of mineral and waste sites offers unique opportunities for the creation of high-quality green infrastructure, especially where they are located in close proximity to communities. It is important that access is provided to green space, taking into consideration accessibility for all user and social groups and abilities, following the restoration of sites and this can be secured in perpetuity by dedicating new public rights of way or open access area. Sandon Quarry in Chelmsford restoration scheme for instance will provide public access and circular permissive routes for walkers and horse riders. It is acknowledged that the natural environment can be vulnerable to greater public access, where, for example, the public and their dogs can disturb ground nesting birds or other breeding populations of mammals. In this regard some restored areas may need access management to avoid the public conflicting with nature conservation interests.

A Mineral Resource Assessment should also be completed for each of the Garden Communities as required by the Minerals Planning Authority to ensure a sustainable approach through the potential on-site resource of sand and gravel for building materials, thus lowering transport and carbon emissions and costs. Upon completion the minerals site becomes part of the planned green infrastructure of the Garden Community.

Minerals and Waste Local Plans

Essex County Council is the Minerals and Waste Planning Authority (MWPA) for Essex, while Thurrock Council and Southend-on-Sea Borough Council are the respective MWPAs for their administrative areas. The MWPA has a statutory responsibility to plan for future minerals supply and waste management and determines mineral and waste planning applications. Each have produced a Waste Local Plan and Minerals Local Plan that sets out strategy, policies and locations for this development. ECC's vision is to make the Essex Minerals Local Plan a national exemplar for sustainable development. The Essex Minerals Local Plan will deliver significant long-term benefits for wildlife and people, transforming intensive agricultural land to wildlife-rich habitats through positive planning of minerals development. It expects all minerals developments to achieve a net gain in biodiversity and contribute to the enhancement of priority habitats and the local ecological network. It specifically seeks the creation of 200 ha of 6 Priority Habitats at 5 Flagship Schemes as shown in table 3 by 2029. While the Waste Local Plan sets out for all restoration schemes should, in the first instance, be seen as an opportunity to enhance and upgrade greenways, especially PROW where possible, with regard to the provision of Bridleways as multiuser paths as part of any permission granted.

Location	Minimum area of Priority Habitat Creation at each preferred or reserve site
A3-A7 Bradwell, Rivenhall	50 ha (A3-5 'preferred sites': 28ha; A6-7 'reserve sites': 22 ha)
A9 Broadfield Farm, Rayne	50 ha
A46 Colemans Farm	20 ha
A31 Maldon Road, Birch	23 ha
A20 Sunnymead, Alresford	50 ha

Table 3: Area of Priority Habitat to be created at each Flagship Scheme

Careful consideration of the environmental impacts and opportunities of the minerals and waste development will be necessary as part of a planning application with proportionate levels of mitigation to be established. Especially with the final restoration and long-term management and maintenance to be beneficial to the biodiversity and habitat creation. ECC as MWPA prepared a Mineral Site Restoration for Biodiversity Supplementary Planning Guidance as a tool to provide guidance to developers on mineral site restoration and after use that aids the delivery of green infrastructure[17]. Further recommendations for planners and developers to consider are set out in Appendix B10 (10.1.3).

Key Summary Chapter Actions

- **We expect green infrastructure to be planned at the earliest opportunity and address the multiple benefits (listed in this Essex Green Infrastructure Strategy).**
- **We would expect all development to set out the green infrastructure "checklist" showing how each element will be substantially addressed and should follow the key green infrastructure planning principles listed under 8.1.**
- **Restoration and mitigation plans for mineral and waste sites should ensure that opportunities to create and link biodiversity and habitats are fully explored to create mitigation and environmental net gains.**

Checklist topics include: Multiple green infrastructure functions and benefits, biodiversity, active travel and mobility, carbon sequestration, landscape, habitat connectivity, air quality, water environment, inclusivity, management and maintenance, etc.

[17]. https://www.essex.gov.uk/Environment%20Planning/Minerals-Waste-Planning-Team/Planning-Policy/minerals-development-document/Documents/Mineral%20Site%20Restoration%20for%20Biodiversity%20SPG.pdf

8.2 Highways and Other Routes

Context

There are over 5,000 miles of roads within the public realm in Essex, together with a footway network of 4,000 miles (including footways shared with cycleways), and 4,000 miles of public rights of way. Essex County Council maintains this vast network and ensures that people and goods in Essex move safely and seamlessly. While the two unitary authorities, Southend-on Sea Borough Council and Thurrock Council are responsible for the roads within their administrative area. Our transport network is essential to economic growth but also contributes to poor air quality, impacts on biodiversity, landscape and heritage, through the vehicles using our roads. Road traffic creates many harmful pollutants, including particulate matter (PM10), volatile organic compounds (VOCs) and other gaseous pollutants such as carbon monoxide (CO) and oxides of nitrogen (NOx). These pollutants are linked to a number of health conditions, such as asthma, heart disease and cancer (Ibex Earth, NSCiti2S, 2018).

Environmental Impacts and Mitigations

Roads also impact on biodiversity through ecosystem destruction and fragmentation, thereby negatively impacting ecosystem services. Our transport network has a huge impact on our environment and our quality of life. However, green infrastructure can help mitigate against these issues and also enhance the value of the network by providing other functions such as:

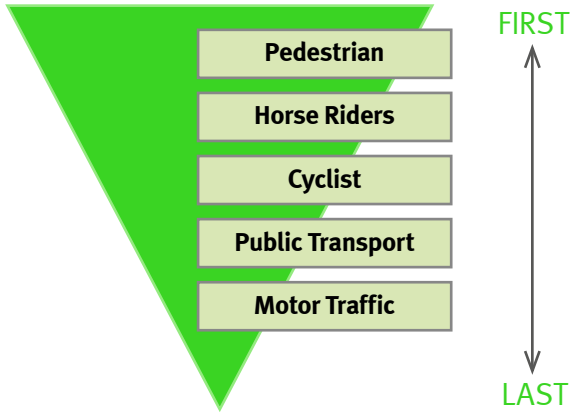
- Integration of transport and green infrastructure may enhance scenic value, landscape character and connectivity resulting in increased benefits from leisure and tourism.
- Intelligent use of green infrastructure and appropriate planting in street and roadside design can be incorporated as a traffic calming measure which also help soften the street scene by creating visual interest, improving the microclimate and providing valuable wildlife habitats.
- Highway green infrastructure such as road verges, roundabout centres, tree belts and other green spaces such as ditches and mowed grassland can make a major contribution to people's everyday experience of green spaces.
- Maintenance of some of the green infrastructure assets, e.g. verges, can be done by local residents, increasing the sense of ownership among the community and reducing maintenance costs for the councils (as shown in the "Végétalisons Paris!" case study in chapter 7, Figure 9).
- Moreover, providing people with high quality and attractive alternative to car use and public transport for short trips to work, school and other destinations relieves the pressure on the road network and has proven health benefits.
- Planting and retaining of trees, low hedges and other vegetation alongside roads act as porous bodies that influence the distribution of pollutants and improving air quality by absorbing through leaves, plant surfaces and the bark.
- Green infrastructure in the highway can provide for SuDS removing water from the drainage system and preventing flooding and improving water quality.

There are many areas of green space along the highway network and other linear routes that are not necessarily accessible but are nevertheless of visual importance. In some cases, these play an important role in creating visual separation between roads, housing and the surrounding countryside, as well as providing habitat value. Road and railway verges and waterway banks form important wildlife corridors and play a key part in the tourism appeal of the landscape for many recreational activities. Combining green infrastructure with permeable pavements may further reduce storm management costs and environmental pollution. Green walls or green embankments along infrastructure function as noise barriers, and reduce air pollution through particulate filtering (Trinomics, 2018).

The planting of hedges has the greatest effect when safeguarding residents from airborne pollutants. Roadside hedges could also be planted in "bio retention areas" which absorb the highway water as a SuDS feature, thus alleviating two important issues for our towns and cities, water pollution and urban flooding, whilst providing aesthetic value. Hedges are also flexible in that they can be planted in troughs where underground services restrict tree planting. Furthermore, with good design, hedge trough can also accommodate seating, bins, cycle racks etc. Where there are large buildings close to the road, low hedges are far more effective than taller trees in reducing the impact of pollution from vehicles.

Roads also impact on the local connectivity and accessibility of the landscape severing links between places. Improvements to the connectivity and accessibility of existing green infrastructure and creation of new green infrastructure can be highly influenced by Highways. It is important to consider the user hierarchy when considering how people access green spaces to encourage modal shift from cars to more sustainable and active travel options. This is a well-established concept which places the most vulnerable road users at the top, pedestrians and people with disabilities, followed by cyclists, public transport and motorised transport as shown in Figure 12. The objective is not to give priority for pedestrians, horse riders and cyclists in every situation, but to ensure that the needs of vulnerable road users are considered first.

Figure 12: User hierarchy for accessing green space



There is a possibility of reconnecting green spaces fragmented by the road network through the creation of green bridges that cross over the road linked with new pathway connections to carry people over (RiverLab, 2018). Land Use Consultants on behalf of Natural England undertook a study on the benefits of green bridges and found that they could become an important part of the sustainability of future transport projects by:

- Creating a safe crossing point for wildlife movement.
- Joining up habitats and connecting colonies, as they are also used by wildlife as a home in their own right.
- Creating a crossing point for people and benefit pollinators.
- Integrating roads and railways into the surrounding landscape (NE, 2015).

Providing better connection between and improving access to green infrastructure assets including greenways is in support of a number of Highway Authority's strategies and plans, such as the Local Transport Plan, Cycling Strategy and plan, Sustainable Travel Plan (i.e. Essex Sustainable Modes of Travel Strategy, Better Southend Programme and Thurrock Travel Plans), Rights of Way Improvement Plan, and Local Cycling and Walking Infrastructure Plans.

Further recommendations that the Transport Authorities, planners, developers and other partners should consider can be found in Appendix B10.2.

Image: Essex County Council

8.2.1 Greenways

Sustainable Travel Networks, Connectivity and Health

Essex green infrastructure network can be used as a viable and sustainable transport option. In support of the Health and Wellbeing and transport authorities promotion of active travel through walking, cycling and other physical activity, including horse riding. Greenway routes can be creatively designed to encourage leisure use, a method for accessing recreational activities, as well as providing commuting routes to work and school. Especially since walking, cycling and horse riding is on the increase and the proportion of users with decreased mobility is also increasing. These users range from parents with pushchairs, who are keen to take their young children out into the countryside and green spaces, to people who may have mobility related disabilities.

This strategy seeks to help ensure that our green infrastructure will be seen not just as destination but also as an attractive through route that links places and communities. This can provide significant incentives to encourage increased physical activity as a result of the high-quality journey as the route passes through diverse natural environments.

A network of public rights of way, footpaths, bridleways and cycle routes exists in the county including other accessible greenways (as shown in Appendix B12, Figure 8). However, more work can be done on connecting these routes and allowing for multi-user accessibility such as horse riding. To ensure the selection of a gap, gate or stile which permits people to use a path crossing a field boundary such as a hedge or fence should result in as little restriction as possible for potential users, whilst meeting the land management needs of the landowners. Within urban areas, consideration should be given how the routes can be made more attractive such as tree planting, so they are used by residents more frequently for their daily trips, for instance, to retail and employment areas. While, better connectivity and promotion for the use of our waterway paths, river paths and towpaths are needed. These routes are not only valuable green infrastructure in urban and rural areas by enhancing biodiversity and providing aesthetic value; but as routes for sustainable transport and recreational for walking, horse riding and cycling and providing a tourism resource which encourages healthy exercise and contributes to wellbeing. The Highway Authorities are developing Local Walking and Cycling Infrastructure Plans and programmes and Rights of Way Improvement Plans, which will prioritise the development of the Public Rights of Way (including bridleway) and cycling networks over the coming years.

Essex Green Infrastructure Routes

There are many long-distance trails, bridleways and cycle routes that pass-through Essex, such as The Essex Way, Flitch Way and Thames Estuary Path. These may take the form of woodland routes, riverside or coastal routes, former railway lines routes or cross-country routes, for example.

Some parts of the path network are promoted paths, which include:

- The Forest Way
- The St Peter's Way
- The Roach Valley Way.
- The Stour Valley Path
- The Saffron Way
- Blackwater Rail Trail
- John Ray Walk

Future Opportunities

Opportunities should be taken to add to and improve the promoted paths and the emerging coast path to encourage more active use of the network through more targeted promotion and improved signage particularly on the urban fringes. Other smaller routes can also be found across Essex, providing potential opportunities to:

- Create an Essex Outer Greenway if some of the existing routes are connected.
- Link greenways outside urban areas for leisure and recreation by, for example, a greater variety of short routes that can be completed by multi-users with different needs including circular routes around towns and villages which can be reached within walking distance.
- Ensure the design is resilient and sustainable, through planting trees and vegetation along new paths to make more attractive and provides optimum habitat for biodiversity.
- Consider allowing the new greenway paths to be wider than 2 metres where there are trees/verges to enable the paths to remain usable during periods of vegetation growth and prevent canyon effect.
- Build in the principle of least restrictive access in the design of new paths and routes to provide access for all users.
- Expand upon existing schemes such as:
  - Hadleigh Park Riders to be replicated in other suitable green spaces teaching children and adults how to ride a bike.
  - The Cake Escape, where cafes throughout Essex signed up to encourage residents and visitors to cycle through some of the most beautiful places in Essex, could be expanded to include more greenways.

Appendix 10, 1.1 provide other recommendations that those responsible for greenways, including planners and developers should consider as matter of best practice.

Key Summary Chapter Actions

- **Sustain and improve existing Greenways and Highways green infrastructure network working in collaboration with partners, whilst engaging and involving Parish Councils and communities.**
- **New development will use appropriate green infrastructure design and its multi-functions that will enhance the quality ,ease of accessibility, inclusivity and connectivity to green spaces, local amenities and across the development.**

8.3 Coast

Essex has one of the country's longest coastlines stretching for over 300 miles. The many different uses of the Essex coast all exert varying pressures on this sensitive and highly valued natural resource. Much of the Essex coast is also particularly vulnerable to the effects of climate change including the loss of salt marsh (which is itself, a natural form of coastal sea defence) and the increased risk of coastal erosion and flooding to numerous communities and landowners.

There are several types of coastal green infrastructure that provide protective services that can help reduce vulnerability and enhance resilience to these pressures often referred to as living shorelines. These primarily include (but are not limited to):

- Saltmarshes. Coastal wetlands that form in saline tidal zones along protected shorelines.
- Ridges of material submerged at or below sea, estuarine, or river surfaces. For example, biogenic (composed of organisms such as mussels and oysters) or geogenic (composed of rock, sand, or other inorganic substrates).
- Seagrass beds. Submerged aquatic vegetation that grows in shallow marine and estuarine habitats.
- Sand beaches and dunes. Deposits of sand and gravel shaped by waves, wind, and coastal vegetation.

Using coastal green infrastructure such as plants, sand, and natural barriers will reduce erosion and flooding. It also can lessen the associated impacts on human health and property. Restoring affected wetlands can reduce wave heights and property damage.

In contrast to hard structures such as bulkheads and sea walls, vegetative shorelines provide multiple ecosystem benefits, including improved water quality, aquatic habitat, and carbon sequestration. Managed coastal improvements also provide potential sites for renewable energy and creates connected habitats for wildlife. Coastal areas provide opportunities for learning and leisure and deliver economic benefits through the creation of distinctive places for tourism such as coastal county parks and the 300 mile England coast path in Essex being developed by Natural England. The coast path will provide opportunities for the economy and health benefits of often deprived seaside towns. The coastal landscape provides important perceptual (i.e. aesthetic) and cultural qualities, that all form part of the ecosystem services it delivers.

Further consideration for coastal strategic planning and decision making should seek to achieve the recommendations set out in Appendix B10 (10.3) as a matter of good practice.

Key Summary Chapter Action

Opportunities for multifunctional green infrastructure should be maximised by developments located within the developed areas of the coast and coastal projects, such as the Coast Path in Essex. These developments should include the restoration, enhancement, connection and protection of the watercourses and coastal areas providing environmental, economic and social benefits. This should be delivered using adaptive design and in accordance with the guidance and actions set out in the Shoreline Management Plans, RAMS, Local Plans and South East Inshore Marine Plan.

8.4 Flooding

Context

Flooding remains one of the most frequent natural hazards in Essex and is predicted to experience an increase in flooding, extreme weather events and summer droughts through climate change. Green infrastructure provides significant opportunities to deliver space for water and natural options for flood alleviation and water management.

Under the Flood and Water Management Act 2010, Essex County Council and the two unitary authorities are defined as a Lead Local Flood Authorities and are required to produce, implement and monitor a strategy for the management of local flood risk. This includes flood risk from surface water, ground water and ordinary watercourses. Although the Flood Strategy does not reference green infrastructure, it does mention working with the natural environment.

"To encourage innovative new thinking, considering community needs, while working with the existing natural and built environment". (ECC/Place Services, 2018)

Water Management - Roles and Benefits of Green Infrastructure

Green infrastructure can contribute to making areas less vulnerable to flood risk whilst ensuring development doesn't increase flood risk to third parties, through its key role in:

- sustainable drainage;
- drought mitigation;
- flood and water stress reduction;
- providing opportunities for attenuation or infiltration that can help to recharge aquifers;
- maintaining levels in watercourses or other blue infrastructure features.

Green infrastructure can also influence water quality through limiting diffuse pollution and controlling water levels in watercourses. Whilst all the elements used to control flood waters can be valuable green infrastructure assets if developed and managed appropriately. Therefore, using green infrastructure rather than hard landscaping and grey infrastructure to attenuate flood will be more environment friendly and will provide savings compared to the cost of hard and grey infrastructure solutions which could pose problems for local ecosystems and communities. Multiple benefits can be reaped from the same green infrastructure. This can be in the form of small-scale rain gardens or large scale Sustainable Drainage System (SuDS) solutions. Leaky Dams project as shown in Figure 10 (Chapter 7, 7.5) are an excellent example of financially and sustainable land management, with conservation of an important ancient woodland helping to deliver innovative flood alleviation measures.

Sustainable Drainage Systems (SuDS)

The implementation of SuDs is becoming an integral part of best management practices within the public realm, new and existing developments and is widely applied as a planning condition. SuDs are a national planning policy requirement for major developments, unless there is clear evidence that this would be inappropriate. SuDs work on the principles of managing surface water run-off on site as near to source as possible, slowing down run-off, treating it naturally and releasing good quality surface water to watercourses or groundwater. Keeping surface water on the surface increases the capacity for flood storage, provides easy access for maintenance and is cheaper to construct. Moreover, the end design solutions can provide attractive aesthetic and amenity features within the development, provide opportunities for biodiversity enhancement, recreational corridors and deliver multi functions and benefits to a community, especially when natural flood management techniques are considered within the flood management schemes design. SuDS may become a key driver for green infrastructure.

To ensure that green infrastructure maximises the opportunity for flood management and improving water quality in Essex for individuals and organisations involved in managing flood risk at a local level, including local authorities, developers, landowners, farmers, and voluntary sector organisations these need to:

- Ensure that SuDS and other urban natural flood management measures are linked into the overall green infrastructure network.
- Consider how the retained water from SuDS can be used for active and passive irrigation for urban plants and green spaces, for example by designing green corridors and street trees as stormwater planters.
- Encourage take up of small-scale urban drainage measures such as green roofs, green facades, rain gardens and ponds to be implemented on an individual level by households and businesses.
- Consider the use of incentives to facilitate this process.
- Explore possibilities of converting arable land to woodland and grassland in mid and upper catchments to stabilise soils, reduce sediment and nutrient run-off and improve flood management.
- Make small adjustments to land management or allowing unproductive land to be used for flood storage and alleviation to protect urban area downstream.
- Where development is alongside water courses and bodies, protection and enhancement of safe public access and enhanced amenity value should be demonstrated in a Water Management Plan.

- Use of watercourses, SuDS and other urban natural flood management measures to be incorporated into new developments and into proposals to refurbish existing neighbourhoods, providing a drainage role, but also contribute to the visual aesthetic and amenity value.

Consideration for multi-functional green infrastructure measures to improve water quality and alleviate flooding could be encouraged through the delivery mechanisms, such as the SuDs Design Guide and Local Plans and should seek to achieve the recommendations set out in Appendix B10 (10.4) as a matter of good practice.

Key Summary Chapter Action

All development proposal should incorporate SuDS and natural flood management techniques. This should demonstrate multifunctional green infrastructure solutions to flood management. Development should include biodiversity and open space provision, which will enhance biodiversity, natural capital and provide aesthetic and amenity value; and safe public access. These designs should draw on national and local best practice guidance and must comply with requirements set out in the Essex SuDS Guide and national policy.

Image: Essex County Council

8.5 Energy

Context & Environmental Impacts

The non-renewable energy sector - the burning of coal, natural gas and oil for electricity and heat - is the largest single source of global greenhouse gas emissions and is responsible for over 2,897 kt CO2 which equates to over a quarter of all Greater Essex greenhouse gas emissions (Gov.UK, 2018). Energy transmission infrastructure, such as power stations also generally lead to fragmentation of natural habitats, ecosystem destruction and depletion of ecosystem services.

Mitigations and Roles of Green Infrastructure

There is an increasing pressure on those involved in the delivery of energy transmission infrastructure to mitigate some of the deleterious effects that such development has on the environment and there is a matching understanding that often quite simple actions involving the integration of some quantity of green infrastructure into these energy transmission infrastructure schemes is a potent way of helping to address the problem.

Green infrastructure can play a role in reducing the negative impacts of the energy sector, by:

- Reducing energy consumption;
- Reduce buildings energy costs through natural shading and insulation;
- Contributing directly to energy production, such as providing bioenergy, and providing carbon uptake and storage (carbon sequestration), and;
- Some facilities and ways of energy production that can serve as green infrastructure assets within an overall green infrastructure network.

Green infrastructure has significant potential to reduce energy consumption and the direct impact from energy transmission infrastructure on the landscape in Essex. For example, green areas such as urban parks, and tree-lined streets can play a role in reducing an area's overall energy demand and thus contribute to the moderation of the 'urban heat island' effect. Green roofs and walls and other green infrastructure features reduce heating, cooling and associate energy demands within buildings, resulting in reducing energy needs and therefore, decreases the emissions from power stations. For example, domestic buildings are responsible for 31.3% of CO2 emissions in Essex. A 20% tree canopy over a house providing shading for instance, results in annual cooling savings of 8 to 18% and annual heating savings of 2 to 8% (Trinomics, 2018). Investment in green infrastructure can contribute to meeting the emissions reduction target of the UK Climate Change Act 2008. Mitigating the impacts of subsidence from the tree roots, the need for extra lighting from the tree canopy cover and other conflicts with buildings and utilities will need to be taken into consideration.

Examples of such interventions that can be explored further are summarised in Table 4 .

Table 4: Summary of Green Infrastructure Energy Interventions

Green Infrastructure Energy Intervention	
Bioenergy	Green infrastructure can provide biomass heat and electricity generation derived from trees or agricultural residues (biofuel crops), which is deemed to be a renewable energy source. Green infrastructure can both capture and store carbon from the atmosphere, and provide biofuel, when it is managed in a way as to provide biomass (mowing, pruning, logging). If energy crops are to be regarded as green infrastructure, they must provide a net gain to the site-based biodiversity and the delivery of multiple ecosystem services. It depends on the species selected (indigenous or not) and the harvest cycle whether that is the case. Utilising timber from Essex woodlands for wood fuel is not easily achievable due to the small size and disparate location of these woodlands. However, a study by AGB Environmental on behalf of ECC and Thames Chase explored the local authority woodland resource and found the potential opportunities of coordinating small cluster of woodlands across the districts and boroughs. Due to 38% of all PM2.5 pollution is derived from woodburning fuels the use of biofuels will need to be carefully considered and managed.
Renewable Energy	Wind and solar farms could in some way be considered as a green infrastructure asset if managed correctly. These facilities are typically constructed on green infrastructure assets – Solar farms take up less than 5% of the land leaving scope to develop protected habitats to support local wildlife. A study in 2016 investigates whether solar farms can lead to greater ecological diversity when compared with equivalent undeveloped sites. The results of the botanical surveys revealed that overall, solar farms had greater diversity than control plots, and this was especially the case for broadleaved plants. This greater diversity was partly the result of re-seeding of solar farms of species-rich wild flower mixes and/or agricultural grass mixes. The report suggest that the findings are not only beneficial for wildlife but could also provide ecosystem services important for people and agriculture. For example, by becoming net producers of pollinating insects, which are in decline across the UK, solar farms can promote the health of surrounding crops such as cereals, vegetables, soft fruits and orchard fruits (Hannah Montag, 2018).
Nuclear	Bradwell in Essex is one of the proposed sites in UK for a new nuclear power station. Nuclear power projects are large energy infrastructure projects which, in most cases, would result in significant change of land use. This would likely lead to loss of green spaces to allow for construction and potential impact on the designated sites within the Essex estuary. There are opportunities involving the local communities to use green infrastructure within the landscaping of the nuclear site.

Further details on the green infrastructure energy interventions and recommendations to consider are set out in Appendix B10 (10.5).

Key Summary Chapter Actions

- **Promote green infrastructure:**
  - **As a mitigation tool for Energy (i.e. energy production, reduce emissions and renewable infrastructure).**
  - **To make urban areas liveable against the effects of climate change, through for example, insulting buildings, shading against UV rays and mitigating against the Heat Island effect.**
- **Policies and plans should maximise green infrastructure through making connections between energy and at least three or more of the following sectors: heritage assets; recreation and access; biodiversity and social exclusion, to ensure multi- purpose and functional use.**

8.6 Health and Wellbeing

In addition to the important role green infrastructure plays in providing In addition to the important role green infrastructure plays in providing healthy and comfortable urban environments, access to green infrastructure also provides general health benefits. Green infrastructure not only provide clean air and clean water, it provides natural places to play and serves a green space for improving health and wellbeing.

PERFECT (2018), a European project , advocated that if a large proportion of health care budgets were redirected to prevention it could fund the enhancement of green infrastructure to deliver health benefit outcomes and avoid mental and physical health costs. Increased provision of and access to public green spaces will reduce the costs of treating ailments due to air and noise pollution. In general, more time outdoors and nearby green places (from countryside to green streets) creates an exposure to the healing effects of nature contributing to health. It provides benefits to:

- Health services – reducing costs for, and pressure on, services through:
  - Actively tackling the effects of mental ill health, obesity and key conditions and diseases such as cardiovascular illness, stroke, diabetes and dementia.
  - De-medicalising some conditions, such as mild to moderate anxiety and depression.
- Social care – reducing pressures on the services through:
  - The development of independent living skills and improved personal resilience.
  - Tackling social isolation and the health consequences of loneliness.

Considerations of the health and wellbeing benefits from green infrastructure should be integral to decision making across sectors, by completing a Health Impact Assessment. In addition, there are other opportunities to use green infrastructure to meet the needs of the community through the delivery and/or promotion of green care. Green Care is a wide range of treatment programmes which aim to improve people's mental and physical wellbeing through doing outdoor activities in nature. Green care includes:

- Facilitated green exercise interventions;
- Social green prescribing by GPs referring to therapy or treatment programmes that take place in natural surroundings;
- Ecotherapy; and
- other nature-based solutions (i.e. horticulture, nature arts and crafts)

Health professionals working with providers of green spaces, sport activities (including those delivering equine therapy) and communities are well placed to use the natural environment as a resource, delivering green care. It should be possible for people to participate in therapeutic nature-based activities, wherever they live and give people a greater choice of ways to get active in the outdoors.

Case Studies

The case studies in Figure 13 provides examples of where there are opportunities to work in partnership to coordinate delivery of green care. While Appendix B10 (10.6) provides examples of recommendations for health professionals, sport and leisure, planning, transport, social care and economic development should consider as best practice to connect people with nature and improve health and wellbeing.

Essex Local Delivery Pilot

Figure 13: Evidence to action case study examples of green care opportunities

Essex is just one of 12 Local Delivery Pilots selected by Sport England nationally and all the pilots are deliberately focused on whole system change – the need for strong vision and leadership at the highest level and with the collaboration of all stakeholders, at all levels, being key. The aim is to create innovative partnerships that make it easier for people in these communities to access sport and physical activity, including use of green spaces.

The pilot is led by The Essex Health and Wellbeing Board and supported by Active Essex, Basildon Borough Council, Colchester Borough Council, Tendring District Council, the University of Essex and other partners. Basildon, Colchester and Tendring are three areas that represent 37% of all inactive people in Essex and are the focus areas for the Delivery Pilot.

Some of the findings from the test and learn pilots included:

Success factors identified for example:

- An accessible location which is safe, friendly, and welcoming.
- Strong and passionate leadership, typically comprising a paid leader supported by trained volunteers.
- A collaborative approach with a range of engaged partners.
- Effective use of community insight and engagement to understand the place and people and to co-produce projects and activities.

Factors that limit the success for example:

- Individual barriers faced by residents (e.g. long-term physical condition, child care needs, lack of confidence).
- Referral processes are currently not successful in introducing new participants to the projects.
- There is a lack of knowledge and awareness by residents and providers of existing physical activity programmes.

(www.activeessex.org/essex-local-delivery-pilot/)

Metal Art School, Chalkwell Park, Southend-on-Sea Netpark & Wellbeing Project

Metal has been active in Southend-on-Sea since 2007. They support artists, working in all disciplines, at all career levels and work from buildings of historic significance like the renovated Georgian Chalkwell Hall, situated within the grounds of Chalkwell Park into vibrant cultural community hubs. Metal run activities and projects such as NetPark (the world's first Digital Art Park), and NetPark Wellbeing Project (short courses and sessions to encourage positive mental health).

NetPark was developed to create an added visitor attraction to the usual stroll in Chalkwell Park through the uses of a smart device apps. Building upon this NetPark Wellbeing Project uses the collection of apps to offer a free support system for people living with mental health and wellbeing concerns including dementia, creating a safe space for the community to make friends and explore their creativity.

Metal has been working with Southend Borough Council Public Health team and NetPark to provide one off sessions to weekly group activities, short courses and days out. The art therapy group works allows the attendees carers two hours free respite.

Achievments so far:

- 37 organisations involved.
- 806 people with mental health issues have participated. Patients have suffered from, depression, bi polar, isolation Post Stress disorder, paranoia etc.
- 1,234 hours of free art therapy has had been offered to those with dementia, by October 2017.
- 73% of participants said symptoms reduced.
- 43% of participants said reduced GP visits.

http://www.metalculture.com/about-us/southend-on-sea/

Key Summary Chapter Action

Promote community-led activity to enable inclusive use of green infrastructure, that will provide health and wellbeing benefits.

8.7 Education

Context and Benefits of Green Infrastructure to Learning

Green infrastructure provides learning opportunities as an 'outdoor classroom' relevant to both the National Curriculum and lifelong learning (e.g. forest schools and Continuing Professional Development). It is a valuable educational resource and has the potential to improve educational achievement, through improved concentration and self-esteem. Exploring the wider environment such as woodlands, ponds, wildlife areas help children and young people to learn a variety of skills through play and social interaction –stimulating the imagination and testing boundaries. These are essential for our children and young people to grow and learn.

Greening learning facilities means educational establishments with green outdoor environments allow children and young people to have safe, ready-made access to green places and engagement with nature, whilst improving their health and wellbeing. It can also provide other benefits such as mitigating flood risk, reducing air pollution and improving energy efficiency. Advancing environmental education of green infrastructure can help to showcase the social and ecological benefits of green infrastructure to peoples' everyday lives, thus increasing awareness of the value of nature. Appendix B10 (10.7) provides examples of recommendations for those responsible for education and green spaces should consider in awareness raising and public engagement in delivering green infrastructure within schools and the community.

Green Infrastructure Educational Opportunities

Green infrastructure offers the following educational opportunities:

- Formal and informal place-based learning in built and natural green infrastructure settings.
- Using other green infrastructure for educational purposes that otherwise may not be perceived as educational (e.g., waste management facilities, and SuDs).
- Employment and higher educational opportunities in the green sector especially serving the demand of specialist input to maintain, expand and monitor the green infrastructure assets and their overall function as a network.
- Multi-benefit green infrastructure should be taught in all green infrastructure related sectors, by developing centres of excellence where possible. For example, in the field of green infrastructure and environmental technology covering subjects such as sustainable land management, renewable energy, bio-engineering and water management.

The opportunities to support initiatives to foster links between education and the environment include:

- Ensure the use of green infrastructure in schools and other educational premises (retrofitting in the playgrounds, gardens and buildings of existing and new builds).
- Outdoor classrooms - an outdoor learning space.

- Forest schools, – long term programmes within a natural space, led by a qualified practitioner. They focus on developing personal, social and emotional life skills through learner led, nature-based learning. There are opportunities for schools to become a qualified practitioner[19]
- Living laboratories – for example, wildlife habitats, weather stations, and grow your own.

Essex benefits from some valuable educational assets set in green infrastructure settings, such as Epping and Hatfield forests, the coasts and rivers. There is also a network of country parks and associated facilities providing a comprehensive range of learning opportunities, suitable for schools and other groups visits.

While some schools do deliver environmental education through Forest Schools, it is largely on an ad-hoc basis. An environmental education framework could be developed to improve facilities and establish a programme of activities with schools and children centres which meets curriculum-based needs and wellbeing of families, as well as creating positive use of school grounds, parks, woodlands and other green spaces.

The framework could build upon existing programmes and activities available such as Forest Schools and Wellies in the Woods project to help children and their families to feel more confident in using local green spaces as described in Figure 14.

Case Study

Figure 14: Evidence to action case study of outdoor education

Wellies in the Woods

Wellies in the Woods delivered by Groundwork East provides play sessions for parents and children based around wildlife exploration, creativity with nature and getting active. The project offered:

- a website funded by the Sylvia Adams Charitable Trust with outdoor activities,
- courses run by Groundwork East to help parents and children explore local wildlife and get creative with nature together, and
- training opportunities for staff at children centres and schools (and even social workers) to promote the importance of and continue to support families to enjoy the outdoors whatever the weather.

The activities are designed for children of pre-school age, but older children can also get involved. Wild play sessions are less about coaching or teaching and more about enjoying the outdoors through one-off or a short set of school holiday activities. There are activities to do for each of the seasons.

https://www.welliesinthewoods.org.uk/

Key Summary Chapter Actions

- **Developments to enhance school grounds for environmental education and biodiversity or open links to green spaces to provide access for existing schools.**
- **Promote environmental education for encouraging hands-on-stewardship or restoration of green infrastructure, as well as provide opportunities for programmes such as Forest Schools and further education courses.**

[19]. Forest School - http://forestschools.com/

8.8 Agriculture

Context

Agricultural practices have had a significant impact on shaping the landscape character of Essex, with 68% of Essex designated as graded agricultural land (mapped in Figure 1 of Appendix B2). Agriculture is an important industry in rural communities. The agricultural system can also play a significant role in maintaining the health of our natural and cultural heritage (highly valued landscapes, structures and biodiversity influenced by natural processes and a long history of land management).

The Roles of Farmers in Green Infrastructure

Farmers have a key role to play as custodians of the countryside to protect and enhance the natural environment and cultural heritage and to meet the needs in areas where opportunities for access and recreation are limited. It is important to encourage and build on their ethos of caring for the environment. Engaging farmers, therefore, in delivering green infrastructure can offer substantial social and environmental benefits, such as:

- Green infrastructure on agricultural properties can support farming production and provide additional ecological goods and services, such as biofuels etc.
- Green infrastructure features can retain stormwater for use during droughts while also filtering runoff, which reduces phosphorus loads and contributes to improving water quality.
- Buffers and hedgerows protect agricultural lands from wind and soil erosion, create green corridors providing vital habitat for wildlife, including pollinators. Along rights of ways on agriculture land they offer a more aesthetically pleasing alternative to standard chain link or wooden fences and provide visual screens, while helping define boundaries.
- Woods and forests offer the potential for very significant benefits in carbon sequestration; provide outdoor spaces for exercise and recreation; and also contribute to improving agricultural productivity.

A number of farmers are engaged in countryside and environment stewardship activities (shown in Appendix B2 Figure 2) and adopt management practices that include green infrastructure features, such as conserving and restoring wildlife habitats, landscape conservation, protection of the historic environment and woodland creation and management, all contribute significantly to the green infrastructure of the County, but more can be done at a local level to support them. There is a need to take into account their local context to work out how best to engage with the agricultural community. Especially with the potential opportunities that could be presented from the withdrawal from the European Union's Common Agricultural Policy (CAP), that originally governed the financial support or market interventions that certain crops and practices receive, that influenced how the land is farmed, food is grown and the state of the natural environment. It is optional for landowners and farmers to take up these subsidies and support. It is likely that some market intervention will remain, particularly in the short-term, after we leave the EU . The emerging new agricultural bill would also offer farmers environmental land management contracts, requiring them to sign up to specified measures to safeguard the natural environment, such as maintaining waterways, reducing harmful emissions and measures to reduce flooding, as well as public access to the countryside (Defra, 2018).

Agriculture and Green Infrastructure - Key Success Factors

A key success factor in integrating agricultural-related green infrastructure is to:

- Manage agricultural land to protect and enhance existing areas of wildlife habitat.
- Maximise opportunities for creating new habitats and filling gaps in ecological networks in agricultural landscapes, with particular attention to green corridor connectivity.
- Increase participation in agri-environmental stewardship schemes.
- It may require many individual farmers to coordinate their management to link green infrastructure on a regional scale across agricultural landscapes. For example, work with existing strategies such as Turtle Dove Friendly Zones; Essex beach-nesting birds Group and the Farming & Land Management Group around the Blackwater Estuary.
- Maximise the opportunity to promote the use of the farmland for outdoor recreation and improved public access for all user groups that could enhance the natural heritage, provide economic value to the industry and educational value, through well designed recreational developments such as farm trails, visitor centres, bridleways and access routes etc.
- Promote public access and enjoyment of the historic countryside by means for example, of information boards, way markers, supported by information and maps on-line.
- Choose robust native vegetation that is adapted to our climate and can withstand the nutrient loads associated with runoff.
- Explore effective management and maintenance regimes of verges and hedgerows to enhance biodiversity net gain.
- Use climate and environment-friendly farming practices (no pesticides, crop diversification, maintaining, existing permanent grasslands and creating and/or maintaining an ecological focus area of at least 5% of the arable area), as promoted by CAP.

- Explore opportunities to implement green infrastructure on agricultural land through for example:
  - Bioswale (wet or dry) - simple landscaping features used to slow, collect, infiltrate, and filter stormwater.
  - Dry pond - a drainage feature that can help reduce surface flooding. It is a man-made depression that captures stormwater runoff during a heavy rainfall.
  - Wet pond - a stormwater facility constructed through filling and/or excavation that provides both permanent and temporary storage of stormwater runoff.
  - Filter strip - are gently sloping, vegetated strips of land that provide opportunities for slow conveyance and infiltration used to reduce sediment, organics, nutrients, pesticides, and other contaminants from runoff and to maintain or improve water quality.
  - Hedgerow - are rows of trees, shrubs and/or vines along roads, and between fields and residential areas.
  - Riparian buffer - a vegetated “buffer-strip” near a stream, which helps to shade and serves as a buffer to pollutants entering a stream from runoff, controls erosion, and provides habitat and nutrient input into the stream.
  - Woodland Creation - recognising that there may be important opportunities for small scale tree planting, for example, on field margins, along water courses or on other (non-prime) arable land.

Green Infrastructure Support for Agriculture and Rural Land

Planting of a large riparian buffer zone or hedgerow can be expensive, but though partnership working with conservation trusts, local council authorities and community groups (e.g. 'Friends of' groups, student groups, scouts etc.) can help reduce the cost to implementing green infrastructure on agricultural land. This will also provide opportunities for public education.

Grant funding is available for planting new woodlands through the Forestry Commission, such as the planning the woodland grant[20] and the Woodland Carbon Fund (WCF)[21]. Under the WCF landowners, land managers, local authorities and public bodies can apply for support to plant large-scale productive woodland. The scheme offers capital funding for the creation of new productive woodland for carbon sequestration. This includes the planting of trees and costs of protection items including tree guards, fencing and gates. There is also funding for the installation of forest roads and recreational infrastructure. While, the Woodland Creation grant, which is part of the Countryside Stewardship scheme offers grants per hectare for planting new woodlands with an additional multi-annual small payment per hectare for a period of 10 years for eligible applicants, which can include payments for capital items[22].

Key Summary Chapter Action

- **Rural communities and associated stakeholders should be supported to create and enhance green infrastructure as a tool to address identified health and wellbeing needs.**

Image: Essex County Council

[20]. Woodland Planning - https://www.gov.uk/guidance/woodland-creation-planning-grant
[21] .Woodland Carbon Fund - https://www.gov.uk/guidance/woodland-carbon-fund
[22] .Woodland Creation grant - https://www.gov.uk/guidance/woodland-creation-grant-countryside-stewardship

Chapter 9

Implementation and Delivery of Strategy

Image: Essex County Council

It is essential that this strategy translates its objectives and proposals into tangible actions and projects where they can be identified. This section sets out how green infrastructure actions and projects can be implemented and resourced.

The aim is to move away from looking at individual parts of the environment in isolation, towards a more joined-up, partnership approach which uses limited resources to secure the greatest gains for the environment and the sustainable economy, as well as the health and wellbeing of its communities. The green infrastructure approach provides opportunities to add value to existing programmes, by highlighting more sustainable solutions, making optimum use of existing budgets and resources to achieve multifunctional outcomes. This will help achieve the sustainability objective of the strategy.

The successful delivery of the strategy vision will be dependent on coordinated, targeted activity and strong working relationships with many partners including the local community.

Image: Essex County Council

9.1 Stakeholder Engagement

The purpose of the Essex Green Infrastructure Partnership is to optimise planning and delivery of green infrastructure in Essex. The partners represent a diverse range of interests, all focused on enhancing the natural and historic environment, whilst encompassing sustainability, health and wellbeing and the economy.

Working in partnership will help to achieve a coordinated, cross boundary and inter agency approach to the delivery of green infrastructure across the county and beyond. Delivery will be achieved in a wide variety of ways and with different bodies taking the lead through for example:

- Engagement with partners such as the Local Authorities on this issue, Planners, Landowners, Developers and other key Service Areas.
- Public Consultation.
- Essex Planning Officers' Association engagement.
- Workshop sessions, with key stakeholders to input into setting the strategic action priorities.
- Further green infrastructure mapping is to be undertaken and updated to form the evidence base for the strategic action priorities.

Equally important to ensure the green infrastructure is valued by people is to seek input and involvement, from local communities to tap into their local knowledge and give them a chance to shape the design. Green infrastructure is all about 'place making', in which the communities are their true owners. Getting buy in and support makes all the difference in getting a scheme to work, be sustainable and encourage community ownership and involvement such as volunteering. Communities can provide useful information on what existing green infrastructure should be kept, the best places for new connections, routes and linkages, and what new additions they would like in their area, be it allotments, cycle routes or parks. This can help foster community pride in the place.

Image: Essex County Council

9.2 Funding

Whilst there are traditional funding pots for green infrastructure such as Lottery, Section 106, charity funding etc, this strategy has shown that green infrastructure meets the objectives of many other sectors, and as such, there are a variety of potential projects and funding sources which can fund green infrastructure. Below are some examples:

- Government's High Street Fund bid where ECC are looking to invest £25 million in an Essex Town centre where reshaping of the centre will include green infrastructure.
- The programmed Pitsea Landfill restoration of 3.7km2 in 2023, will create another huge area of green infrastructure in South Essex.
- Coast path implementation which is 100% funded by Natural England and first section of nine can now be implemented.
- Surface Water Amelioration Schemes from Essex Highways could include green infrastructure to absorb water.
- The Environment Agency and the water companies have funded new green infrastructure to create "Natural Flood Management".
- Community Access Fund, funding access to Lee Valley across Essex for groups to visit and be coached in the Lee Valley Park.
- The Active Essex partnership has won £10 million for the Essex Local Delivery Pilot from Government to enable local communities to access sport and other activities using local facilities, including green infrastructure.
- Anglian Water have a campaign called "Make Rain Happy" and want to soften landscapes to absorb water and plant a million trees over 25 years.
- Social Prescribing - Government announced social prescribing in late Jan 2019 as a way to link GPs with walking groups etc to utilise green infrastructure.
- Highways schemes to lower pollution such as the A127 study which is providing cycleway infrastructure which is often also green infrastructure.
- Green Space sponsorship to ensure their long-term management and offer opportunities to show case best practice.
- Recreational disturbance Avoidance and Mitigation Strategy could consider the delivery of creating and improving appropriate green infrastructure within their mitigating projects. The 12 Councils in Essex will produce a shared mitigation strategy to identify the measures that are needed and how they will be funded and delivered.
- The Essex Forestry Initiative has earmarked a £500,000 Carbon reserve over 5 years to pay for 150 hectares of woodland or 375,000 trees with another £500,000 coming from Forestry Commission grants and partner contributions.

Much can be achieved with existing resources including invaluable volunteer efforts. This is especially important since public sector finances continue to be constrained across the county, therefore, there will be a need to work more efficiently with the resources that are available. This means identifying opportunities to deliver across outcomes, working in partnership and accessing external funding wherever possible to deliver our priorities.

Although a challenge, planning for the delivery of green infrastructure will need to consider and make arrangements, (whether through developers, landowners, community groups and managing companies) for the ongoing management and maintenance of the asset. As well as over time, to be assured that the benefits and functions are delivered and secured in the long term, therefore we will need to look at different ways of using revenue funding to secure long-term maintenance.

There are a range of grants and funding options available that will be explored, although they rely on the preparation and submission of applications and the outcome of competitive bidding processes. As a result, there will be a need to establish a coordinated approach to identifying and maximising funding opportunities, establishing mechanisms for co-delivery as appropriate. Table 7 in Appendix B13 describe the variety of funding sources will be derived from. Making this happen can take many years, but the results can transform an area for the better.

To fund green infrastructure, we require a flexible funding mechanism. A Green Essex Fund could act as a fund for endowments, donations, successful bid and other green infrastructure purposes (including maintenance). Whilst managed by ECC it could be steered and used by the wider Green Essex Partnership. It will require clear governance and terms of reference to define the purpose, objectives, roles and delivery of green infrastructure projects.

Figure 15 gives two examples where ECC has created financially self-sustaining green infrastructure to ensure its long-term management and maintenance; namely the Essex Country Parks and Essex Woodlands project.

Essex Parks & Woodlands	Essex Woodland Project
Essex County Council manages 7 Country Parks to provide recreation, allow flora and fauna to flourish and protect history. The parks' maintenance and development are funded mainly through car parking costs. Additional incomes are derived from catering offers, commercial hire, admissions events, rental of areas of the park and film company hires. This diverse income stream is a good model for many green infrastructure venues to consider, making the parks self-sustaining, an important resource for today and the future. http://www.visitparks.co.uk/ 	The Essex Woodlands Project is an innovative and sustainable approach to the management of Essex County Council's woodland estate. It aims to sustainably manage remote (unstaffed) areas of woodlands in a way that minimises financial burdens on the Council. With little or no active management over the past ten years, the woodlands have suffered from overgrown paths, unmanaged habitats and historic features and outdated interpretation materials. Under a Countryside Stewardship agreement with the Forestry Commission and Natural England, Place Services will implement woodland management plans for 32 sites and a total area of 3km^2. This includes 3 sites which are designated Sites of Special Scientific Interest (SSSI) and 22 areas of ancient woodland (which are over 400 years old). Maintenance work will be undertaken in a sensitive way with the use of Suffolk Punch horses and will be supported by rangers, volunteers and partner organisations such as The Conservation Volunteers. *http://www.essexwoodlandproject.org/*

Figure 15: Evidence to action case study example of self-sustaining funding

9.3 Timelines for Delivery

The strategy sets the framework for delivery but needs to be monitored and reviewed on an ongoing basis.

Key Summary Chapter Actions

- **Green infrastructure needs continued investment and managing to ensure that the benefits from green infrastructure is maximised. This will be achieved through the creation of a Green Essex Fund and exploring other funding opportunities mentioned in this strategy. Contributions towards local green infrastructure projects will be sought where green infrastructure is provided as part of a development, applicants should also detail how it will be maintained in the long term.**
- **We will form better partnership working across Greater Essex to deliver a green infrastructure network.**

Chapter 10

Delivery - Action Plan

Image: Essex County Council

The action plan will set out a programme of proposed actions and measures for implementation of the green infrastructure strategy to achieve the green infrastructure objective over the next 15 years. It is primarily intended to provide a framework for the coordination of green infrastructure planning and delivery as well as facilitating coordinated action by local partnerships and stakeholders in the public, private and voluntary sectors involved in the delivery and management of specific green infrastructure assets or sites. A wide variety of individuals, groups and organisations, in addition to Essex County Council and the Local Authorities in Essex, will have an important delivery role to play.

The Council will continue to work with partners to validate and programme the delivery priorities and emerging strategic projects and tasks and will develop further implementation plans. The action plan will be monitored, updated and reviewed to focus on delivery as and when resources become available and will respond to changing priorities and opportunities. A priority will be to agree and put in place an appropriate governance structure to oversee development of the action plan and to monitor progress.

The following action plan is broken down into the key themes aligned to the objectives and the proposals mentioned in chapter 6, as well as divided into four phases of priority. Phase one lists the actions and projects prioritised for years one and two of the strategy.

Image: Essex County Council

Phase One

Objective	Themes	Proposals	Actions
Protect	Re-designation of green infrastructure	Encourage and support the review of existing designations (i.e. SSSis etc.) and local landscape designations to ensure their currency and maintain the accuracy of site information. Support the recognition and appropriate designation of new green infrastructure, e.g. Local Wildlife Site, Local Nature Reserve.	Discuss with Local Planning Authorities, Natural England, Essex Wildlife Trust and Place Services (Environmental consultancy to lead) regarding reviewing and re-designating (as LoWS etc.) the new green infrastructure as new designations e.g. Wallasea, South Essex Marshes, Thames Chase etc. taking into consideration the Assessments and Best and Most versatile Land analysis for agricultural land.
Improve	Marketing, branding & promotion	Create a Green Essex Network to develop, improve and promote Green Essex	Contact the green infrastructure Knowledge Hub group to liaise about the establishment of the Green Essex Network. The GE Network would comprise of the main green infrastructure managers, Landscape Planners and would coordinate the development of Green Essex.
Improve	Improve, repurpose and create new multi-functional green infrastructure	Public Realm green infrastructure improved to reduce pollution and improve character and sense of place	• Establish a tree planting programme of delivery for the Essex Forest Project 2019 – 2025 to address air quality issues and carbon reduction • Work with partners to develop local targets for increasing tree and woodland cover. • Work with Essex Highways to increase green infrastructure in the public realm.
Improve	Natural Flood Management techniques	Create Water Gardens, Green roofs and Bio-retention areas to absorb urban water	Working with MITIE and explore opportunities of garden roofs on ECC Estate and establish a volunteer Gardening Group.
Improve	Natural Flood Management techniques	Continue creating green spaces which also function as Natural Flood Management and SuDs schemes	• Seek funding from partners to address flooding but also create green spaces with multiple benefits and provide environment net gains. • Delivery Make Rainwater Happy – Flood prevention Programme
Create	Improve, repurpose and create new multi-functional green infrastructure/ Environment net gain & offsetting	Use planning policy to secure multi-functional green spaces within and beyond development site boundaries through the application of biodiversity net gain, biodiversity off-setting and the creation of compensation habitat and other green infrastructure promotion schemes.	• Work with Essex Planning Officer Association (EPOA), Place Services and partners to develop the 'biodiversity net gain' methodology the first stage of development towards an environment new gain approach, to ensure wider benefits of the green space is realised (i.e. access for people). Pilot the methodology in Castle Point Borough Council area.

Phase One Cont.

Objective	Themes	Proposals	Actions
Create/ Connectivity	Connect people green infrastructure through active travel	Develop the coast path in Essex in a sustainable manner.	• Contact Natural England about the status of the 9 stretches of coast path in Essex • Essex Highways to manage the delivery of the Essex Coast path • Improve access to the coast path using sustainable transport, signage etc utilising innovative funding such as the Coastal Communities Fund • Deliver "Path to Prosperity" in Tendring. – Provide a Hopper Bus
Create	Improve, repurpose and create new multi-functional green	Create green infrastructure in new developments such as Garden Communities, with best practice guidance on its design and management for multiple benefits.	• Continue to consult on green infrastructure on key documents, such as: – Essex Design Guide – Highways Plans – Local Plans – Garden Communities and villages proposals – Health Impact Assessments. • Establish a Green Infrastructure Garden Communities and Planning Development consultation service. • Create links to Best Practice for GI via a Green Essex website.
Inclusivity	Delivering environmental therapies and activities	Explore Environmental therapies and challenges across all social, demographic, ethnic and diversity groups and promote activities in green spaces.	• Liaise with Education service, Children's services, health partners, Outdoor pursuits and Country Park to build upon existing programmes • To help develop young people and provide activities across all social groups.
Health and Wellbeing	Marketing, branding & promotion	Develop and Promote Healthcare and Wellbeing through green infrastructure activities.	• Liaise with Public Health and Health and Wellbeing Boards in District, Borough and City to assess health deficiency areas and propose green activities such as walking and other physical activities. • Work with Active Essex and Active Southend on their projects to better use green spaces to encourage more people to be active.
Sustainability	Improve, repurpose and create new multi-functional green infrastructure	Create a Green Essex Fund for endowments, fund raising bids, donations etc. in conjunction with the development of a Green Essex Network.	• Set up a fund in conjunction with Essex Finances and steered by the Green Essex Network and Partnership. • Ensure funding includes managing volunteers and maintenance programmes, terms of reference and clear governance processes.

Phase Two

Objective	Themes	Proposals	Actions
Protect	Marketing, branding & promotion	Highlight green infrastructure in Essex in terms of their multi-functionality and benefits – through rebranding Essex as Green Essex with 1,978 designations.	• Working with Visit Essex, Essex Communications and partners to develop a pan Essex Marketing Strategy to create a brand for Green Essex that also promotes local identifies and brands
Protect	Environment net gain & offsetting	Embedding an 'environmental net gain' principle for development, including housing and infrastructure.	• Create the methodology of the 'environmental net gain' principle so it can be used in the following guides/plans: – Essex Design Guide – Highways Plans – Local Plans – Garden Communities and villages proposals – Walking Strategy, Cycle & Walking Improvement Plans, Cycle Action Plan, Rights of Way Improvement Plan. – Essex Planning Officers' Association (EPOA) Healthy Places guidance notes – Work with EPOA, Place Services and partners to develop the 'environmental net gain' methodology.
Improve	Improve, repurpose and create new multi-functional green infrastructure	Encourage better management of green infrastructure to benefit locally native species, focussing on recognised nature conservation priorities.	• Promote locally native species in the rural environment; otherwise consider species selection in urban areas and new developments balanced with other attributes such as visual quality, scent, size, all year interest, autumn colour etc.
Improve	Improve, repurpose and create new multi-functional green infrastructure	Public Realm green infrastructure improved to reduce pollution and improve character and sense of place.	• Development and coordination of cycling and walking strategies to deliver green infrastructure within those projects. • Working with rural communities, landowners and other relevant bodies (i.e. EA, NFU, CLA, MOD, EH etc.) in delivering landscape, biodiversity, heritage and access enhancements through existing and potential future environmental stewardship programmes. • Explore opportunities to greening town centres for air pollution amelioration through the creation of Parklets

Phase Two cont.

Objective	Themes	Proposals	Actions
Improve	Natural Flood Management techniques	Continue creating green spaces which also function as Natural Flood Management and SuDs schemes.	• Seek funding from partners to address flooding but also create green spaces with multiple benefits and provide environment net gains. • Delivery through development management on major development sites.
Create/ Connectivity	Connect people to green infrastructure through active travel	Develop the coast path in Essex.	• Market and promote the coast path through Visit Essex, Comms and other partners.
Connectivity	Connect people to green infrastructure through active travel	Restore and promote Essex promoted paths.	• Liaise with Public Rights of Way team, Country Park, community groups and other partners to assess condition of current paths and prioritise promotion and any improvement works needed or recommendations for new and better paths.
Create	Connect people to green infrastructure through active travel	Create Town or village circular routes especially in areas of green infrastructure deficiency.	• Seek sponsorship for a pilot circular village route(s) competition. Liaise with Parish Councils, District, City and Borough Councils, Active Essex, Active Southend, Local Health and Wellbeing teams and/ or Village groups to deliver circular route.
Connectivity	Connect people to green infrastructure through active travel	Establish Inter connecting paths between green infrastructure, that provides access for all.	• Using the UEA mapping to identify greenway routes which realise most multiple benefits by connecting green infrastructure , wildlife and landscape.
Inclusivity	Marketing, branding & promotion	Promote activities to raise awareness of green infrastructure and its benefits across all social, demographic, ethnic and diversity groups.	• Provide support to groups through activities, provision of site maps, and design of sites, such as sensory gardens/walks, improved signage etc. • Promote and make wider use of Parks and other open spaces e.g. for community events, park runs, markets, walking and cycling loops, outdoor gyms and natural play areas.
Health & Wellbeing	Delivering environmental therapies and activities	Explore Environmental therapies delivered through mental health services.	• Liaise with Mental Health Agencies, wider health partners and community voluntary sector to develop Green Activities such as green gym, eco-therapies, guided walks.

Phase Three

Objective	Themes	Proposals	Actions
Protect	Improve, repurpose and create new multi-functional green infrastructure	Coordinate the protection of coastal green infrastructure through the Essex Coast Recreational disturbance Avoidance and Mitigation Strategy (RAMS).	• Engage with Place Services and partners to develop the RAMS schemes to protect important nature conservation sites in Essex.
Improve	Improve, repurpose and create new multi-functional green infrastructure	Support the development of new Visitor Centres and facilities.	• Liaise with ECC Country Parks and partners to support new Visitor Centre improvements and facilities in the Country Parks.
Improve	Improve, repurpose and create new multi-functional green infrastructure	Public Realm green infrastructure improved to reduce pollution and improve character and sense of place.	• Working with health and flood partners to seek funding to create a green infrastructure Pilot project to support people to lead healthier lives. • Seek funding to improve the public realm for pollution and other benefits.
Create. Connectivity	Connect people to green infrastructure through active travel	Develop the coast path in Essex in a sustainable manner.	• Liaise with Highways about the opening of further sections of the coast path in Essex.
Create	Marketing, branding & Promotion	Increased access to the Outdoor Pursuits Centres.	• Liaise with Outdoor Pursuits Centres, Active Essex, Active Southend and Country Parks to explore extending the Outdoor Pursuits offer.
Create	Improve, repurpose and create new multi-functional green	Establish green infrastructure as part of Minerals and Waste restorations with reference to nature conservation priorities e.g. Pitsea Landfill.	• Consult on green infrastructure after use with Mineral and Waste Planners. • Liaise with Mineral and Waste Planners as minerals and waste sites are prepared for restoration and after care as green space to maximise green infrastructure value.

Phase Three Cont.

Objective	Themes	Proposals	Actions
Connectivity	Connect people to green infrastructure through active travel	Establish Inter connecting paths between green infrastructure.	• Use this map to identify gaps and missing links in the greenways network to be prioritised and apply the principle of least restrictive access (considering wildlife and people separately).
Inclusivity	Marketing, branding & promotion	Explore Environmental therapies and challenges across all social, demographic, ethnic and diversity groups and promote activities in Green spaces e.g. mountain biking, Go Ape, Geocaching, arts and crafts, etc.	• Promote activities in Country Parks, Outdoor Pursuits centres, Active Essex, Active Southend and partner sites to develop activities for all social groups, including youth orientated activities.
Health & Wellbeing	Delivering environmental therapies and activities	Explore Environmental therapies delivered through mental health services.	• Better promotion and tailor Green Therapies to mental health service users.
Health & Wellbeing	Marketing, branding & promotion	Develop and Promote Healthcare and wellbeing through green infrastructure activities.	• Improve attractiveness of site facilities through improved signage (e.g. destination information, maps), amenities (e.g. seating, toilets) and ensuring accessible.
Sustainability	Improve, repurpose and create new multi-functional green infrastructure	Develop new and existing facilities that will generate revenues.	• Liaise with green space managers to identify potential income generation facilities, including a creation of a Green Discovery Park. • Identify the relevant funding streams to create new facilities via the Green Essex Network • Cross reference actions within the Local Planning Authority's green infrastructure strategies with the Essex Green Infrastructure Strategy to ensure the strategies are aligned and create opportunities for collaboration via the Green Essex Network • Work with the districts to help draft and/or deliver their Green Infrastructure Strategies to add value and ensure a coordinated approach via the Green Essex Network

Phase Four

Objective	Themes	Proposals	Actions
Improve	Marketing, branding & promotion	Better marketing & promotion of green infrastructure to increase use and income.	• Working with Visit Essex, ECC Comms and partners to develop a pan Essex Marketing Strategy to: – Promote new Visitor Centres and facilities. – Creation of a Green Essex promotion – a network for pan Essex green space and facilities marketing. • Promote public access and enjoyment of the historic countryside) (e.g. by means of information boards supported by information and maps on-line.
Improve	Improve, repurpose and create new multi-functional green infrastructure	Public Realm green infrastructure improved to reduce pollution and improve character and sense of place.	• Explore and Implement an Essex Green Permit Scheme, allowing locals to adopt and green up areas within the public realm.
Improve	Natural Flood Management techniques	Create Water Gardens, Green roofs and Bio-retention areas to absorb urban water.	• Liaise with Essex Highways and Floods teams to seek funding for the provision of green infrastructure and SuDS (Sustainable Drainage Systems).
Create. Connectivity	Connect people and wildlife to green infrastructure through active travel	Develop the coast path in Essex.	• Collaborate with Visit Essex and Culture to develop events on the coast increasing the cultural offer of the coast.
Create	Improve, repurpose and create new multi-functional green infrastructure	Develop green infrastructure as part of Minerals and Waste restorations with reference to nature conservation priorities e.g. Pitsea Landfill.	• Explore opportunities to create a Green Discovery Park, showcasing green Infrastructure, solar energy, SuDS, climate resilient planting, Waste and Recycling and electric vehicle charging and sustainable visitor centre as a multi-functional and educational site. • Provide green infrastructure training for Minerals and Waste planners.

Phase Four Cont.

Objective	Themes	Proposals	Actions
Create Connectivity	Improve, repurpose and create new multi-functional green infrastructure/ Environment net gain & offsetting	Strategically identify priority areas for the creation or improvement of green infrastructure that could provide most benefit for locally native species of recognised nature conservation priority and enhance local landscape character. Use new green infrastructure provision to buffer or extend existing designated sites.	• Action to be confirmed • Work with EPOA, Place Services, Essex Wildlife Trust and partners to develop the 'environmental net gain' methodology.
Connectivity	Connect people to green infrastructure through active travel	Establish Inter connecting paths between green infrastructure.	• Seek funding from various benefit funders to create inter connecting paths.
Connectivity	Connect people to green infrastructure through active travel	Restore and promote Essex promoted paths.	• Seek funding (local and national) to fund promotion and infrastructure to those paths identified for improvements.
Health & Wellbeing	Marketing, branding & promotion	Develop and Promote Healthcare and wellbeing through green infrastructure activities.	• Raise the profile of these facilities through marketing, advertising locally and on the internet, such as Visit Essex.
Sustainability	Marketing, branding and promotion	Create a distinct Green Essex identity through the development of a Green Essex Network to encourage a strong community engagement through the pan Essex Marketing Strategy and brand for Green Essex that also promotes local identities and brand.	• Partnership working with stakeholders and community groups to provide and maintain green infrastructure.

Chapter 12
Strategy Review

Image: Essex County Council

To ensure that the vision, objectives and actions proposed by this strategy continue to be met, evaluation and monitoring will be undertaken as shown in Figure 16. This will allow progress to be continually monitored, allow the strategy to be responsive to legislative change and remain current and on track to achieve its vision. The planning, funding and provision of green infrastructure will continually be improved, and current best practice followed. This strategy is intended to be a 'live' document that is regularly reviewed so that it can maintain the essential characteristics of the county's environment into the future.

Figure 16: Review and Monitoring Process

Chapter 12
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Image: Essex County Council

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This information is issued by
Essex County Council

Contact us:
environment@essex.gov.uk

Environment and Climate Action
Essex County Council
Chelmsford
CM1 2QH

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