AECOM

GREATER ESSEX GROWTH AND INFRASTRUCTURE FRAMEWORK 2016-2036

February 2017

EXECUTIVE SUMMARY

Greater Essex is a place of opportunity. Currently home to 1.8 million people, with a further 300,000 forecast to live in the area within 20 years.

Expected growth on such a substantial scale is testament to the economic strength and quality of life offered by the towns and villages within Greater Essex. But to be successful, growth requires infrastructure, and infrastructure needs investment.

To better understand the scale of the infrastructure challenge, all of the local authorities in Essex commissioned AECOM to prepare a Growth and Infrastructure Framework (GIF) for the county and two unitary authorities. The framework presents an overview of growth patterns to 2036, evidences the infrastructure required, and estimates likely costs and funding gaps.

This report 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 toward their delivery and the funding gap for the period up to 2036. The framework has been produced by AECOM based upon an analysis of available evidence provided by local authorities throughout Essex and augmented by a desk based assessment of additional published information. The framework was then verified through further engagement with all the Essex local authorities and with other infrastructure providers.

It provides a "snap-shot" reflecting the position in October 2016. It is not intended to supersede or replace local studies, some of which use different metrics that may better reflect local circumstances. Findings are based on common funding and cost assumptions and modelling work that may differ from those used in individual local infrastructure delivery plans and documents.

KEY FINDINGS FROM THE GIF

The following key findings have been established:

- Greater Essex authorities are required to accommodate housing and economic growth over the 20 year period to 2036 delivering on average **8,980 dwellings per annum, or 179,660 dwellings over the 20 year period.** This compares to average annual completions of 4,630 dwellings per year across Essex from 2004 to 2015.
- ONS Population projections forecast a **population increase of 298,700 people (an increase of 17%**).
- **79,000 additional jobs** are forecast by the East of England Forecasting model (2016 run), an increase of 10%.
- Local authorities across Greater Essex have identified housing **supply trajectories for approximately 137,660 homes** between 2016 and 2036.
- Delivering the necessary infrastructure to support that growth from now to 2036 is **estimated to cost at least £10.4 billion** in 2016 terms. This represents an estimate of capital delivery costs only and does not include the additional annual revenue requirements and maintenance costs.
- The study has reviewed the potential costs of delivery alongside currently identified secured funding, potential funding from public, private and developer contributions highlighting a **remaining funding gap estimate of over £4.4 billion** at 2016 prices.

INFRASTRUCTURE ASSESSMENT

The study has examined a comprehensive scope of infrastructure topics and has highlighted a number of key infrastructure issues facing Greater Essex including:

- Growth in Greater Essex over recent decades has created a deficit in existing infrastructure.
- In particular the growth in journeys by road and rail has not been matched by sufficient government investment to enhance the network. The framework has identified that **major transport projects need to secure £26.5 billion (regional) and £5.5 billion (cross-boundary) funding. These projects currently have a funding gap of around £11 billion.**
- Infrastructure capacity within Greater Essex will also be affected by housing and economic growth in neighbouring areas. In particular the influence and reach of the London City Region, and the over-heating Cambridge economy will impact in different ways on localities within Essex. The emergence of the new London Plan is expected to displace housing and employment from London along strategic growth corridors into Essex. Equally, major developments planned outside Essex but within the region including the Gilston area north of Harlow, Ebbsfleet Garden City Kent, Northstowe New Town and the expansion of new Garden Settlements surrounding Cambridge will all have an impact.
- Infrastructure planning in Greater Essex must take into consideration the demands and capacities of infrastructure across the region as a whole, including for example major development in East Herts and in the Thames Gateway. Major infrastructure investment is

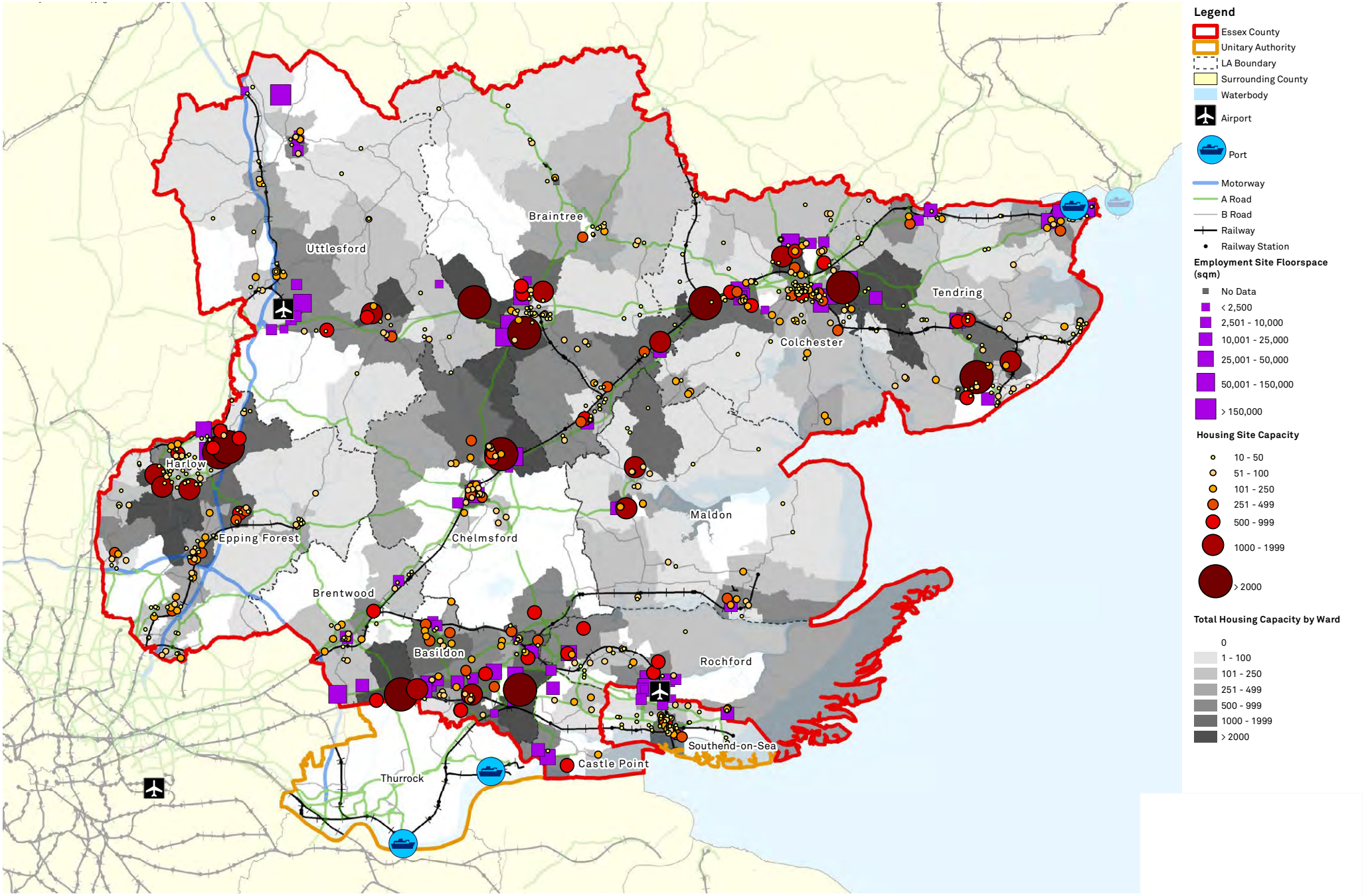


FIGURE A - STUDY AREA AND MAJOR HOUSING/EMPLOYMENT SITES

* This is based on the most up to date information at the time of publication (October 2016) and could be subject to change, subject to the local plan work

Source: Local Authority data

proposed on the regional strategic road network (M25, M11, A12, A14 in Cambridgeshire and the third Thames Crossing) and rail network which will have direct impacts on the sub regional and local network. The long term uncertainty of some of these major infrastructure projects, including the third Thames Crossing, makes it difficult to plan effectively to support that infrastructure and accommodate growth. For example the additional Thames Crossing and uncertainty about its route makes spatial planning particularly difficult in the South of Essex.

- Education demand will expand considerably over the next twenty years driven by the scale of housing growth planned. A number of new secondary schools will need to be built, in addition to those required by population growth and policy changes. The limitations of the Community Infrastructure Levy (CIL) make it impossible to secure sufficient funding from developers, particularly to cover the full cost of building new secondary schools. Consequently, for the strategic development sites, the Education Authorities look for a zero CIL rating to ensure the correct level of developer funding is capable of being secured. This particularly applies to the strategic development sites and new Garden Settlements, which will each require new secondary school provision.

- To stay healthy, more residents and employees need to walk and cycle, and take fewer journeys by car. We need to invest in a transport system that enables this change. The principles of planning for public health benefits will need to be applied through carefully crafted Local Plan policies and land allocations. The concept of planning for healthy new settlements will need to apply to the larger scale site allocations including the new Garden Settlements.

- Pressure on the existing health and social care sector is acute and will continue to grow. There is also a drive to reconfigure acute hospital beds, and transfer further significant services into the community - promoting realignment of community and primary care facilities to benefit the need of the changing population demographics. This will require a different approach to facilitate co-location of public services and other community facilities. At the time of drafting the Growth and Infrastructure Framework the local health economies have been developing Sustainable Transformation Plans (STP) collaboratively with key stakeholders through the Clinical Commissioning Groups. The STP's will be the key documentation guiding strategic planning and change to the healthcare system.

- Greater Essex is shown to have a diverse, high quality landscape with numerous natural assets. Impacts from planned housing and economic growth will need to be mitigated through the provision of new strategic sites and also by enhance the quality of existing sites, improving access and wider landscape management practices. Options for infrastructure provision and delivery may be limited by environmental constraints. Essex is within an area of acute water stress and development costs may be considerably higher where habitats/species are water dependent.

- Any future decision to proceed with the potential nuclear power station, Bradwell B in the Maldon District, would have a significant impact on infrastructure needs locally and across Greater Essex. A potential construction project lasting many years and generating up to 6,000 jobs would have major impacts on the transport network and local social infrastructure requirements. As no decision has been taken at the time of publication, these impacts are not within the scope of this study. The timetable for a potential power station at Bradwell B is unknown at this stage.

INFRASTRUCTURE FUNDING

- Existing funding will not deliver the scale of infrastructure investment identified in this framework. Developer contributions (whether s106, s278 or CIL), local authority capital programmes or current public sector funds and grants will fall short.

- All local authorities in Essex need to work together to devise an integrated package of funding sources and delivery mechanisms that meet the needs of different areas and types of infrastructure. Section 6 of this framework document presents a summary of potential options and the benefits and limitations of each.

- The challenge will need to be met in part through approaches that achieve the demands of residents and businesses through innovative services that require less capital investment. This change has already begun across many sectors, through integrated services, technological advances and redirecting service demand, for example to more cost effective solutions such as community healthcare and outpatient services to relieve pressure on acute hospitals.

- Given the funding gap, Greater Essex will have to prioritise infrastructure investment with the greatest impact. This requires further analysis to assess which projects are most important, and which funding sources are appropriate for Essex. Authorities need to consider the potential for investment mechanisms, such as Local Delivery Vehicles and revolving investment funds, in the light of their capability and capacity to develop and manage such instruments.

- The GIF recognises the invaluable work undertaken by the local authorities, LEP and its partners across Greater Essex to produce its latest Growth Bid document and the level of work required to arrive at a 'shortlist' of priority projects chosen to facilitate growth and deliver the greatest returns on investment. This approach may be one model to follow when determining prioritisation.

FUTURE ACTIONS FROM THE GIF

Greater Essex and its partners have identified the following actions to take the Growth and Infrastructure Framework forward:

- Enable the wealth of information and GIS mapping data collated in the production of this Growth and Infrastructure Framework to be accessed by all relevant partners to inform their respective infrastructure planning work and to enable partners to understand and interrogate the data held within the GIF databases. It is currently envisaged that this will be enabled through integration of the GIF data into one of the existing online platforms operated by Essex County Council.
- Revisit the evidence base behind this study on a regular basis in collaboration with partners to maintain a rolling understanding of the infrastructure landscape and funding priorities. Consideration of the desired review and update mechanism for the GIF information sharing and analysis and how frequently this is undertaken will need to be considered by the Greater Essex authorities. Future iterations of the GIF will need to use Infrastructure Delivery Plans prepared by the local authorities, a number of which are currently updating these documents.
- Consider the commissioning of detailed infrastructure topic specific assessments of infrastructure supply and demand modelling for the medium and long term to provide a more robust evidence base when planning over 20 year timeframes, which often exceed any organisation's planning horizon. This would support effective planning past the 5 - 10 years as is currently undertaken.
- Continued joint working between the Greater Essex authorities through sub regional partnerships such as the South Essex Growth Partnership and the Haven Gateway Partnership and work with the Local Enterprise Partnerships and other local authorities in the South East on strategic issues and priorities. This may include linkages to London and routes to better connect the wider sub region. In addition, considering the impacts of major infrastructure proposals such as the Lower Thames Crossing and the Crossrail extension.
- The potential for an organised GIF Engagement Forum between the Greater Essex authorities and relevant external partners such as the health sector, utility companies, Environment Agency, Highways Agency, Network Rail and other operators to consider greater integration on long term growth and infrastructure planning.
- Consider the joining up of infrastructure modelling across a much larger geography, principally the East and wider South East regions, for subjects including transport models, waste water modelling, and social infrastructure models. Including holistic consideration of cross border requirements and aligned to planning and funding bid timetables.
- Use the evidence provided within the GIF and subsequent updated versions of it, to help review existing capital programmes to shape, prioritise and sense check project pipelines across a range of infrastructure work streams to optimise outcomes. The sequencing of capital infrastructure expenditure is very important, if this is done well it can offset future capital expenditure.
- Use the study as a tool for engagement with Central Government and the National Infrastructure Commission (NIC) in demonstrating the challenges faced in supporting growth across Greater Essex and continue dialogue with the GLA, DCLG, BEIS and other government departments on wider issues including the growth of London.
- Use the study as a tool for engagment with adjoining authorities including the Co-operation for Sustainable Development Boards in Essex through which West Essex, for example, engages with East Herts authorities.
- Consider the implications of infrastructure providers' decisions both now and in the future. This study has used standard metrics to determine requirements for some infrastructure elements (such as healthcare, libraries, community and leisure, youth services, social care accommodation etc.), but the actual requirements will be heavily dependent on service decisions on new delivery models which are affected by regulatory, financial and technological changes.
- Explore further links between sub regional infrastructure planning as presented within the Greater Essex GIF and opportunities and synergies between the requirements identified in this work and the continued review of local authority assets as part of the One Public Estate programme.

A RECOMMENDED WAY FORWARD

The GIF outlines and identifies considerable funding and therefore delivery challenges to 2036. Given that housing delivery across Greater Essex needs to double the current rate of provision for the next 20 years, the cost of the infrastructure required to support this growth equates to £10.4bn which amounts to £5,780 for every current resident. However, only 7% of the required funding has been secured and, while a further 50% is expected, there are no current funds for the remaining £4.4bn.

As well as some difficult decisions, the way forward will require radical and innovative funding solutions as well as a prioritisation approach that aligns with early stage business case development. This will involve:

- A focus on innovative large scale funding solutions, accepting that just leveraging up the current mix will not fix the funding gap. This may require new locally devolved tax raising measures and spreading the costs across many users and beneficiaries.
- Recognising that the capital investment needed to support infrastructure requires a different approach to planning particularly in relation to bringing forward land allocations. Generally the larger scale strategic development sites meet their infrastructure costs. The allocation of Garden Settlements being progressed by a number of local authorities is cognisant of this infrastructure funding challenge.
- A clear focus on securing the expected funding otherwise the infrastructure funding gap rises to 93% and, as far as possible, working to remove uncertainty around major investments that will have a disproportionate long term impact on growth in Greater Essex such as the third Thames Crossing.
- Essex identifying strategic transport corridors as the key priorities for future investment. These are the three corridors radiating out of London; the M11 corridor including the West Anglia mainline and Crossrail 2 (including the potential extension of Crossrail 2 to Harlow), the A12 corridor including the Great Eastern mainline, and the A13/A127 corridor and parallel Essex Thameside rail line. In addition to these three corridors radiating from London, the Essex economy is also dependent upon a fourth corridor providing connectivity between Essex to the rest of Britain via the A120/A14 and parallel rail routes. These priority corridors have also been identified by the Greater London Authority and the East of England region as part of the new London Plan work as foci for growth and investment.
- Developing an infrastructure prioritisation matrix across Greater Essex based on potential, deliverability and leverage of funding.
- In terms of potential, this could, for example, focus on key locations that deliver the greatest housing numbers (e.g. Harlow and Basildon given their ability to accommodate London housing pressures, areas north of Chelmsford and areas around Colchester) or that leverage strategic economic nodes (e.g. any expansion of Stansted, potential Bradwell B effects and/or impacts of the third Thames Crossing).
- As well as potential, there is a need to consider deliverability of homes and jobs so those schemes which are at an advanced stage (e.g. in terms of consenting, other funding in place, funding of partners, risks) would be considered a higher priority for infrastructure investments.
- Finally, given the funding gap, there should be a focus on funding leverage from public and private sectors so the minimum is invested for the maximum returns.

GREATER ESSEX

THE INFRASTRUCTURE STUDY IDENTIFIES THE FOLLOWING HEADLINES BETWEEN 2016 & 2036:

179,660
homes needed

137,660
homes planned

298,700
new people (+ 17%)

79,000
new jobs (+10%)

Total Infrastructure Costs: **£10,365,240,000**

Total Secured Funding: **£715,610,000**

Total Expected Funding: **£5,225,530,000**

Total Funding Gap: **£4,424,100,000**

% of Infrastructure Funded: **57%**

Costs and Funding presented on this page excludes Regional Projects presented on page 106.

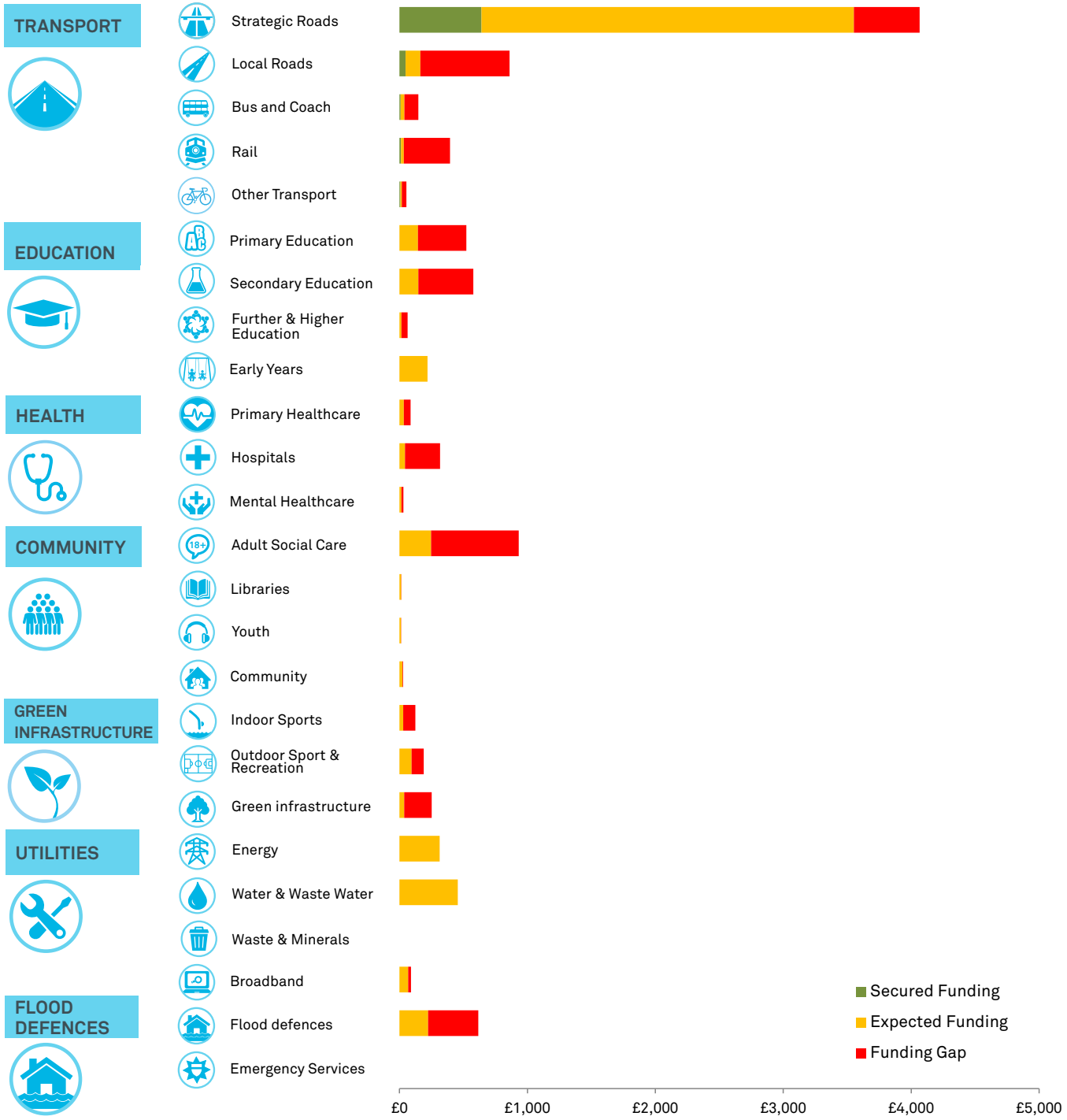


FIGURE B -SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)

The diagram on the facing page illustrates the range of infrastructure required to support 179,660 new homes, 79,000 new jobs and 298,700 new residents. This infrastructure includes social infrastructure, transport, utility networks, open space and flood protection. The analysis highlights more than £10.4 billion in estimated infrastructure costs between 2016 and 2036.

Our analysis has reviewed the potential costs of infrastructure alongside currently secured funding, and potential funding from public, private and developer contributions, highlighting a funding gap of as much as £4.4 billion. Further analysis is required on the level of secured and potential funding.

Figures C and D on this page summarise the local infrastructure project costs for each of the local authorities. These figures do not include the cross border projects that benefit more than one authority, and those cross border projects have been included in the Greater Essex total on the facing page.

It should be noted a number of caveats are associated with the headline growth figures presented on the facing page. Refer to the section 8 of the document which sets out the caveats, modelling benchmarks and assumptions behind cost and funding figures.

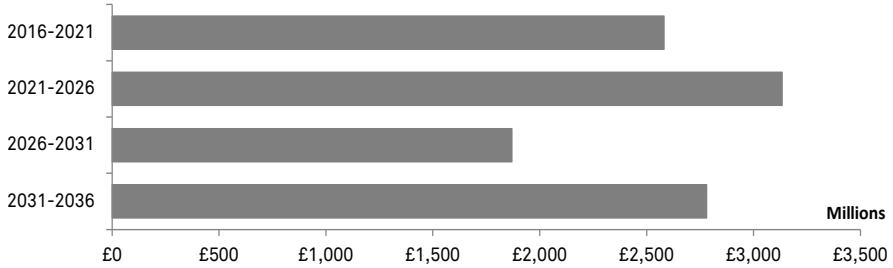


FIGURE D - TOTAL INFRASTRUCTURE COSTS

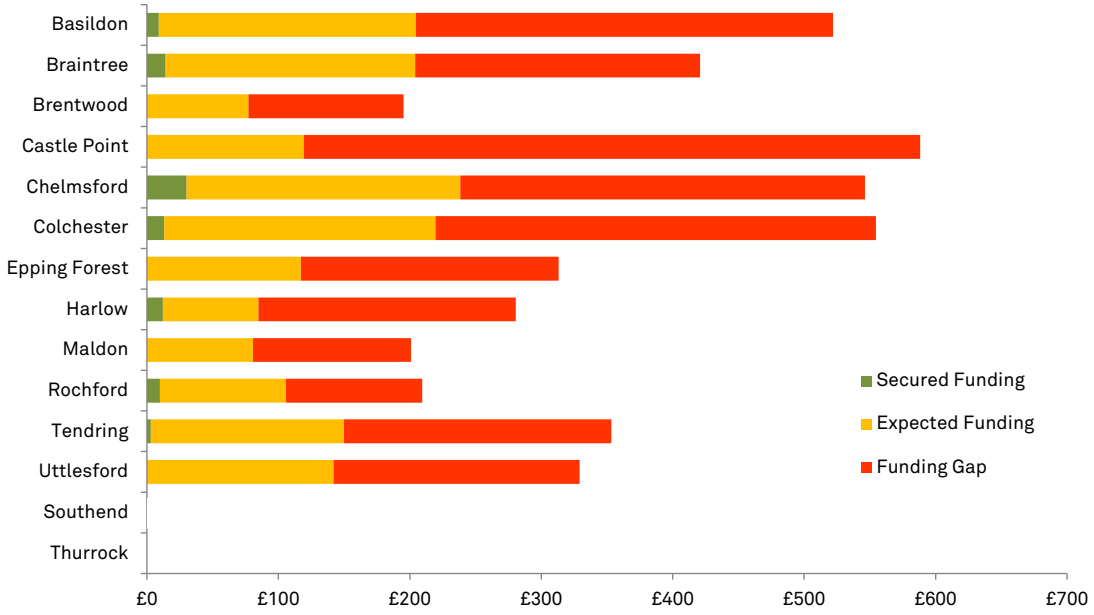


FIGURE C - TOTAL COST OF INFRASTRUCTURE AND ESTIMATED FUNDING

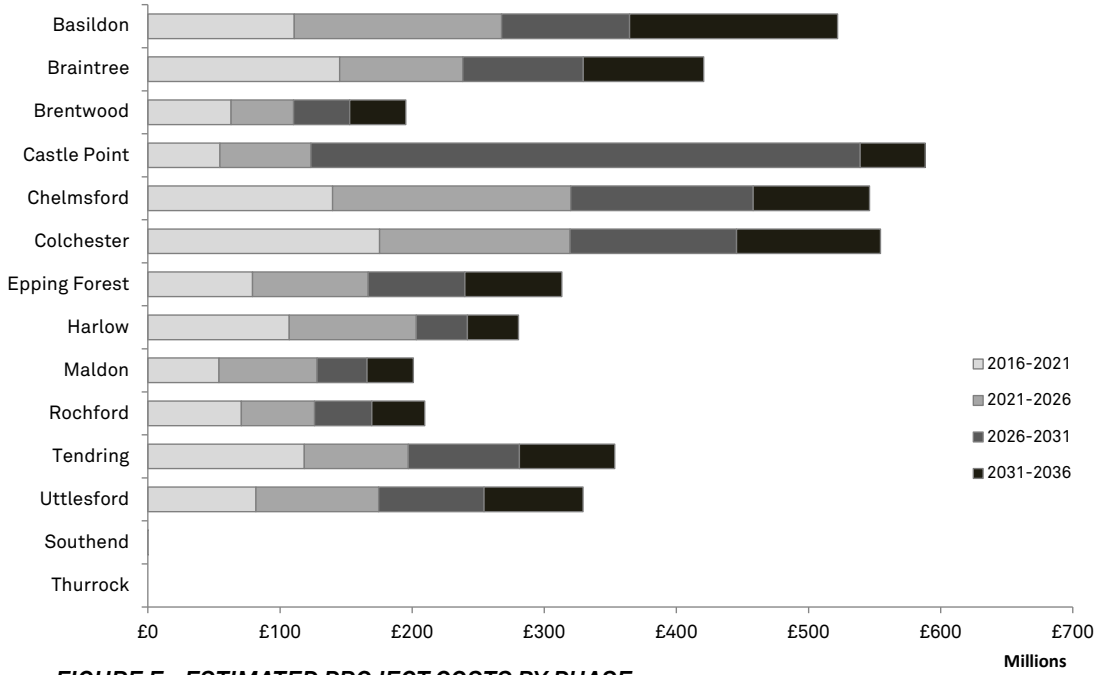


FIGURE E - ESTIMATED PROJECT COSTS BY PHASE

CONTENTS

01

The Greater Essex Growth and Infrastructure Framework has been developed to demonstrate to Government, infrastructure providers, local communities and business the challenges being faced across Essex in funding the infrastructure required to support and facilitate growth and enhance the lives of existing and future residents.

INTRODUCTION

The Greater Essex Growth and Infrastructure Framework has been prepared on behalf of the Greater Essex local authorities to provide a view of emerging development and infrastructure requirements to support growth from 2016 to 2036.

At present a strategic view of growth distribution and infrastructure provision is lacking across Greater Essex. Each local authority is at a different stage of Local Plan preparation and working to a range of viability assumptions. Meanwhile infrastructure is being provided by a host of different providers.

This document begins to paint a strategic picture of the price of and risks to growth. It aims to:

- Collate and summarise population, housing and economic growth projections across Greater Essex.
- Set out a combined understanding of capacity within current infrastructure provision and pipeline infrastructure projects being taken forward by local authorities and other infrastructure providers.
- Highlight cumulative costs, funding streams and gaps in infrastructure funding.
- Facilitate discussion across partners by highlighting the core infrastructure issues which require attention in order to deliver sustainable communities and economic growth.
- Enable the infrastructure investment required to promote balanced economic growth and support access to employment.

The Greater Essex Growth and Infrastructure Framework has been produced for the following audiences:

- Members and officers of Essex County Council, Southend-on-Sea Borough Council, Thurrock Council and the 12 Essex District, City and Borough Councils.
- The South East Local Enterprise Partnership to inform priorities for investment to support growth objectives at sub regional level.
- Government and infrastructure providers to demonstrate the potential distribution of growth, infrastructure requirements and funding gaps.
- Residents and businesses to provide a regional view of development and infrastructure requirements and the difficulties in delivering infrastructure across Greater Essex.
- For use by the East of England local authorities to support their dialogue and engagement with the Greater London Authority, in response to emergence of the new London Plan.

SCOPE OF THE STUDY

The Growth and Infrastructure Framework (GIF) covers all forms of infrastructure supporting the economic, environmental and social needs of the study area, as illustrated in figure 1.2. The infrastructure scope covered in the report is comprehensive as illustrated in Figure 1.1.

This study is supported by all of the local authorities in Essex County, and Southend and Thurrock. The detailed infrastructure requirements for Southend and Thurrock is not available for this iteration of the GIF. The Greater Essex area has been grouped into four quadrants (Table 1.1) as illustrated in sub-regions provided later within the report.

The study is structured as follows:

- Section 2 provides an overview of how growth and infrastructure is planned across Greater Essex.
- Section 3 sets out social and economic growth drivers and the potential distribution of development in Greater Essex.
- Section 4 provides an overview of infrastructure requirements across Greater Essex for a range of infrastructure provision including education, health, community, transport, utilities and flood protection.
- Section 5 provides a summary of infrastructure issues and potential investment requirements for each local authority across Greater Essex.
- Section 6 presents a commentary on delivery and funding issues affecting growth and infrastructure across Greater Essex.
- Section 7 identifies recommendations and conclusions of the study.
- Section 8 details specific caveats supplied by some of the local authorities to accompany data provided.

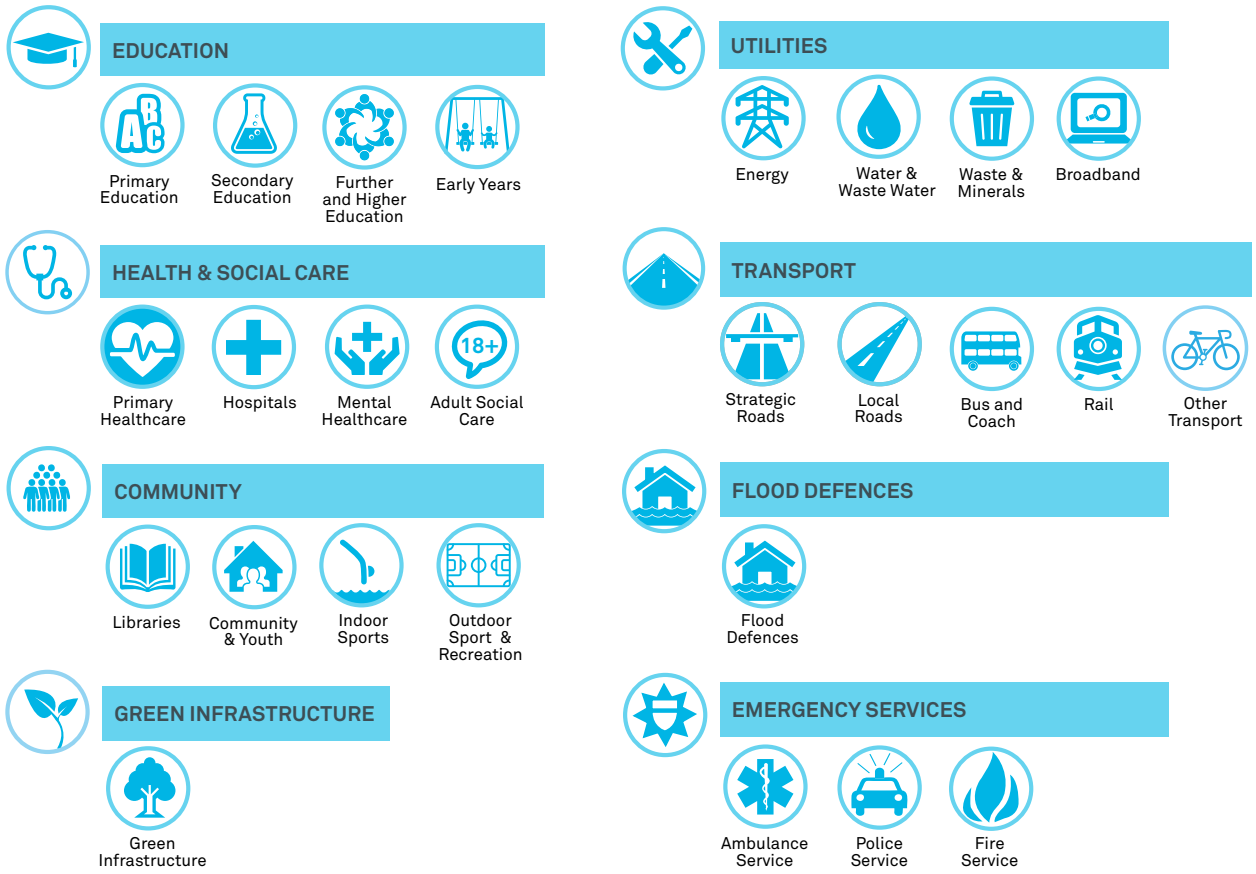


FIGURE 1.1 - TYPES OF INFRASTRUCTURE WITHIN SCOPE OF STUDY

Study Area Quadrant	Local Authorities
West Essex	Epping Forest District Council, Harlow Council, Uttlesford District Council and Brentwood Borough Council
Haven Gateway	Braintree District Council, Colchester Borough Council, Tendring District Council and Maldon District Council
South Essex	Basildon Borough Council, Castle Point Borough Council, Rochford District Council, Southend-on-Sea Borough Council and Thurrock Borough Council
Heart of Essex	Chelmsford City Council

TABLE 1.1 - STUDY AREA DIVIDED INTO QUADRANTS

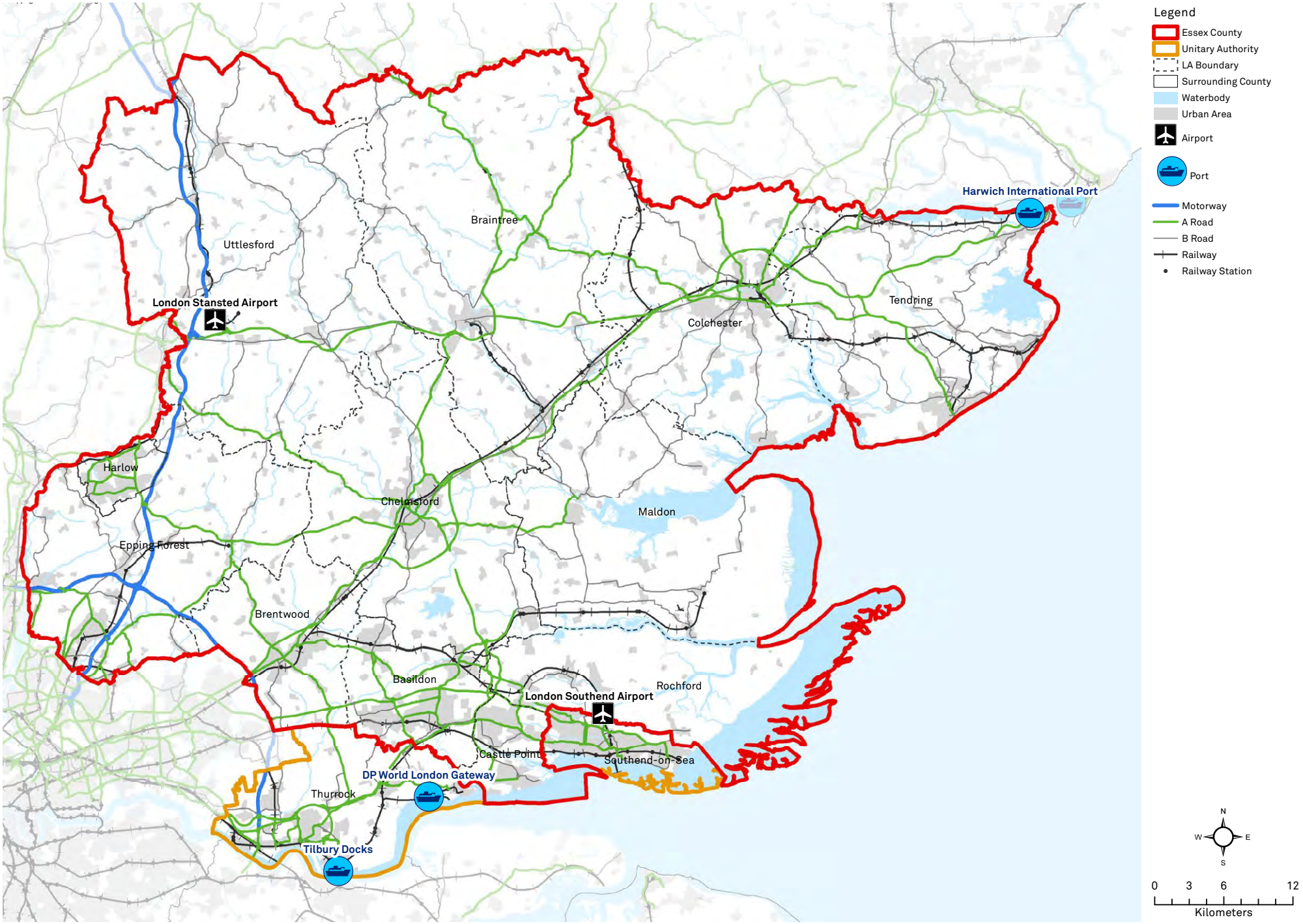


FIGURE 1.2 - STUDY AREA

PROJECT METHODOLOGY

The Growth and Infrastructure Framework project has been developed in two stages.

STAGE 1 TASKS UNDERTAKEN

Key tasks that have been undertaken within Stage 1 of the Framework include establishing the following:

1. Data gathering from all project partners including baseline statistics, infrastructure topic specific data, GIS mapping data and strategy documents.

2. The infrastructure planning landscape, and the social and economic context for the Growth and Infrastructure Framework.

3. The scale of growth to present within the GIF in terms of housing need, housing supply, housing sites, population growth, employment forecasts and employment sites. These were preliminary figures for review and revised through stage 2 of the project in collaboration with all project partners to ensure the document presented comparable and agreed figures for each local authority.

4. Engagement with project partners to introduce the framework and to gather required information involving:

- Essex County Council commissioning and delivery teams across all county services.
- Thurrock and Southend unitary authorities.
- Local Authority Infrastructure Delivery Plans available at project commencement. It is noted that a number of IDPs are currently being updated.
- External Infrastructure service provider workshops (Utilities, Strategic Transport and Healthcare).

5. An infrastructure baseline and review of existing capacity issues where possible, including a geodatabase of GIS mapping layers, for all areas of Greater Essex across all infrastructure topics.

6. A preliminary assessment of future infrastructure requirements to support the identified level of housing and economic growth to 2036. This assessment required review by the relevant project partners to agree the appropriate assumptions and conclusions to draw from this process.

7. A Stage 1 draft infrastructure project schedule for review by relevant project partners. This project schedule recorded the existing and forecast projects required to support growth and associated information including project timings, scale, location, cost and funding status. Information sources used to collate this draft position included, but not limited to, the following:

- Local Authority Infrastructure Delivery Plans.
- ECC Meeting the demand for school places in Essex 10-year plan (2016-2025).
- LEP Local Growth Fund Tracker.
- ECC Economic Pipeline.
- ECC Capital Programme.
- FCERM Pipeline Programme (Environment Agency).

8. A preliminary assessment of potential infrastructure costs to deliver the required infrastructure projects. In the case of social, green and utility infrastructure the costs were based on a theoretical assessment utilising benchmark planning standards rather than tangible project entries within the infrastructure projects schedule. In the case of transport and flood projects a number of the entries in the project schedule were not at this stage costed.

9. Housing and economic growth profiles, infrastructure capacity and investment requirements for each of the Greater Essex local authorities.

STAGE 2 TASKS UNDERTAKEN

Key tasks that have been undertaken within Stage 2 of the Framework, the results of which are presented within this document, include the following:

1. Stage 1 draft document review by project partners

2. Re-engaged with project partners to review in detail the Phase 1 Draft Report, the working assumptions and data behind its development and the draft project schedule:

- Targeted meetings with Essex County Council commissioning and delivery teams to address outstanding issues in the Stage 1 document.
- Individual sessions with Thurrock and Southend unitary authorities and Local Authority Planning teams to review local data and presentation of key issues and proposals.
- Targeted discussions with external infrastructure service providers where necessary to refine the framework content.

3. Growth data verification, completions and sign off. Stage 1 was successful in establishing a draft position in terms of housing need and largely successful in terms of establishing the current known housing supply across the study area. There were however some information gaps remaining due to the local plan work of a number of local authorities. Where possible Stage 2 has provided an opportunity to feed in previously unavailable housing and employment site data. Stage 2 has also allowed each local authority to agree a position for presentation and a full set of project caveats to accompany this.

4. The further development of the Stage 1 Project Schedule. The stage 1 project schedule has formed the basis, alongside this draft document, of discussions with each of the project partners in Stage 2 of the project. Existing projects within the draft project list have been removed where no longer found to be appropriate and additional projects added where evidence for this has been provided.

5. An infrastructure costing review. This Stage 1 draft document included preliminary cost estimates for each of the infrastructure topics where existing information and analysis allowed. All theoretical infrastructure requirements and associated cost estimates have been reviewed with project partners. A benchmark sense-checking exercise has been undertaken by AECOM's cost consultancy team to review the total infrastructure costs against the scale of economic and housing growth for each area. Where the infrastructure project schedule includes tangible projects with sufficient project details but no estimate on cost, the AECOM cost consultancy team has provided estimated capital costs.

6. A funding and delivery review. As part of the project partner review of the project schedule all known infrastructure funding associated with projects have been recorded. As expected, a large proportion of the projects do not have details regarding funding options and the GIF therefore reviews potential funding levels from public and private sources. The GIF also includes a working assumption towards the scale of development contribution that may be generated across each local authority given the identified housing trajectory (whilst acknowledging the limited adoption of CIL across the authorities). The Stage 2 funding and delivery review also considers the wider role of partner organisations and their ability to fund and deliver infrastructure projects.

7. Completion of a GIF GIS Geodatabase and packaging for transfer back to Essex County Council for continued use and integration into the existing Map Essex web based information platform.

PARAMETERS OF THE STUDY

This study has been prepared in accordance with the following parameters:

A Snapshot in Time:

- The housing, employment and population forecasts presented in this document represent our understanding of the growth context at October 2016 but it is recognised that this information is continually evolving and should therefore be treated as a snap shot in time only for the period 2016-2036.

Population Forecasts:

Population Forecasts:

- The study uses projected population growth from 2016 to 2036, from an ONS projection to 2036 (using 2014 data).

Housing Growth:

Existing Housing Stock:

- The study uses current housing stock across Greater Essex from an ONS projection to 2016 (using 2014 data).

Housing Completion Rate:

- The study has determined an annual housing completion rate, using the most recent 10 year period (to 2015) for which historical completions data is available.

Housing Need:

- The study has used various existing Objectively Assessed Need (OAN) and Strategic Housing Market Assessment (SHMA) documents to compile an aggregate number of dwellings needed in Greater Essex from 2016 to 2036.

Housing Supply:

- The study has collated the various housing supply trajectories supplied by each Local Planning Authority (LPA) to compile an aggregate number of dwellings in the housing supply trajectory to 2036.
- The study has also collated details of identified housing sites from all sources known to LPAs.

Employment Growth:

- The study uses the number of additional jobs to 2036, projected by the East of England Forecasting Model from 2016 (using 2014 data).
- The study has collated details of key employment sites likely to have implications for infrastructure provision from LPAs.

Infrastructure Need:

Current Infrastructure Provision

- The study collates detail of the scale, distribution and capacity of existing infrastructure across Greater Essex, from available service data.

Infrastructure-Type Provision Benchmarks

- The study uses industry infrastructure need benchmarks in conjunction with projected population growth (from Section 3.1) or the number of dwellings needed (Section 3.2) to determine the necessary level of provision for each type of infrastructure. The benchmarks used are set out in Section 8.2.

Project Schedule

- The study is supported by a schedule of planned projects across Greater Essex to 2036. This schedule records all identified project requirements, including the infrastructure type, location and timing.
- The study models additional theoretical projects to deliver the necessary infrastructure and supplement the project schedule.

Infrastructure Cost:

Available Planned Costs

- The study collates detail of available planned project costs.

Theoretical Costings

- The study supplements available costings with AECOM costing advice. The sources for these costings and caveats applicable to AECOM's costings are set out in Section 8.3.

Total Cost

- The study aggregates these costings to estimate the total cost in 2016 terms of providing the necessary infrastructure.

Secured and Expected funding

Secured Public and Private Funding

- The study estimates secured funding from public and private sources to 2036 by aggregating detail of known funds committed to planned projects.

Expected Public and Private Funding

- In addition to the secured funding recorded, the study also estimates the potential scale of funding from public and private sources to 2036 by applying benchmark assumptions about likely funding for future projects. These assumptions are set out in Section 8.

Expected Developer Contributions

- The study estimates the funding from developer contributions to 2036, by applying a flat rate of developer contributions per dwelling against the number of dwellings planned in the aggregated Greater Essex housing supply trajectory to 2036 (set out in Section 3).
- Further detail of the assumptions supporting these estimates of funding contributions is set out in Section 8.

Funding Gap

- The estimated funding gap is determined by subtracting secured and expected funding contributions from the estimated total costs (set out in Section 5).

02

PLANNING FOR INFRASTRUCTURE IN GREATER ESSEX

THE BASIS OF THE STUDY

THIS STUDY DRAWS TOGETHER INFORMATION AND DATA FROM A RANGE OF SOURCES. IT SEEKS TO PIECE TOGETHER A STRATEGIC PERSPECTIVE OF GROWTH AND INFRASTRUCTURE PROVISION IN GREATER ESSEX AT THE PRESENT TIME AND 20 YEARS INTO THE FUTURE.

It draws on the following information:

- Adopted and emerging Local Plans and Infrastructure Delivery Plans for all local authorities within Greater Essex
- Local Authorities' Local Plan evidence bases
- Other existing and emerging information, strategies and plans from local authorities across Greater Essex
- GIS database information provided by Essex County Council
- ONS Census Sub National Population Projections, 2014
- Documents produced by the South East Local Enterprise Partnership (SELEP)
- Information from other infrastructure provider's plans including utility providers, the Environment Agency, Network Rail, Highways England and the National Health Service (NHS).
- DCLG Household Projections (July 2016)

The study is based on a detailed analysis of issues in Greater Essex relating to growth and infrastructure current to October 2016. It should be recognised that this presents a snapshot in time and is not produced to meet a specific statutory requirement.

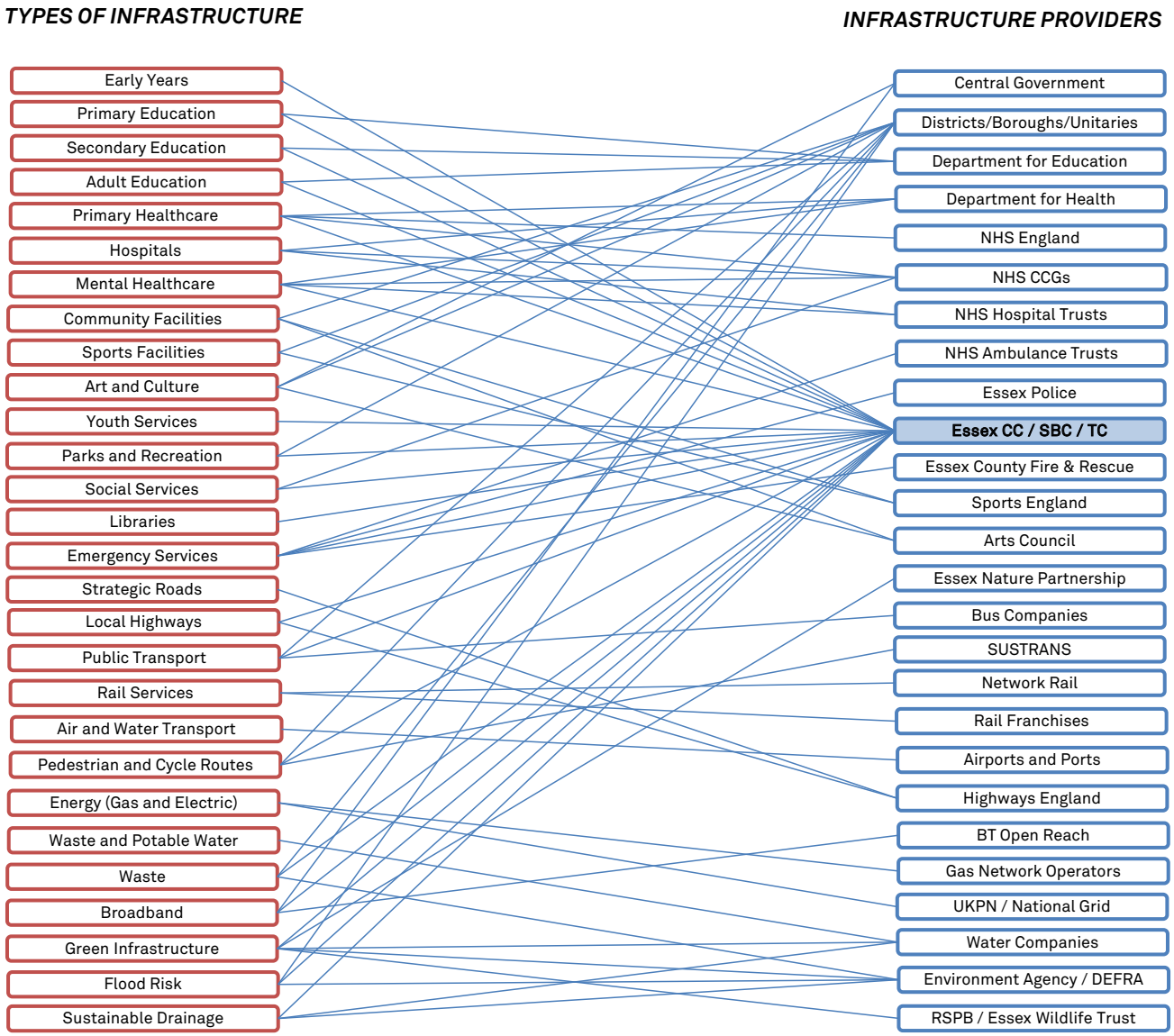


FIGURE 2.1- THE COMPLEX PATTERN OF INFRASTRUCTURE PROVISION IN GREATER ESSEX

INFRASTRUCTURE PROVIDERS

THE COMPLEX RELATIONSHIP BETWEEN INFRASTRUCTURE REQUIREMENTS AND PROVIDERS ACROSS GREATER ESSEX IS SHOWN IN FIGURE 2.1. THE COUNTY AND THE LOCAL AUTHORITIES PLAY A VITAL ROLE IN THE SUPPLY OF INFRASTRUCTURE. IN ADDITION A NUMBER OF PUBLIC, NOT-FOR-PROFIT AND PRIVATE ORGANISATIONS HAVE RESPONSIBILITY TO PROVIDE INFRASTRUCTURE TO SUPPORT EXISTING POPULATION AND PROPOSED GROWTH.

This study covers the following aspects of infrastructure provided by the local authorities.

- Education (early years and childcare, primary, secondary, higher and further education and community learning)
- Other social infrastructure (libraries, adult social services and youth services, public health, community and sports facilities, parks and recreation)
- Highways and transport
- Waste management

In addition, other providers' requirements have been investigated including:

- Healthcare (NHS)
- Highways (Highways England)
- Green infrastructure providers (e.g. Royal Society for the Protection of Birds (RSPB), National Trust, Essex Wildlife Trust and Department for Environment, Food & Rural Affairs (DEFRA)
- Railway and bus operators
- Utility services
- Other significant infrastructure (e.g. Environment Agency)

PLANNING FOR INFRASTRUCTURE

Planning for infrastructure provision is critical to ensure infrastructure is in the right place, made at the right time and sufficient to unlock opportunities into the future. The current approach to infrastructure planning and delivery in Greater Essex is described below and illustrated in Figure 2.2.

Planning for the use of space in England, including the placement of infrastructure, is regulated by Central Government through legislation, including the Planning and Compulsory Purchase Act 2004. This legislation is supported by the National Planning Policy Framework (NPPF), introduced in 2012, and associated Planning Practice Guidance issued by the Department of Communities and Local Government (DCLG).

Responsibility for this spatial planning at a local level is held principally by lower tier authorities (typically District, Borough and City Councils, but also Unitary Authorities) in their capacity as designated Local Planning Authorities (LPAs).

Each LPA is required by the Planning and Compulsory Purchase Act to produce a Local Plan setting out, amongst other things, intentions for growth in jobs and dwellings across their area.

LPAs should make clear in their Local Plan what infrastructure will be required for at least the first five years of its duration, how that infrastructure will be funded, who will provide it, and how that infrastructure relates to the anticipated rate and phasing of development. These strict requirements are more relaxed later in the Local Plan period, reflecting the greater uncertainty about infrastructure need and provision over time.

The Act also provides that each Local Plan must be supported by an Infrastructure Delivery Plan (IDP), setting out the economic and social infrastructure planned to support the growth in jobs and dwellings set out in the Local Plan. An IDP also informs development of Community Infrastructure Levy (CIL) rate, which LPAs are empowered to charge developers, under the Planning Act 2008, to support infrastructure provision. (See Section 6.2 for further information).

Each LPA in Greater Essex is at a different stage in ensuring their Local Plan is up to date, as set out in Table 2.1, opposite. Some are updating an existing Local Plan to ensure consistency with the subsequently introduced NPPF and others are developing an IDP to support an existing Local Plan.

Responsibility for planning for minerals and waste is held by upper tier authorities (typically County Councils and Unitary Authorities).

Upper tier authorities are also responsible for providing a range of infrastructure and related services, including Highways and Transport.

Central government bodies, such as the Environment Agency, Highways England and Network Rail, also have important roles as providers of infrastructure in Greater Essex.

Local Enterprise Partnerships between local authorities and businesses were established in 2011 to inform priorities for investment in roads, buildings and facilities in local areas. Greater Essex is a part of the South East Local Enterprise Partnerships (SELEP).

Recognising that the geographic areas covered by individual LPAs are not isolated, but are interconnected and interdependent, the Localism Act 2011 creates a duty for LPAs to co-operate with various infrastructure providers on strategic planning issues. Such issues are often, but are not exclusively, where service or infrastructure provision crosses LPA boundaries.

Within and above this statutory duty to cooperate, continued dialogue and close collaboration between local authorities and infrastructure providers is essential to ensure infrastructure planning and delivery is adequate to meet growing demand.

In Greater Essex, the 15 local authorities have agreed that there is value in bringing together the existing evidence bases held by various LPAs and infrastructure providers, to produce a higher-level view of the infrastructure needs and challenges facing the whole of Greater Essex. This document seeks to support these important sub-regional level discussions .

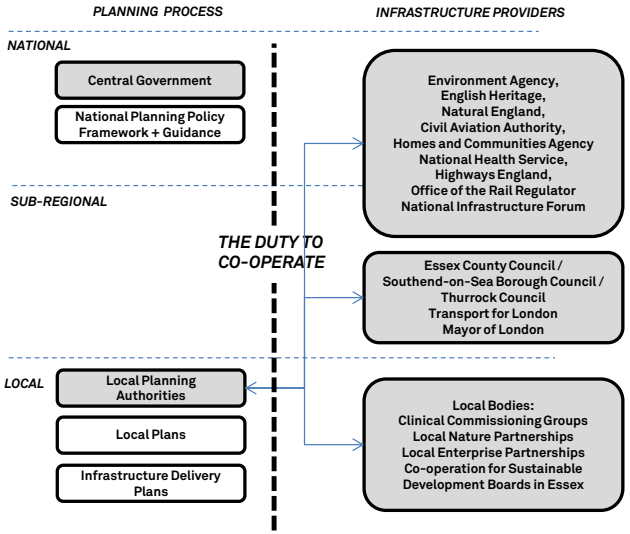


FIGURE 2.2- THE CURRENT PLANNING PROCESS AND INFRASTRUCTURE PROVISION IN GREATER ESSEX

Authority	New Local Plan Progress	Plan Period	Degree of Certainty on Growth and Infrastructure requirements
Basildon	Draft Local Plan Reg 18 Consultation (January 2016)	2014-2034	Known
Braintree	Submission to Secretary of State (May 2017).	2016-2033	Partial
Brentwood	Draft Local Plan (January 2016), Presubmission consultation January 2017	2013-2033	Known
Castle Point	Castle Point New Local Plan 2016 Submitted to Secretary of State for examination 25 August 2016	2014-2031	Known
Chelmsford	Prefered option consultation February-March 2017 Chelmsford's Local Development Framework (2001-2021) is the adopted Plan	2021-2036	Partial
Colchester	Submission to Secretary of State (May 2017).	2013-2033	Partial
Epping Forest	Draft Plan Preferred Approach (Reg 18) consultation Oct- Dec 2016	2011-2033	Known
Harlow	Draft Plan Preferred Approach (Reg 18/19) consultation winter 2016 / Spring 2017	2011-2033	Known
Maldon	Maldon District Main Modifications Consulation (2016). Examination resumed following call in of the LDP by the Secretary of State	2014-2029	Known
Rochford	Undertaking local development plan review (currently to 2025) with Issues and Options Consultation expected Spring 2017	Post 2025	To Be Determined
Tendring	Submission to Secretary of State (May 2017).	2013-2033	Partial
Uttlesford	Draft Plan (Reg 19) Early 2017	2011-2033	Known
Southend	Core Strategy to 2021 is still current Plan	2001-2021	To Be Determined
Thurrock	Issues and Options Consultation (February 2016)	2015-2036	To Be Determined
Essex County Council	Essex Minerals Local Plan Adopted (July 2014)	2012-2029	Known
ECC & Southend on Sea	Essex and Southend on Sea Waste Local Plan -Pre-Submission Draft (March 2016), Examination held (October 2016)	2016-2032	Known

TABLE 2.1- LOCAL PLAN STATUS

Caveats: Caveats apply to each local authority which cannot all be presented on this page. Refer to Section 8 for details.

Authority	Availability of IDP / Infrastructure Evidence Base	IDP / Evidence Base Assessment Period
Basildon	Draft IDP (living document last published Jan 2016) to be republished Winter 2016/2017	2015-2034
Braintree	Braintree, Chelmsford, Colchester and Tendring - Jointly commissioned Infrastructure Development Plan - Draft Report (December 2016)	2016-2033
Brentwood	Brentwood - 2016-2033, EF - Draft IDP prepared Autumn 2016	-
Castle Point	Community Infrastructure Needs Assessment (2013). New IDP in preparation	2011-2031
Chelmsford	Braintree, Chelmsford, Colchester and Tendring - Jointly commissioned Infrastructure Development Plan - Draft Report (December 2016)	2016-2036
Colchester	Braintree, Chelmsford, Colchester and Tendring - Jointly commissioned Infrastructure Development Plan - Draft Report (December 2016)	2016-2033
Epping Forest	IDP in preparation to be completed Autumn 2016	-
Harlow	Infrastructure Study (March 2010), currently being reviewed.	2011-2031
Maldon	Infrastructure Delivery Plan Update (May 2014)	2014-2029
Rochford	Infrastructure requirements included in local development plan (currently to 2025). IDP in prepartion to support local development plan review	-
Tendring	Braintree, Chelmsford, Colchester and Tendring - Jointly commissioned Infrastructure Development Plan - Draft Report (December 2016)	2016-2033
Uttlesford	Infrastructure Delivery Plan (April 2014). To be updated.	2011-2031
Southend	Infrastructure Delivery Plan (June 2014)	2014-2021
Thurrock	Infrastructure Prioritisation (Feb 2010). New draft to be prepared	2006-2021

TABLE 2.2- LOCAL AUTHORITY INFRASTRUCTURE DELIVERY PLANS

GREATER ESSEX IN CONTEXT

In considering the growth across Greater Essex to 2036 it is important to consider the growth in housing, employment sites and infrastructure planned nearby, including in the surrounding counties and Greater London.

STRATEGIC HOUSING DEVELOPMENTS

Figure 2.3 on the facing page illustrates a conservative estimate of planned housing across all local authorities which adjoin the boundaries of Greater Essex between 2016 and 2036 (where the information is publicly available).

Also illustrated in Figure 2.3 are a number of possible housing development sites which are proposed in neighbouring authorities and are considered likely to impact on the strategic infrastructure that also serves Greater Essex, in particular transport. These sites include:

- Ebbsfleet Garden City, North Kent
- Ipswich Northern Fringe, Suffolk
- Cambridge Urban Extensions (North West, East Cambridge and Southern Fringe)
- Northstowe New Town, Cambridgeshire
- Alconbury Weald Garden Settlement, Huntingdonshire
- Cambourne New Town, Cambridgeshire
- Meridian Water, Enfield
- Gilston Area, North of Harlow, East Herts
- Land North and East of Ware, East Herts
- Bishops Strotford / Broxbourne sites, East Herts

As can be seen by the illustration of planned growth the greatest pressures of additional growth are likely along the northwestern, western and southwestern boundaries of Essex County and Thurrock with a number of large strategic sites to the west of the study area and the high level of planned housing delivery across the London boroughs.

The Greater London Authority (GLA) Further Alterations to the London Plan (FALP 2015) seeks to provide for at least 420,000 additional homes or 42,000 per annum over the period 2015 – 2025 on specified sites, with a commitment to explore means of accommodating the 7,000 shortfall compared to need identifed within London boroughs.

The London Plan Review, which will identify London's housing requirement, may lead to requests for Greater Essex authorities to accommodate additional housing growth. Member and officer working groups have been established as part of this process. At present it is uncertain what level of unmet growth in London may be asked to be accommodated in Greater Essex.

It should be noted however that the SHMAs and OAN studies prepared or being prepared by Greater Essex authorities already take account of growth from London, and are incorporated into the OAN figure through an uplift in future out migration from London.

STRATEGIC EMPLOYMENT DEVELOPMENTS

Planned employment growth in the surrounding area is also likely to affect growth in Greater Essex. These sites include:

- Cambridge Biomedical Campus, Cambridge
- Cambridge City Deal Growth Projects
- Greater Ipswich Enterprise Zones, Suffolk
- Felixstowe Port, Suffolk
- Northfleet Embankment East, Kent
- Ebbsfleet Central, Kent
- London Paramount NSIP, Kent

INFRASTRUCTURE PLANNING

The significant growth in housing and economic activity planned adjoining Greater Essex is also to be supported by significant infrastructure investment, some of which will also affect Greater Essex.

Kent County Council has recently completed a Growth and Infrastructure Framework for Kent and Medway similar to this document. Suffolk County Council have recently commissioned the development of a Suffolk Planning and Infrastructure Framework (SPIF) and the GLA has produced the London Infrastructure Plan 2050 and Mayor's New Transport Strategy.

The transport section of this framework highlights some of the regional transport projects that will have a direct impact on or benefit to Greater Essex but there are additional non transport specific projects that should also be recognised. The following are in some cases regional but in other cases nationally significant infrastructure projects in areas adjoining Greater Essex:

- A14 improvements in Cambridgeshire - and connectivity to A1
- Lower Thames Crossing
- Felixstowe to Peterborough – rail freight and passenger connectivity improvements
- Potential new river crossings at Silvertown, London
- West Anglia Mainline 4 tracking
- Crossrail 2 developments
- Potential nuclear power plant at Sizewell (Suffolk), in addition to the potential new nuclear power plant at Bradwell (Essex)
- East Anglia Offshore Wind Project and National Grid 27km 400kV high voltage electricity transmission connection between Bramford, Suffolk and Twinstead, Essex

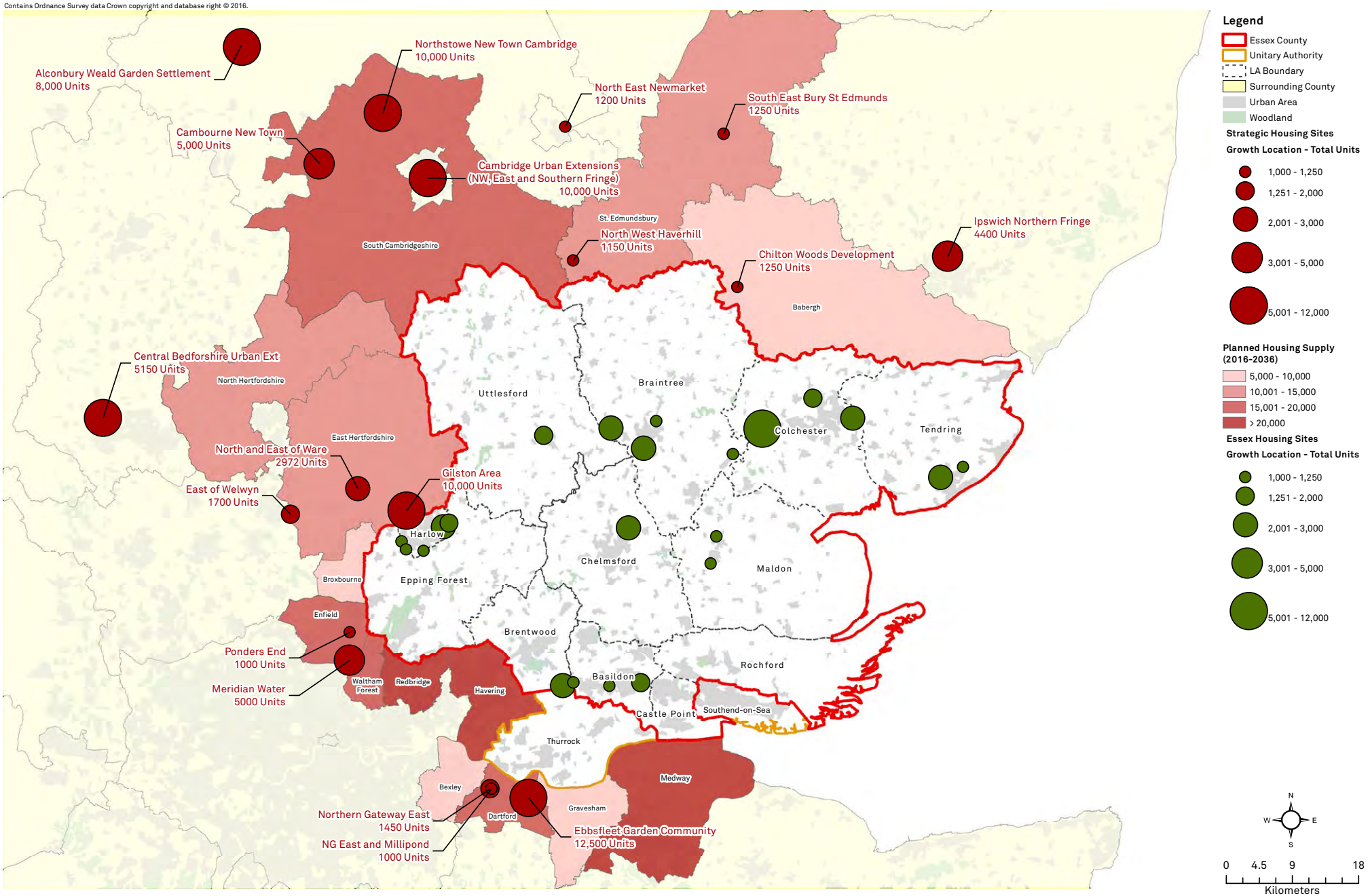
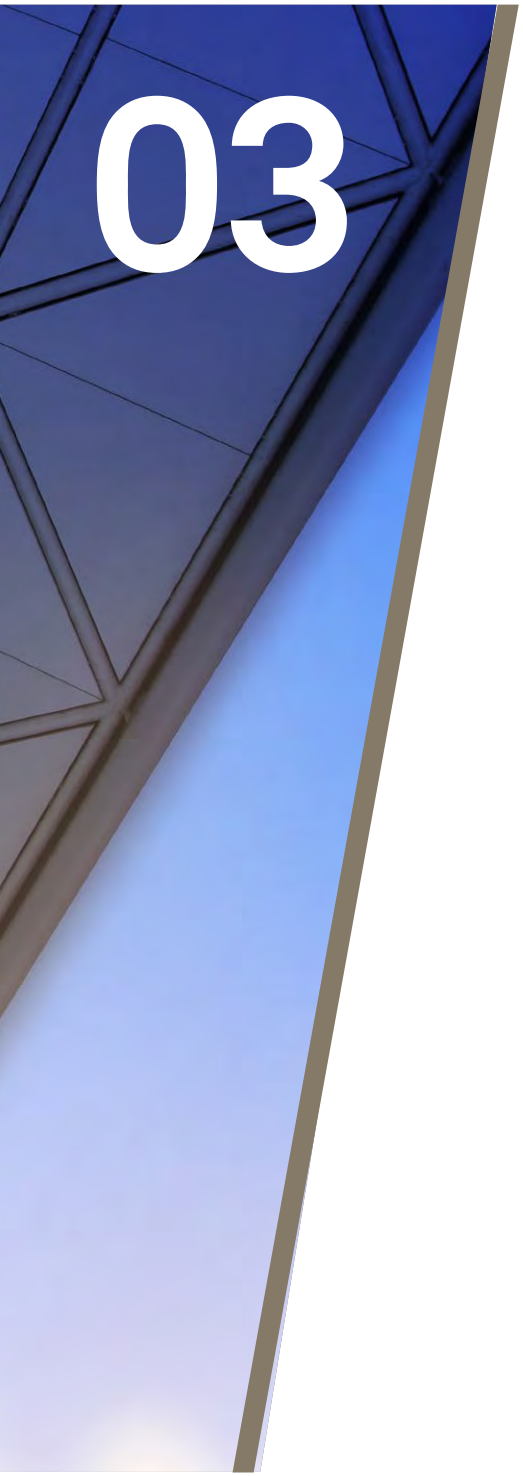


FIGURE 2.3 - ESTIMATED PLANNED HOUSING SUPPLY AND KEY STRATEGIC SITES FOR LOCAL AUTHORITIES SURROUNDING GREATER ESSEX

Source: Published Local Plan documents and Further Alterations to the London Plan



03

UNDERSTANDING EXPECTED GROWTH

THIS SECTION AIMS TO SUMMARISE THE KEY ISSUES IN PLANNING FOR GROWTH IN GREATER ESSEX TO 2036.

As highlighted in the previous section, accommodating growth across Greater Essex is planned for through the Local Plan process on an Local Planning Authority basis. This section seeks to set the context for study area growth requirements and current planned growth areas as established within the Local Plans.

This comprises:

A SOCIAL PORTRAIT

- Population forecasts to 2036
- Current socio-demographic issues and trends likely to impact on growth and infrastructure provision

A HOUSING PORTRAIT

- Current housing stock and completions
- Housing need and supply forecasts to 2036
- An understanding of housing growth requirements and planned growth locations

AN ECONOMIC PORTRAIT

- Current economic issues and trends likely to impact on growth and infrastructure provision
- An understanding of employment requirements and planned growth locations

This growth context is then used as the basis for examining infrastructure requirements in the remainder of this study.

3.1 SOCIAL PORTRAIT

Greater Essex could grow by 298,700 people between 2016 and 2036, per ONS projections

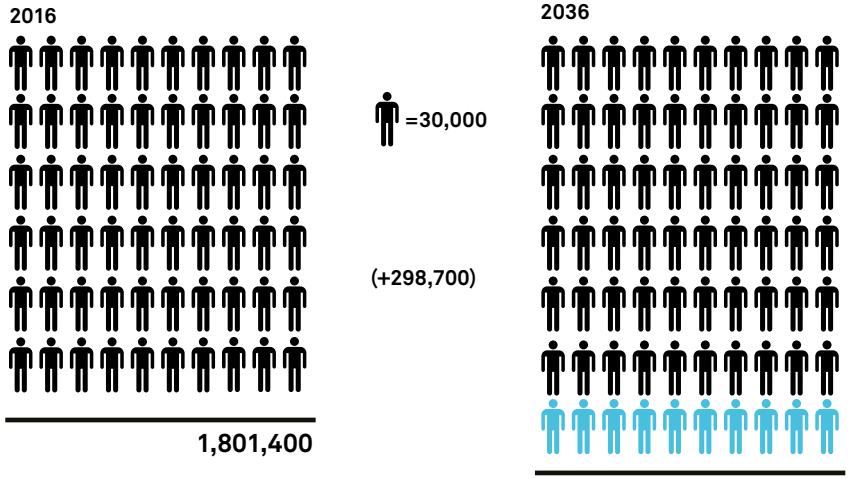


FIGURE 3.1 PROJECTED POPULATION CHANGE 2016-2036

Source: 2014 based ONS Sub National Population Projections, 2016

This population growth is distributed unevenly across Greater Essex, with the greatest increases currently projected in Thurrock, Colchester and Basildon. Maldon and Castlepoint are forecast to see the lowest growth in population.

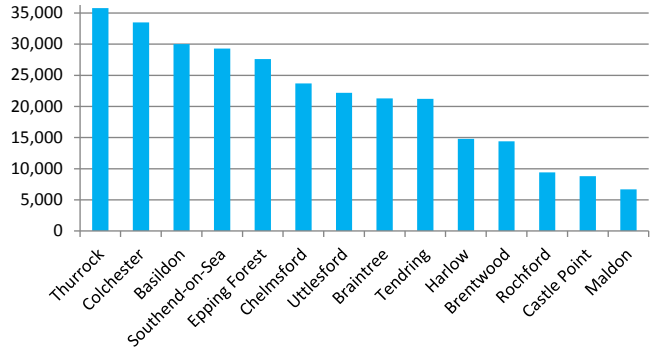


FIGURE 3.2 PROJECTED POPULATION CHANGE BY LOCAL AUTHORITY 2016-2036

Source: 2014 based ONS Sub National Population Projections, 2016

In 2014 the natural increase was 4,497 people:

BIRTHS	DEATHS	NATURAL CHANGE
+21,017	-16,520	+4,497

FIGURE 3.3 - MID 2013-MID 2014 NATURAL POPULATION INCREASE (GREATER ESSEX)

Source: Birth Summary Tables & Death Summary Tables – England and Wales, 2014 ONS, 2014

Mid-2013 to mid-2014, there was net international migration of 4,048 people into Greater Essex

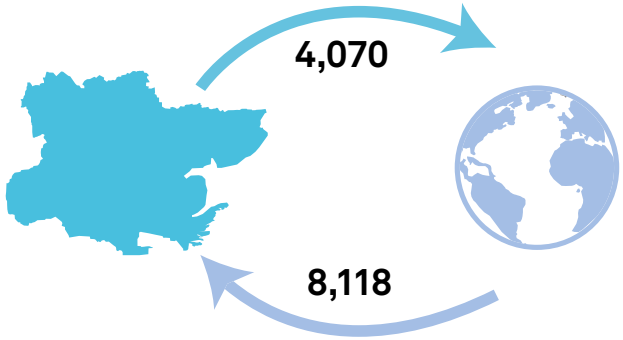


FIGURE 3.4 - MID 2013-MID 2014 NET INTERNATIONAL MIGRATION (GREATER ESSEX)

Source: Local Area Migration Indicators 2015, ONS

Mid-2013 to mid-2014, there was net domestic migration (within UK) of 10,449 people into Greater Essex

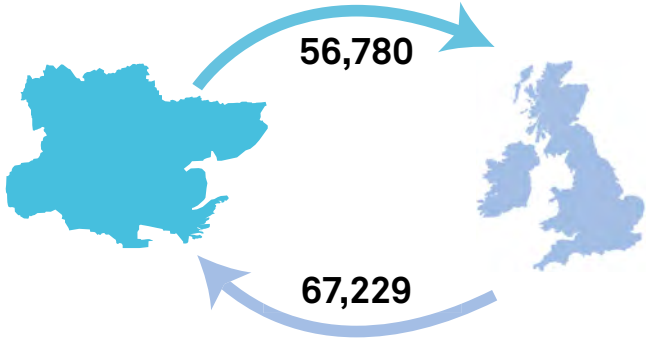


FIGURE 3.5 - MID 2013-MID 2014 NET DOMESTIC MIGRATION (GREATER ESSEX)

Source: Local Area Migration Indicators 2015, ONS

Migration between London and Greater Essex

London and Greater Essex are increasingly interconnected, with people frequently migrating between them. From 2002 to 2014, twice as many people moved from London to Greater Essex as moved from Greater Essex to London, resulting in a net increase in Greater Essex's population of 181,620 during this period.

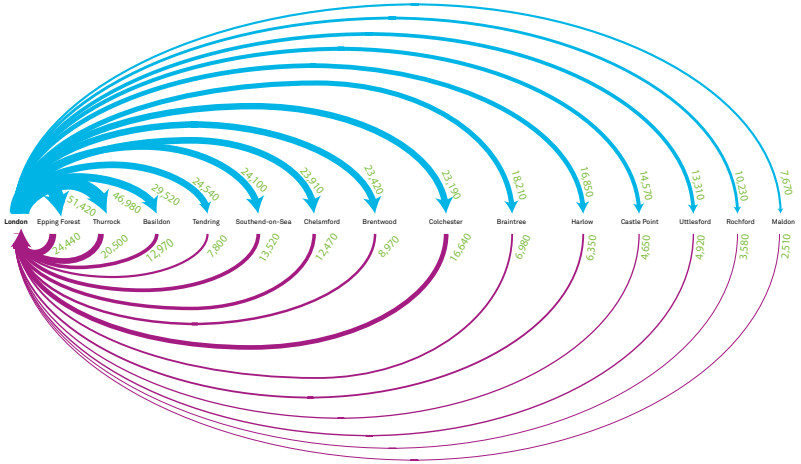


FIGURE 3.6 - INTERNAL MIGRATION BETWEEN LONDON AND GREATER ESSEX LOCAL AUTHORITIES (2002-2014)

Source: Internal Migration: Moved Within England and Wales, 2002-2014, ONS

While all Greater Essex local authorities have a positive balance of migration from London in the period 2002 to 2014, it is particularly acute in Uttlesford and Thurrock which have each received 15% of the migrants into Greater Essex.

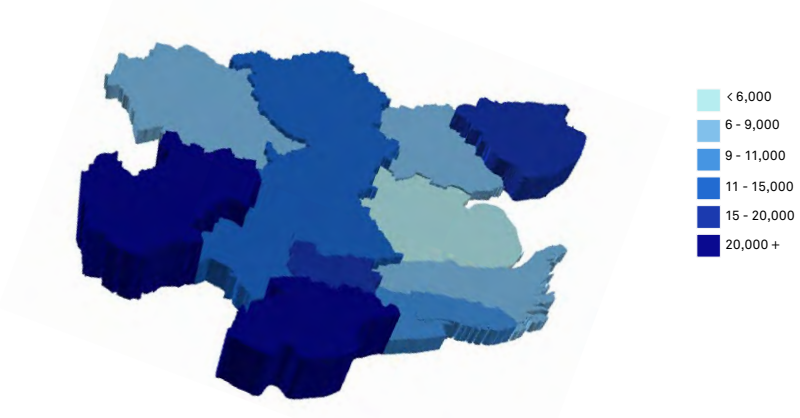


FIGURE 3.7 - NET INTERNAL MIGRATION FROM LONDON TO GREATER ESSEX LOCAL AUTHORITIES (2002-2014)

Source: Internal Migration: Moved Within England and Wales, 2002-2014, ONS

The population is ageing: The greatest increase in age categories in absolute terms will be those over 70, with the biggest increase in the 85+ cohort. The greatest contraction in population will be the working age 50-54 year age cohort.

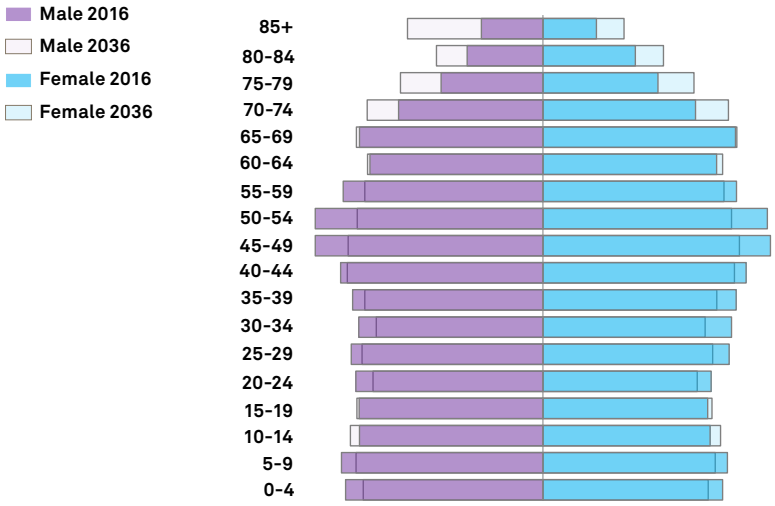


FIGURE 3.8 FORECAST CHANGE IN AGE PROFILE 2016-2036

Source: 2014 based ONS Sub National Population Projections, 2016

An ageing population will cause significant additional demand for certain types of infrastructure.

As those over the age of 65 begin to represent an increased proportion of the population, different types of housing will be required, demand for health care will increase and accessible infrastructure will be both expected and necessary.

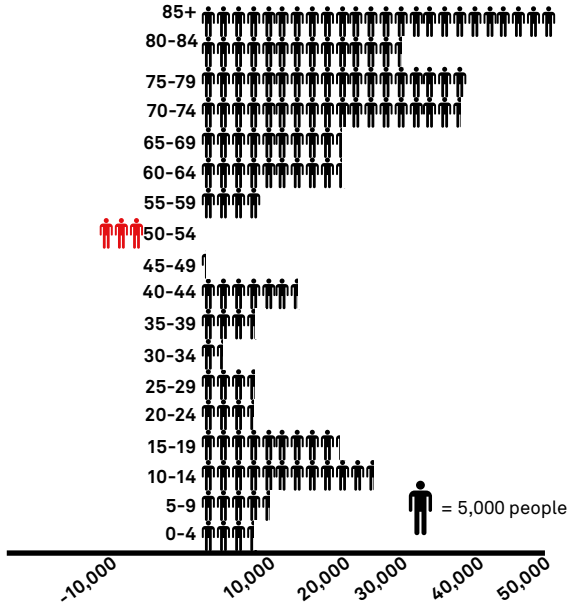


FIGURE 3.9 ADDITIONAL POPULATION BY AGE COHORT

Source: 2014 based ONS Sub National Population Projections, 2016

As the population gets older, working age residents will decline by 5% (equivalent to -9% decrease) in their total share of the population by 2036, whereas elderly residents will increase their share by 5% of the population (a 25% increase between 2016-2036). This will result in a reduced tax base against the increase in infrastructure demands.

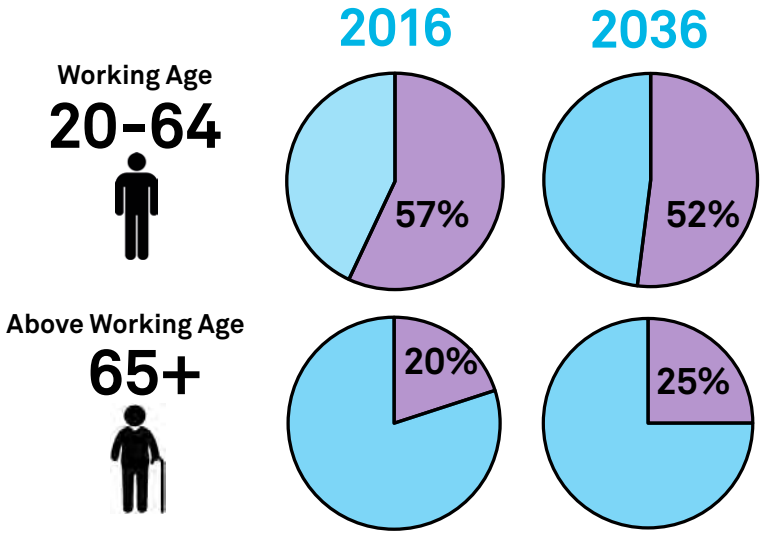


FIGURE 3.10 - FORECAST CHANGE IN GREATER ESSEX WORKING AGE COHORT

Source: 2014 based ONS Sub National Population Projections, 2016

As the elderly population increases this will potentially create greater demand for smaller dwellings, including accessible apartments. Elderly residents may however prefer not to downsize which would also present challenges to prices in the housing market as larger family homes are not made available to younger and larger families.

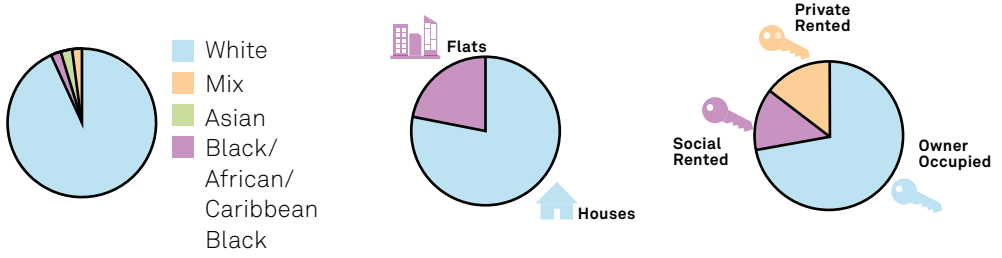


FIGURE 3.11 - GREATER ESSEX HOUSING CHARACTERISTICS

Source: ONS 2011

The resident population of Greater Essex in 2011 is relatively homogeneous with approximately 93% of the population identifying as white

Over 82% of the current housing stock in Greater Essex is single family homes

The current population of Greater Essex mostly own their homes (73%) with few renting (14%) or in social housing (11%)

Quality of life is relatively strong, but with pockets of high deprivation across Greater Essex

As demonstrated in Figure 3.13, Tendring has some of the highest levels of deprivation across Greater Essex, while many of the urban areas of Harlow, Colchester, Chelmsford, Basildon, Southend and Thurrock also have pockets of deprivation.

While there are pockets of deprivation across greater Essex, there is typically a high quality of life that is reflected by the fact that only 1.2% of Greater Essex's working age population (16-64) are claiming Jobseekers Allowance (JSA). Furthermore, an analysis of the number of JSA claimants from April 2015 to April 2016 shows a significant drop of 25%, suggesting an improving economic position in Greater Essex. Tendring (2.6%) and Harlow (2.2%) experience the highest level of JSA claimant rates of working age population across Greater Essex.

FIGURE 3.12 - POPULATION CLAIMING JOBSEEKERS ALLOWANCE ACROSS GREATER ESSEX

Source: NOMIS 2016

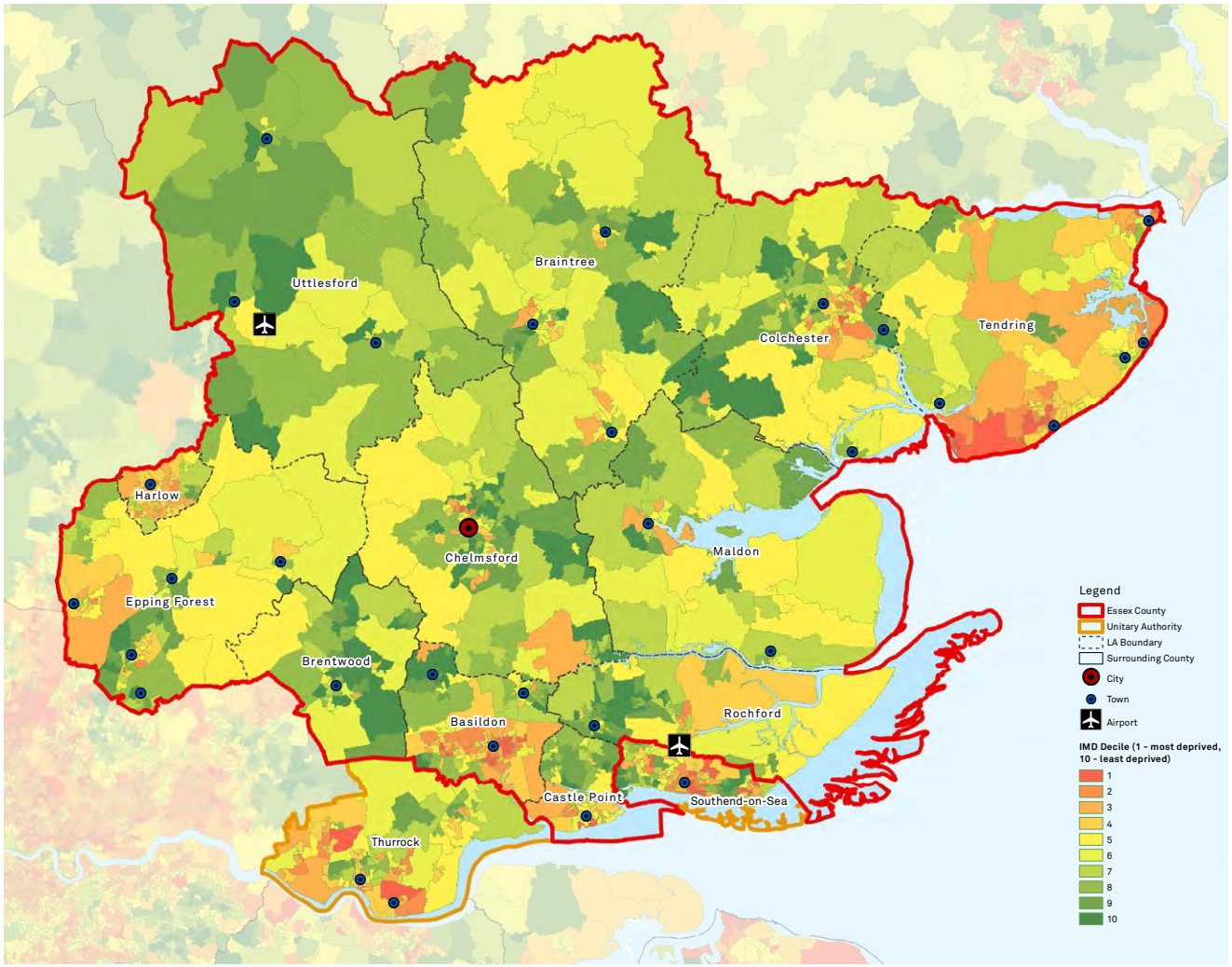


FIGURE 3.13 - INDEX OF MULTIPLE DEPRIVATION ACROSS GREATER ESSEX (2016)

Source: DCLG Index of Multiple Deprivation 2016

3.2 HOUSING PORTRAIT

EXISTING HOUSING

There are approximately 784,000 households across Greater Essex local authorities. Figure 3.14 illustrates the distribution of those existing households across Greater Essex with the largest share accommodated by Southend-On-Sea, Colchester, Basildon and Chelmsford and the least within Maldon and Brentwood.

Figure 3.15 illustrates the total completions achieved for each local authority in Greater Essex between 2005/06 and 2014/15 according to completions data verified by the Local Planning Authorities. 46,300 homes have been delivered across Greater Essex over the 10 year period from 2005 to 2014. This equates to an average annual completion rate of approximately 4,630 dwellings with the highest level of completions achieved in Colchester.

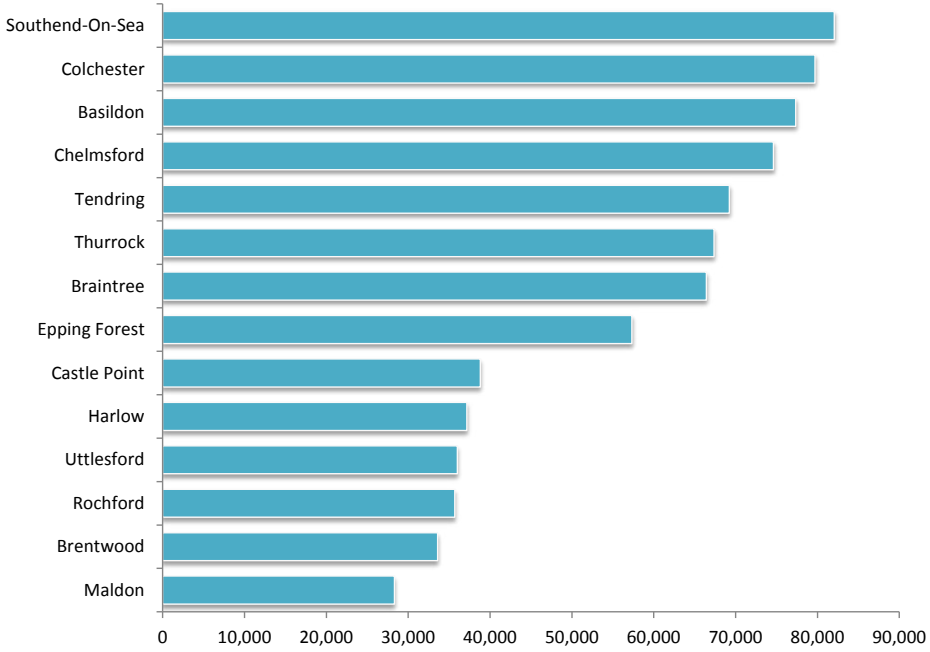


FIGURE 3.14 - EXISTING HOUSEHOLDS 2016

Source: 2014-based Household Projections, Department for Communities and Local Government

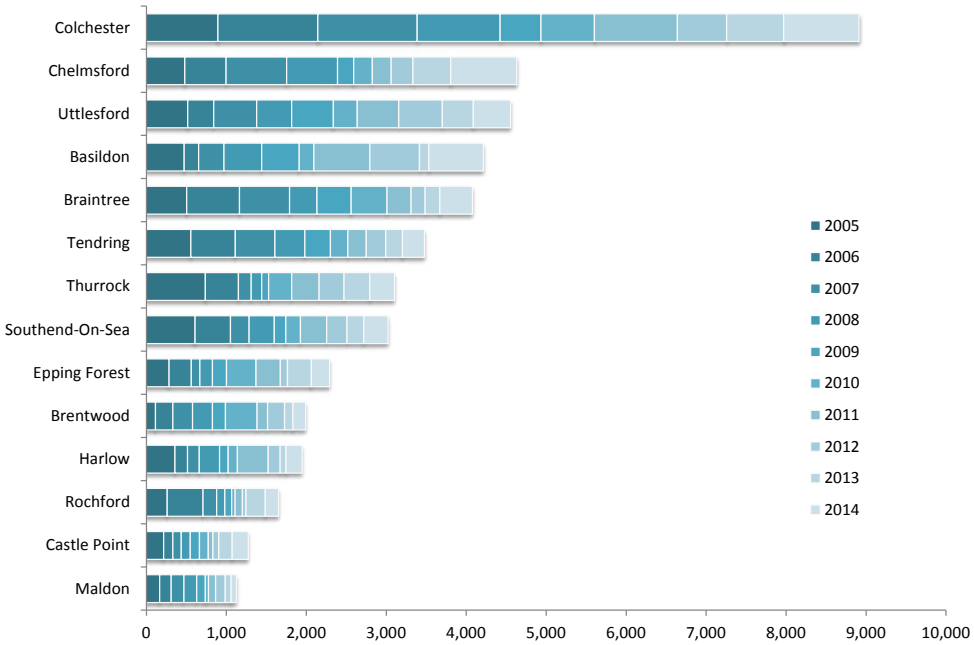


FIGURE 3.15 - HOUSING COMPLETIONS OVER 10 YEARS TO 2015

Source: ECC Completions Data

IDENTIFIED HOUSING NEED TO 2036

GREATER ESSEX HOUSING NEED

Compilation of the various assessments of housing need across Greater Essex indicates an objectively assessed need for around 179,000 additional dwellings across Greater Essex between 2016 and 2036.

Housing need, in this context, refers to the scale and mix of housing types and tenures that is likely to be needed in the area over the period - taking into account existing housing and likely demand over the period.

Table 3.1 below and Figure 3.16 opposite illustrate the total housing need for each LPA from 2016 to 2036. Table 3.1 also sets out the sources from which Greater Essex housing need has been compiled for this study and any assumptions required to do so.

A number of LPAs are working together (consistent with their statutory duty to cooperate) to establish the most effective approach towards delivering this scale of housing need across their respective housing market areas. This work may materially affect future housing need figures.

HOUSING DELIVERY

To deliver this scale of new housing would require a completion rate of approximately 8,960 dwellings per annum. This is considerably higher than the average completions achieved between 2005/6 and 2014/15, which was an average of around 4,630 dwellings per annum.

	HOUSING NEED DATA SOURCE	SHMA FORECAST	ASSUMPTIONS APPLIED FOR GIF TO COVER 2016-2036	2016-2020	2021-2025	2026-2030	2031-2035	2016-2035/6
Basildon	South Essex SHMAA May 2016	2014-2037	None - Extracted from phasing in SHMAA Appendix 8	4,034	4,693	4,262	4,070	**17,059**
Braintree	Braintree, Chelmsford, Colchester and Tendring Councils OAHN Study Update October 2016	2013-2037	None - Annualised figure applied	4,225	4,225	4,225	4,225	**16,900**
Brentwood	Brentwood SHMAA (2014)	2013-2033	Annualised figure (2013-2033) extrapolated post 2033	1,810	1,810	1,810	1,810	**7,240**
Castle Point	South Essex SHMAA May 2016	2014-2037	None - Extracted from phasing in SHMAA Appendix 8	1,978	2,548	2,089	1,857	**8,472**
Chelmsford	Braintree, Chelmsford, Colchester and Tendring Councils OAHN Study Update October 2016	2013-2037	None - Annualised figure applied	3,875	3,875	3,875	3,875	**15,500**
Colchester	Braintree, Chelmsford, Colchester and Tendring Councils OAHN Study Update October 2016	2013-2037	None - Annualised figure applied	4,600	4,600	4,600	4,600	**18,400**
Epping Forest	West Essex & East Hertfordshire SHMAA - Sept 2015	2011-2033	Annualised figure (2011-2033) extrapolated post 2033	2,570	2,570	2,570	2,570	**10,280**
Harlow	West Essex & East Hertfordshire SHMAA - Sept 2015	2011-2033	Annualised figure (2011-2033) extrapolated post 2033	1,340	1,340	1,340	1,340	**5,360**
Maldon	Maldon District Local Development Plan (LDP)	2014-2029	Annualised figure (2014-2029) extrapolated post 2029	1,550	1,550	1,550	1,550	**6,200**
Rochford	South Essex SHMAA May 2016	2014-2037	None - Extracted from phasing in SHMAA Appendix 8	1,972	2,271	1,944	1,805	**7,992**
Tendring	Braintree, Chelmsford, Colchester and Tendring Councils OAHN Study Update October 2016	2013-2037	Only adjustment to add shortfall of 600 to first 5 years	3,350	2,750	2,750	2,750	**11,600**
Uttlesford	West Essex & East Hertfordshire SHMAA - Sept 2015	2011-2033	Annualised figure (2011-2033) extrapolated post 2033	2,840	2,840	2,840	2,840	**11,360**
Southend	South Essex SHMAA May 2016	2014-2037	None - Extracted from phasing in SHMAA Appendix 8	4,743	6,272	6,190	6,119	**23,325**
Thurrock	South Essex SHMAA May 2016	2014-2037	None - Extracted from phasing in SHMAA Appendix 8	3,989	5,144	5,342	5,496	**19,969**
ESSEX				***34,143***	***35,072***	***33,855***	***33,292***	**136,363**
GREATER ESSEX				***42,875***	***46,488***	***45,387***	***44,907***	**179,657**

TABLE 3.1 - OBJECTIVELY ASSESSED HOUSING NEED 2016 - 2036

Caveats: Caveats apply to each local authority which cannot all be presented on this page. Refer to Section 8 for details.

Housing Need Data Methodology:

Greater Essex housing need presented in this document has been compiled from various Objectively Assessed Need (OAN) and Strategic Housing Market Assessment (SHMA) documents. Each of these assessments has been prepared for different geographical (housing market) areas, over different time periods and based on various assumptions about future economic conditions and housing mix.

These assessments are based on a range of population projections, which are not necessarily consistent with the population projections used in Section 3.1. However, these are the best available assessments of housing need, and so have been used to identify aggregated housing need across the study area.

Where an assessment covers a period that starts before 2016, the years of the assessment period that fall before the study period have been excluded from the aggregated Greater Essex housing need. Where an assessment covers a period which ends before 2036, the annualised housing need as at the last year of the assessment has been assumed to continue in each year after the assessment period until 2036. This has allowed the aggregation of Greater Essex housing need on which to assess infrastructure needs on a comparable basis.

In relation to housing need:

- OAN figures are yet to be tested at Local Plan examinations.
- A number of LPAs are currently reviewing their OAN figures in light of updated Government household projection data.

Consequently, the figures presented in this report are correct at publication, but may differ from those emerging from LPAs.

Full details of caveats to these data, supplied by each LPA, are set out in Section 8.1.

WIDER HOUSING NEEDS

While this analysis has focused on the quantum of housing required to support an assessment of future infrastructure requirements, the significance of ensuring the appropriate types of housing are delivered is recognised. For example:

- There is an existing need for affordable housing across Greater Essex, which is not being fully met. Future housing delivery will need to contribute towards addressing this shortfall as well as meeting the needs of future residents.
- Key Worker housing is also required across Greater Essex, to ensure that a growing health, social care and education workforce is accommodated to support future economic development.

The needs of Gypsy and Traveller and Travelling Show people are set out in the Local Authority Gypsy and Traveller and Travelling Show People Accommodation Assessments, which identify the needs of Greater Essex local authorities to plan for the provision of transit sites and emergency stopping places.

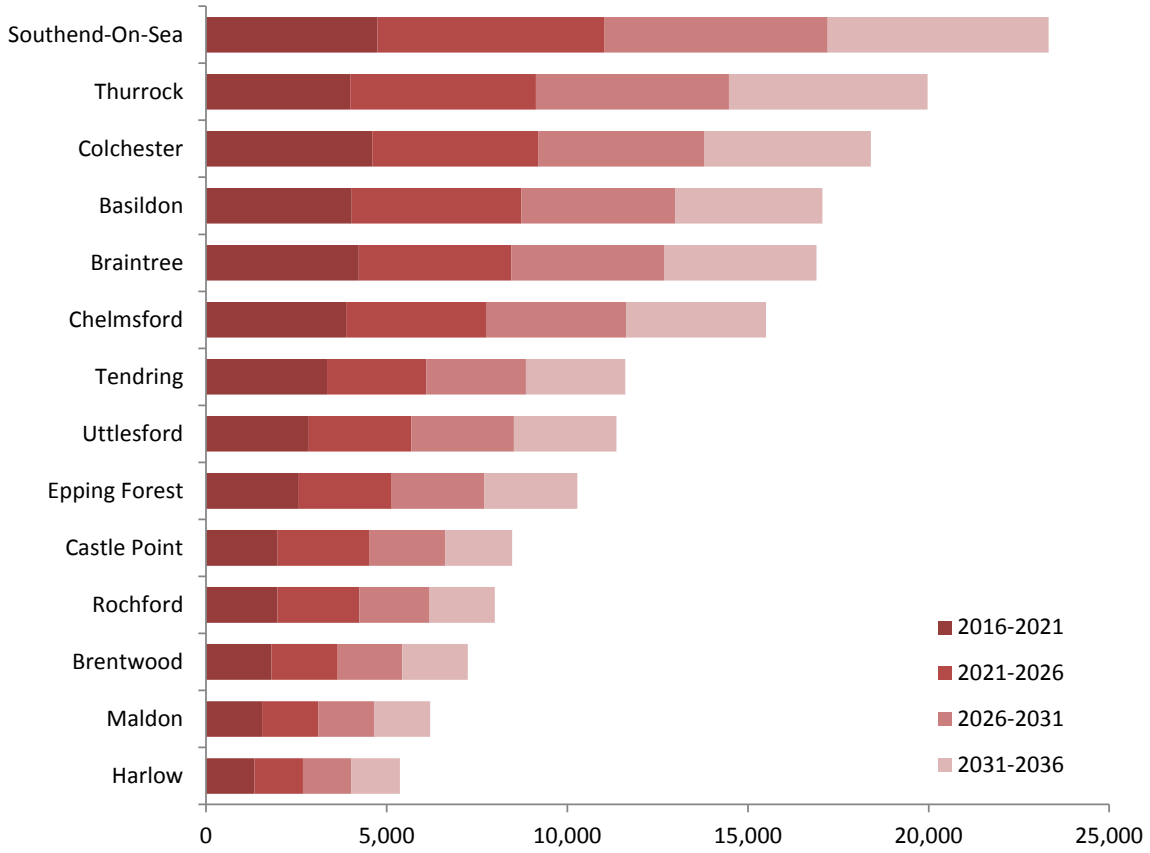


FIGURE 3.16 - OBJECTIVELY ASSESSED HOUSING NEED

Source: See Table 3.1

CURRENTLY PLANNED HOUSING

To complement the Greater Essex housing need from 2016 to 2036, a Greater Essex housing supply trajectory has been compiled for the same period, using LPAs' individual housing supply trajectories. These housing supply trajectories are set out in Table 3.2 below.

While not all LPAs are presenting an adopted Local Plan position with a full housing supply trajectory, the greatest level of housing growth is likely to be in Chelmsford, Braintree, Colchester, Basildon and Epping Forest.

An understanding of the currently identified housing sites from all known sources, including sites under construction, sites with outline or full planning permissions, existing and draft Local Plan allocations, is illustrated in Figure 3.17 opposite.

These identified housing sites do not equal the total number of homes planned for by each LPA (set out in Table 3.2), as not all Local Plans are at a stage where all housing sites have been identified or confirmed for inclusion in the Local Plan.

	2016-2020	2021-2025	2026-2030	2031-2035	2016-2035/6	BASIS OF PLANNED TRAJECTORY
Basildon	2,573	3,666	4,706	2,542	**13,487**	*Trajectory only available to 2033/34*
Braintree	5,507	5,056	4,030	1,660	**16,253**	*Trajectory only available to 2032/33*
Brentwood	1,109	2,536	1,960	1,664	**7,269**	*Target Projected over 20 years*
Castle Point	500	500	500	500	**2,000**	*Target Projected over 20 years*
Chelmsford	4,830	4,830	4,830	4,830	**19,320**	*Target Projected over 20 years*
Colchester	4,600	4,600	4,600	4,600	**18,400**	*Target Projected over 20 years*
Epping Forest	3,541	4,515	3,615	1,113	**12,784**	*Trajectory only available to 2032/33*
Harlow	2,908	1,824	2,070	970	**7,772**	*Trajectory only available to 2032/33*
Maldon	2,535	1,368	997	0	**4,900**	*Trajectory only available to 2029/30*
Rochford	2,043	1,106	0	0	**3,149**	*Trajectory only available to 2024/25*
Tendring	3,255	3,255	3,255	651	**10,416**	*Trajectory only available to 2031/32*
Uttlesford	3,357	1,163	800	140	**5,460**	*Trajectory only available to 2032/33*
Southend	2,347	2,485	1,039	0	**5,871**	*Trajectory only available to 2028/29*
Thurrock	4,457	6,125	0	0	**10,582**	*Trajectory only available to 2025/26*
ESSEX	***36,758***	***34,419***	***31,363***	***18,670***	***121,210***	
GREATER ESSEX	***43,562***	***43,029***	***32,402***	***18,670***	***137,663***	

TABLE 3.2 - PLANNED HOUSING TRAJECTORIES 2016 - 2036

Source: Greater Essex Local Authorities - Supplied trajectories including under construction, planning permissions and allocations

Shading of final column aligned to Table 2.1 to reflect the Local Plan Status

Planned Housing Methodology:

Housing supply trajectories presented in this document have been supplied by each LPA, but represent only the latest working assumption of likely housing delivery to 2036. Because there is significant variation in the status of Local Plans and the associated technical work, some housing supply trajectories are based on anticipated completions or on annual average completion figures drawn from current adopted Local Plans. Where no official housing supply trajectory is available, draft or working figures have been used.

Where an available housing supply trajectory does not cover the full period to 2036, it is assumed no housing is planned in each of the remaining years to 2036.

Thurrock Council has been unable to provide any housing sites data, due to the early stages of its Local Plan and the unconfirmed location of the potential Thames Crossing, which would heavily influence any housing site distribution.

Housing supply trajectories are likely to change as Local Plans are further developed and adopted.

Consequently, the figures presented in this report are correct at publication, but may differ from those emerging from LPAs.

Full details of caveats to these data, supplied by each LPA, are set out in Section 8 of this document.

IDENTIFIED HOUSING SITES

The second set of information requested from the fourteen local authorities was a detailed site specific dataset recording the currently identified housing sites from all known sources (under construction, with outline or full planning permissions, plan allocations and strategic sites).

This data has been used to map the distribution of forecast growth as illustrated in Figure 3.17 over the page.

The identified sites do not equal the total number of homes planned for each local authority as not all of the local authority plans are at a stage where sites have been identified or confirmed for inclusion in the Local Plan.

As highlighted by Figure 3.17 Thurrock Borough Council have not been able to provide the study with any housing sites for inclusion in the mapping due to the early stages of the Local Plan and the unconfirmed location of the potential Thames Crossing which would heavily influence any housing site distribution.

HOUSING GROWTH PATTERNS

Table 3.2 on the previous page highlights the areas planning for the greatest level of housing growth over the next 20 years. Whilst it is acknowledged that not all of the Local Authorities are presenting an adopted Local Plan position with a full trajectory, a number of Local Authorities are seen to accommodate the greatest level of growth including Chelmsford, Braintree, Colchester, Basildon and Epping Forest.

Figure 3.17 on the facing page illustrates the currently identified housing sites which will make up a share of those planned new homes.

Many of these identified housing sites are located along four key corridors, following major transport routes:

- The A12 & Great Eastern Mainline Corridor (Brentwood-Chelmsford-Colchester) with the potential for a number of large-scale urban extensions around Chelmsford (though these are not illustrated at this stage)
- The A120 Haven Gateway Corridor including the North Essex Garden Communities (East of Colchester Garden Community, West of Colchester Garden Community and West of Braintree Garden Community)
- The M11 London Stansted Cambridge Corridor with a number of strategic housing sites surrounding Harlow
- The A127 and A13 Corridors with notable strategic housing sites in East and West Basildon.

While housing supply trajectories indicate anticipated housing delivery, actual delivery could differ significantly - depending on a number of factors, including changing economic conditions, development viability and infrastructure delivery.

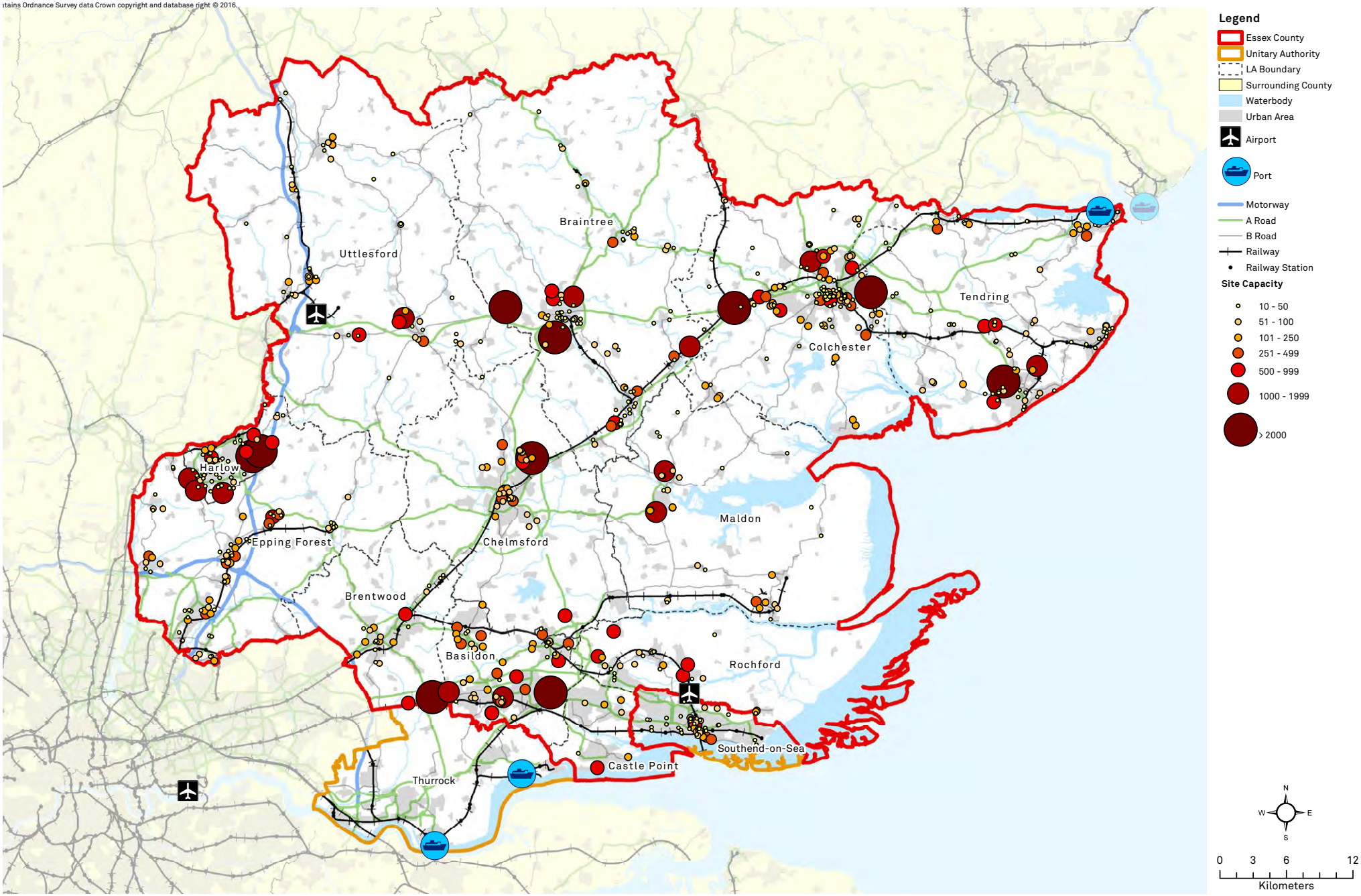


FIGURE 3.17 - IDENTIFIED HOUSING SITES IN GREATER ESSEX TO 2036

* This is based on the most up to date information at the time of publication and could be subject to change, subject to review of planning policy documents. Some sites listed are potential development sites and not guarenteed at to be included in adopted Local Plans

Source: Local Authority data provided for Infrastructure Study

3.3 ECONOMIC PORTRAIT

INVESTMENT IN INFRASTRUCTURE IS ESSENTIAL TO PROMOTE PROSPERITY AND SUPPORT BALANCED ECONOMIC GROWTH ACROSS GREATER ESSEX. THIS SECTION SETS OUT SOME OF THE KEY ISSUES AROUND THE GREATER ESSEX ECONOMY, TO WHICH FUTURE INVESTMENT IN INFRASTRUCTURE MUST RESPOND.

ECONOMIC CONTEXT

Greater Essex is a significant driver of the UK economy – generating £36bn Gross Value Added (GVA) and supporting over 816,000 jobs. (ONS Regional GVA, 2014; East of England Forecasting Model, 2016).

As well as its own economic base, Greater Essex also has a strong labour market relationship with London and other surrounding areas. The west, central and southern districts of Essex in particular rely on access to employment opportunities in London, and in turn play an important role in providing a readily available labour force.

The Greater Essex economy builds on its position in close proximity to London and continental Europe, as well as other key economic locations such as Cambridge. Greater Essex also benefits from international links through its airports (Stansted and Southend) and ports (Harwich, London Gateway and the Port of Tilbury). Much of the Greater Essex economy is focused along four key corridors, following major transport routes:

- The A12 & Great Eastern Mainline Corridor (Brentwood-Chelmsford-Colchester)
- The A120 Haven Gateway Corridor
- The M11 London Stansted Cambridge Corridor
- The A127 and A13 Corridors (London-Basildon-Southend/Thurrock-Canvey Island)

Key high performing economic sectors, and growth opportunity sectors, include advanced manufacturing; low carbon and renewable; transportation and logistics; life sciences and healthcare; digital, cultural and creative industries; and finance and business services. Other sectors including health, education, and wholesale and retail trade play an important supporting role and make up a major share of the employment base.

The M11 London Stansted Cambridge Corridor crosses through Greater Essex but has significant economic growth potential through its globally significant Life Science and Technology sector economies. Harlow Enterprise Zone and London Stansted Airport are of particular importance to supporting that growth.

Despite Greater Essex's economic strengths, the area faces some key challenges. GVA per head and recent GVA growth lag the national average. Essex faces a skills deficit, with a below-average share of residents holding advanced qualifications, and in some areas a high rate of residents with no qualifications.

There are wide disparities between different areas of Greater Essex, including in economic performance (e.g. GVA per head, strength of the local employment base) and in the labour market (e.g. qualification rates, employment rates and resident earnings). Disparities in some areas are exacerbated by poor transport connectivity.

Looking ahead, an acceleration in productivity and employment growth will be required to support a growing and ageing population. Forecasting patterns of economic growth (by the East of England Forecasting Model 2016) suggest an intensification of existing disparities within Essex, requiring infrastructure investment to promote more balanced economic growth and support access to employment.

POLICY CONTEXT

Greater Essex lies predominantly within the South East LEP (SELEP) area which also encompasses Kent & Medway and East Sussex. Uttlesford District is part of the Greater Cambridge / Greater Peterborough LEP and SELEP.

As articulated in the SELEP Strategic Economic Plan (2014-21), SELEP's objectives include enabling the creation of 200,000 sustainable private sector jobs by 2021 while levering up to £10 billion of private sector investment. Priorities include boosting productivity (through enterprise zones and support for innovation); improving skills; and investing in key transport corridors.

The Economic Plan for Essex (2014-21) sets out Essex County Council's economic priorities over the same period for the authorities within Essex County. These include improving skills across the Essex workforce and addressing skills gaps; focusing a £1bn pipeline of investment in growth sites, transport and skills infrastructure across Essex's four strategic growth corridors; and targeting enhanced productivity within Essex economy focused on five key growth sectors.

Figure 3.18 opposite presents current employment density and the key economic growth corridors across Greater Essex, while the following pages illustrate further some of the key characteristics of the Greater Essex economy.

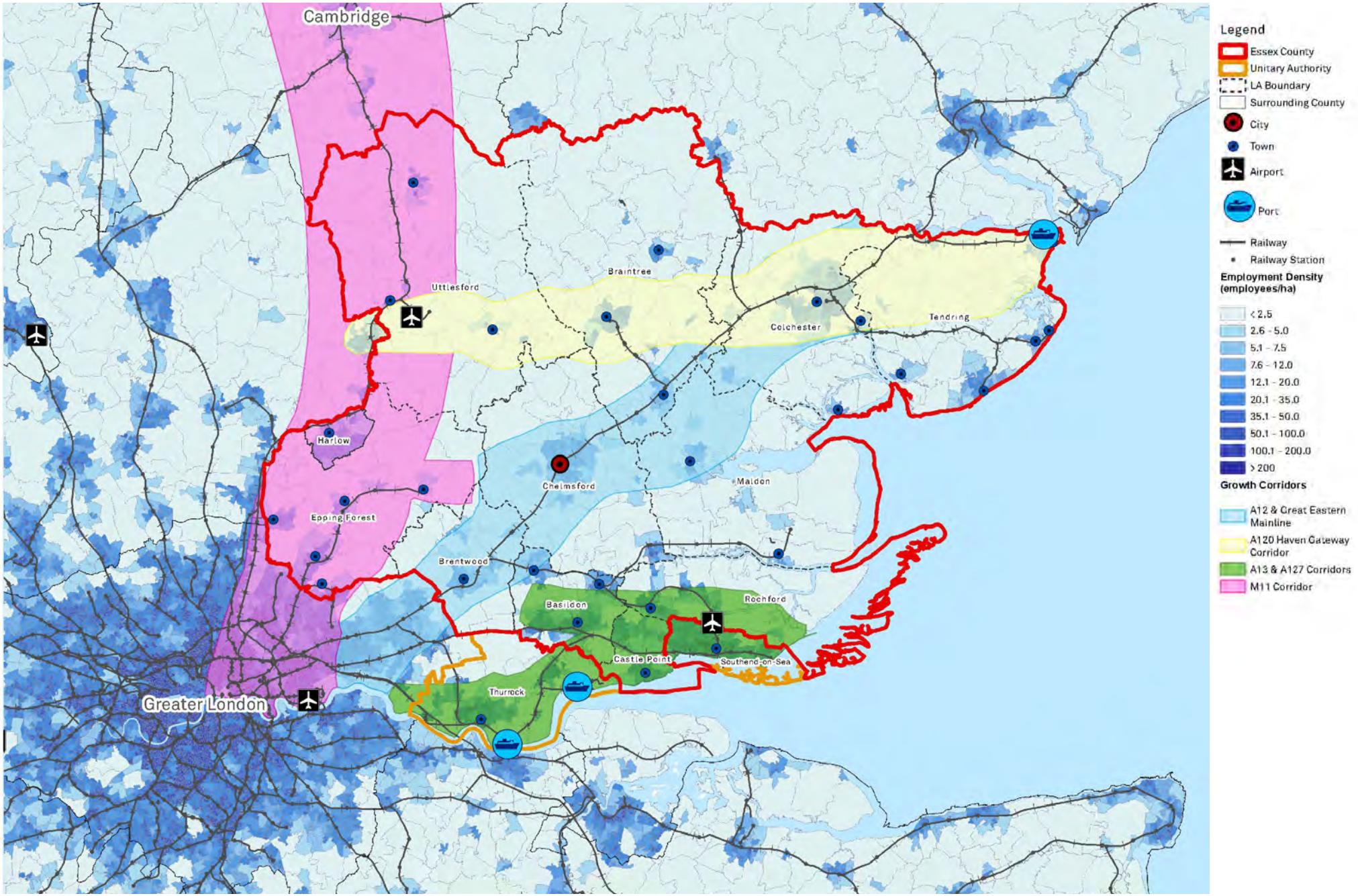


FIGURE 3.18 - EMPLOYMENT DENSITY AND ECONOMIC GROWTH CORRIDORS

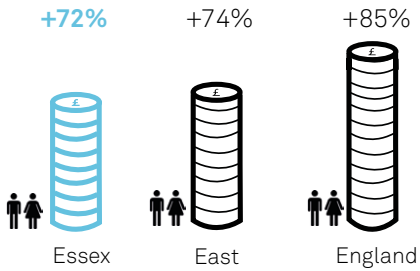
Source: Employment density by Lower Level Super Output Area, ONS 2011

The Greater Essex Economy

GVA per head in Greater Essex is below the national average (though similar to the average across the East of England)

FIGURE 3.19 - GVA PER HEAD (WORKPLACE BASED) Source: 2014 Regional GVA (ONS)

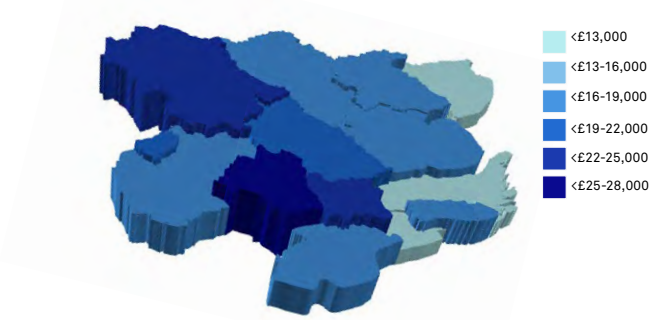
Recent GVA growth (from 1997-2014) also lags the national average



Source: 2014 Regional GVA (ONS)

FIGURE 3.20 - GROWTH IN GREATER ESSEX GVA PER HEAD

These headline figures hide some clear disparities in GVA per head



Source: Cambridge Econometrics, East of England Forecasting Model (2016).

FIGURE 3.21 - GVA PER HEAD BY LOCAL AUTHORITY

The Greater Essex economy supports 815,870 jobs in 2016. Employment is strongly concentrated in the districts of Chelmsford, Basildon and Colchester.

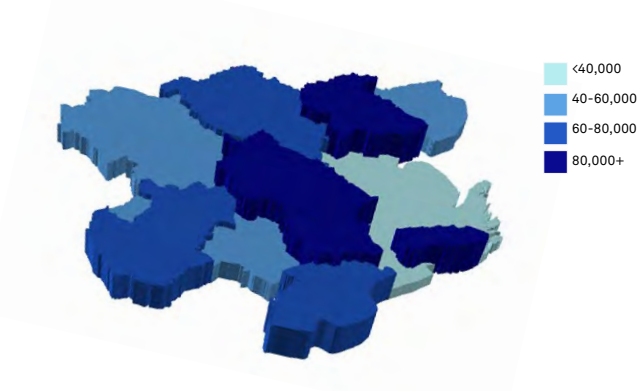
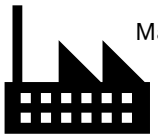


FIGURE 3.22 - TOTAL WORKPLACE-BASED EMPLOYMENT BY LOCAL AUTHORITY

Source: Cambridge Econometrics, East of England Forecasting Model (2016).

Economic specialisms vary across Greater Essex



Manufacturing

LQ 1.0

Higher specialisation in- *Basildon, Harlow, Maldon*

Knowledge-based services

LQ 0.9*

Higher specialisation in - *Brentwood, Epping Forest, Southend-on-Sea*

Transportation and storage

LQ 1.2

Higher specialisation in - *Uttlesford, Thurrock*

Education

LQ 1.2

Higher specialisation in - *Colchester*

FIGURE 3.23 - ECONOMIC SPECIALISM BY LOCAL AUTHORITY

*Source: Cambridge Econometrics, East of England Forecasting Model (2016).LQ (Location Quotient) is a measure of the relative economic specialisation of an area, and represents the share of employment found in a given sector as a proportion of the share nationally. The sectors illustrated above have the highest LQ scores for all sectors across Greater Essex

The Greater Essex Labour Force

The proportion of Greater Essex residents employed in highly skilled occupations is similar to the national average

Source: ONS Annual Population Survey, April 2015

FIGURE 3.24 - % OF WORKFORCE IN MANAGERIAL, PROFESSIONAL AND TECHNICAL OCCUPATIONS

However, Greater Essex has a skills deficit with a lower proportion of residents educated to NVQ4+

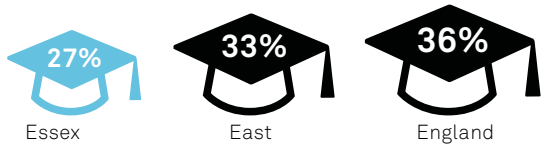


FIGURE 3.25 - % WORKFORCE WITH NVQ4+ THAN NATIONAL AVERAGE

Source: ONS Annual Population Survey, April 2015

Once again, there are strong contrasts across the area with Brentwood and Uttlesford having above-average rates of NVQ4+, and some districts having much lower rates

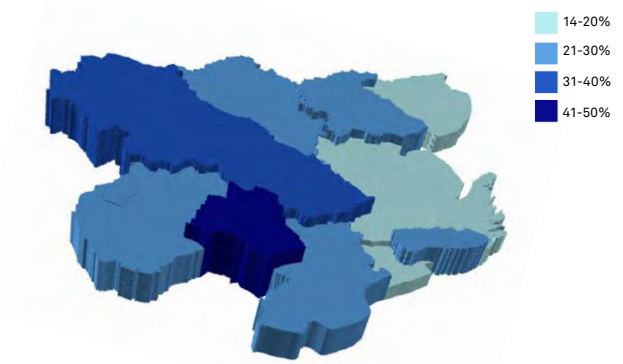


FIGURE 3.26 - % WORKFORCE WITH NVQ4+

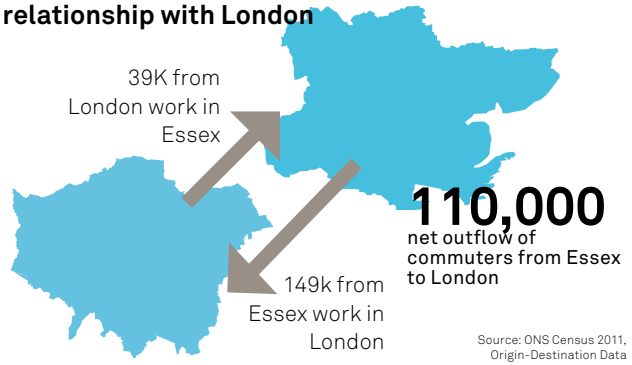
Source: ONS Annual Population Survey, April 2015

The average salary of Greater Essex residents is higher than the average paid by Greater Essex jobs

FIGURE 3.27 - ESSEX MEAN AVERAGE EARNINGS (2014)

Source: ONS Annual Survey of Hours and Earnings (2015)

This reflects the strong commuting relationship with London



Source: ONS Census 2011, Origin-Destination Data

FIGURE 3.28- EXISTING COMMUTER PATTERNS

All local authorities are net exporters of labour, with Braintree and Castle Point having the largest net out-commuting

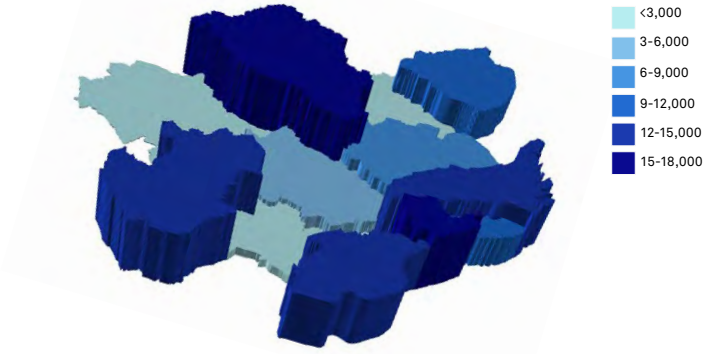


FIGURE 3.29 - NET OUT-COMMUTING FROM GREATER ESSEX LOCAL AUTHORITIES

Source: ONS Census 2011, Origin-Destination Data

Forecast employment growth

The East of England Forecasting model projects that the Greater Essex Economy could add 79,000 jobs to 2036, representing growth of 10%

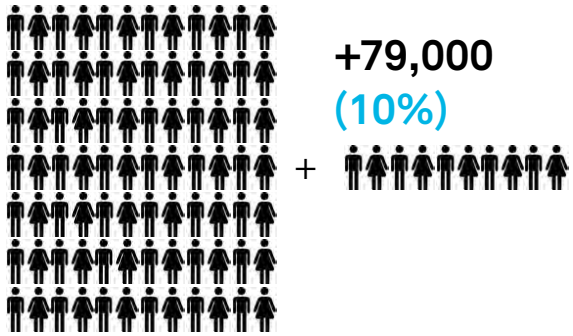


FIGURE 3.30 - EMPLOYMENT GROWTH FORECAST 2016-36

Source: Cambridge Econometrics, East of England Forecasting Model (2016)

The strongest employment growth to 2036 is forecast in business administration and support services, while manufacturing is projected to contract

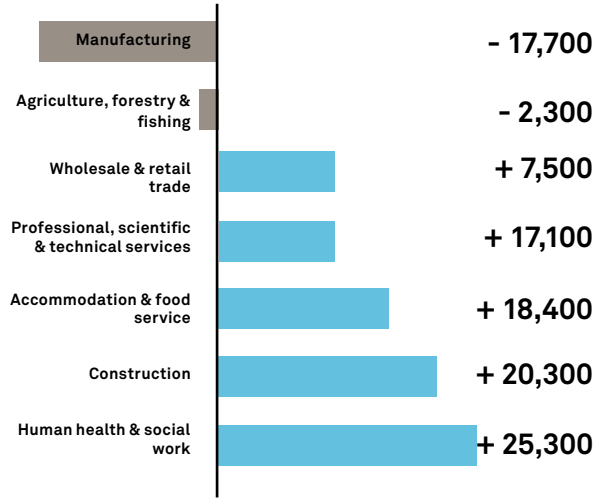


FIGURE 3.31 - FORECAST CHANGE IN EMPLOYMENT IN SELECTED ECONOMIC SECTORS, 2016-36

Source: Cambridge Econometrics,, East of England Forecasting Model (2016)

The strongest employment growth is forecast in Chelmsford, Basildon, Colchester and Thurrock, while the slowest growth is forecast in Rochford, Uttlesford and Castle Point

FIGURE 3.32 - FORECAST CHANGE IN TOTAL WORKPLACE-BASED EMPLOYMENT BY LOCAL AUTHORITY, 2016-36

Source: Cambridge Econometrics, East of England Forecasting Model (2016)

What does this mean?

Infrastructure is essential to address economic deficiency as Greater Essex grows.

With jobs concentrated in major centres, and high dependency on commuting to London, transport infrastructure is essential to support access to employment.

Transport infrastructure must also meet the needs of the important ports, airport, logistics and manufacturing sectors in key areas of Essex - while managing the sometimes competing demands of passenger and freight transport.

Education and other social infrastructure can help address the skills disparity within Greater Essex.

IDENTIFIED GROWTH SITES AND CORRIDORS

Figure 3.33 highlights some of the key sites for employment growth which will support the expansion of the Greater Essex economy over the next 20 years.

This data has been collated from local authorities. It identifies sites from planning permissions, employment allocations in adopted and draft Local Plans and from an understanding of existing sites with expansion capacity. Only sites with capacity for 1,000 sq.m or more of additional employment floorspace have been mapped. This provides a helpful, but not entirely complete picture of Greater Essex's future employment capacity, as smaller sites are excluded - even though they may make an important contribution to employment.

This includes a number of sites identified by partners in Greater Essex as strategic priorities to support economic development, and which should be supported by growth funding streams. These include:

A127 and A13 Corridors (London-Basildon-Southend / Thurrock-Canvey Island)

- The new Saxon Business Park in Rochford District and other sites around London Southend Airport are covered by the London Southend Airport and Environs Joint Area Action Plan (JAAP). This is a joint plan prepared by Rochford District Council and Southend Borough Council which seeks to deliver thousands of jobs on a high quality business park.
- Very large capacity for new industrial and logistics space in Thurrock and Southend, as well as premises in the Basildon A127 Enterprise Corridor (a nationally leading location for advanced manufacturing).
- New business parks to be delivered by 2020 on Canvey Island, to provide 65,000sq.m of business and commercial floorspace.

A12 & Great Eastern Mainline Corridor (Brentwood-Chelmsford-Colchester)

- Concentrations of new retail employment space in Chelmsford City Centre supported by public realm improvements and the Chelmsford Innovation Centre (MedBIC).
- Key employment sites in Colchester including the Stanway, North Colchester, Knowledge Gateway/ University and Town Centre Service sector concentration.
- Brentwood Enterprise Park, delivering over 1 million sq.ft of employment space with access to the M25 and A127.
- Proposed Beaulieu Business Park alongside new Beaulieu Station.

A120 Haven Gateway Corridor (Stanstead-Harwich-Braintree-Colchester)

- Sites benefiting from access to Stansted Airport, Harwich and Felixstowe, including the Tendring Europark Site at Horsely Cross, Harwich Supply Base and Energy Skills Centre in Harwich, and Eastlink 120 site in Braintree, as well as key employment sites within the Knowledge Gateway

M11 London Stansted Cambridge Corridor (LSCC) (London-Harlow-Stansted-Cambridge)

- The Harlow Enterprise Zone, accommodating more than 5,000 new jobs .
- Harlow Town Centre employment growth and Public Health England move with estimated 2,500 additional jobs.
- Stansted Airport, with considerable economic growth proposals amounting to over 8,000 additional jobs based on existing runway capacity.

The need for Grow-on-Space

In addition to employment sites, research recently commisioned by ECC has identified a mismatch between the supply of and the demand for "Grow-on-space" (employment spaces sized from 100 to 300 sq.m) across Essex, for both office and industrial space. This shortage reflects that the leasing of Grow-On-Space to newer, expanding businesses is not an attractive proposition for the private sector. Expected return on investement for developers of Grow-On-Space is lower than other types of uses for the same land. Additionally, leasing on a short-term basis to newer businesses carries a higher level of risk to return on investment for the developer.

Lack of suitable Grow-On-Space is constraining business growth, forcing them to stay in existing and sometimes inadequate premises. Where these premises are Incubation/Enterprise centres across Essex, larger businesses remaining in these spaces crowds out new start-up and nascent businesses from utilising these spaces.

In addition, anecdotal evidence suggests that some businesses which aren't able to secure appropriate Grow-On spaces have looked outside the county to fulfil this need, which leads to the potential loss of GVA and jobs to the county.

Impact of Permitted Development Rights

Across Greater Essex town centres, particularly in Chelmsford and Harlow, the impacts of permitted development rights is being seen through the conversion of office floorspace to residential development. Ensuring alternative provision is maintained alongside these conversions is essential to retain an adequate supply of office space to support employment growth.

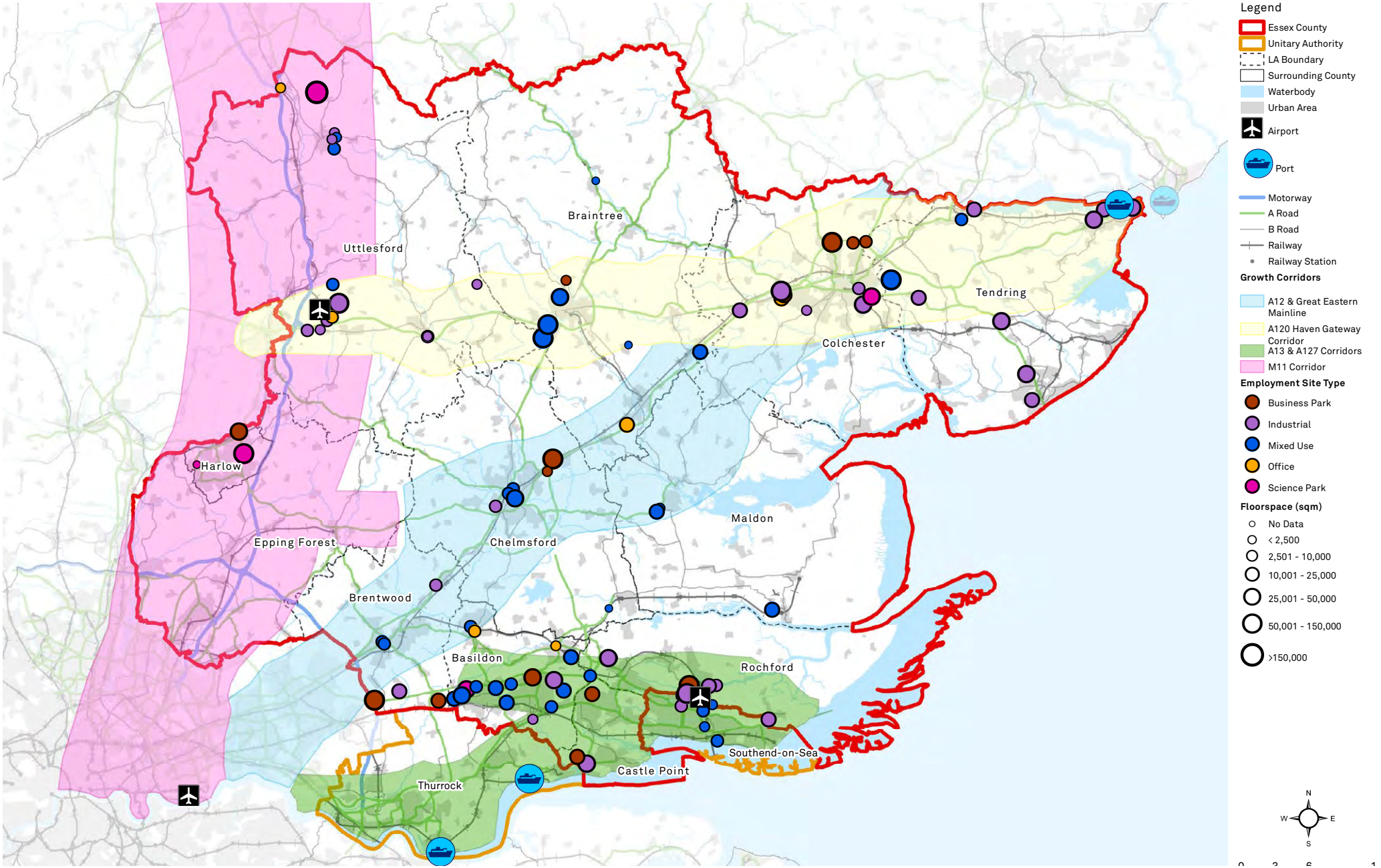


FIGURE 3.33 - IDENTIFIED EMPLOYMENT SITES AND CAPACITY OVER 1,000 SQ.M

* This is based on the most up to date information at the time of publication and could be subject to change, subject to review of planning policy documents

Source: Local Authority data provided

04

INFRASTRUCTURE NEEDS AND REQUIREMENTS

THIS SECTION PRESENTS AN ASSESSMENT OF CURRENT INFRASTRUCTURE PROVISION AGAINST GROWTH FORECASTS TO 2036.

The document builds a picture of the infrastructure needed to support the expected growth in Greater Essex to 2036, outlined in Section 3, and the anticipated gap in funding to provide it.

Future infrastructure need is assessed by applying industry standard benchmarks to either the projected increase in population or necessary additional dwellings to 2036.

- The projected increase in population to 2036 (+298,700) is sourced from ONS population projections outlined in Section 3.1.
- The number of necessary additional dwellings to 2036 (+180,000) is derived from Strategic Market Housing Assessments and Objectively Assessed Need data, as outlined in Section 3.2.
- Further detail of the benchmarks used in this assessment is set out in detail in Section 8.2.

The total cost of providing the necessary infrastructure is estimated from detail of planned and theoretical infrastructure projects required to meet each type of infrastructure need, based on existing infrastructure.

- A project schedule comprising the projects required to meet the infrastructure need has been collated from detail of planned projects and theoretical projects (where data about specific planned projects is unavailable).
- Costings for theoretical projects were generated by applying industry cost benchmarks for each type of infrastructure to each project.
- Where no data was available from which to estimate project costs, the cost has been assumed as £0. Accordingly, the costs of infrastructure presented in this document are minimum figures.
- All costs presented are based on 2016 prices and have not been indexed forward to the assumed date of requirement or delivery.
- The sources for these costings and caveats applicable to those costed by AECOM are set out in Section 8.3.

Finally, the funding gap is estimated by reducing the total cost in line with anticipated public and private sector funding and developer contributions. These contributions are determined largely by assumptions of future funding, set out in detail in Section 8.4.

These high level estimates of cost and available funding have been assessed theoretically and are highly sensitive to the accuracy of the supporting assumptions. We recommend that future iterations of this study are informed by further data, research and analysis to refine and improve these assumptions. In the meantime, over-reliance on these figures should be avoided, as they are partly based on theoretical need, costed theoretically, and subject to theoretical assumptions about the availability of future funding.

Notably, this Section does not include detailed analysis of the likely impact of anticipated growth in adjoining areas (Greater London, Suffolk, Cambridgeshire, Hertfordshire and Kent) on Greater Essex. However, as these growth areas are likely impact on service demand in Greater Essex, especially along border areas, these are explored at a high level in Section 2.

This section covers the following infrastructure categories:

4.1 TRANSPORT

- Strategic road network
- Local road network
- Rail
- Bus and coach
- Walking and cycling
- Airports
- Ports

4.2 EDUCATION

- Early years and childcare
- Primary education
- Secondary and sixth form education
- Further and higher education

4.3 HEALTH + SOCIAL CARE

- Primary healthcare
- Hospitals and mental health
- Adult social care

4.4 EMERGENCY SERVICES

- Police service
- Fire service
- Ambulance service

4.5 COMMUNITY

- Libraries
- Community and youth services
- Indoor sports
- Outdoor sports and recreation

4.6 GREEN INFRASTRUCTURE

- Natural capital and landscape
- Ecological
- Open space

4.7 UTILITIES &WASTE

- Energy
- Broadband
- Water + waste water
- Waste + minerals

4.8 FLOOD & DRAINAGE

- Flood protection
- Sustainable drainage

4.1 TRANSPORT

Greater Essex
103
Km of Motorways (64mi)

Greater Essex
1,348
Km of A Road Highway (838mi)

Greater Essex
362 / 65
Km of Railways (225mi) / Rail Stations

POLICY CONTEXT

Transport investment across Greater Essex is governed by the frameworks set out in the statutory Local Transport Plans (LTP) produced by each of the three transport authorities.

The current Essex LTP (the Essex Transport Strategy) prioritises the effective use of the current network including support for less infrastructure intensive forms of transport focused on the effective movement of people and goods. Investment is then targeted at local improvements such as: addressing pinch points, improving sustainable transport and providing access to new developments.

The Growth and Infrastructure framework focusses on areas where more substantial interventions have been identified as being necessary to support growth. Transport infrastructure requirements fall into three categories:

- Securing improvements to the strategic road and rail networks that connect Greater Essex, the rest of the UK, London, and the ports and airports to enable trade within the wider UK and Global economies.
- Providing effective connections to and between the main economic centres of Greater Essex enabling the efficient movement of people and goods within each economic catchment.
- Planning for efficient movement within key economic centres to maintain the effectiveness of the transport network as these key centres grow.

EXISTING TRAVEL PATTERNS

Analysis of 2011 Census travel to work data has been undertaken to understand current travel patterns. Data has been analysed at the Super Output Area level to provide a full picture of travel patterns across the whole of Greater Essex as well as to and from neighbouring areas including London.

The analysis shows the following:

- The average distance travelled to work in Greater Essex is 18km, with residents of rural areas, especially in the north of Essex, travelling further than urban residents; for example residents of Uttlesford and northern Braintree districts typically travel more than travel 22km while Harlow residents travel 12.9km on average.
- Working from home is most common in rural areas of Essex whilst the main urban centres have lower proportions of residents working from home.
- People living in Greater Essex's main urban centres are also more likely to travel less than 5km to work. For example 43% of residents in Southend-on-Sea travel less than 5km to work.
- Areas with the highest share of short distance trips to work also correlate with the highest proportion of walking and cycling trips (Figure 4.1). Cycling and walking to work is therefore most common in the main urban centres.
- Car travel is the most common way to travel to work across Greater Essex (69%) and car travel is especially important in rural areas (Figure 4.2)
- Rail mode share is highest in areas close to London but rail commuting is significant in all locations adjacent to the three main rail corridors. (Figure 4.3). The Underground replaces the train as a main mode around Epping due to access to the Central Line (Figure 4.4).
- The highest cycle mode share is seen in urban areas where more than 10% of journeys are made by bicycle.
- Walking forms an important mode of transport throughout Greater Essex with the highest levels seen in urban areas.
- The highest internalisation is witnessed in Colchester (65%) followed by Tendring (60%) and Southend (55%) whilst the lowest can be seen in Epping Forest (26%) and Castle Point (29%) (Figure 4.5).
- The highest level of out-commuting to London is from Epping Forest, Brentwood and Thurrock (Figure 4.5)
- From North Essex (Braintree, Colchester, Tendring) a significant proportion of people travel to Suffolk (2%) and from Harlow and Uttlesford to Hertfordshire (8%) and Cambridgeshire (2%) (Figure 4.5).
- The major urban centres of Essex feature large work catchment zones which in the cases of Harlow and Colchester also stretch into neighbouring Hertfordshire and Suffolk respectively. A number of the catchment areas overlap resulting in significant levels of cross boundary movements (Figure 4.6).

Overall the Census analysis identifies that current commuting patterns place a significant pressure on the road and rail network across the area. Opportunity exists to increase walking, cycling and public transport trips, particularly in the major urban settlements and a package of measures that encourages modal shift is essential if the level of growth identified is to be delivered without significant detrimental impact on an already congested transport network.

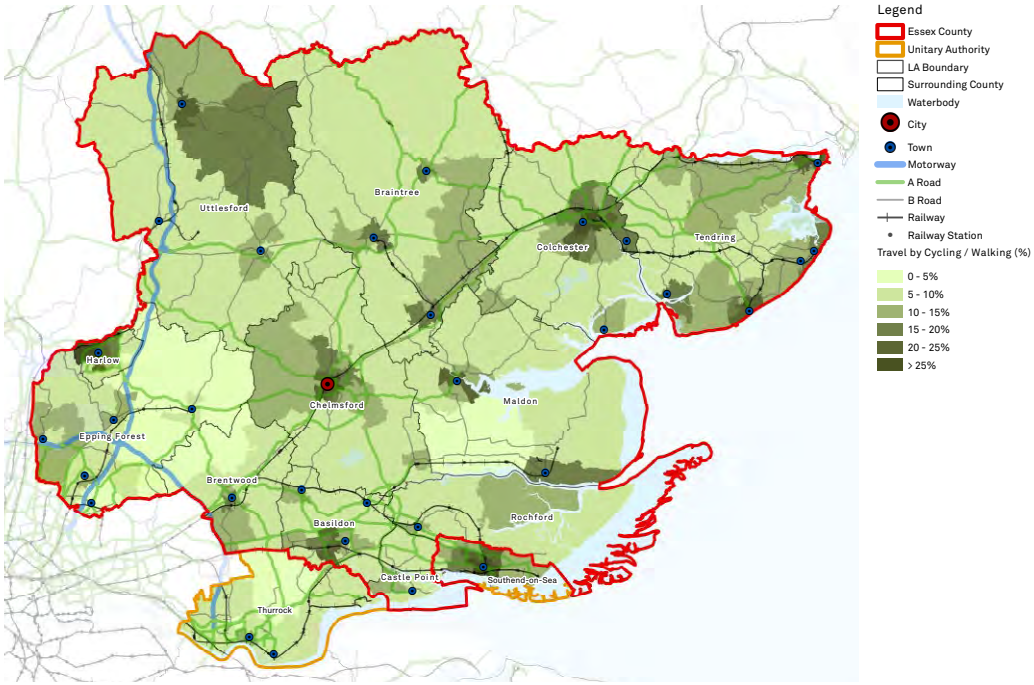


FIGURE 4.1 - METHOD OF TRAVEL TO WORK: WALKING & CYCLING

Source: ONS Census

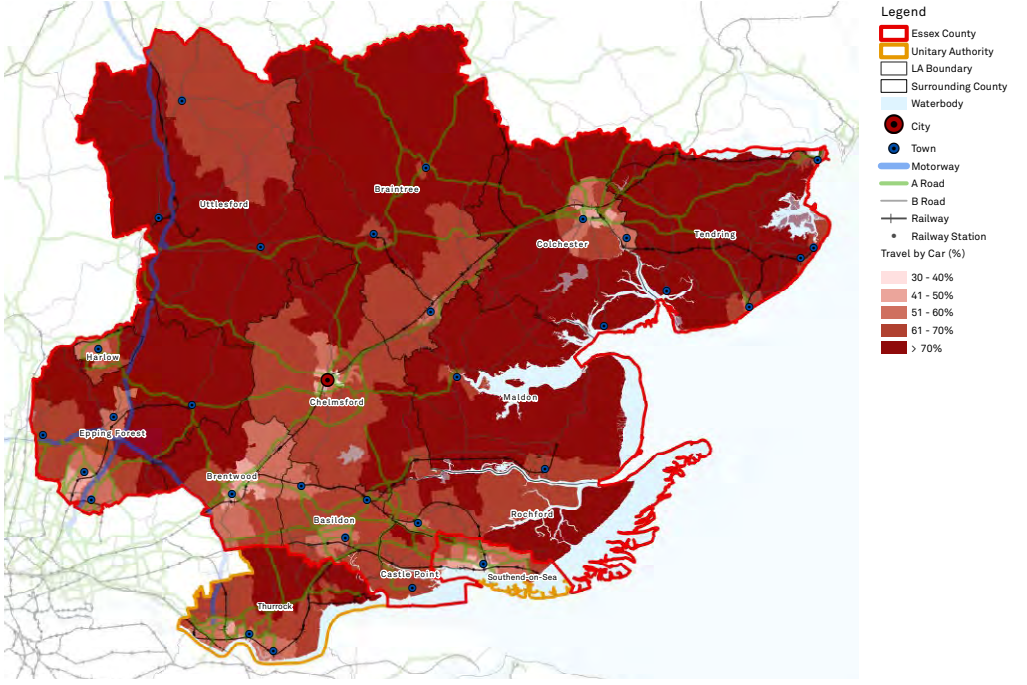


FIGURE 4.2 - METHOD OF TRAVEL TO WORK: CAR DRIVING

Source: ONS Census

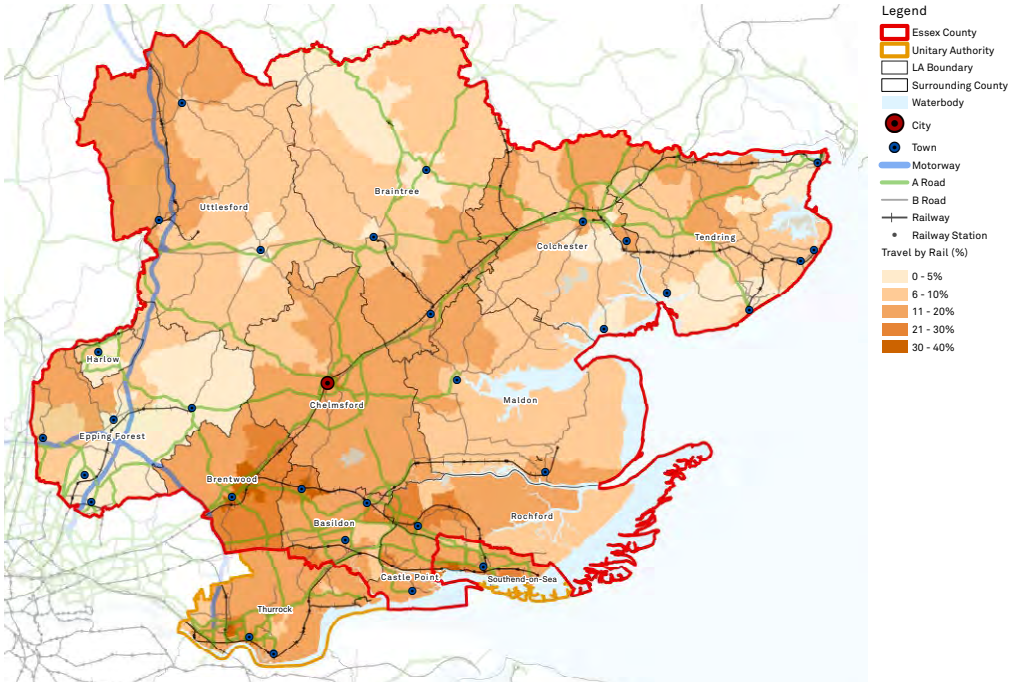


FIGURE 4.3 - METHOD OF TRAVEL TO WORK: RAIL

Source: ONS Census

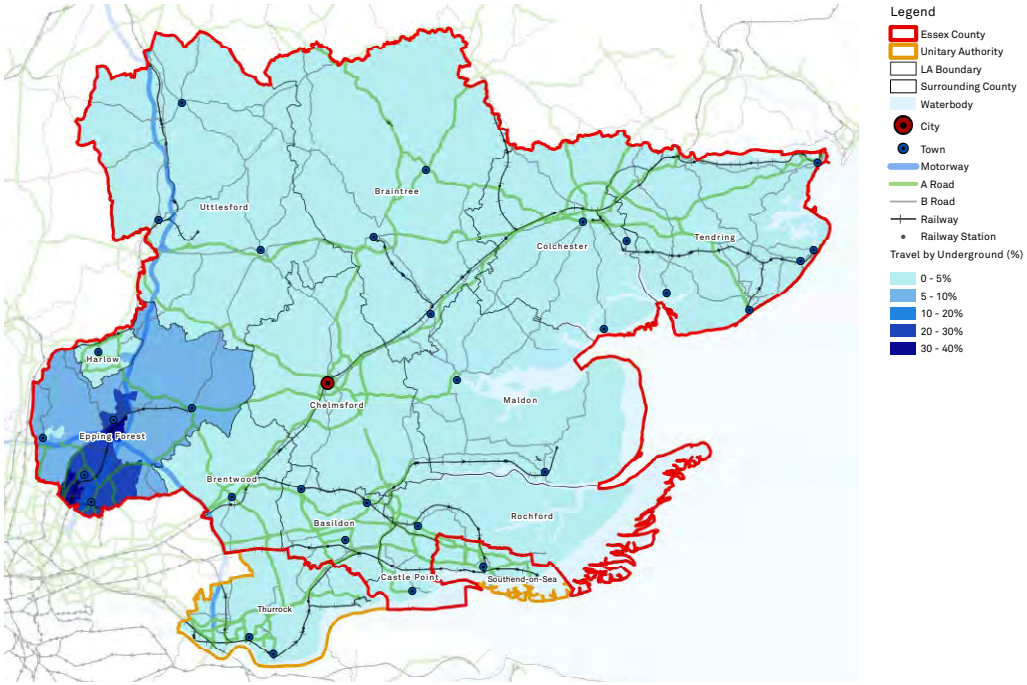


FIGURE 4.4 - METHOD OF TRAVEL TO WORK: UNDERGROUND

Source: ONS Census

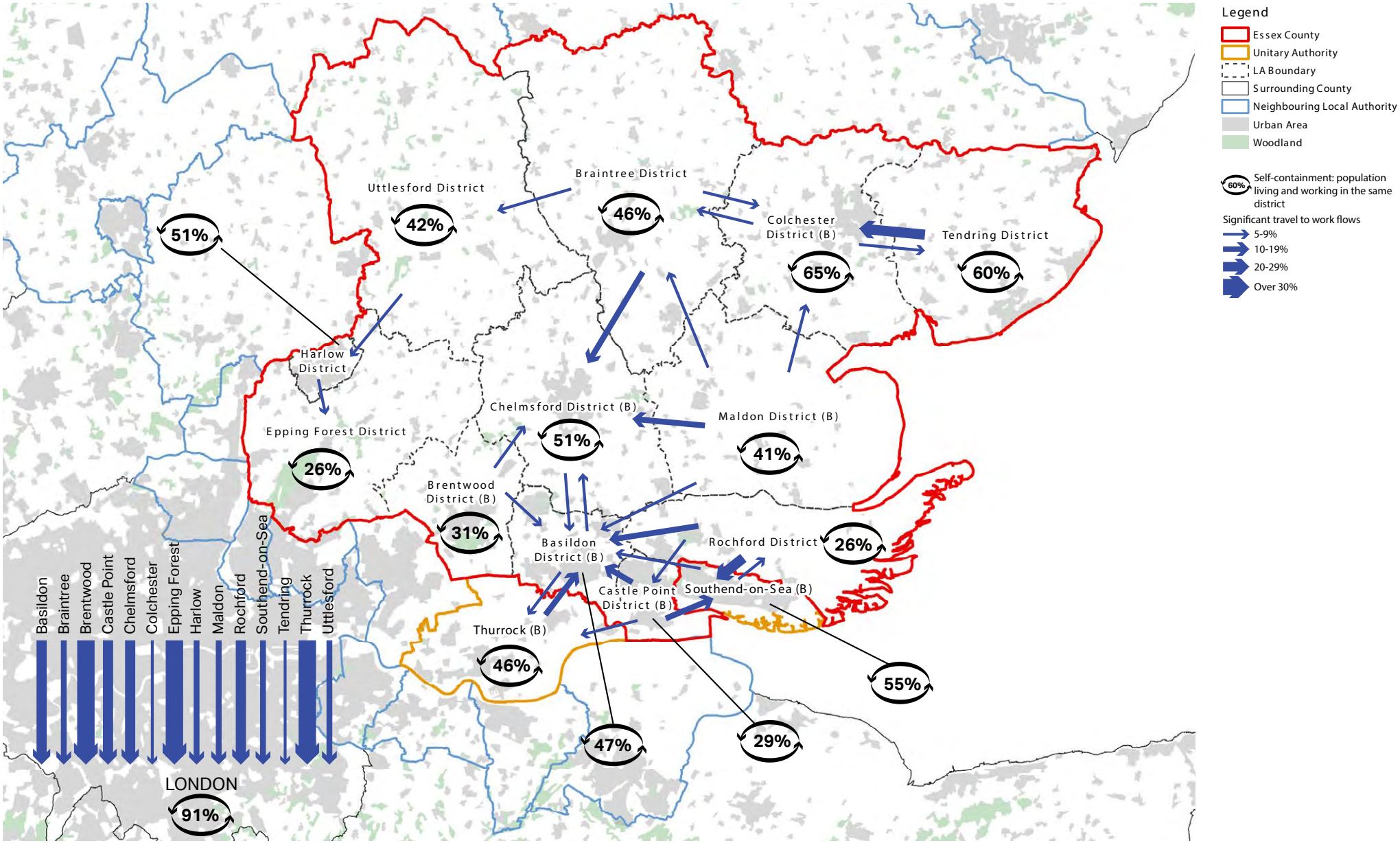


FIGURE 4.5 - MODE SHARE TRAVEL PATTERNS AND INTERNALISED TRIPS

Source: ONS Census

FIGURE 4.6 - TRAVEL TO WORK CATCHMENT ZONES

Source: ONS Census

EXISTING CAPACITY

STRATEGIC ROAD NETWORK

The trunk and motorway network is managed by Highways England and plays both a national role carrying freight and long distance traffic as well as local inter-urban movements. The section of the M25 that runs through Greater Essex is dominated by the Dartford river crossing where peak time queuing is commonplace, especially on the Dartford southern approach. Following the recent introduction of free flow tolling, congestion is observed to have reduced on the Essex side of the Thames but as with many parts of the strategic road network journey reliability is poor resulting from the high volumes of traffic that it carries and in Essex the vulnerability of the QE2 Bridge to adverse weather conditions. Long term delivery of the Lower Thames Crossing will have significant impacts on the transport network across Greater Essex and a decision is expected from Central Government on delivery of this project in late 2016.

In the west the M11 provides a strategic north-south link between London and the M25 in the south and Cambridge and the A14 in the north. The M11 carries a large volume of freight movements with many vehicles travelling between the key container and Roll-on/Roll-off (RORO) ports of Essex and Kent and the Midlands and north of England. As a result, journey speeds/times on the M11, particularly north of London Stansted Airport, where the road becomes two lanes in each direction is constrained by HGV speeds. A 2015 trial to ban HGV over taking during peak periods has not yet been made permanent. Junctions 7 and 8 currently suffer from peak time congestion which constrains growth. The level of growth anticipated at London Stansted Airport and neighbouring growth on the A120 corridor (Junction 8) and around Harlow (Junction 7) will require improvements to be made. A new junction at Harlow (Junction 7a) is proposed and growth around this area will be constrained until this project is delivered. The M11 also suffers from peak time congestion towards London and the A406 North Circular.

The A12 provides a key spine road linking London and the M25 with the City of Chelmsford and north to Colchester, Ipswich, the A14 and the port of Felixstowe. This is a major container freight corridor connecting London and the M25 to the south and the Ports of Harwich and Felixstowe to the north. The corridor suffers from peak time congestion around the key urban settlements (Brentwood, Chelmsford, Witham and Colchester) with congestion at junctions particularly around Chelmsford and Colchester an acute problem. Journey reliability poses a major issue on the A12, with limited alternative routes meaning that when delays occur these can be severe and have knock-on effects for neighbouring routes. With the A12 being at capacity some traffic diverts through Chelmsford, exacerbating problems for residents and commuters, and worsening air quality in the urban area.

The A120 provides an east-west strategic connection across the north of Essex. Whilst the section between the M11 and Braintree has been improved in recent years the central section between Braintree and the A12 suffers significant congestion as well as safety issues which impact upon the community that live along and use this route. A scheme to upgrade this corridor to dual carriageway is required if growth in the north of Essex is to be realised. In particular, congestion around Braintree at Galley's Corner and Marks Farm constrains growth. The final section of the A120 between Colchester and Harwich provides an important connection to/from the Port of Harwich and will need to be enhanced if the Port is to grow as anticipated.

The current operational performance of the strategic road network is shown in Figure 4.7.

In addition to the trunk and motorway network, the Greater Essex authorities of Essex County Council, Southend Borough Council and Thurrock Council also have responsibility for a series of strategic roads largely in the south of Greater Essex. The A13 and A127 provide strategic highway access to the south including London Gateway Port and London Southend Airport from London and the M25 with the A127 carrying over 70,000 vehicles per day, more than some trunk roads. The lack of a trunk road network in the south of Greater Essex has led to under-investment in the strategic roads serving this area. Both the A13 and A127 suffer from significant levels of congestion and the A127 in particular features a sub-standard layout for the volume and type of traffic that it carries. As a result the corridor is now coming to the end of its operational life, and substantial improvements and significant investment beyond the normal maintenance programme is required to improve and increase the future capacity of this strategic asset to facilitate growth.

The A13 carries a significant volume of strategic traffic with its national importance growing with the development of London Gateway Port. Widening of the carriageway is required to facilitate growth. The A130 provides the strategic access between the A12 at Chelmsford and the south of Greater Essex, connecting to the A127 and A13. The traffic volumes on the A130 in 2015 have triggered the opening of the third lane between the A12 and Rettendon which will add further capacity in the short term. Whilst part of this corridor has been improved in recent years further enhancements are required to relieve existing bottlenecks, particularly where the A130 meets the A127 at Fairglen and A12 at Howe Green.

North of Chelmsford access towards Braintree and London Stansted Airport is provided via the A130/A131. These routes suffer peak time congestion and do not provide the most direct route to/from London Stansted Airport. Delivery of a north east bypass for Chelmsford will need to be a priority to relieve this corridor and improve access north-south across Essex.

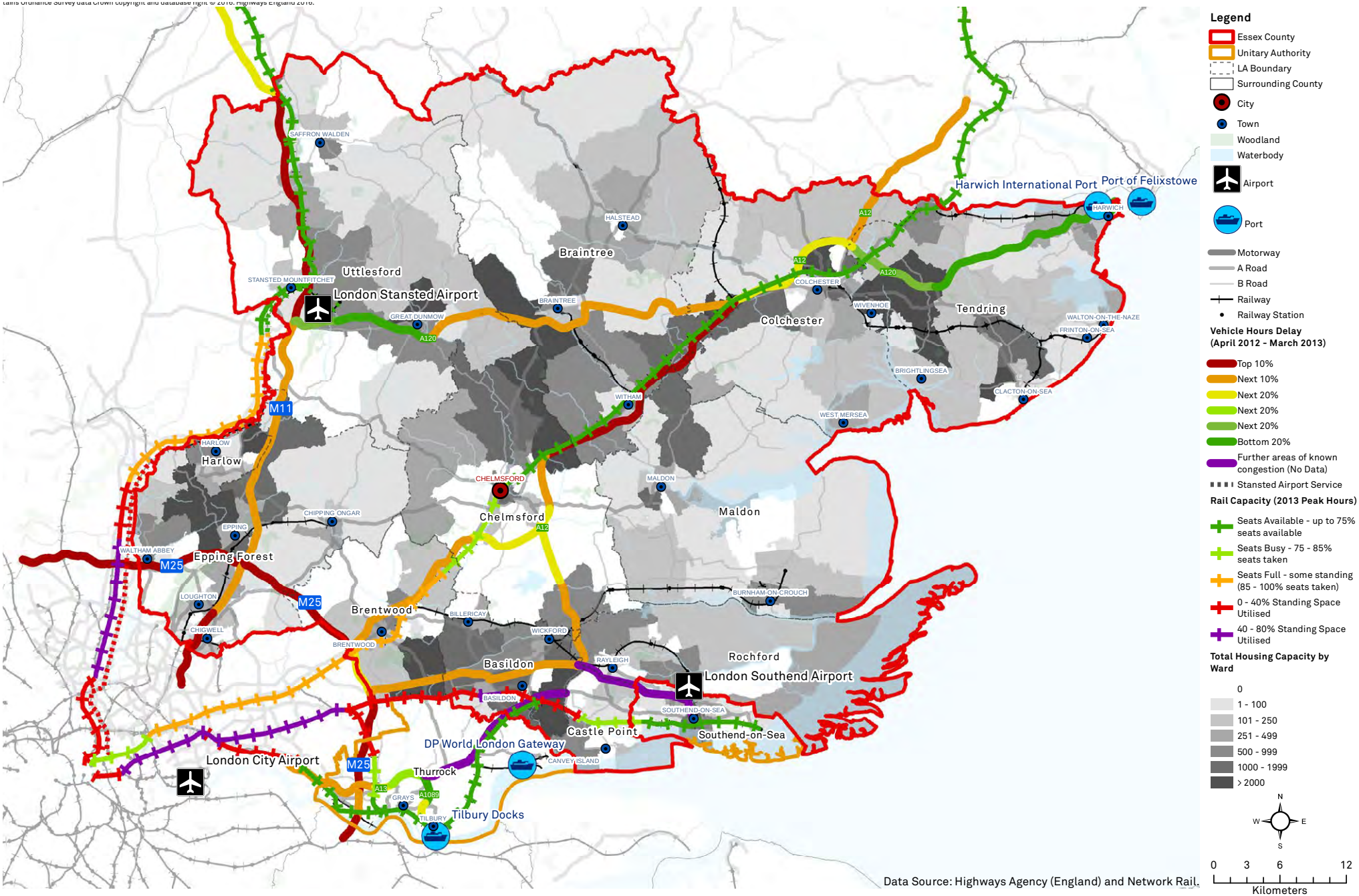


FIGURE 4.7 - NETWORK PERFORMANCE 2012/2013

Source: Essex County Council

LOCAL ROAD NETWORK

The Greater Essex local road network connects the major urban centres to each other and provides access to and from smaller settlements and the rural hinterland. The following traffic issues have been identified in the major urban centres:

- Basildon benefits from good access to the A127, A130 and A13 strategic routes as well as the A128 and A129 which run through the wider borough and provide important north-south connections across the south of Greater Essex. However, journey reliability, particularly along the A127 and A13 corridors can affect the operation of the highway network through the town. To facilitate growth Basildon will require a package of improvements to the local road network including a new junction on the A127 and link roads in Billericay and Wickford.
- The highway network around Braintree is heavily influenced by the operation of the A120 and improvements to this, particularly around Galley's Corner will help to deliver relief on the network throughout the town. The delivery of growth to the north and south of Braintree will require a package of measures including new infrastructure, junctions and promotion of non-car modes of travel. Further afield across Braintree District, towns and villages on the A12 corridor are heavily impacted by a series of substandard junctions which will require improvements.
- The City of Chelmsford's road network operates very close to capacity and its main highway corridors converge at the Army and Navy roundabout where peak time congestion is common place with a resulting Air Quality Management Area (AQMA). A package of improvements over the years have incrementally increased capacity but a more significant improvement will be required in the longer term. The delivery of growth to the north of Chelmsford will require a package of improvements to the road and sustainable transport networks in Chelmsford whilst in the longer term more strategic options such as the North East and North West bypasses will need to be considered if the City is to continue to grow.
- Colchester has a historic core which is attractive for employment, retail and leisure. The core however is dominated by traffic despite dual carriageways on two sides which lead to air quality issues. Radial routes towards the town centre suffer peak time congestion. Congestion on the east side leading out to the University and Tendring is particularly prevalent. Significant growth has been allocated in North Colchester and new infrastructure has recently been provided for this. Further improvements to the network will be required to support growth.
- Harlow, as a new town has been designed around the car and features wide highway corridors. The urban form encourages travel by car despite an extensive walking, cycling and public transport network which results in peak time congestion. Access to the M11 motorway is only provided from a single junction and as such the A414 corridor into the town witnesses congestion. Wider congestion is also seen from the east through to the west into East Herts. Delivery of a new junction onto the M11 will be key to enabling growth alongside a new northern by-pass and measures to encourage sustainable travel.
- Strategic access to Southend is provided by the A127 which suffers from peak time congestion and is substandard for the volume of traffic and the function of the road. The delivery of growth within Southend and the neighbouring districts of Rochford and Castle Point will require a substantial package of improvements. Improving access to London Southend Airport will be key to facilitating growth and encouraging inward investment.
- The performance of Thurrock's highway network is heavily influenced by the performance of the M25 and A13. Until a decision on the Lower Thames Crossing is made planning for growth will remain a challenge. Lakeside is a regional shopping centre and the roads both in and around this area suffer congestion at peak shopping times.

RAIL

The rail network across Greater Essex is based around a series of radial routes connecting London with the main urban settlements of the area. Very limited east-west movement is possible by rail in the north of Greater Essex, for instance between Braintree and Colchester, and north-south movement in the south, for instance between Southend and Chelmsford resulting in limited modal choice and high levels of car usage.

The Great Eastern Main Line (GEML) runs between London Liverpool Street and Norwich broadly following the alignment of the A12 through Essex County and carries a mixture of intercity services, commuter services serving the major urban settlements, a local stopping service between Shenfield and London and freight trains across the network. Congestion both on the rail network itself as well as at the key commuter stations is common place and the poor resilience of the line results in frequent delays. The two tracks configuration of much of the lines also limits capacity. Congestion on the GEML is currently a problem (Figure 4.7) on the route towards London and this is only expected to get worse. The timetable for the line focuses upon serving the London commuter market, which comes at the cost of other movements.

A new franchise has been awarded to Greater Anglia for the region and with this new rolling stock will be delivered, adding capacity to the trains. However, additional infrastructure improvements will be required to facilitate the level of growth anticipated to be as high as 75% by the 2040s on the GEML (Source: Anglia Route Study).

A branch of the GEML connects with Shenfield and serves South Essex towards London Southend Airport and Southend Victoria with a further branch to Southminster. Connections northwards from South Essex requires a change at Shenfield making rail an unattractive mode for north-south travel across Greater Essex, resulting in limited modal choice and high levels of car usage. Further branch lines provide connections to Braintree, Sudbury, Harwich and Clacton.

The West Anglia line also commences at London Liverpool Street and connects with Harlow and London Stansted Airport in the west of Essex County before continuing to

Cambridge. However, much of the line is currently two tracks which limits the potential for improvements and additional services. Improvements will be required if London Stansted Airport is to expand as expected along with major growth in Harlow. Delivering Crossrail 2 to Broxbourne and extending the currently proposed route to Harlow may help to deliver these improvements.

The Essex Thameside line connects London Fenchurch Street with the Thames Estuary towns and whilst being one of the best performing lines in the Country is constrained by the size of Fenchurch Street which limits line capacity.

Greater Essex is also served by London Underground with the Central Line terminating at Epping. This line into Central London already suffers significant congestion and over-crowding in the peak periods. Improvements in the form of signal upgrades and the new Tube Train for London will help to facilitate growth. Whilst not in Greater Essex the District line extends to Upminster providing a further connection into London for those living in close proximity to the London border. The current level of capacity on the rail network is shown in Figure 4.7.

BUS AND COACH

As a largely rural area, bus network coverage varies with both London Bus services in the far south and regional operators such as First in Chelmsford and Thames Estuary Essex, Arriva in Harlow and Southend and Go Ahead in Braintree and Colchester. A number of National Express services also connect the major towns with the Capital, London Stansted Airport and destinations across the Country. A series of part subsidised services provide connections between London Stansted Airport, Chelmsford, London Southend Airport, Rayleigh, Southend and Basildon as well as a further service from London Stansted Airport towards Braintree and Colchester.

London Stansted Airport also acts as a transport hub for local residents with a wide range of bus, coach and rail services available to destinations across the Country.

The bus network struggles to deliver frequent commercial services in the challenging geography of Greater Essex. It has a number of national and local operators but much of the network remains historic and there are few areas where the market is truly competitive. The dispersed urban settlements and large rural hinterland mean there is a substantial supported network. The current network is not sufficient to support future growth and mitigate congestion.

Bus forms a key mode of transport, particularly for shorter distance trips across the area where other modes of public transport are not available.

The growth of the major urban centres will require a step change in bus provision if it is to offer a real alternative to the private car. Partnership working between operators and the local authority will be key to delivering change. With limited rail connectivity in the area areas the bus will become an essential mode to facilitate growth and the Essex Bus Strategy aims to facilitate this change.

WALKING AND CYCLING

Walking and cycling infrastructure across Greater Essex varies with a good level of provision in the larger settlements but fewer formal facilities in the smaller towns and villages.

The topography means there is great potential for encouraging these modes of transport to replace short distance car-based trips. However, the quality of infrastructure has not kept pace with the expectations of modern residents and will need to be improved with more direct and attractive routes if these modes are to offer a real alternative to car based travel.

AIRPORTS

Stansted Airport

35 million

Passengers per annum (current planning permission)

Greater Essex features two international airports with London Stansted Airport in the north west and London Southend Airport in the south east. London Stansted Airport enjoys a dominant position as one of the UK's major hub airports serving mainly the low cost and package holiday markets and benefits from large demand for freight. The airport facilitates significant inward investment to Greater Essex. Demand at London Stansted Airport is growing fast with considerable employment growth of up to 10,000 jobs forecast during the GIF period.

A package of surface access improvements will be required if the airport is to continue to grow at the current rate. In particular rail journey times to London and M11 Junction 8 represent two major constraints to growth.

London Southend Airport provides access to a range of European destinations and is served by Easyjet and Flybe amongst others. Recent improvements have delivered a dedicated railway station for London Southend Airport. A package of highway improvements have already been implemented but access remains constrained by the operation of the A127 and the terminal's location away from a strategic corridor emphasising the need for improvements to surface access. Public transport improvements will also be essential to enable growth.

PORTS

Greater Essex features three major container ports in the form of Harwich, London Gateway and the Port of Tilbury and the Port of Felixstowe is across the river in Suffolk. These ports all generate significant volume of road and rail freight movements that are felt across the strategic road and rail networks. The ports are major employment hubs and are a focus for downstream supply chain and logistics jobs. All three ports are expanding and infrastructure provision will need to be planned around this growth.

FUTURE DEMAND FOR TRAVEL

Further analysis of 2011 Journey to Work Census data has been undertaken to provide a high level estimate of the potential future demand for travel generated by the housing and employment growth predicated across Greater Essex.

This analysis highlights that across Greater Essex, a total of 203,000 trips could be added to both the AM and PM peak periods. Without measures to encourage travel by sustainable modes, this level of demand would result in a further 127,000 car journeys, a further 8,000 bus journeys and 30,000 rail trips during peak periods. This level of growth is not sustainable without significant investment in the transport infrastructure across Greater Essex.

COMMITTED PROJECTS TO DELIVER GROWTH

Based upon the existing issues identified and projected future demand for travel as a result of growth the following key transport projects have already been identified to address existing issues and deliver growth up to 2036 divided by scale and mode. Projects have been divided spatially between regional (those that cross boundaries outside of Greater Essex but are important to deliver growth), sub-regional (those within Greater Essex that cross geographic boundaries), and local (those specific to a district or borough).

REGIONAL PROJECTS

(SCHEMES LOCATED PARTIALLY IN OR OUTSIDE GREATER ESSEX)

Strategic Road Network

- M11 peak time HGV over-taking restriction and technology upgrades
- A14 Cambridge to Huntingdon improvement scheme
- A12 whole route technology upgrade

Rail

- Anglia traction power supply upgrade
- GEML new rolling stock
- Crossrail 1
- Barking to Gospel Oak electrification to facilitate better freight connections to London Gateway Port and the running of four car electric trains
- Felixstowe to Nuneaton to meet growing demand for freight paths from Felixstowe and Harwich Ports

SUB-REGIONAL PROJECTS

(SCHEMES LOCATED IN GREATER ESSEX BUT CROSSING BOUNDARIES)

Strategic Road Network

- A127 corridor for growth route based strategy improvements (resilience package and signing strategy)
- A414 route based strategy improvements
- A131 route based strategy improvements
- A12 widening – Chelmsford to A120

LOCAL PROJECTS

(SCHEMES SPECIFIC TO A DISTRICT OR BOROUGH)

Strategic Road Network

- M25 junctions 30/31 short term improvements
- M25 junction 28 improvements
- M11 junction 7 improvements
- A120 interim improvements package (Braintree)
- London Southend Airport surface access improvements (Rochford)
- A127/A130 Fairglen interchange (short term improvements)
- A130 Additional Lane Rettendon to A12

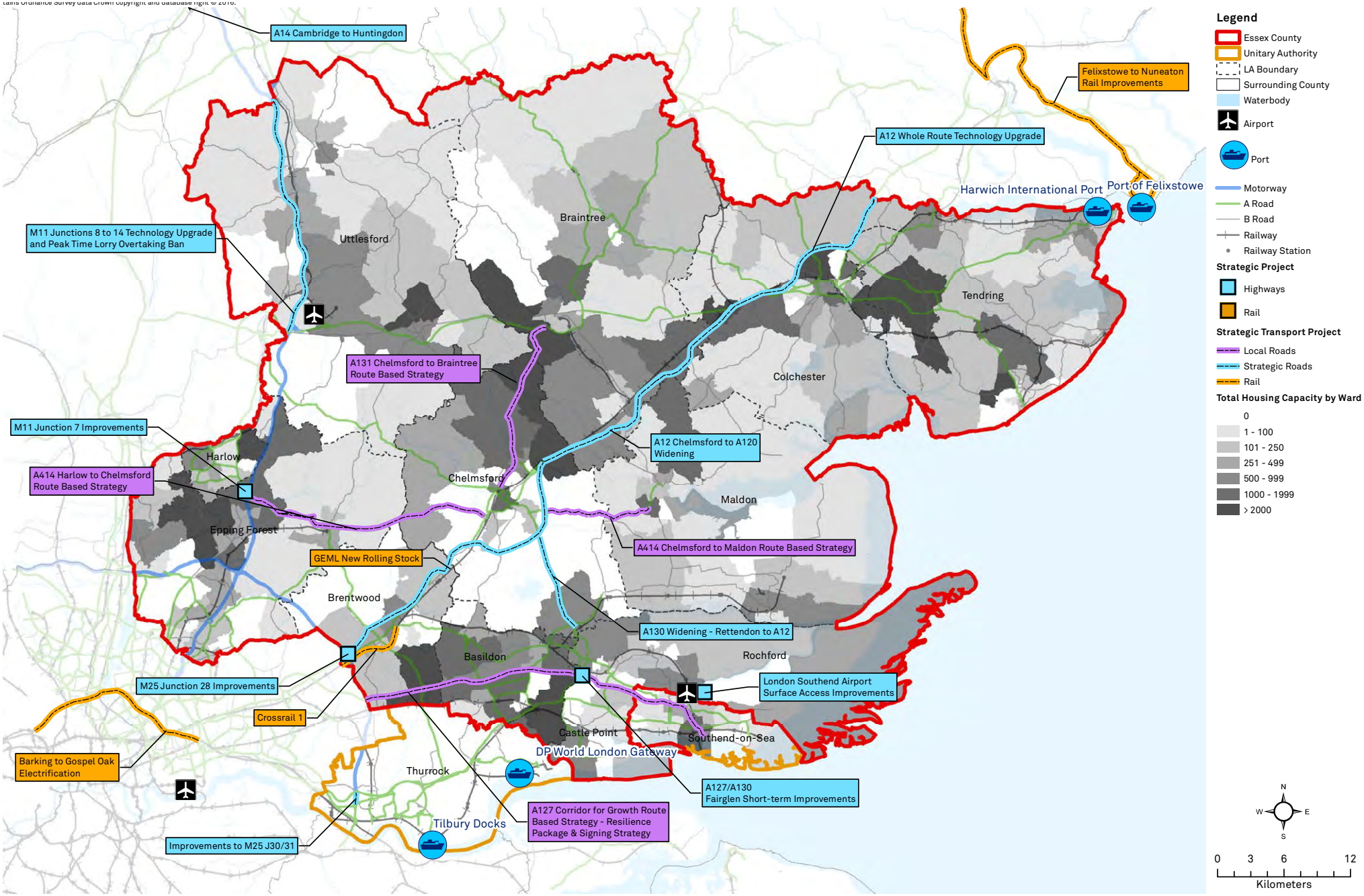


FIGURE 4.8 - KEY STRATEGIC TRANSPORT PROJECTS

Source: Essex County Council

FURTHER PROJECTS TO DELIVER GROWTH

Further projects considered necessary to support the level of growth across Greater Essex include:

REGIONAL PROJECTS

(SCHEMES LOCATED PARTIALLY IN OR OUTSIDE GREATER ESSEX)

Strategic Road Network

- Lower Thames crossing – new crossing of Thames Estuary between Thurrock and Gravesham

Rail

- Bow junction improvements to facilitate the ability to run 24 trains per hour (tph) in the peak periods on the GEML
- Remodelling of Liverpool Street Station following completion Crossrail 1 and a longer term aspiration for more platforms
- Delivery of Crossrail 2 and extension of the route from Broxbourne to Harlow
- Four tracking between Tottenham Hale and Broxbourne to facilitate Crossrail 2 and increase capacity in west Essex
- Digital Railway across the network
- Targeted signalling and line speed improvements
- Central Line frequency and signalling upgrades including New Tube Train for London

SUB-REGIONAL PROJECTS

(SCHEMES LOCATED IN GREATER ESSEX BUT CROSSING BOUNDARIES)

Strategic Road Network

- A130 widening between Rayleigh Spur and Rettendon
- A13 route based strategy improvements
- A120 Hare Green to Harwich Improvements
- A127 corridor for growth route based strategy Improvements (maintenance)
- A12 widening – M25 to Chelmsford
- A12 widening – Colchester Bypass
- Greater Essex wide strategic signing review
- A120-A133 link road
- A120 Braintree to A12 improvements
- M11 junction 8 short and long-term improvements
- New M11 J7a, link to Gilden Way and widening (Harlow)
- Widening of A13 between A128 and A1014
- A13 Five Bells to Pitsea route improvement
- A127/A130 Fairglen interchange (long term improvements)

LOCAL PROJECTS

(SCHEMES SPECIFIC TO A DISTRICT OR BOROUGH)

Strategic Road Network

- Chelmsford North East by-pass
- A120 Millennium Way slips (Braintree)
- M25 junctions 30/31 long term improvements
- A130 widening Fairglen to Rettendon

Rail

- Beaulieu Railway Station (Chelmsford)
- Passing loop north of Witham
- Braintree to Witham Rail Improvements (Braintree)

Multi-modal

- London Stansted Airport surface access improvements including improvements to road network and additional rail infrastructure

Bus and Coach

- Chelmsford Third Park and Ride

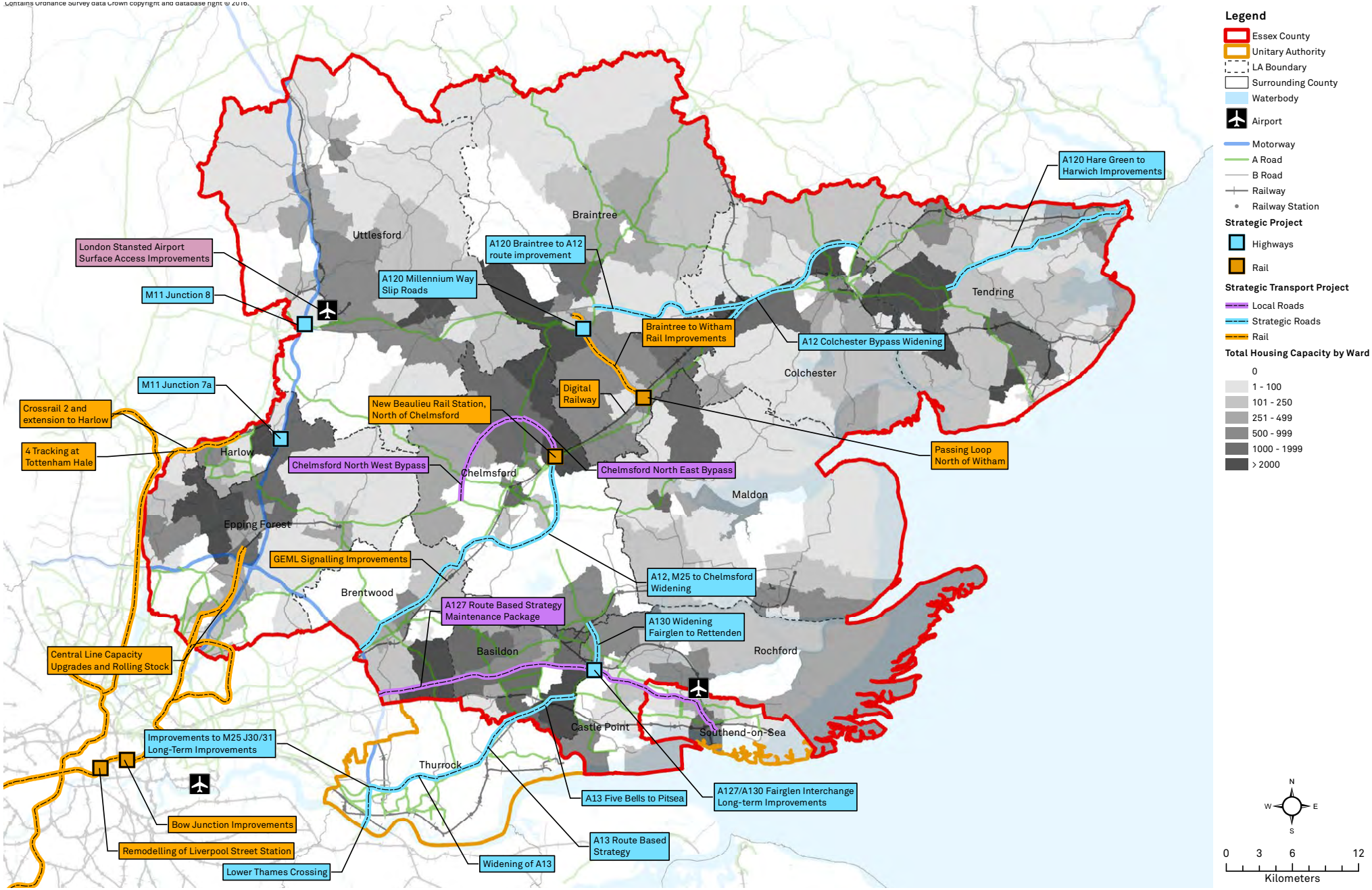


FIGURE 4.9 - FURTHER TRANSPORT PROJECTS TO DELIVER GROWTH

FURTHER CONSIDERATIONS

SUSTAINABLE TRANSPORT

Adding further capacity to the existing highway and passenger transport networks will not necessarily deliver the level of capacity required to accommodate the level of growth anticipated, particularly in urban areas where the built form constrains the type of infrastructure improvements possible. Increasing the level of walking and cycling trips for journeys under five kilometres and encouraging public transport use for longer distance trips will therefore be crucial to delivering growth. To achieve this, improvements to infrastructure should be prioritised to encourage non-car modes. This should be coupled with a package of smarter measures such as travel planning for schools and businesses to reduce the need to travel and where necessary encourage sustainable modes.

PUBLIC TRANSPORT

Public transport will play an essential role for the delivery of growth. The projection of growth identifies that without enhancements to encourage sustainable transport an additional 27,000 rail trips and 8,000 bus trips in each peak hour would be generated. The Essex Bus Strategy seeks to maximise the use of technology to bring about improvements in passenger experience. Working in partnership with operators will be key to delivering this step change in provision to meet the future demand and changing expectations of users anticipated.

SMART CONNECTIVITY

The last two decades have seen technology playing an ever-increasing role in people's lives. With long lead in times for transport infrastructure there is a clear need for the transport authorities to think ahead when planning the infrastructure requirements of tomorrow. Technology will play an ever increasing role in ensuring the efficient movement of people across Greater Essex and it will be important that any investment in technology is able to adapt to changing needs.

ASSET REPLACEMENT

Greater Essex's transport infrastructure is heavily used and a rolling process of renewal is required to ensure continued service. With a large number of bridges and highways, the cost of asset replacement represents a significant burden to the authorities that is not currently accounted for in maintenance grants provided by Central Government. The value of Essex County Council's transport infrastructure is £9 billion for instance. Whilst not costed for in this study due consideration must be given to how ageing assets across the area will be replaced in due course. Essex County Council alone are responsible for over 5,000 miles of highway, 400 miles of footway and 4,000 miles of public rights of way. The ability to replace these assets is challenging. In 2016/2017, £66m is being spent on carriageways and £25m on other infrastructure. This level of funding cannot be guaranteed but represents what is needed.

MAINTENANCE

Maintaining the transport infrastructure across Greater Essex poses a large burden on the local highway authorities. Following years of under-investment in asset maintenance Essex County Council are in a process of funding upgrades to bring their network up to the expectations of today's residents. However, the £91 million spent annually on maintenance is far in excess of the Department for Transport's block funding provided by Central Government to maintain transport infrastructure which is approximately 25% of this figure. With further cuts from central government expected increased local funding for maintenance will need to be prioritised alongside improvements if the current network is to facilitate further growth. Furthermore delivery of new housing and employment sites will result in a larger network of adopted highways and other infrastructure that requires maintenance. It is estimated that a further £6 million per year will be required to maintain the additional transport infrastructure that this level of growth will require.

COSTS AND FUNDING

Based upon the GIF Project Schedule, the following costs and funding have been identified for all transport projects excluding annual maintenance costs set out above.

Regional Transport Costs =
£26,556,250,000

Regional Transport Funding Gap =
£9,170,000,000

Sub Regional and Local Transport Costs =
£5,523,650,000

Sub Regional and Local Transport Estimated Funding Gap =
£1,717,680,000

Costs are set out for each local authority in Section 5

4.2 EDUCATION

EARLY YEARS & CHILDCARE

Greater Essex
2,651
Early Year & Childcare Providers

Greater Essex
1,194
FEEE Funded Facilities

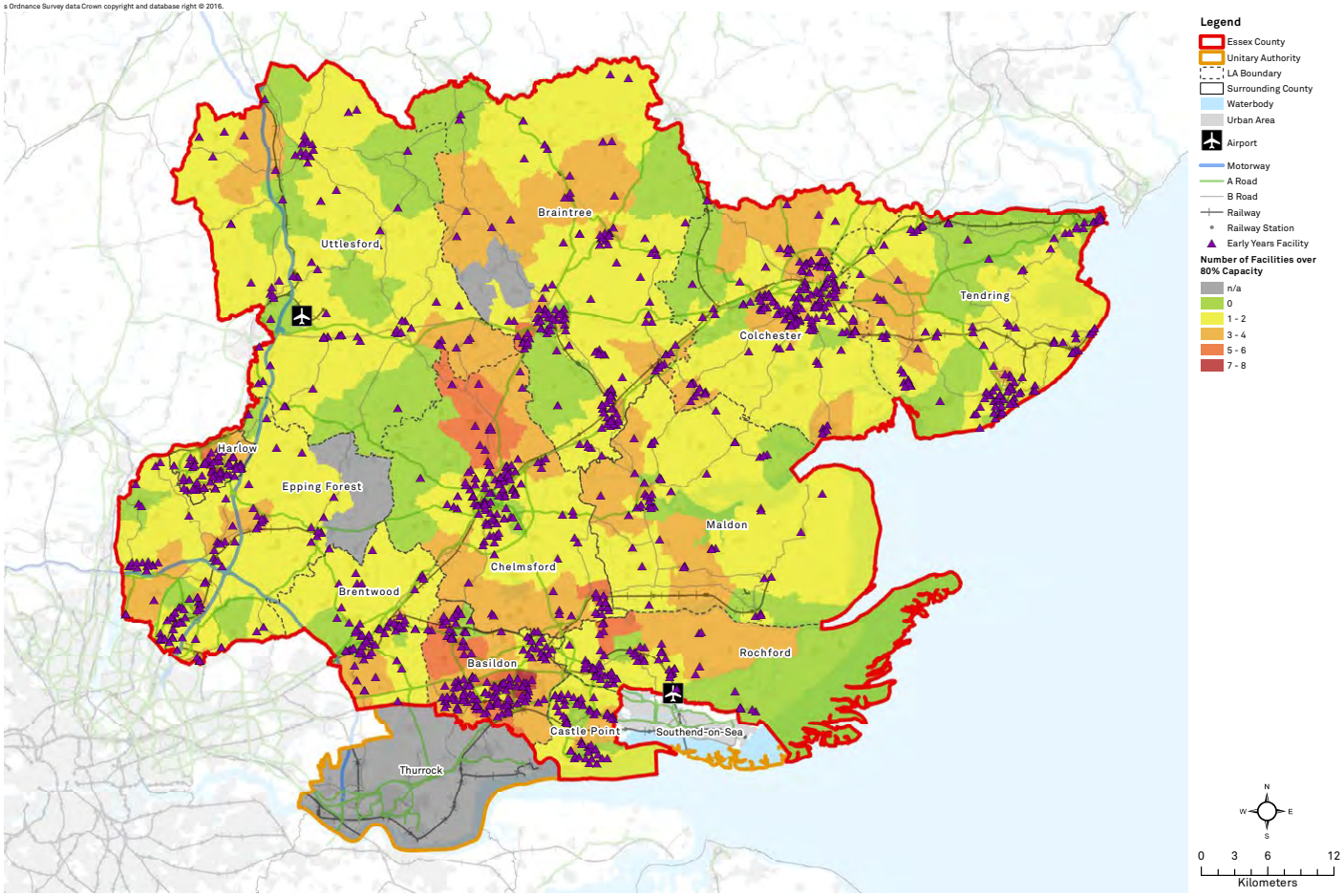
CURRENT SITUATION

Early years education and childcare across Greater Essex is provided by a range of types of providers, including childminders, independent nurseries, pre-schools, and out-of-school education for children over 5. The Childcare Act 2006 places a duty on all local authorities to ensure there are enough childcare services for parents that want them.

Essex County Council and the two unitary authorities deliver Early Years and Childcare for children 0-4, through a commissioning approach, with a responsibility for providing certain elements for securing Government Free Early education Entitlement (FEEE) for vulnerable 2 year olds, all 3 and 4 year olds and identifying gaps in Early Years and Childcare provision. These are commissioned from the private, voluntary and independent sectors. Early years and childcare facilities and capacity are shown in Figure 4.10 and Table 4.1 respectively.

The main challenge faced in Essex County is the size of the area. With more than 1,000 Free Entitlement funded providers across the county, individual engagement is challenging outside of the continuous support offered to providers. The change in requirements to extend FEEE for 3 and 4 year olds has brought additional changes in terms of identifying the additional places need, such as the number of working parents eligible for the extended hours and number of providers willing to create new FEEE places to deliver 30 hours from September 2017.

Figure 4.10
FEEE funded early years & childcare facilities



Source: Essex County Council Early years Sufficiency Report, Summer 2016
Note - Diagram does not map all of facilities listed in table 4.1, only illustrating day nurseries

Table 4.1

Early years and childcare capacity

	FREE ENTITLEMENT PLACES TAKEN + REPORTED AS AVAILABLE *					ESTIMATED ELIGIBLE POPULATION 2-4 YEAR OLDS. ***	ESTIMATED CAPACITY AVAILABLE 2016 ****	FUTURE REQUIREMENT	
	CHILD MINDERS	DAY NURSERY	PRE-SCHOOL	SCHOOL**	TOTAL			ADDITIONAL CHILDREN 0-4 TO 2036	ADDITIONAL FACILITIES TO 2036
Basildon	142	1695	2156	929	4922	4769	153	1,098	20.0
Braintree	245	1520	1790	302	3857	3641	216	1,088	19.0
Brentwood	157	653	944	148	1902	1456	446	466	8.0
Castle Point	117	596	783	292	1788	1694	94	545	10.0
Chelmsford	195	1645	2055	681	4576	3795	781	997	18.0
Colchester	253	1645	1830	890	4618	4407	211	1,184	21.0
Epping Forest	62	933	1449	564	3008	2972	36	662	12.0
Harlow	187	847	911	539	2484	2544	-60	345	6.0
Maldon	33	334	865	24	1256	1177	79	399	7.0
Rochford	169	674	866	100	1809	1643	166	514	9.0
Tendring	206	1247	1150	484	3087	3025	62	746	13.0
Uttlesford	32	789	1046	243	2110	1836	274	731	13.0
ESSEX	**1798**	**12578**	**15845**	**5196**	**35417**	**32960**	**2457**	**8775**	**156**
Southend	-	-	-	-	-	-	-	1,501	27.0
Thurrock	-	-	-	-	-	-	-	1,285	23.0
GREATER ESSEX	**-**	**-**	**-**	**-**	**-**	**-**	**-**	***11,561***	***206***

Source: Essex County Council, Forecasts utilise the Essex County Council Developers Guide to Infrastructure Contributions child yield rates

** Sufficiency returns from all registered FE funded providers from Summer 2016 and headcount returns for all 2,3&4 year old places in Summer 2016.*

*** Maintained Nursery/ nursery units of independent schools/ primary school nursery*

**** ONS MYE 3 year olds, 4 year olds with % of Summer population in reception class deducted, % of 2 year old population eligible under DWP criteria*

***** estimation based on total places reported and taken deducted from the estimated eligible population.*

FUTURE REQUIREMENTS TO MEET GROWTH TO 2036

Table 4.1 sets out the current capacity in terms of FEEE Early Years provision. The age specific population forecasts that have been utilised are from the recently published ONS Sub-National Population Projections 2014 and the ECC Developers Contribution Guide's child yield rates. These show an increase in children aged 0-4 in each local authority, however the level of growth varies significantly. Overall there could be a need equivalent to 206 new early years facilities. It is acknowledged, however, that major developments will produce increased demand locally which will need to be catered for and the challenge for adequate cover is greater in the rural parts of the county.

Numerous projects are in confirmed planning stages and others have notable investment currently being decided. Within the current financial year £2.6 million has been profiled to create a minimum of 219 places across Essex County. The highest numbers are in the following authorities:

- Chelmsford - 54 places
- Basildon - 81 places
- Uttlesford - 50 places

Southend Council are also expanding local childcare provision through lottery funded 'Better Start Southend'.

COSTS AND FUNDING

Based upon theoretical benchmark modelling where no tangible projects have been identified, the following costs and funding have been identified:

Cost = £219,430,000

Estimated Funding Gap = £0

Costs are set out for each local authority in Section 5

PRIMARY EDUCATION

Greater Essex
525
Primary Schools

Greater Essex
12,048
Surplus places

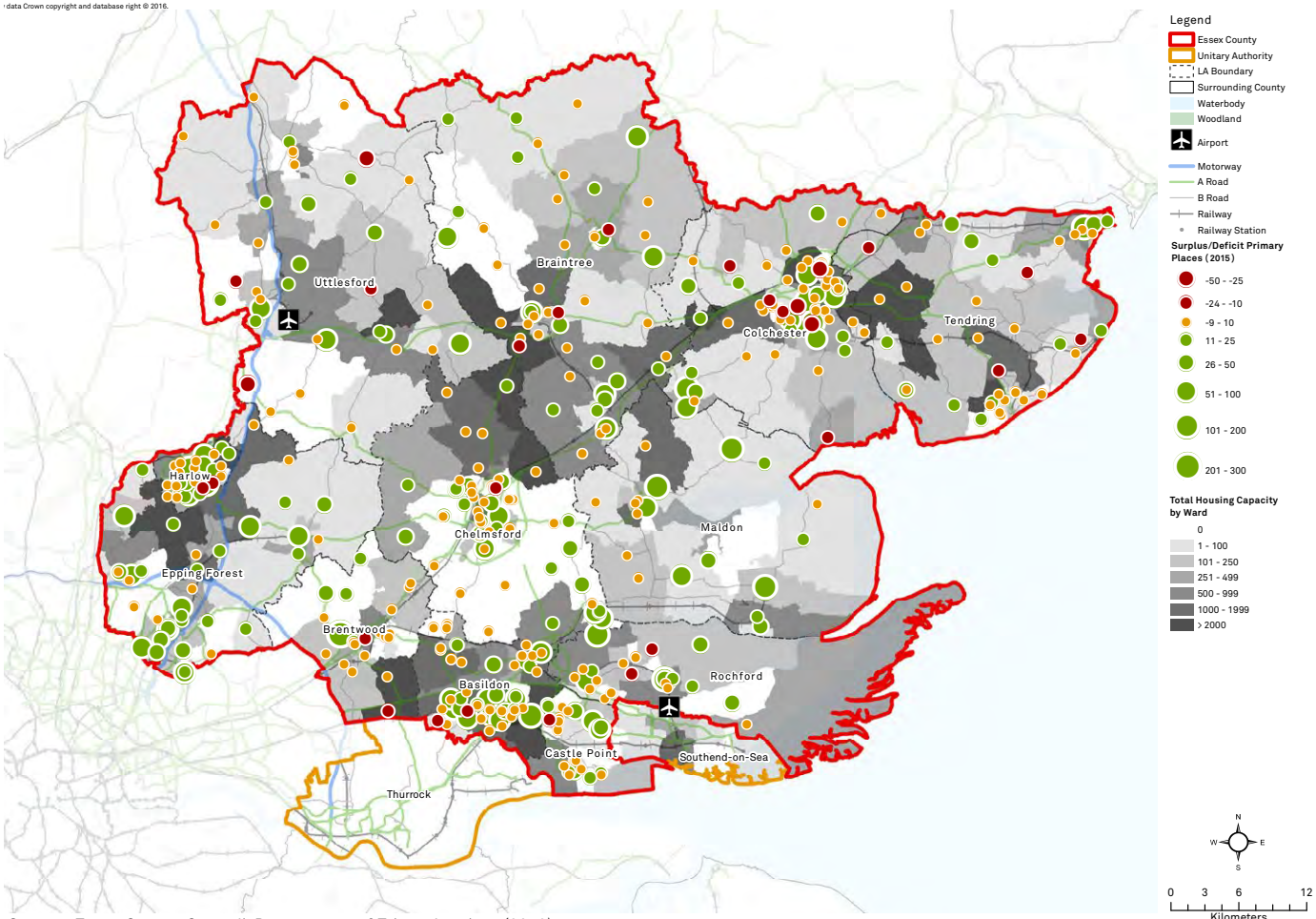
CURRENT SITUATION

There are 525 primary schools in Greater Essex. The planning of and provision of education for primary school aged children is the statutory responsibility of Essex County Council and the two unitary authorities. Recognising that there is a significant change in the way public services are funded and delivered, national policy has moved towards a more diverse education system, rather than the traditional structure of schools under the direct control of the education authority. The role of the three education authorities has become a 'commissioner' of school places, including the assessment of necessary school provision as a consequence of development. Existing distribution and capacity is shown in Figure 4.11.

HEADLINES

- Based on data from May 2015, there is a surplus capacity of 7,899 places in Essex County, with a total of 12,048 across Greater Essex as a whole. However, a large amount of this surplus provision is in rural areas not close to planned development and covers all years not simply reception class.
- On a macro level across each local authority, there is a strong level of provision. This can be particularly seen in Thurrock and Southend, and to a lesser extent Colchester and Basildon.
- A spatial review of the individual schools and their capacities illustrates that there are site specific tensions occurring across the area. Notable deficits in school places can be seen in and around major urban centres. This is particularly seen in Braintree and Chelmsford.

Figure 4.11
Primary school capacity against housing growth



Source: Essex County Council Department of Education data (2016)

Table 4.2

Primary school capacity and forecast pupil change

	LOCAL AUTHORITY WIDE PLACES DATA, 2015				IDENTIFIED GROWTH IN PUPIL NUMBERS			
	PRIMARY SCHOOLS	NET CAPACITY 2014/15	NUMBER ON ROLL MAY 2015	SURPLUS/ DEFICIT PLACES	ECC ANALYSIS OF ADDITIONAL PRIMARY PUPILS 2016 - 2020	2016 - 2020 (FORM ENTRY)	AECOM ANALYSIS OF ADDITIONAL PRIMARY PUPILS 2016 - 2036	2016 - 2036 (FORM ENTRY)
Basildon	56	16,693	15,634	1,059	1,726	8.2	2,794	13.3
Braintree	53	12,634	11,771	863	496	2.4	2,719	12.9
Brentwood	24	6,018	5,671	347	343	1.6	1,165	5.5
Castle Point	23	6,799	6,502	297	160	0.8	1,393	6.6
Chelmsford	55	13,773	13,030	743	1,191	5.7	2,494	11.9
Colchester	62	15,464	14,351	1,113	2,376	11.3	2,960	14.1
Epping Forest	37	9,713	8,718	995	931	4.4	1,654	7.9
Harlow	28	8,536	7,951	585	1,249	5.9	862	4.1
Maldon	18	4,757	4,062	695	352	1.7	997	4.7
Rochford	22	6,920	6,415	505	133	0.6	1,291	6.1
Tendring	40	10,234	9,893	341	526	2.5	1,770	8.4
Uttlesford	36	7,105	6,749	356	998	4.8	1,828	8.7
ESSEX	**454**	**118,646**	**110,747**	**7,899**	**10,481**	**49.9**	**21,926**	**104**
Southend	34	15,107	14,499	608	640	3.0	3,986	19.0
Thurrock	37	18,866	15,325	3,541	-	-	3,428	16.3
GREATER ESSEX	***525***	***152,619***	***140,571***	***12,048***	**-**	**-**	***29,340***	***140***

Source: Place Data from Essex County Council Commissioning School Places 2015-2020 (2015), & Department of Education data extracted for Thurrock and Southend (2016),
2016 - 2020 Demand forecasts utilise the Essex County Council Commissioning School Places 2015-2020 (2015)
2020 - 2036 Demand forecasts apply the Essex County Council Developers Guide to Infrastructure Contributions child yield rates to forecast housing need presented in Section 3

**Surplus depicted in green , Deficit depicted in red*

The need for additional places has not considered the implications of the spatial strategies identified in emerging Local Plans and is based solely on the forecast housing need presented in Section 3

FUTURE REQUIREMENTS TO MEET GROWTH TO 2036

Table 4.2 sets out forecast growth in terms of primary school places to 2020 as identified by the three education authorities. Forecasts from 2021 to 2036 have been produced through AECOM analysis of the housing trajectory. The information should be considered in the context of the following key issues:

- There will be an additional demand to 2020 of 52.9FE across the local authorities, with a total demand for 140FE between 2016-2036 across Greater Essex.
- Within Essex County, Colchester will experience the greatest increase in additional demand to 2020
- Between 2016 and 2036 the unitary authorities and Colchester and Basildon will experience the greatest increase in additional demand

EXAMPLE INFRASTRUCTURE PROJECTS PROPOSED

Notable investment in primary school provision includes:

- 2,000 primary school places are due to be delivered in 2016/17
- Beaulieu Primary School (2FE) , Chelmsford
- Newhall Farm Primary School x2 (2FE), Harlow

COSTS AND FUNDING

Based upon theoretical benchmark modelling the following costs and funding have been identified:

Cost = £521,910,000

Estimated Funding Gap = £378,000,000

Costs are set out for each local authority in Section 5

SECONDARY EDUCATION

Greater Essex
100
Secondary Schools

Greater Essex
13,649
Surplus places

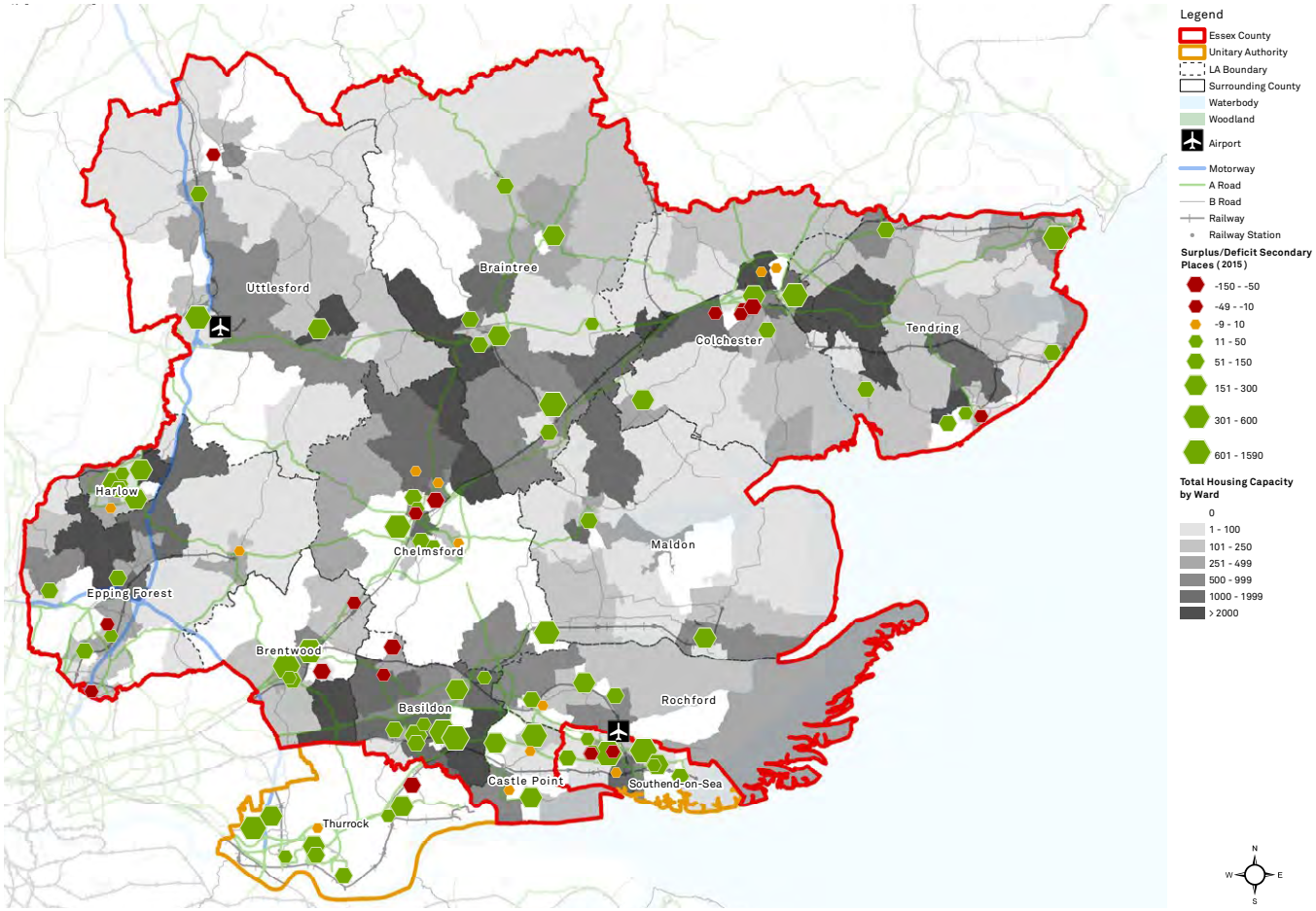
CURRENT SITUATION

Secondary schools across Greater Essex comprise state schools, academies, and free schools which are independent of the local authority. The planning of and provision of education for secondary school aged children is the statutory responsibility of Essex County Council and the two unitary authorities. Significant changes are underway in the way public services are funded and delivered, national policy has moved towards a more diverse education system. The role of the three education authorities has become a 'commissioner' of school places, including the assessment of necessary school provision as a consequence of development. Existing distribution and capacity is shown in Figure 4.12.

HEADLINES

- Based on data from May 2015, there is a surplus capacity of 12,130 places in Essex, with a total of 13,649 across Greater Essex as a whole.
- Surplus provision exists across the area, with Thurrock, Southend, Basildon, Braintree, Brentwood and Castle Point having the largest surpluses.
- Like primary schools, large amount of this surplus provision is in rural areas not close to planned development and covers all years not simply year 7 class.
- Demand for school places is not uniform, and overall figures can mask the pressures felt across the area. Major urban centres such as Colchester and Chelmsford have several secondary schools that are over capacity, along with several schools in more rural locations struggling with capacity issues.

Figure 4.12
Secondary school capacity against housing growth



Source: Essex County Council Department of Education data (2016)

Table 4.3

Secondary school capacity and forecast pupil change

	LOCAL AUTHORITY WIDE PLACES DATA, 2015				IDENTIFIED GROWTH IN PUPIL NUMBERS			
	SECONDARY SCHOOLS	NET CAPACITY 2014/15	NUMBER ON ROLL MAY 2015	SURPLUS/ DEFICIT PLACES	ECC ANALYSIS OF ADDITIONAL SECONDARY PUPILS 2016 - 2020	2016 - 2020 (FORM ENTRY)	AECOM ANALYSIS OF ADDITIONAL SECONDARY PUPILS 2016 - 2036	2016 - 2036 (FORM ENTRY)
Basildon	10	11,958	9,887	2,071	680	4.5	1,863	12.4
Braintree	8	8,958	7,494	1,464	563	3.8	1,813	12.1
Brentwood	6	8,182	7,060	1,122	258	1.7	776	5.2
Castle Point	5	6,727	5,656	1,071	472	3.1	929	6.2
Chelmsford	10	13,113	12,212	901	855	5.7	1,662	11.1
Colchester	10	10,796	9,863	933	1,953	13.0	1,973	13.2
Epping Forest	6	6,143	5,812	331	1,406	9.4	1,103	7.4
Harlow	6	5,820	4,846	974	1,158	7.7	575	3.8
Maldon	2	2,891	2,582	309	316	2.1	665	4.4
Rochford	4	6,150	5,744	406	228	1.5	861	5.7
Tendring	7	9,156	8,328	828	380	2.5	1,180	7.9
Uttlesford	4	5,225	4,505	720	697	4.6	1,218	8.1
ESSEX	**78**	**95,119**	**83,989**	**11,130**	**8,966**	**59.8**	**14,617**	**97**
Southend	12	11,503	10,381	1,122	1,573	10.5	2,657	17.7
Thurrock	10	10,521	9,124	1,397	-	-	2,285	15.2
GREATER ESSEX	***100***	***117,143***	***103,494***	***13,649***	***-***	***-***	***19,560***	***130***

Source: Place Data from Essex County Council Commissioning School Places 2015-2020 (2015), & Department of Education data extracted for Thurrock and Southend (2016),
2016 - 2020 Demand forecasts utilise the Essex County Council Commissioning School Places 2015-2020 (2015)
2020 - 2036 Demand forecasts apply the Essex County Council Developers Guide to Infrastructure Contributions child yield rates to forecast housing need presented in Section 3

**Surplus depicted in green , Deficit depicted in red*

The need for additional places has not considered the implications of the spatial strategies identified in emerging Local Plans and is based solely on the forecast housing need presented in Section 3

FUTURE REQUIREMENTS TO MEET GROWTH TO 2036

Table 4.3 sets out forecast growth in terms of secondary school places to 2025 as identified by the three education authorities. Forecasts from 2026 to 2036 have been produced through AECOM analysis of the housing trajectory. The information should be considered in the context of the following key issues:

- There will be an additional demand to 2020 of 70.3 Form Entry (FE) across the local authorities, with a total demand for 130FE between 2016-2036 across Greater Essex.
- Between 2016 and 2036 the unitary authorities and Colchester and Basildon will experience the greatest increase in additional demand
- New secondary school provision will be required to serve each of three planned new Garden Settlements in north Essex, with the first phase (4FE) of each school coming forward within the later part of the GIF time period

EXAMPLE INFRASTRUCTURE PROJECTS PROPOSED

Notable investment in secondary provision includes the following:

- New Secondary School at Beaulieu Park (6-8FE)
- New Secondary School and SEN provision for Harlow
- Capital investment of over £50m in SEN accommodation is being made over the next 3 years

COSTS AND FUNDING

Based upon theoretical benchmark modelling the following costs and funding have been identified:

Cost = £576,600,000

Estimated Funding Gap = £428,650,000

Costs are set out for each local authority in Section 5

FURTHER AND HIGHER EDUCATION

Greater Essex **3** HE Campus

Greater Essex **9** FE Colleges

Greater Essex **17** Adult Community Learning Centres

HEADLINES

- Adult Learning – currently supporting 13,000 of the estimated 800,000 adult population in Essex. Existing FE infrastructure capacity is underutilised at present
- Current labour market shortages of particular skills: Advanced Manufacturing and Engineering, Care, Construction, Finance and Insurance, Health, IT, Digital and Creative, Logistics) and subsequent requirement for associated FE and HE courses.
- Central government is reducing is funding to FE through the Adult Skills Budget so existing facilities will need to work harder to remain financially stable.

CURRENT SITUATION

There are 31 institutions delivering Further Education (FE) places across Greater Essex (not including Sixth Forms).

The three Higher Education (HE) institutions in Essex are Anglia Ruskin University (Chelmsford and Harlow), University of Essex (Colchester and Southend) and Writtle University College (Chelmsford). Writtle College is both a HE and FE provider and is counted as both. Higher Education facilities in Greater Essex serve local and international markets and contribute to economic growth across Greater Essex.

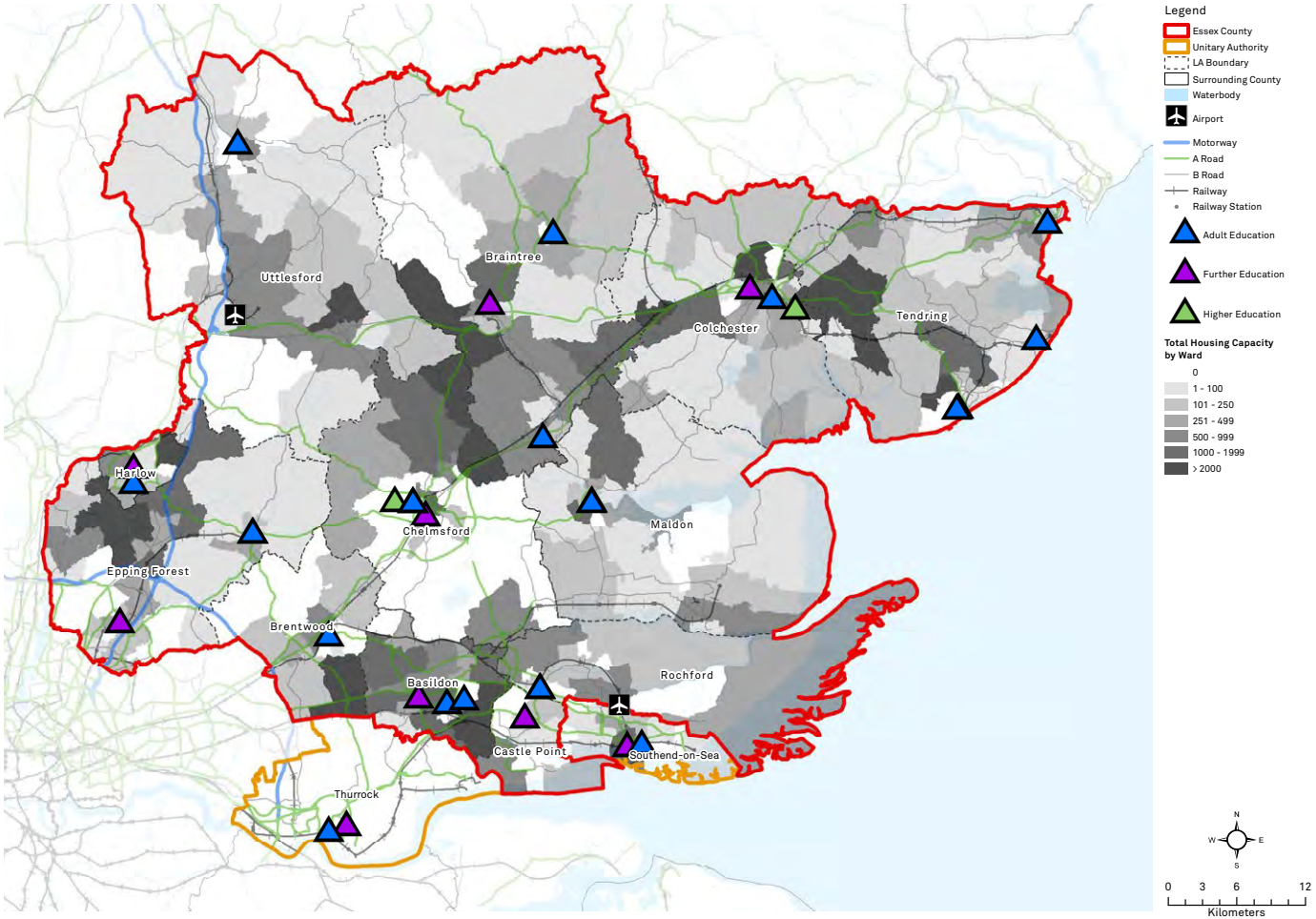
In addition, there are 9 colleges (including Writtle College), offering a variety of vocational programs (FE) across Essex. Some Colleges also offer HE courses (Colchester Institute and Harlow College).

Essex Adult Community Learning, run by Essex County Council, is the key supplier of Adult Education across Essex. There is a fairly even spread of centres across Greater Essex with at least one centre located in 13 of 14 local authorities in Greater Essex.

Table 4.4 sets out the current distribution of facilities.

Figure 4.13

Post 16 education facilities against housing growth



Source: Essex County Council location data 2015

FUTURE REQUIREMENTS TO MEET GROWTH TO 2036

- Employer-led training and the creation of a productive and responsive skills system can only be achieved with state-of-the-art training facilities and specialist equipment to deliver high value training.
- Higher Education institutions largely have the capacity to meet their future infrastructure ambitions.
- Structural adjustment in the FE sector will be required to align offerings with employer needs. Changes will need to be supported by improved careers advice.
- Increased demand for FE places offset by changes in delivery models, requiring less infrastructure provision but placing additional demands on other infrastructure.
- Flexible Government funding of skills programs, training in secondary schools and accreditation would support local ambitions. Essex has made the case for greater local determination of employment and skills provision.
- Increased Adult Learning demand constrained by operating pressures.
- University of Essex Student numbers are forecast to grow from approximately 15,000 at present to 20,000 by 2025 (principally on the Colchester campus).

Table 4.4

Post-16 education facilities and forecast pupil change

				IDENTIFIED GROWTH IN PUPIL NUMBERS	
	UNIVERSITIES/ HIGHER EDUCATION	COLLEGES	ADULT COMMUNITY LEARNING	ADDITIONAL SIXTH FORM PLACES 2016-2036	ADDITIONAL ADULT LEARNING CLIENTS -2036
Basildon	-	2	2	256	147
Braintree	-	1	2	128	179
Brentwood	-	-	1	160	111
Castle Point	-	2	-	64	106
Chelmsford	2	1	1	224	47
Colchester	1	1	1	320	34
Epping Forest	-	1	1	256	74
Harlow	1	1	1	192	138
Maldon	-	-	1	0	168
Rochford	-	-	1	64	119
Tendring	-	-	3	128	44
Uttlesford	-	-	1	224	72
ESSEX	**4**	**9**	**15**	**2,016**	**1,237**
Southend	-	1	1	224	107
Thurrock	-	1	1	384	150
GREATER ESSEX	***3***	***11***	***17***	***2,624***	***1,494***

Source: Essex County Council and AECOM web-based research

Adult Community Learning includes stand alone facilities and facilities that include adult learning in addition to other services (library, primary school, etc) in Essex

EXAMPLE INFRASTRUCTURE PROJECTS PROPOSED

A number of FE and HE investment projects have been identified including:

- Creation of STEM Innovation Centre, Braintree (FE)
- National Institute for Advance STEM Technology, Basildon (FE)
- Technical and Professional Skills Centre, Stanstead (FE/ HE)

COSTS AND FUNDING

Based upon the GIF Project Schedule and theoretical benchmark modelling where no tangible projects have been identified, the following costs and funding have been identified:

Cost = £63,270,000

Estimated Funding Gap = £47,890,000

Costs are set out for each local authority in Section 5

4.3 HEALTH + SOCIAL CARE

PRIMARY & COMMUNITY SERVICES

Greater Essex
1,103
GPs

Greater Essex
273
Dental Practices

CURRENT SITUATION

The Health and Social Care Act 2012 has radically changed the way that primary care services are planned and organised by allowing a move to clinical commissioning, a renewed focus on public health and allowing healthcare market competition for patients. This is primarily provided by the Clinical Commissioning Groups - of which there are 7 covering the Greater Essex area.

NHS Essex Success Regime is currently reviewing A&E and hospital specialisations in South and Mid Essex.

HEADLINES - GPs

- The provision of GP services is concentrated in the major urban areas, however future housing need does not precisely match current provision.
- Analysis of GPs to patients indicates that in Greater Essex there are 1,919 patients per FTE GP, in which 3 CCGs have higher ratios (Thurrock. Basildon and Mid Essex).
- Several CCGs, in particular Thurrock, are reviewing their Estate Strategies towards a rationalised approach due to loss of GPs (retirement) and growth in new homes

HEADLINES - DENTISTS

- An assessment of dentists to current population indicates that across Greater Essex there are 273 dentists
- Facilities concentrated around the major urban centres

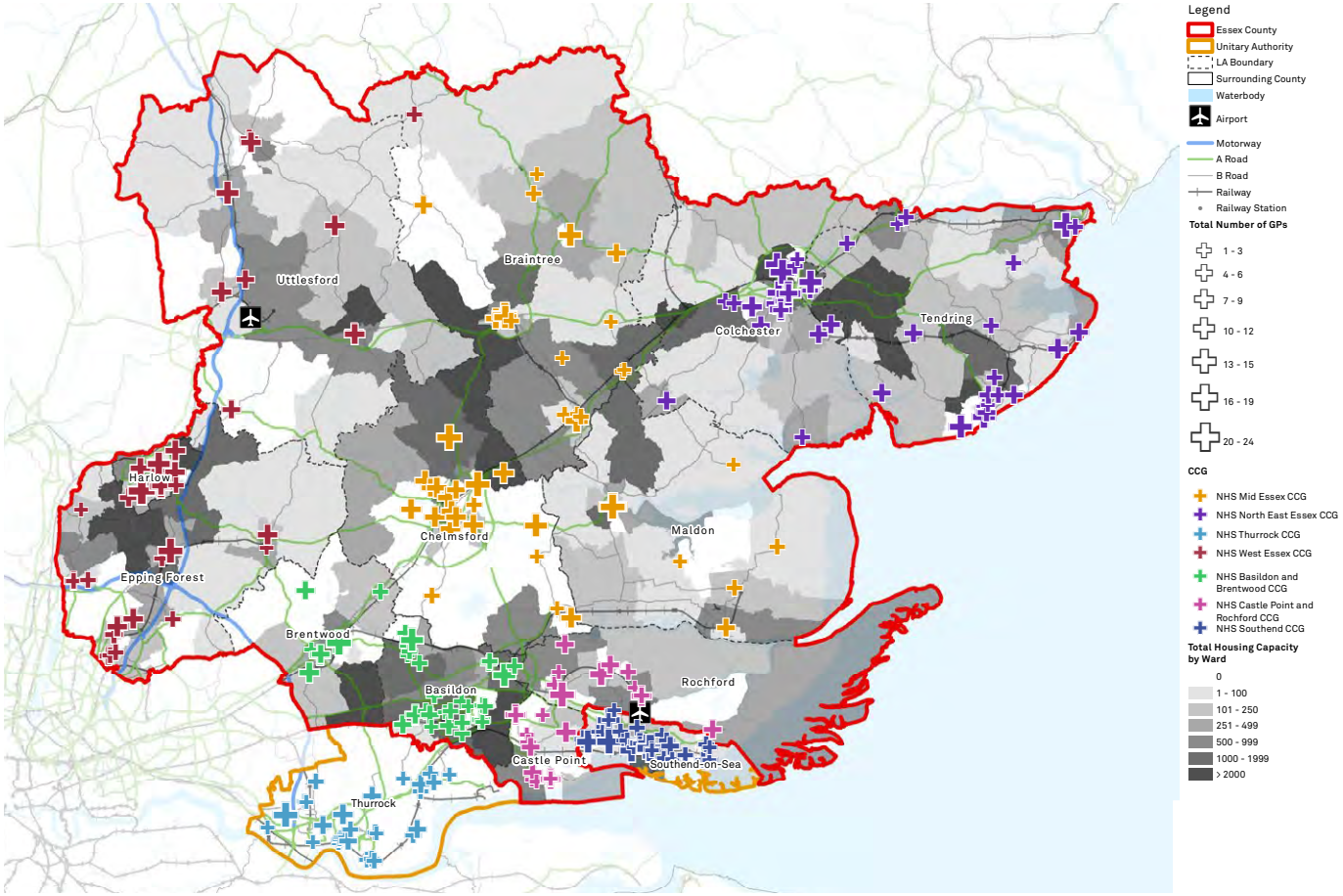
Health and Well Being Boards:

Responsibility for public health was moved out of the NHS into local government in April 2013. Health and Wellbeing Boards (HWBs) promote co-operation from leaders in the health and social care system to improve the health and wellbeing of their local population and reduce health inequalities.

HWBs are responsible for producing a Joint Health & Wellbeing Strategies (JHWS), Joint Strategic Needs Assessments (JSNA) and Pharmaceutical Needs Assessments (PNA) for Greater Essex.

Figure 4.14

Primary healthcare capacity against housing growth



Source: Health and Social Care Information Centre, GP (Feb 2016) and GP Patients (April 2016), and Dentists (Feb 2016)

Local Strategic Estates Plan

In respect of capital investment each CCG has a local Strategic Estates Plan, developed in collaboration with local healthcare providers and other stakeholders such as local government. The Local Strategic Estates Plan is intended to support the health economy to create a sustainable, fit-for-purpose estate that maximises value for money and ensures an estate that will enable high quality service. They specifically address changes in demography and population demand; changes in the way that health care services are provided (specifically reflecting plans for integrated health and social care, greater levels of care within communities and new commissioning models); and challenges in funding and affordability.

Table 4.5

Primary healthcare capacity

	EXISTING PRIMARY CARE PROVISION 2016					
	GP PRACTICES	GPS	FTE GPS	PATIENTS PER GP	PATIENTS PER FTE GP	DENTAL PRACTICES
NHS Basildon and Brentwood CCG	42	155	128	1,764	2,128	44
NHS Castle Point and Rochford CCG	26	103	98	1,778	1,860	22
NHS Mid Essex CCG	48	238	200	1,616	1,925	59
NHS North East Essex CCG	40	180	180	1,660	1,884	53
NHS West Essex CCG	35	199	163	1,461	1,786	46
Essex	**191**	**875**	**769**	**1,681**	**1,911**	**224**
NHS Southend CCG	35	134	103	1,383	1,798	28
NHS Thurrock CCG	32	94	78	1,788	2,147	21
Greater Essex	**258**	**1,103**	**951**	**1,654**	**1,919**	**273**
NHS England Midlands and East (East)	541	3,603	3,164	1,227	1,397	-
England	**7,674**	**41,877**	**34,592**	**1,365**	**1,653**	**-**

Source: Health and Social Care Information Centre, GP (Feb 2016) and GP Patients (April 2016), and Dentists (Feb 2016), Forecast based on ONS SNPP 2014 and application of GP and Dentist planning standards

**An assessment at a local authority level reviewing the current capacity of GPs to patients, based on data collected from the Housing and Social Care Information Centre and NHS England*

***An assessment of the level dental provision to the local authority population has been conducted to give an indicator of where potential capacity issues could be occurring, based on ONS SNPP 2014*

Greater Essex

27,400

Additional sq.m of primary healthcare space by 2036

Greater Essex

8,500

Additional sq.m of dental healthcare space by 2036

FUTURE REQUIREMENTS TO MEET GROWTH TO 2036

Future requirements are based on the application of best practice standards against population growth forecasts. It is acknowledged that this approach does not reflect the general shift to preventative models of health and social care and a move to integrated health and social care models including integrated healthy living centres.

This analysis also does not take into account wider primary care service such as pharmacies, opticians, community health (health visiting, school nursing, midwifery, district nursing etc) which will all be impacted by demand from growth.

EXAMPLE INFRASTRUCTURE PROJECTS PROPOSED

Notable investment in primary healthcare provision include the following;

- Creation of Integrated Health Living Centres across Thurrock area
- Development of Laindon Health Centre
- Reconfiguration of acute services as part of Success Regime
- Development of new health hubs in Castle Point and Rochford area
- Redevelopment of St Peter's Hospital, Maldon

COSTS AND FUNDING

Based upon the theoretical benchmark modelling the following costs and funding have been identified:

Cost = £85,890,000

Estimated Funding Gap = £51,610,000

Costs are set out for each local authority in Section 5

HOSPITALS AND MENTAL HEALTH

Greater Essex
>3,000
NHS Acute hospital beds

Greater Essex
>900
Mental health hospital beds

CURRENT SITUATION

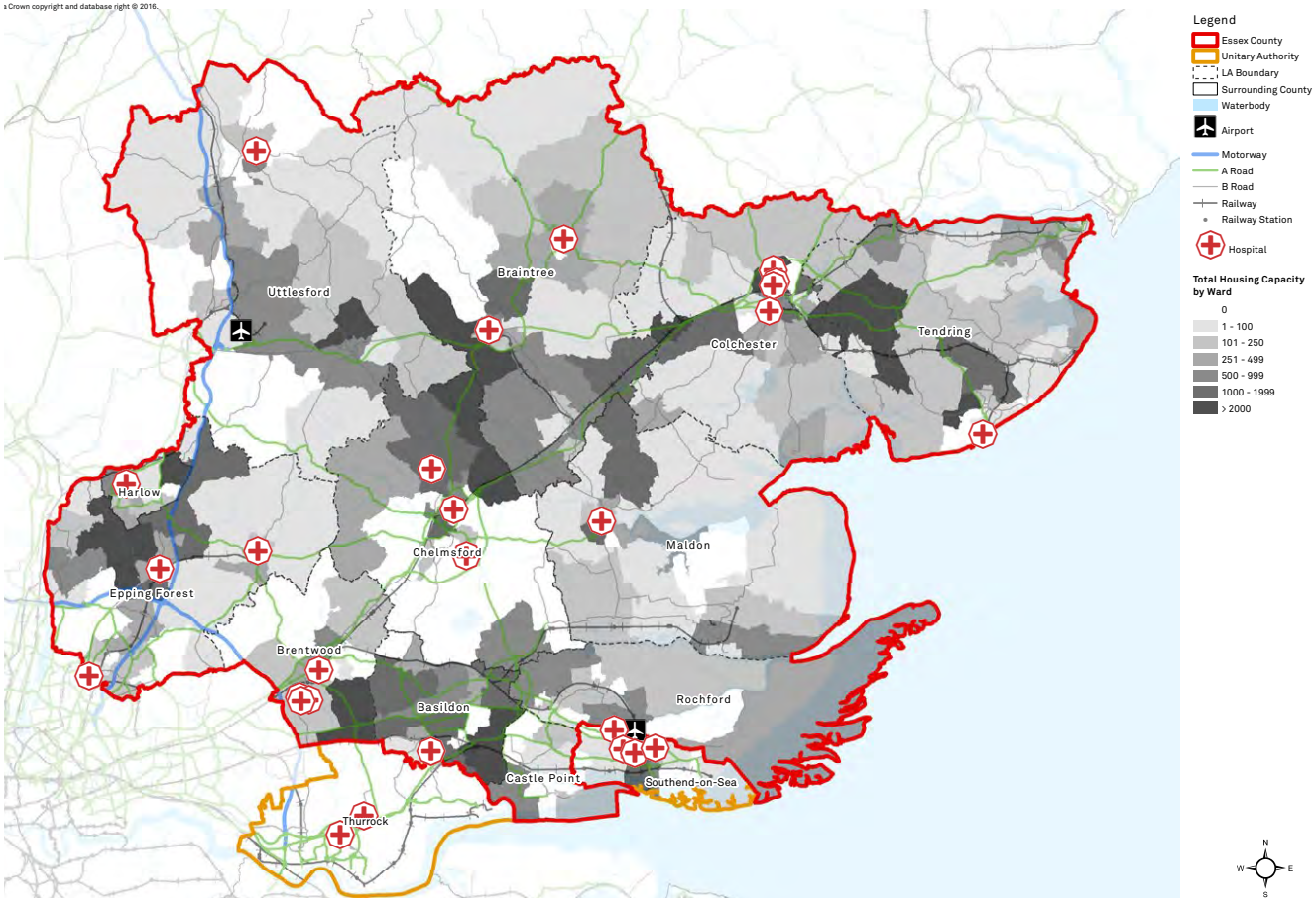
There are a significant number of organisations providing acute hospital, community and mental health services in Essex, which include Foundation Trusts, NHS Trusts, and social enterprises. The majority of these services are commissioned locally by CCGs with some more specialist services under the responsibility of NHS England. Acute health trusts provide secondary care and more specialised services, in which acute trusts are commissioned by CCGs.

HEADLINES - HOSPITALS

- South Essex local authorities (i.e. Thurrock and Basildon) and Brentwood have the highest proportion of acute/specialist hospital beds across the county.
- Figure 4.15 does not include all private hospitals. A large number of health episodes are treated within private healthcare facilities in Essex.
- Spatially, the existing hospitals are located in areas that will see significant growth.
- There are a significant number of community hospitals providing intermediate care and other sub-acute beds across the county.

Figure 4.15

Hospital locations against housing growth



Source: OS Open Local Mapping showing all General Acute, Community and Private Hospitals

Sustainability and Transformation Plans (STPs)

In response to the Five Year Forward View (5YFV), NHS providers, Clinical Commissioning Groups (CCGs), Local Authorities, and other health and care services have come together to form STP 'footprints'. In Essex there are 3 STP areas: West Essex with Hertfordshire, North East Essex with Suffolk, and the remaining 5 CCG areas creating the Mid and South Essex STP, also known locally as the Success Regime. The STP's purpose is to recognise the need for change and enable it, to support new models of care and plans for growth.

Greater Essex
94,000
Additional sq.m of acute hospital bed space by 2036

Greater Essex
10,000
Additional sq.m of mental health bed space by 2036

Table 4.6
NHS hospital capacity

	EXISTING HOSPITAL BED CAPACITY (2015)			
	GENERAL ACUTE	MATERNITY	MENTAL ILLNESS & LEARNING DISABILITY	TOTAL
Southend University Hospital NHS Foundation Trust	521 (90%)	25 (41%)	0	546
Basildon and Thurrock University Hospitals NHS Foundation Trust	682 (95%)	55 (58%)	0	737
Colchester Hospital University NHS Foundation Trust	571 (93%)	34 (55%)	0	605
Mid Essex Hospital Services NHS Trust	527 (96%)	55 (48%)	0	582
The Princess Alexandra Hospital NHS Trust	424 (96%)	41 (71%)	0	465
Barking, Havering and Redbridge University Hospitals NHS Trust	909 (97%)	62 (75%)	0	971
South Essex Partnership University NHS Foundation Trust	73 (88%)	0	388 (94%)	461
North East London NHS Foundation Trust	182 (92%)	0	214 (86%)	396
North Essex Partnership University NHS Foundation Trust	0	0	326 (94%)	326
TOTAL*	***3,889***	***272***	***928***	***5,089***

Source: NHS England: Unify2 data collection - KH03 - Average daily number of available and occupied beds open overnight by sector (January to March 2016)

Source: Future Requirements based on AECOM Analysis of population change (ONS 2014 SNPP) and continuation of ratio of beds to population.

Note - Existing Hospital Bed capacity data is not available at the site specific level (and therefore local authority level) but available at NHS Trust level as presented above.

Note - These are the principle NHS organisations in Essex or adjoining that provide services within the county. It does not represent all of the facilities available to the people of Essex. Also, te NHS Trusts presented above in some cases cover wider areas outside Essex County (such as Redbridge or Havering). Therefore the total figure provides a figure which covers a wider area than Greater Essex exclusively.

FUTURE REQUIREMENTS TO MEET GROWTH TO 2036

Future requirements are based on the application of best practice standards against population growth forecasts.

- Both health and social care services are moving away from bed based care for both physical and mental health with a greater emphasis on avoiding hospital admissions and nursing/residential home placements. The focus is on managing people in their own communities. It is unlikely that the current benchmarks used reflect the planned move towards fewer acute beds with more people with increasingly complex needs being managed in the community and supported, medically, by general practice.
- The existing Princess Alexandra Hospital site faces significant challenges and its relocation is currently under review. The Princess Alexandra Hospital NHS Trust and the East and North Hertfordshire NHS Trust have signed a 'Memorandum of Understanding' and work has started to identify areas where services can be shared and or improved through joint working.'
- The Mid and South Essex Success Regime is undertaking a detailed review of the provision of services across its constituent five CCGs. In particular the balance of services between the three acute hospitals in Basildon, Chelmsford and Southend are being considered to ensure that communities have suitable access to financially and clinically sustainable services

COSTS AND FUNDING

Based upon theoretical benchmark modelling, the following costs and funding have been identified:

Cost = £347,210,000
Estimated Funding Gap = £289,650,000

Costs are set out for each local authority in Section 5

ADULT SOCIAL CARE

Greater Essex
99
Nursing Homes

Greater Essex
493
Residential Care Homes

CURRENT SITUATION

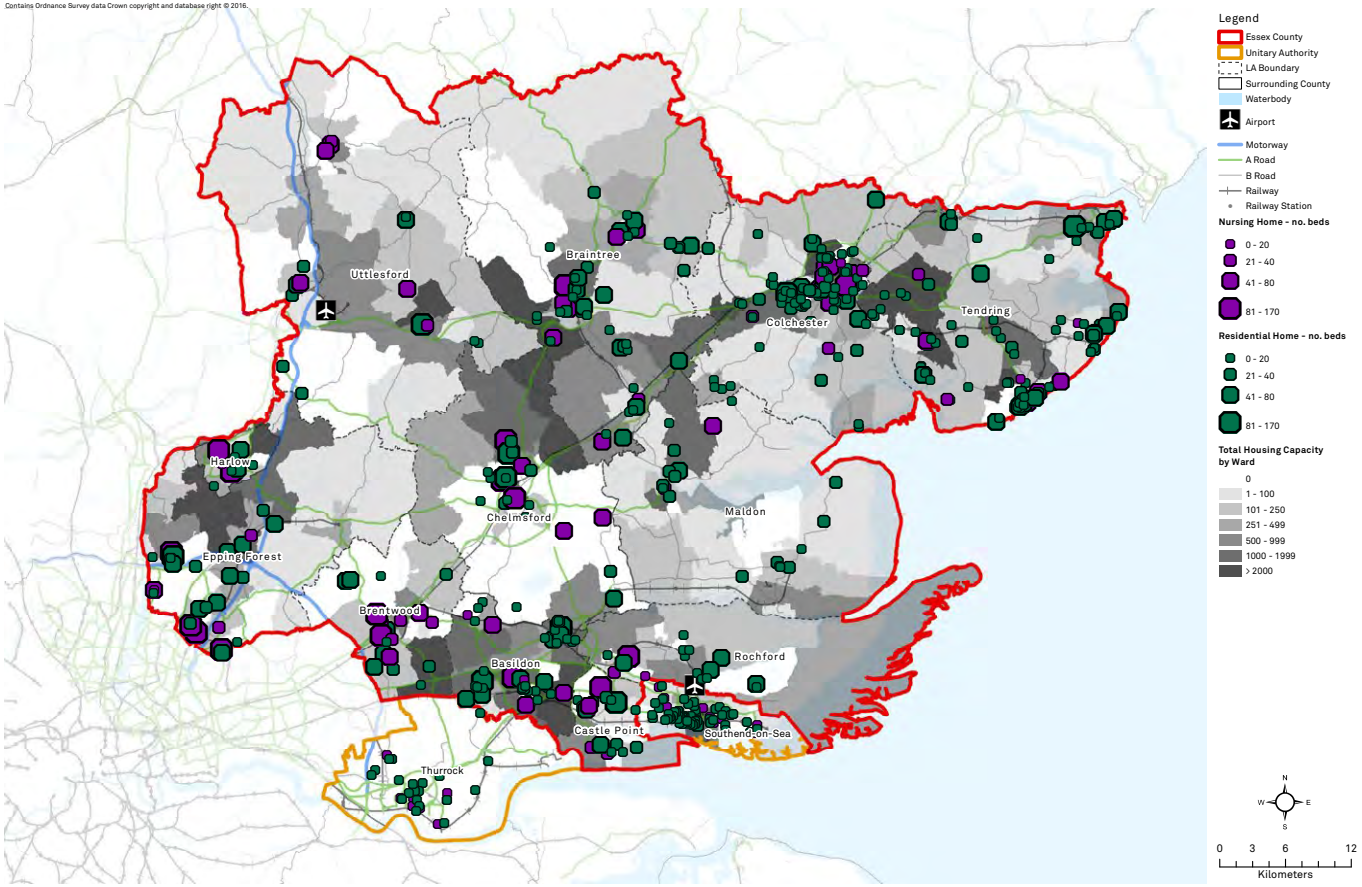
From 1 April 2009 all health and social care services in England are registered and regulated by the Care Quality Commission (CQC). ECC plays a role in commissioning adult social care services and in the referral and placement of clients with Learning Disability (LD), Physical and Sensory Impairment (PSI) and for Older People (OP). Social care services are delivered by a mix of public and private providers.

ECC is aiming to transform the delivery of adult social care, recognising the growth of the older cohorts will make the current delivery model financially untenable, with greater emphasis towards independent living. ECC's long term objective is to increase the contribution of independent living.

ECC is taking an active role in scoping the market for independent living housing and promoting an increase in the supply for independent living units. In 2015 ECC endorsed capital investment of around £27 million to facilitate the delivery of around 1,800 units of independent living over a 5 year period.

The absolute size of the residential care market is not expected to contract significantly, but to stabilise with the proportional shift away from residential care offset by the significant growth in the older persons cohort.

Figure 4.16
Social care accommodation against housing growth



Source: Essex County Council database of social care providers Year End 15-16, supplemented with CQC database for Unitary Authorities, Shaping Futures: Market Position Statement, Independent Living Position Statement (April 2016)

Table 4.7

Social care accommodation & theoretical future need

	EXISTING CARE PROVISION			INDEPENDENT LIVING PROVISION		2016-2036 ADDITIONAL REQUIREMENT		
	NURSING	RESIDENTIAL	BEDS PER 10,000 PEOPLE	INDEPENDENT LIVING UNITS	EXISTING SHORTFALL IN INDEPENDENT LIVING UNITS	NURSING CARE BEDS REQUIREMENT	RESIDENTIAL CARE BEDS REQUIREMENT	INDEPENDENT LIVING UNIT REQUIREMENT
Basildon	355	665	57	65	-274	113	517	437
Braintree	490	1,216	114	89	-263	152	698	590
Brentwood	457	451	120	26	-127	50	229	194
Castle Point	247	434	77	0	-230	82	378	320
Chelmsford	575	529	64	65	-214	139	640	540
Colchester	644	1,243	105	56	-203	131	602	509
Epping Forest	542	805	105	40	-187	97	448	378
Harlow	239	165	48	42	-153	46	213	180
Maldon	78	451	84	0	-134	74	341	288
Rochford	112	297	48	30	-129	72	330	279
Tendring	351	2,156	179	30	-190	147	677	572
Uttlesford	330	350	81	0	-159	94	432	365
ESSEX	**4,420**	**8,762**	**92**	**443**	**-2,263**	**1,199**	**5,506**	**4,649**
Southend	-	34	-	-	-	133	613	518
Thurrock	-	-	-	-	-	91	416	351
GREATER ESSEX	***4,420***	***8,796***	**-**	**-**	**-**	***1,423***	***6,534***	***5,517***

Source: Essex County Council database of social care providers Year End 15-16, supplemented with CQC database for Unitary Authorities, Shaping Futures: Market Position Statement, Independent Living Position Statement (April 2016)

Future Additional Care requirements based upon application of benchmark planning standards on the ONS Population Projections for over 75 year olds 2016-2036. Standards from The Housing Learning and Improvement Network (LIN) SHOP TOOL

FUTURE REQUIREMENTS TO MEET GROWTH TO 2036

Table 4.7 sets out the theoretical requirements for additional nursing, residential and independent living beds based upon the forecast increase of 122,600 people over the age of 75 between 2016 and 2036. Future demand ratios have been reduced in line with ECC trend analysis of changes in demand for care services over the past 5 years. Refer to Section 2 to understand scale of ageing population to 2036.

Greater Essex
18 (with 1,423 beds)
Additional Nursing Care Facilities (80 bed)

Greater Essex
82 (with 6,534 beds)
Additional Residential Care Facilities (80 bed)

Greater Essex
69 (with 5,517 beds)
Additional Independant Living Facilities (80 bed)

EXAMPLE INFRASTRUCTURE PROJECTS PROPOSED

The list below sets out key investments expected to support population growth:

- ECC aims to deliver approximately 60 specialist housing schemes for vulnerable people over the next 3 to 5 years
- ECC aspires to increase the number of Independent Living units available for elderly residents by 2,500 by 2022 (700 existing or already in development)

COSTS AND FUNDING

Based upon the GIF Project Schedule and theoretical benchmark modelling where no tangible projects have been identified, the following costs and funding have been identified:

Cost = £931,520,000

Estimated Funding Gap = £684,490,000

Costs are set out for each local authority in Section 5

4.4 EMERGENCY SERVICES

EMERGENCY SERVICES

Ambulance Service | Police | Fire Service

POLICE SERVICES

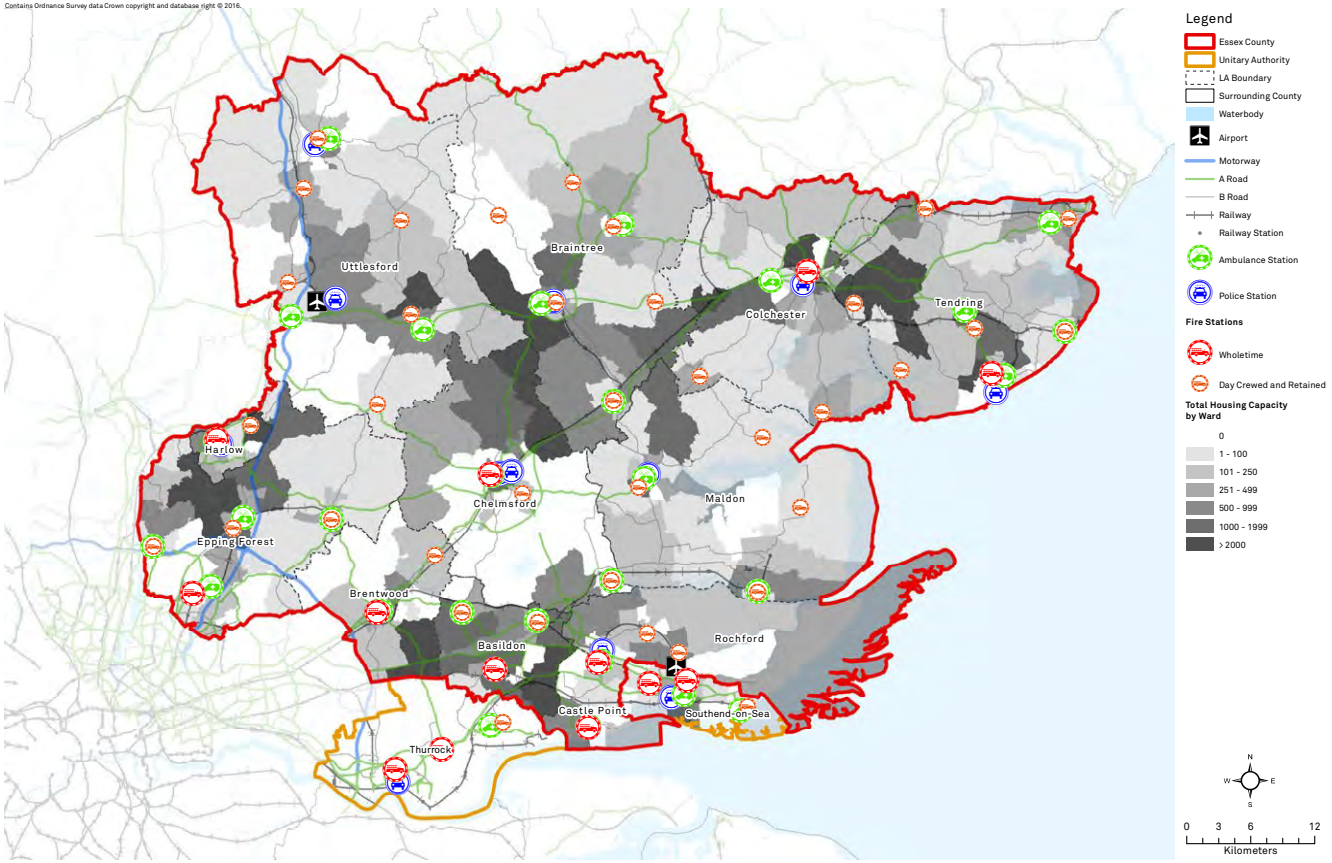
Essex is policed by Essex Police, with their headquarters located in Chelmsford. Essex Police, until recently, has had a large estate (27 front desk premises), compared to other services nationally. However due to a significant funding gap, there has and will be a reduction of the current estate by over 50%. The premises in Chelmsford, will be decommissioned and rebuilt to include enhanced IT infrastructure. This is resulting in a change of model towards Operations Hubs and Community Safety Hubs, which do not have front desks, with a focus towards co-location of services.

FIRE SERVICES

Essex County Fire and Rescue Service is one of the largest fire and rescue services in the country, handling a wide variety of risks. The Service is governed by Essex Fire Authority and has 51 fire stations within its property portfolio which have a mix of both wholetime and on call firefighters. Its headquarters is in Kelvedon, and it also has a number of support sites which help support its service delivery. There is strong fire cover across the county with no current plans to either increase or reduce its estate.

Figure 4.17

Emergency services facilities against housing growth



Source: Essex County Council, Essex Police website, Essex Fire and Rescue Service website, East of England Ambulance Service NHS Trust Website

Table 4.8

Emergency Service Existing Provision

	POLICE STATION	FIRE STATIONS	AMBULANCE STATION
Basildon	1	3	3
Braintree	1	6	3
Brentwood	1	2	1
Castle Point	-	2	2
Chelmsford	2	3	2
Colchester	1	5	1
Epping Forest	-	4	4
Harlow	1	2	1
Maldon	1	4	2
Rochford	1	2	-
Tendring	1	6	4
Uttlesford	2	6	3
ESSEX	**12**	**45**	**52**
Southend	1	3	2
Thurrock	1	3	2
GREATER ESSEX	***14***	***51***	***56***

Source: Essex County Council, Essex Police website, Essex Fire and Rescue Service website, East of England Ambulance Service NHS Trust Website

AMBULANCE SERVICES

East of England Ambulance Service NHS Trust (EEAST) is one of twelve ambulance trusts working across England, in which across Greater Essex there are 56 ambulance stations, community response posts and hospitals where ambulances are located.

EMERGENCY PLANNING

The Civil Contingencies Act 2004 establishes a coherent framework for emergency planning and response ranging from local to national level.

The emergency services, alongside the local authorities and other organisations are defined as Category 1 responders, the primary responders in an emergency. They are supported by Category 2 responders (mostly utility companies and transport organisations).

Essex Civil Protection & Emergency Management (Essex County Fire & Rescue Service in Partnership with Essex County Council) acts on behalf of the county council, which is a Category 1 Responder under the Civil Contingencies Act 2004 and is responsible for the preparation of contingency plans which detail planned response to a disaster or major incident in Greater Essex.

4.5 COMMUNITY, SPORT AND LEISURE

LIBRARIES

Greater Essex
88
Libraries

Greater Essex
26
Sq.m of Library space per 1,000 people

CURRENT SITUATION

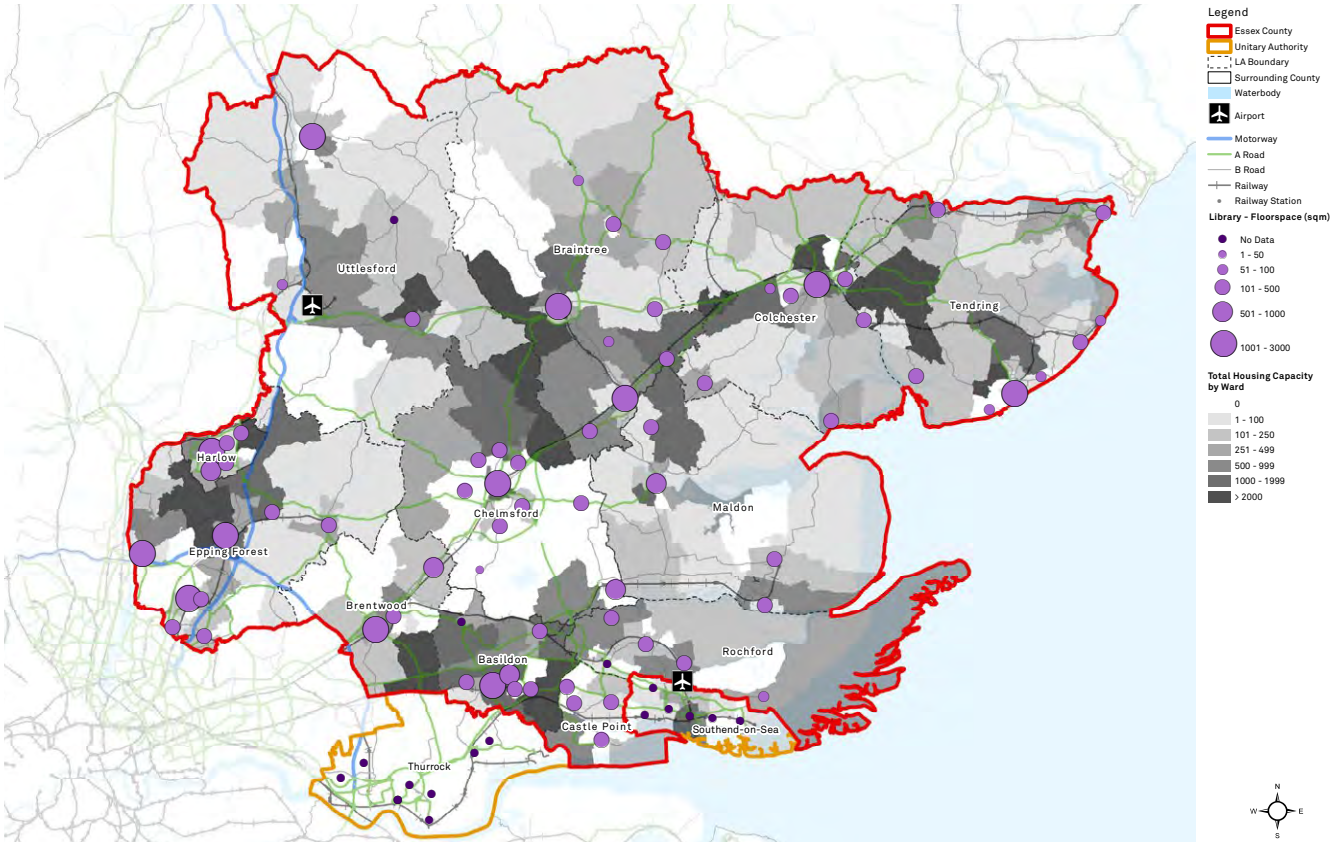
The Library service is undergoing significant restructuring. Some libraries will be transformed into multi-purpose 'community hubs' offering council services (e.g. births, deaths and marriages registration) and accommodating other community functions.

A baseline of libraries has been assembled based on the Operational Properties List provided by ECC, supplemented by information from the websites of the two Unitary Authorities.

HEADLINES

- There are 88 operational libraries in Greater Essex, with 73 in the Essex County Council area providing a total of 34,288 sq.m of space (equivalent data on building size in the Unitary Authorities is not yet available). This represents an average of 26sq.m of library space per 1,000 people. However, provision levels vary between different Essex local authorities.
- The provision and capacity of libraries in Essex will be kept under review and such services are likely to be considered in the context of what services are required in a Community Hub within a specific locality.

Figure 4.18
Library facilities against housing growth



Source: Essex County Council operational property list; District / Unitary council websites

Table 4.9

Library capacity & theoretical future need

	LIBRARIES	LIBRARY SPACE (SQ.M)	LIBRARY SPACE PER 1000 PERSONS	2016-2036 ADDITIONAL LIBRARY SPACE (SQM)
Basildon	7	3,554	20	900
Braintree	9	3,671	24	639
Brentwood	3	2,380	31	432
Castle Point	4	1,248	14	264
Chelmsford	10	5,138	30	711
Colchester	7	4,123	23	1,005
Epping Forest	8	6,439	50	828
Harlow	5	4,271	50	444
Maldon	4	1,071	17	201
Rochford	5	912	11	282
Tendring	8	2,580	18	636
Uttlesford	4	1,751	21	666
ESSEX	**74**	**37,138**	**26**	**7,008**
Southend	6	-	-	879
Thurrock	9	-	-	1,074
GREATER ESSEX	***89***	**-**	**-**	***8,961***

Source: Essex County Council operational property list; District / Unitary council websites; Colchester Community Facilities Audit.

FUTURE REQUIREMENTS TO MEET GROWTH TO 2036

Greater Essex

8,961

Sq.m of additional library space required by 2036

Whilst analysis undertaken for the GIF identifies the need for 8,961 sq.m of additional provision, it is important to recognise the changing nature of library service provision and possibilities for delivering these requirements in new and innovative ways including the shared use of multi functional spaces.

COSTS AND FUNDING

Based upon the GIF Project Schedule and theoretical benchmark modelling where no tangible projects have been identified, the following costs and funding have been identified:

Cost = £15,390,000

Estimated Funding Gap = £1,470,000

Costs are set out for each local authority in Section 5

COMMUNITY AND YOUTH

Greater Essex
34
Total Number of Youth Centres

Greater Essex
8
Mobile Youth Centres

Greater Essex
51
Total Community Centres

CURRENT SITUATION

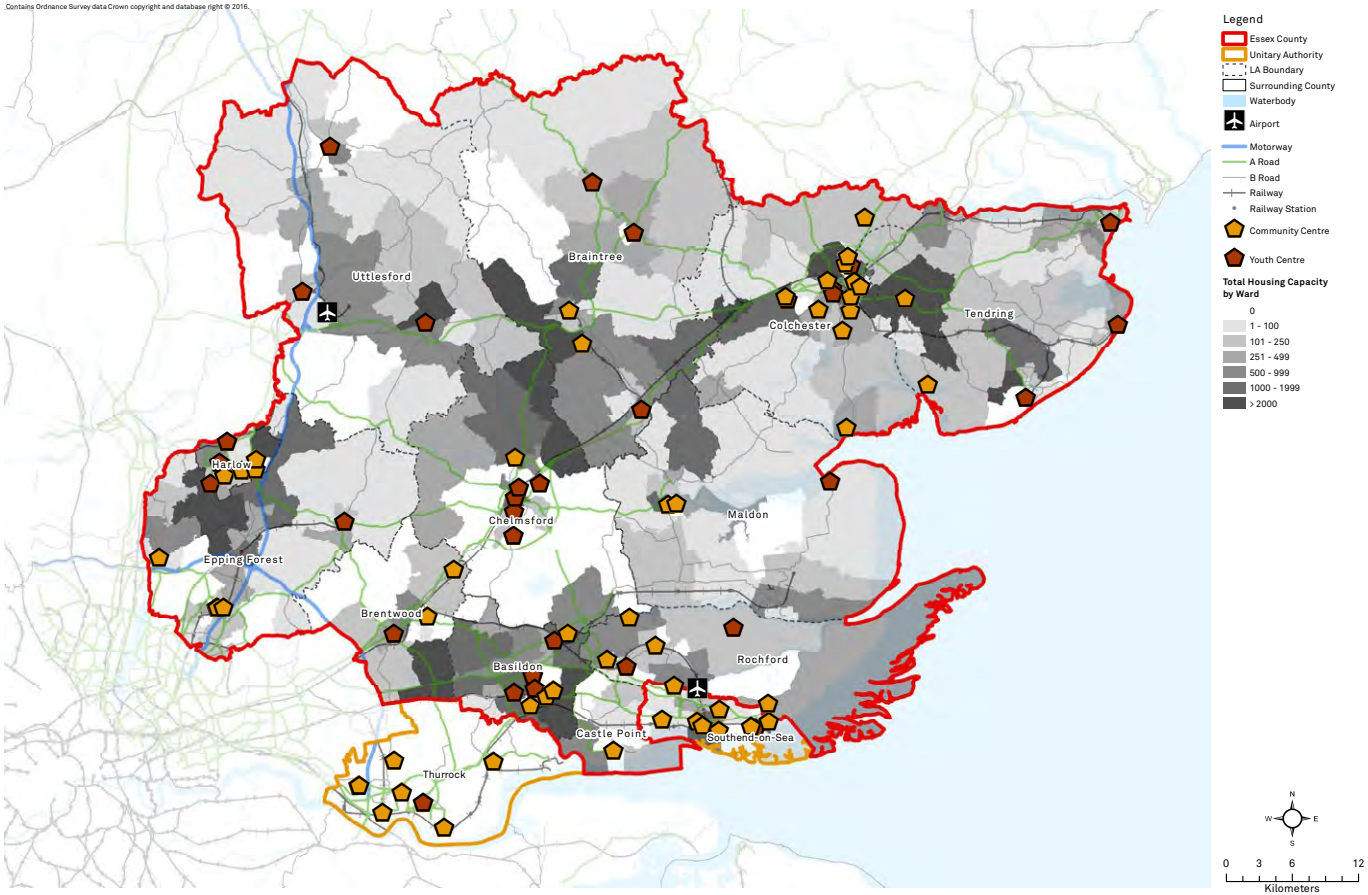
The Essex Youth Service has recently been restructured from a traditional service into a more light-touch, community-led model. In this model, youth workers do not directly deliver services, but become 'community commissioners', supporting the community to deliver services themselves. The service aims for full cost recovery from schools, clients, government and the National Citizens Service.

The County Council retains ownership of a (reduced) number of physical Youth Centres. It aims to maximise utilisation of these assets by other users, and also utilises other buildings where Youth Centres are not available. Retaining some physical assets is important as youth functions are sometimes incompatible with other community uses.

Youth services are now operating efficiently with strong outcomes and further reductions in service are unlikely. There are no plans to build new centres in existing areas, however there will need to be facilities in major new developments. These are likely to take the form of multi-purpose community spaces, but must take account of the specialised requirements of youth provision.

In addition to the County Council's youth services assets, there are many spaces across Greater Essex managed by district councils, the unitary authorities, community groups or other providers.

Figure 4.19
Community Facility provision against housing growth



Source: Essex County Council operational property list; District / Unitary council websites; Colchester Community Facilities Audit.

Table 4.10

Community facility capacity & theoretical future need

	YOUTH CENTRES				COMMUNITY CENTRES		
	NUMBER	CENTRES PER 1,000 YOUNG PEOPLE (AGED 13-19)	ADDITIONAL YOUTH CLIENTS 2016-2036	ADDITIONAL YOUTH FACILITIES 2016-2036	NUMBER	CENTRES PER 10,000 PEOPLE	ADDITIONAL COMMUNITY FACILITY SPACE (SQ.M)
Basildon	4	0.3	140	2	4	0.2	1,950
Braintree	3	0.2	36	1	2	0.1	1,385
Brentwood	1	0.2	78	1	2	0.3	936
Castle Point	0	0.0	36	1	1	0.1	572
Chelmsford	5	0.4	75	1	1	0.1	1,541
Colchester	4	0.3	138	2	12	0.7	2,178
Epping Forest	2	0.2	135	2	3	0.2	1,794
Harlow	3	0.4	78	1	4	0.5	962
Maldon	1	0.2	16	0	2	0.3	436
Rochford	2	0.3	39	1	4	0.5	611
Tendring	3	0.3	70	1	2	0.1	1,378
Uttlesford	3	0.4	96	2	0	0.0	1,443
ESSEX	**31**	**0.3**	**939**	**16**	**37**	**0.3**	**15,184**
Southend	1	0.1	101	2	8	0.4	1,905
Thurrock	2	0.1	140	2	6	0.4	2,327
GREATER ESSEX	**34**	**0.2**	**1,180**	**20**	**51**	**0.3**	**19,416**

Source: Essex County Council operational property list; District / Unitary council websites; Colchester Community Facilities Audit
Future Requirements based upon Application of Benchmark planning standards to forecast population growth

FUTURE REQUIREMENTS TO MEET GROWTH TO 2036

Greater Essex
19,416
additional community facility space (sq.m)

Greater Essex
20
Additional youth spaces

EXAMPLE INFRASTRUCTURE PROJECTS PROPOSED

The list below sets out examples of community infrastructure projects planned to support population growth:

- New Neighbourhood facilities in Strategic Allocations such as Dunton Hills (Brentwood), Beaulieu Park (Chelmsford), Northern Gateway (Colchester) and the Garden Communities
- Town Centre Regeneration in Basildon, Pitsea, Laindon and Wickford.

In addition, a common issue across Essex is the need for new facilities for young people, particularly in the evening

COSTS AND FUNDING

Based upon the GIF Project Schedule and theoretical benchmark modelling where no tangible projects have been identified, the following costs and funding have been identified:

Cost = £41,490,000

Estimated Funding Gap = £6,160,000

Costs are set out for each local authority in Section 5

INDOOR SPORTS FACILITIES

Greater Essex
428
Total Number of Swimming Lanes

Greater Essex
782
Total Number of Sports Halls

CURRENT SITUATION

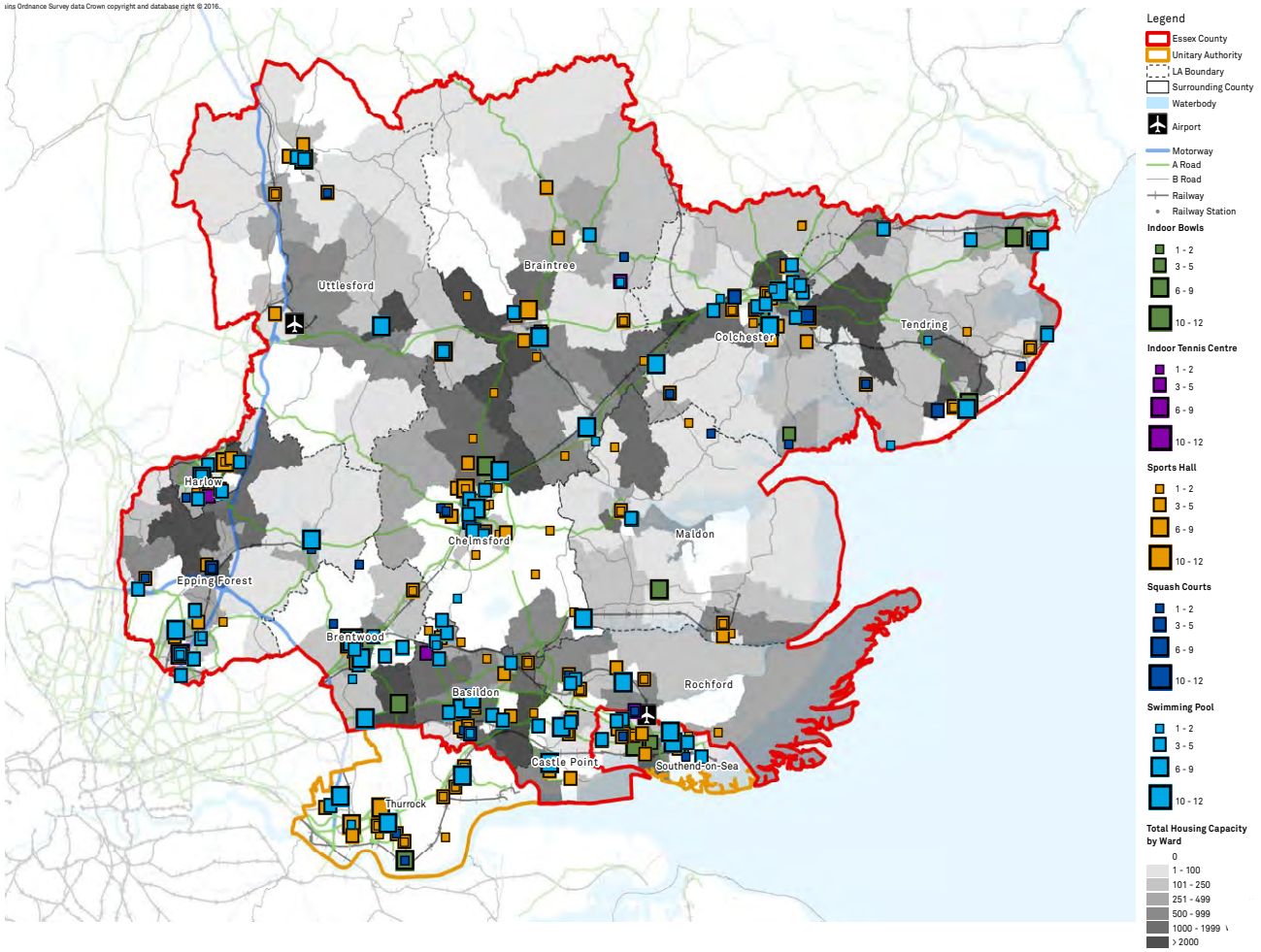
Indoor sports facilities in Essex comprise both public and private facilities. Public facilities are provided and funded by the individual districts, allowing anyone to have access to the facilities. Private facilities often require membership and payment for the use of facilities.

Active Essex, the County Sport and Physical Activity Partnership, works closely with Sport England and Local Authority partners. They are able to and will provide support and expertise to Districts and Boroughs around the provision, demand, standards, community access and engagement for local provision. Through a place based locality driven approach this team can connect and broker local partnership to maximise impact, partnerships and funding.

HEADLINES

- Braintree, Thurrock, Castle Point and Tendring have particularly low provision of indoor sports facilities relative to the population, in comparison to the Essex average.
- Brentwood has the strongest supply of indoor sports facilities relative to the population. Harlow also has relatively strong provision.
- Looking ahead, particular issues may emerge around Braintree, Thurrock and Tendring given existing below-average provision and high level of planned housing growth. Chelmsford and Basildon may also require strengthening of provision given the high housing growth planned in these areas.

Figure 4.20
Indoor Sports provision against housing growth



Source: Sport England Active Places database 2016

Table 4.11

Indoor sport facility provision

	SPORTS HALL COURTS	SWIMMING POOL LANES	SQUASH COURTS	GYM STATIONS	INDOOR BOWLS RINKS	INDOOR TENNIS COURTS
Basildon	81	50	12	1,619	-	11
Braintree	51	31	7	650	-	6
Brentwood	51	39	11	572	7	7
Castle Point	38	21	3	782	-	3
Chelmsford	99	42	18	976	8	-
Colchester	92	46	22	1,543	9	2
Epping Forest	41	39	10	736	7	14
Harlow	44	26	5	658	9	6
Maldon	25	8	6	248	7	-
Rochford	34	15	10	861	4	3
Tendring	39	29	9	445	16	2
Uttlesford	43	19	9	396	6	-
ESSEX	**638**	**365**	**122**	**9,486**	**73**	**54**
Southend	78	38	9	1,104	9	9
Thurrock	66	25	8	967	6	2
GREATER ESSEX	***782***	***428***	***139***	***11,557***	***88***	***65***

Source: Sport England Active Places database 2016

Includes all provision recorded by Sport England (including public, private and educational institutions). Some differences may occur between Sport England and local (district/borough/city) datasets.

FUTURE REQUIREMENTS TO MEET GROWTH TO 2036

Greater Essex
59
new swimming pool lanes

Greater Essex
84
new sports courts

Greater Essex
22
new indoor bowls rinks

The above infrastructure requirements have been identified based on AECOM analysis using Sport England best practice standards.

Each of the local authorities are working towards their own local level assessment of indoor sports requirements. This work is being supported through Active Essex. The GIF analysis presented here is based on a single set of baseline and forecast ratios to ensure consistency across the areas.

EXAMPLE INFRASTRUCTURE PROJECTS PROPOSED

The list below sets out community and leisure facility investments expected to support population growth:

- Redevelopment of Riverside Ice and Leisure Centre, Chelmsford
- Runnymede Swimming Pool
- Brentwood Centre options appraisal
- Major Multi sport facility at Colchester Nothern Gateway

COSTS AND FUNDING

Based upon the GIF Project Schedule and theoretical benchmark modelling where no tangible projects have been identified, the following costs and funding have been identified:

Cost = £123,580,000

Estimated Funding Gap = £95,120,000

Costs are set out for each local authority in Section 5

OUTDOOR SPORTS AND RECREATION

Outdoor Sports & Recreation

Children's Play Space

CURRENT SITUATION

Greater Essex has a wide range of open spaces, outdoor sports pitches, outdoor sports facilities and children's playgrounds. Outdoor sports and playspace are owned and operated by a mixture of private sector and voluntary organisations and local authorities.

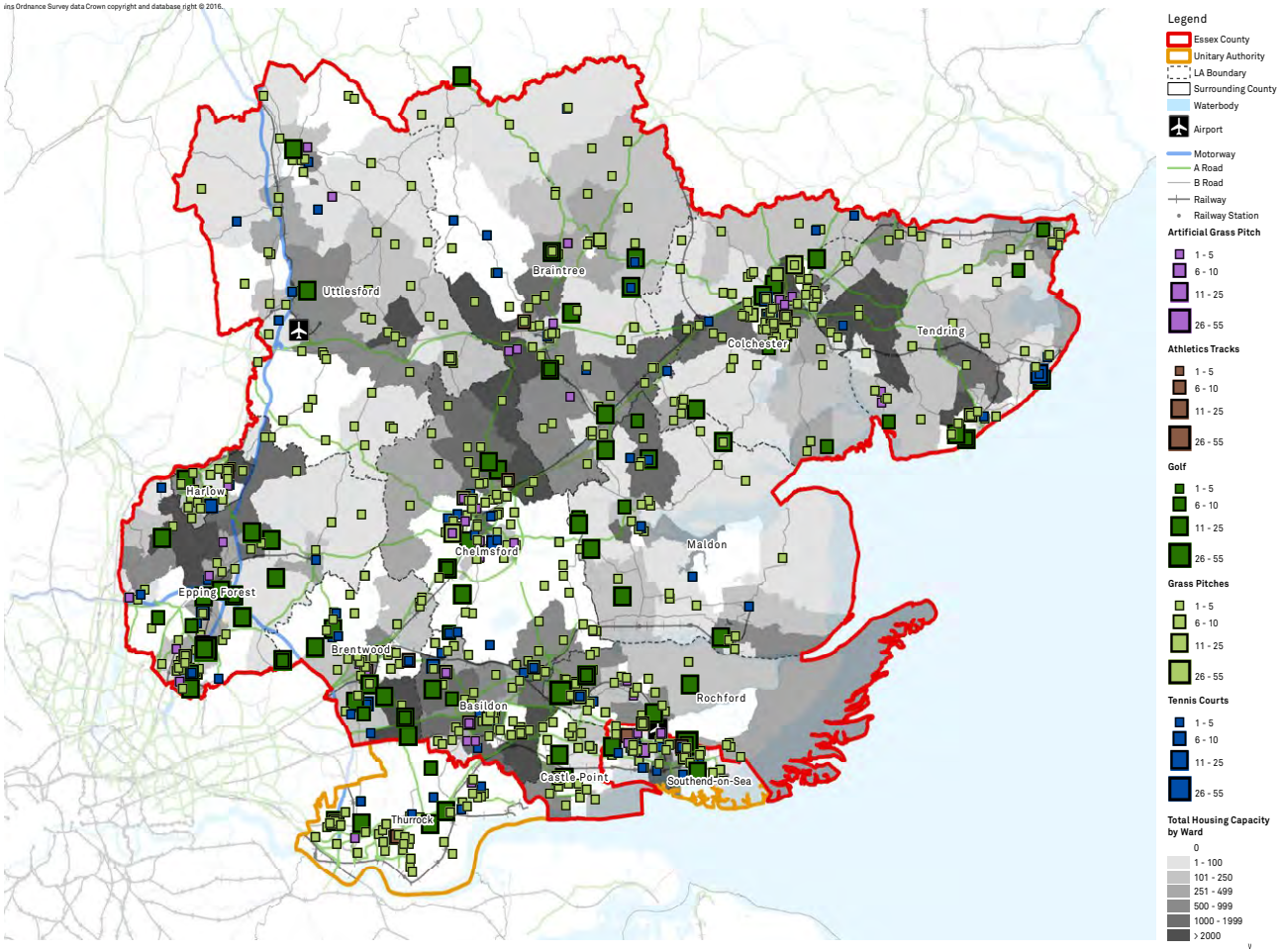
Active Essex also applies the previously mentioned (p.78) place based, locality driven, connection and broker role to green, outdoor space and pitch provision. The team is able to provide support around borough based PPS work (required for local plan evidence) and brings expertise to ensure local clubs, groups and organisations are involved in consultation.

HEADLINES

- Castle Point has the weakest provision of outdoor sports facilities relative to the population, with relative provision below the Essex average across all five facility types shown. Authorities including Tendring, Rochford, Thurrock, Harlow and Basildon have lower relative provision.
- Brentwood has the strongest level of relative provision, with above-average provision across four out of five categories. Local authorities including Chelmsford, Epping Forest, Maldon and Southend-on-Sea also have above-average provision across a number of facility types.
- Looking ahead, particular issues may emerge in Basildon, Tendring and Thurrock given existing below-average provision and high planned housing growth.

Figure 4.21

Outdoor sports and recreation against housing growth



Source: Sport England Active Places database 2016

Note - Country Parks included within Green Infrastructure

Table 4.12

Outdoor sports and recreation

	GRASS PITCHES	ARTIFICIAL GRASS PITCHES	TENNIS COURTS	ATHLETICS TRACKS LANES	GOLF COURSES
Basildon	200	12	27	8	5
Braintree	204	11	26	8	16
Brentwood	117	8	27	12	18
Castle Point	96	3	2	-	3
Chelmsford	291	13	53	14	10
Colchester	305	7	32	8	6
Epping Forest	181	20	30	-	21
Harlow	92	4	10	8	1
Maldon	76	3	22	-	13
Rochford	137	4	7	-	7
Tendring	143	5	31	-	10
Uttlesford	162	7	12	-	2
ESSEX	**2,004**	**97**	**279**	**58**	**112**
Southend	179	16	44	14	7
Thurrock	202	7	13	7	10
GREATER ESSEX	***2,385***	***120***	***336***	***79***	***129***

Source: Sport England Active Places database 2016

Includes all provision recorded by Sport England (including public, private and educational institutions). Some differences may occur between Sport England and local (district/borough/city) datasets.

FUTURE REQUIREMENTS TO MEET GROWTH TO 2036

Greater Essex
9
Artificial Turf Pitches (3G / 4G Pitch)

Greater Essex
358 ha
Playing fields

Greater Essex
45 ha
Children's Play-space

The above infrastructure requirements have been identified based on AECOM analysis using Sport England and Fields in Trust best practice standards.

Each of the local authorities is working towards their own local level assessment of sport and open requirements. This work is being supported through Active Essex. The GIF analysis presented here is based on a single set of baseline and forecast ratios to ensure consistency across the areas.

Governing bodies including Essex Football Association, Rugby Football Union and England Hockey also undertake sport specific demand forecasts which have not been included within this assessment.

COSTS AND FUNDING

Based upon the GIF Project Schedule and theoretical benchmark modelling where no tangible projects have been identified, the following costs and funding have been identified:

Cost = £189,240,000

Estimated Funding Gap = £94,620,000

Costs are set out for each local authority in Section 5

4.6 GREEN INFRASTRUCTURE

GREEN INFRASTRUCTURE

Natural Green Space & Strategic Projects

Parkland

GENERAL OVERVIEW

Green infrastructure (GI) is a broad term that usually refers to a "strategically planned and delivered network...of high quality green spaces and other environmental features" (Natural England). There are a range of different types of space that could be considered GI and they frequently provide multiple social and environmental benefits with an economic value. The Greater Essex authorities recognise these benefits and seek to ensure that the area has a network of high quality green spaces that deliver a number of strategic benefits.

'Respecting our Past, Embracing our Future: A Strategy for Rural Essex - A new strategy for 2016-2020' highlights that, in a county which is predominantly rural, it is important to also consider the nature and quality of the wider landscape. Considering the benefits to society and economic prosperity that the landscape, and habitats contribute to, provides a focus to the value of the natural environment. This can be referred to as ecosystem services, and are dependent on a diversity of natural features, including soils, plants, trees and waterways. As the ecosystem services delivered through natural assets create value, these become known as Natural Capital.

As such for the purpose of this study green infrastructure has been grouped into three subsections:

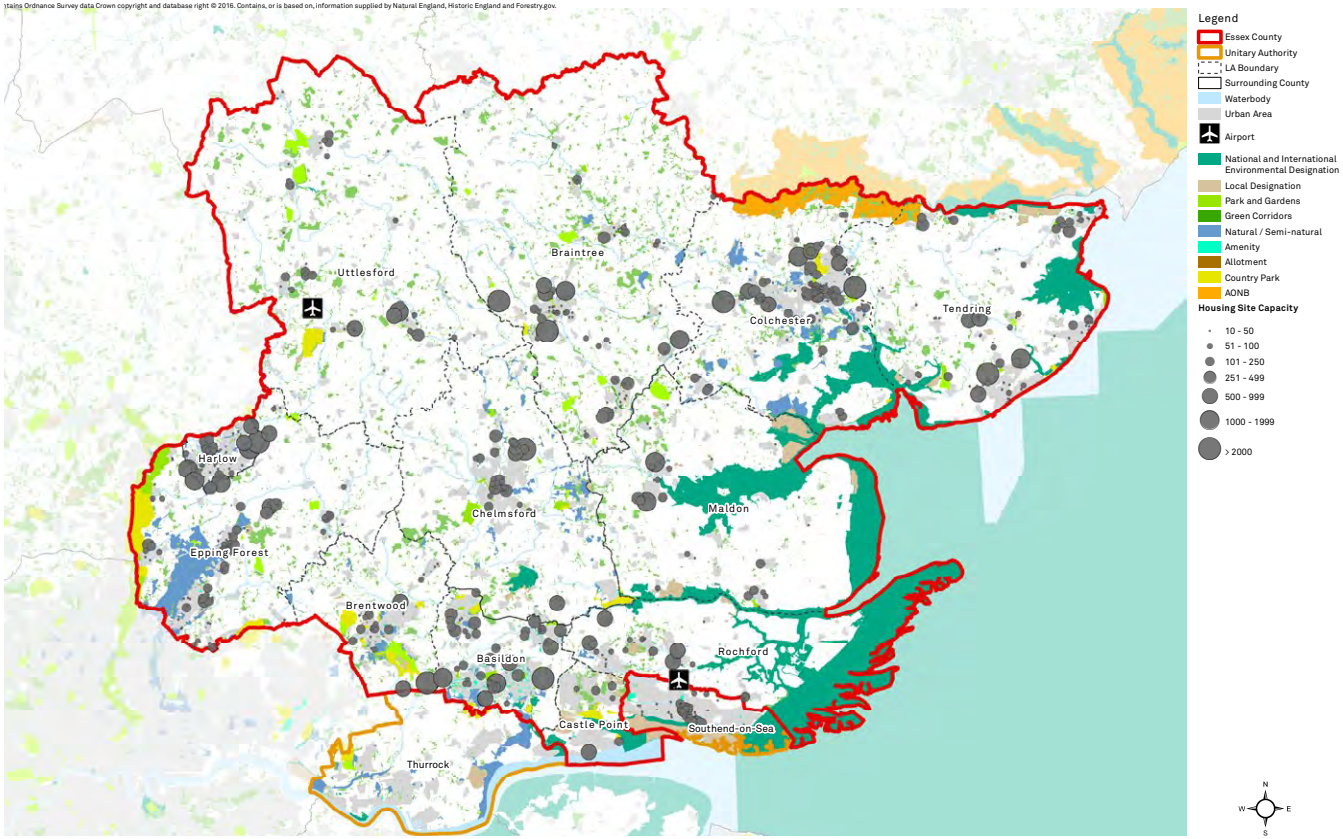
- Landscape scale and natural capital – looking at the role of the wider natural environment
- Ecological designations – focusing on spaces designated primarily for their biodiversity and ecological value
- Green space standards – focusing on green spaces requirement resulting from provision standard requirements to meet the needs of the new populations as set out by local guidance. This section focuses primarily on the natural areas used for informal recreation social value.

LANDSCAPE SCALE AND NATURAL CAPITAL

Essex is estimated to be 72% rural with a diverse landscape character, including expansive farmland plateaus, wooded hills, and an extensive coastline. Designated for their special character, the Dedham Vale and Suffolk Coast and Heaths Areas of Outstanding Natural Beauty highlight the quality of the landscape particularly along the border with Suffolk. With a quintessentially English countryside and 350 miles of coastline, the rural nature of Essex is cited by over 11 million day trippers as what drew them to visit the county. Furthermore, with over 250,000ha of farmland, the Essex landscape is highly productive and crucial to the UK's agricultural sector.

Figure 4.22

Green infrastructure & proposed housing sites



Source: Essex County Council

HEADLINES

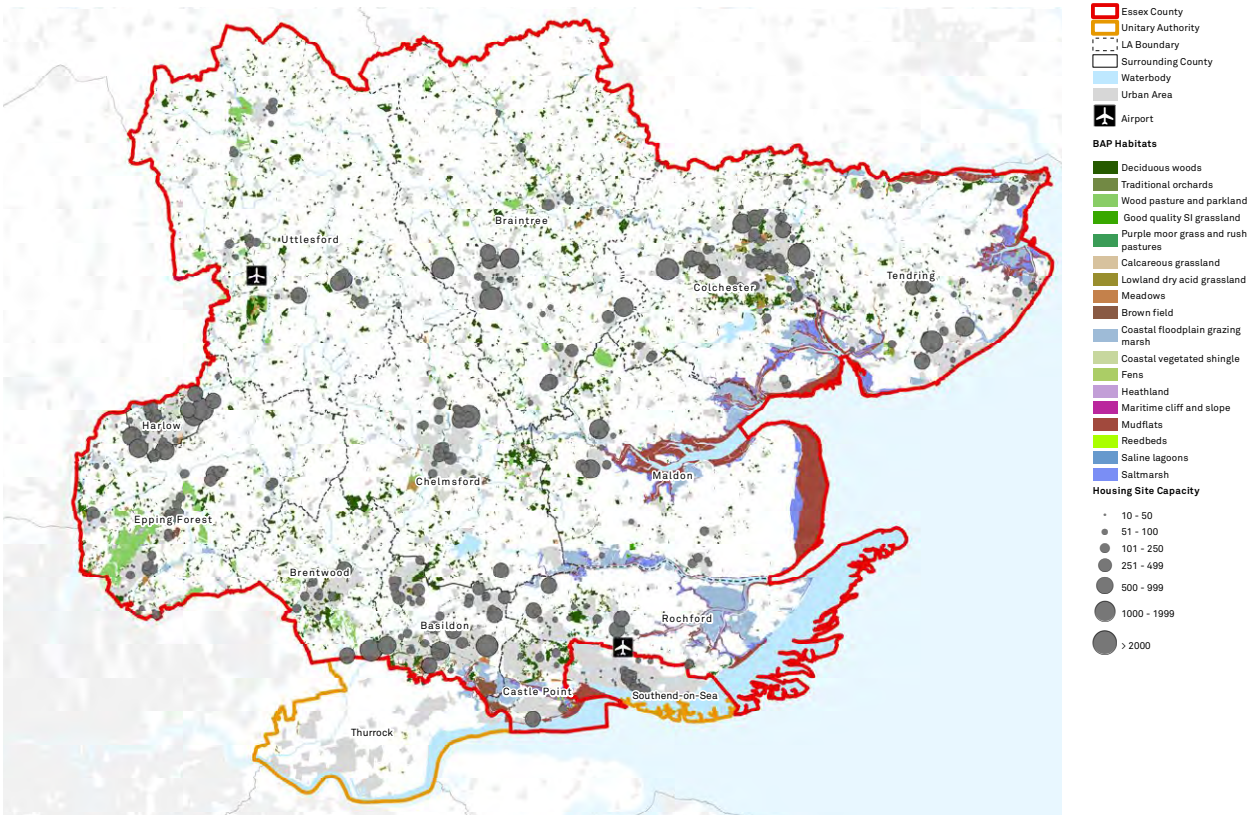
With 180, 000 new homes and associated employment and social infrastructure projected to be delivered by 2036, there could be a significant proportion of growth delivered on greenfield sites. Although it is evident that the Essex countryside has been heavily influenced by human activity, it will be important that this growth is accommodated in a way that protects values placed on the special character and productive qualities of the landscape.

In recognising the importance of the Essex landscape both to the economy and the cultural identity of the county, there are a number strategic initiatives in the county to improve and support the delivery of GI at a landscape scale.

- The Essex Natural Capital Asset Check (ENCAC) is a tool which aims to model the value of natural assets in Essex to show how changes in the natural environment might impact human wellbeing. The ambition is to be able to understand the likely impact on natural capital from new development in order to shape strategic spatial options as well as specific development proposals in order to maximise the natural capital of development and limit adverse impacts.
- Access to the countryside is critical for the social and health benefits of the wider countryside to be felt. There are around 6,500km of public rights of way in Essex, including footpaths, bridal ways and cycle ways. These are currently being supplemented with new coastal walking routes and open space that will extend the length of Essex's coastline, which will be a major tourist attraction as well as local resource. This is expected to be completed in 2020.
- Numerous organisations contribute to the strategic planning and delivery of landscape scale GI in Essex, including Essex County Council, Local Authorities, RSPB, Natural England, Wildlife Trust and numerous other third sector organisations. These organisations are delivering a range of initiatives including:
  - Dedham Vale and Suffolk Coast and Heaths Areas of Outstanding Natural Beauty
  - Essex Coastal Path - ECC intends to establish a comprehensive path around the Essex coastline and estuary and HM Government will also be implementing a national Coastal Path.
  - Greater Thames Marshes Nature Improvement Area (NIA) - led by the Thames Gateway Local Nature Partnership, covering 55,000 ha of estuarine and marshland landscapes in Essex, Kent and London.
  - Green Arc – a partnership of public and third sector organisations identifying opportunities for delivering environmental improvement projects in South East Hertfordshire, South West Essex and North East London.
  - Thames Chase Community Forest- covers 103km^2 of countryside around the London/Essex borders.
  - Thames Gateway South Essex Green Grid – originally set up in 2001 as part plans for sustainable development in the Thames Gateway, the Green Grid partnership brought together a range of stakeholders to set out a strategy for delivering GI projects.
  - Lea Valley Regional Park – covering 4,050ha, the 26 mile linear park covers, 10,000 acre linear stretches from London into Hertfordshire and Essex.
  - Living Landscales - vision is to restore, recreate and reconnect wildlife habitats including SSSIs, Local Wildlife Sites and Nature Reserves

Figure 4.23

Priority Habitats & proposed housing sites



Source: Essex County Council

- Essex Rivers Hub - a partnership initiative led by Essex Wildlife Trust, Essex Biodiversity Project and the Environment Agency, sharing information and results of river corridor surveys and projects aimed at achieving good ecological status for rivers in Essex.
- The Wallasea Island Wild Coast Project in Rochford, being led by the RSPB, is a pioneering scheme recreating the ancient wetland landscape of mudflats and saltmarsh, lagoons and pasture over an area of around 700ha in order to help combat the threats from climate change and coastal flooding. The project is ongoing and due to be complete in 2025.

ECOLOGICAL DESIGNATIONS

Some 49,560ha or around 13.4% of Essex receive some level of formal protection in recognition of its wildlife and ecological importance. This includes 67 Sites of Special Scientific Interest (SSSI) which are designated for their national ecological importance, and several of which are also recognised internationally with European designations. These sites are mainly associated with the large coastal estuaries of the Crouch, Blackwater, Colne, Stour, Roach and Orwell. The majority of these sites, 52, are predominantly in a favourable condition and out of those that are in an unfavourable condition, most are improving. A further 19 SSSIs have been designated purely for geological interest in Essex. Local Wildlife Sites are also found throughout Essex.

The key ecological designations are illustrated in figure 4.22. There are numerous other areas of habitats across Essex, such as the invertebrate habitats of the Thames Terraces. The Essex Biodiversity Action Plan 2010-2020 identifies 19 priority habitats and actions for their long term management. These broader habitats are set out in Figure 4.23.

HEADLINES

- Development should contribute to and enhance the natural environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible. Where impacts are unavoidable, either directly or indirectly through pressure for recreation, mitigation measures will need to be put in place, which could include the provision of Suitable Alternative Natural Greenspace (SANGs) or investment to enhance existing green infrastructure
- Biodiversity Offsetting describes the process of evaluating the impact of development in a standardised way. It can provide a transparent and auditable framework for developers and local planning authorities to demonstrate 'no-net-loss'. This could be linked to the emerging ENCAC described above for example by measuring the impact of development upon 'ecosystem services'.
- Ecological connectivity is important for the health of the natural environment. New development can add to the fragmentation of habitats and reduce their capacity to support ecosystems and the services they provide. It will be important that this is taken into consideration

Table 4.13

Open space standards and assessed provision

HECTARES PER 1,000 POP	NATURAL & SEMI-NATURAL	PARKS & GARDENS	AMENITY GREENSPACE	ALLOTMENTS	SOURCE
Basildon	2.62	1.82	1.33		PPG17 Open Space Assessment Part I (2010); Draft PPG17 Open Space Assessment Part II
Braintree	2.00	1.20	0.80		Braintree Green Spaces Strategy (2008)
Brentwood	2.00			0.18	Brentwood Open Space Strategy 2008-2018
Castle Point	2.38	3.04	0.58	0.06	Castle Point Open Spaces Strategy 2008-2013
Chelmsford	1.00	1.65***	0.40	0.30	Open Space Study 2016 – 2036 Part 1 of 2
Colchester	5.00	1.76	1.10	0.20	Parks & Green Spaces Strategy (2008); Green Infrastructure Strategy Final Report (2011)
Epping Forest	8.45*	0.32**	0.32**	0.33	Epping Forest Open Space, Sport and Recreation Assessment (2009)
Harlow	2.50	2.25	2.00	0.25	Harlow Open Space and Green Infrastructure Study (2013)
Maldon		1.16	1.16	0.20	Maldon District Green Infrastructure Study (2011); Maldon District Children's Play Strategy 2007-2012
Rochford	3.00		0.30	0.20	Open Space Study 2009 (2010)
Tendring	2.00	1.00	0.75	0.25	Tendring Open Spaces Strategy (2009)
Uttlesford	7.00		1.00	0.25	Uttlesford Open Space, Sport Facility and Playing Pitch Strategy (2012)
ESSEX	**3.45**	**1.58**	**0.89**	**0.22**	
Southend	1.00	1.00		0.21	Park & Green Space Strategy 2015-2020
Thurrock	2.00	0.70	0.80	0.16	Open Space Strategy 2006-2011
GREATER ESSEX	***3.15***	***1.44***	***0.88***	***0.22***	

Table 4.14 sets out the quantum per 1000 new population that new development should provide of different open space typologies. The colours in the squares indicate the relative level of current provision, either in relation to provision standard or community perception surveys where availables. Red indicates a deficit, orange is on target and green is higher than the standard. Where cells are white, no infromation on provision has been identified.

* includes new woodland provision, ** provision standard 0.63ha/1000 Managed Open Space (including Parks & Gardens and Amenity Greenspace),***includes recreation grounds

in the planning of new development and that ecological corridors are retained and enhanced.

- The Mineral Site Restoration for Biodiversity Supplementary Planning Guidance (2016) sets out the ambitious target of creating over 200ha of new habitat considered a 'Priority' for conservation action by the Essex Biodiversity Project,

- Epping Forest covers around 2,400ha, extends into Essex and is one of the largest tracts of ancient woodland in the country. It is a registered charity managed by the City of London.

- Essex County Council has produced a Biodiversity Validation Checklist to help developers and local planning authorities to comply with national biodiversity policy and legislation

Table 4.14

Open space requirements

DEMAND BY HECTARES	NATURAL & SEMI-NATURAL	PARKS & GARDENS	AMENITY GREENSPACE	ALLOTMENTS
Basildon	78.60	54.60	39.90	6.46
Braintree	42.60	25.56	17.04	4.59
Brentwood	28.80	20.81	12.65	2.59
Castle Point	20.92	26.74	5.14	0.51
Chelmsford	23.70	39.11	9.48	7.11
Colchester	167.50	58.96	36.85	6.70
Epping Forest	233.22	8.69	8.69	9.11
Harlow	37.00	33.30	29.60	3.70
Maldon	21.10	7.77	7.77	1.34
Rochford	28.20	13.58	2.82	1.88
Tendring	42.40	21.20	15.90	5.30
Uttlesford	155.40	32.08	22.20	5.55
ESSEX	**879.44**	**342.40**	**208.04**	**54.84**
Southend	29.30	29.30	25.73	6.15
Thurrock	71.60	25.06	28.64	5.58
GREATER ESSEX	***980.34***	***396.76***	***262.41***	***66.57***

Figures presented above utilise the open space standards presented in table 4.14 on the facing page against the forecast population growth presented in section 3. Where no standard is available the average standard for Greater Essex as presented in table 4.14 has been applied as an interim assessment position.

OPEN SPACE PROVISION STANDARDS

There are a number of formal GI assets, including natural and semi-natural space. There are 9 country parks in Essex. Most of the local authorities in Essex have developed GI strategies or equivalent that set out provision requirement standards for new development. Table 4.13 sets out, where available, the provision standards for each type of green space in each local authority per 1,000 new population.

- Natural and semi-natural greenspace – there are 9 country parks in Essex at Belhus Woods, Cudmore Grove, Danbury, Great Notley, Hadleigh, March Farm, Thorndon, Weald and Cherry Orchard Jubilee Country Park.

- The local benchmarks suggest that most areas have sufficient natural and semi-natural greenspace, except for Rochford, Tendering and Thurrock. Although provision may appear sufficient, access to space may be more limited. The 2009 Essex Wildlife Trust analysis of Access to Natural Greenspace Provision found that only 29% of people had a site of 2ha within 300m and 10% of people did not have their Natural England Access to Natural Greenspace targets met (ANGSt). Furthermore, rural communities were identified as being particularly affected by lack of access despite being in close proximity to more natural areas.

- Parks, Gardens and Amenity Space – although provision of formal parks and gardens appears to be sufficient across most of the county, the provision of more informal amenity space is lacking. This is particularly the case in more built up areas and exacerbated by the fact that the supply of GI is not matched up with areas that are most at risk in terms of health and deprivation.

HEADLINES

- Table 4.14 sets out estimated demand for new GI based on the provision standards set out by each local authority. Where the local authority does not have a standard, the average across Greater Essex has been applied. This is the demand resulting from new development and does not take into consideration the existing or perceived deficiencies where they occur.

KEY FINDINGS

- Greater Essex has a diverse, high quality landscape with numerous natural assets that provide a range of ecosystem services. Impacts from development will need to be mitigated through the provision of new strategic sites but also by enhancing the quality of the existing sites, improving access and wider landscape management practices.

- Sensitive ecological areas, generally in a favourable condition, may be impacted by development.

- Broadly, rural areas need improved access whereas urban areas need better amenity space.

- Based on Local Authority provision standards, new development will generate demand for 1,585ha of additional new green space.

- Additional funds for ongoing management will be required.

COSTS AND FUNDING

Based upon the GIF Project Schedule and theoretical benchmark modelling where no tangible projects have been identified, the following costs and funding have been identified:

Cost = £251,860,000

Estimated Funding Gap = £214,990,000

Costs are set out for each local authority in Section 5

4.7 UTILITIES

ENERGY - ELECTRICITY

CURRENT SITUATION

Electricity is generated from power stations and transmitted through a national network of electricity lines operating at 275kV and 400kV before connecting to local networks owned by distribution companies. UK Power Networks (UKPN) is the appointed distribution company for the Greater Essex area.

Greater Essex is located within UKPN's Eastern distribution area, within which they are responsible for 3.5 million customers (as of April 2012) with a peak demand load of 6586MW. WPD assets include a 96,000km long distribution network as well as 69,000 substations. The 132kV and 33kV network plans are available from the UKPN Long Term Development Statement (May 2016).

Electricity is generated from power stations and transmitted through a national transmission network of electricity lines operating at 275kV and 400kV before connecting to local networks owned by distribution companies.

National Grid (NG) is responsible for transmitting electricity throughout the country from supply points to the distribution networks. NG are the operator of the high-voltage transmission system for the whole of Great Britain and the owner of the high voltage transmission network in England and Wales. Under Section 9(2) of the Electricity Act 1989, National Grid has a duty:

- to develop and maintain an efficient, co-ordinated and economical system of electricity transmission; and
- to facilitate competition in the supply and generation of electricity.

UKPN is the appointed distribution company for the Greater Essex area.

Greater Essex is located within UKPN's Eastern distribution area, within which they are responsible for 3.5 million customers (as of April 2012) with a peak demand load of 6586MW. UKPN assets include a 96,000km long distribution network as well as 69,000 substations. The 132kV and 33kV network plans are available from the UKPN Long Term Development Statement (May 2016).

EXISTING INFRASTRUCTURE CAPACITY AND ISSUES

- Greater Essex is connected into the national grid of 400 / 275kV circuits at a number of locations to the north, west and south. It is then supplied by the 132kV and 33kV grid that radiates from the main 400 / 275kV sub-stations, refer to Figure 4.24.

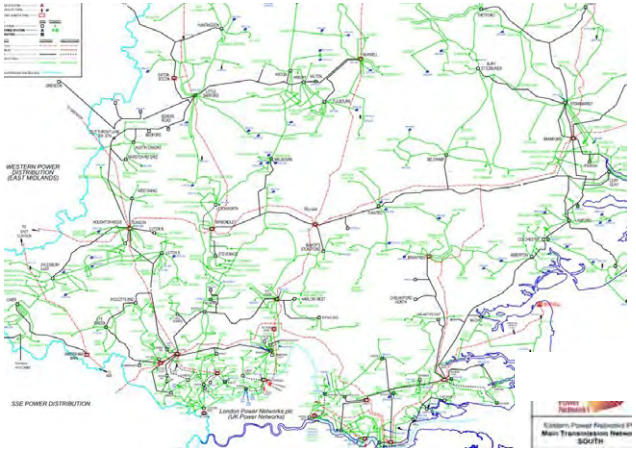


FIGURE 4.24 - UK POWER NETWORK, EASTERN, MAIN TRANSMISSION NETWORK SOUTH

Source: UKPN

- An additional source of power generation within Greater Essex is a network of small scale onshore and offshore wind and solar farms.

INFRASTRUCTURE REQUIRED TO SUPPORT GROWTH (2016 – 2036)

UKPN must offer a connection to any proposed power station; wind farm; major industry or distribution operator wishing to generate electricity or requiring a high voltage electricity supply. This may mean that strategic interventions are required to reinforce or upgrade the existing network to ensure that supply and demand can be effectively managed.

UKPN reports in its Long Term Development Statement that it is expected that, at least in the short term, the need for network reinforcement will be determined by growth in units distributed, maximum demand and the increase in the number of summer peaking networks.

The increase in distributed generation will result in some fault level reinforcement or redesign, but only in certain situations will it reduce the need for load-related reinforcement.

UKPN provides a list of current upgrades to the Eastern distribution network programmed during 2016 and 2017 in their Long Term Development Statement. The works located within the Greater Essex area are:

- Clacton 132/33kV – 33kV switchgear reinforcement (2016-2017)
- Basildon Local 33/11kV – Demand Transfer to Langdon (2017)
- Canvey 33/11kV – Demand Transfer to South Benfleet Local Primary (2017)

BRADWELL NUCLEAR POWER STATION

Bradwell Nuclear Power Station, located in east Maldon, was one of the main sources of power generation in Essex before it ceased generation in 2002. Bradwell B is identified as a preferred site for a new nuclear power station in the National Policy Statement EN – 6 - Nuclear Power Generation (2011). At present the Planning Inspectorate has not been informed by the developer that they intend to submit an application via the NSIP process, and is thus not yet at pre-application stage.

Although there are a number of unknowns regarding the future of Bradwell, the possibility remains that Bradwell B may come online within the period to 2036, turning the Greater Essex area from a net energy importer to a net exporter. Alongside the energy generation from this project a number of associated infrastructure requirements would be generated which in themselves would add a considerable amount to the infrastructure costs presented throughout this framework. These could include:

- Construction related transport infrastructure (road network upgrades and/or rail extensions).
- Flood defence upgrades
- Construction worker accommodation and associated social infrastructure demands (as high as 6,000 worker households)
- Additional transmission capacity (see text to right)

Due to the unconfirmed status of the Bradwell B project, the GIF infrastructure project costs do not account for the impacts of a Bradwell B Nuclear Power Station. The impacts of this scenario will need to be assessed as a next step of the framework.

FUTURE NEED FOR ADDITIONAL ELECTRICITY TRANSMISSION CAPACITY IN EAST ANGLIA

NG has a legal duty to connect new electricity generators to the electricity transmission network.

Over the next decade, the country must make the major investment needed to modernise and build the new energy infrastructure the UK requires. By 2020 a number of power stations are planned to close including:

- Coal and oil-fired power stations which are closing due to EU emissions legislation (12GW)
- Nuclear power stations at the end of their asset lives (7.5GW)

More than 20,000MW of new generation is needed by 2020 to replace the power stations that are scheduled to close and to meet the country's increasing electricity demand.

In East Anglia the existing transmission system is able to meet current electricity demand, but more power generation is planned here. A number of generators have asked for a connection to the national transmission system, including:

- East Anglia Offshore Wind Farm (7,200MW)
- Sizewell C nuclear power station (3,300MW)
- King's Lynn B gas-fired power station (984MW)
- South Holland gas-fired power station (840MW)
- Galloper Offshore Wind Farm (500MW)
- Dudgeon Offshore Wind Farm (500MW)

BRAMFORD-TWINSTEAD CONNECTION PROJECT

NG is planning to build a connection between Bramford near Ipswich, Suffolk and Twinstead, in north Essex, to provide additional capacity on the National Grid high voltage electricity network in East Anglia. This may comprise a new 27km 400kV electricity transmission connection including underground sections.

The proposed connection between Bramford and Twinstead in Essex is needed later than originally planned following updated information from power generation companies, but will be required before 2036.

NG has assessed the latest information from companies proposing to build new power generation around the East Anglia region, including data about when they would like to start producing electricity. This shows the connection is now expected to be required in the early 2020s rather than 2017.

NG's assessment confirms that the proposed 400kVvolt overhead line and underground cable will still be needed to connect new sources of power, including low carbon electricity, to replace old coal and nuclear power stations that are closing. The project has been accepted as an Nationally Significant Infrastructure Project, and was at pre-application stage before being placed on hold.

The potential provision of a new Bradwell B nuclear power station will also require the provision of additional transmission lines to connect to the national grid.

KEY FINDINGS

- Bradwell B, located in Maldon, is identified as a preferred site for a new nuclear power station. This may come online within the planning period.
- UKPN, responsible for electricity distribution in the Greater Essex area, reports in their Long Term Development Statement that it is expected that, at least in the short term, the need for network reinforcement will be determined by growth in units distributed, maximum demand and the increase in the number of summer peaking networks.
- National Grid operates and owns the high-voltage transmission system in England and Wales which connects the distribution networks to supply points. The existing transmission system is expected to be able to meet current electricity demand, however more power generation is planned in the East Anglia area. Upgrades to the transmission network will be required, including a proposed 400kV connection between Bramford, Suffolk and Twinstead, Essex.

ENERGY - GAS

CURRENT SITUATION

National Grid (NG) is responsible for gas distribution in the Greater Essex area. NG operates four of the eight Gas Distribution Networks (GDNs) in the United Kingdom including the Eastern of England area within which Essex is located. The GDNs are further split into Local Distribution Zones (LDZ) with the Greater Essex area straddling the East Anglia and North Thames zones.

NG is also responsible for operating the entire national transmission system (NTS) which transports gas from supply points to the GDNs. NG has a duty to extend or improve the NTS, where necessary, to ensure an adequate and effective network for the transportation of gas.

EXISTING INFRASTRUCTURE CAPACITY AND ISSUES

The Greater Essex area is supplied via the NTS from both Bacton in the Eastern LDZ and from the Isle of Grain in the South East LDZ via the North Thames LDZ.

In addition, the Calor Gas Terminal on Canvey Island imports liquefied petroleum gas (LPG) with a throughput of circa 150,000 tonnes a year.

INFRASTRUCTURE REQUIRED TO SUPPORT GROWTH

NG estimates that peak demand is likely to be reduced by 0.9% on average over the next ten years. This is based on energy efficiency measures in industry and homes as well as emerging technologies such as heat pumps providing alternative heating sources. However future development in Essex inevitably will to lead to localised increases in demand.

Investment within the NG distribution network over the next six years to 2020/21 is split into categories, including HP Distribution System, Storage, Reinforcement and Governors, Connections, Other Capex and Replacement. Connections relate to the cost of connecting new gas consumers to the gas supply network and represents approximately 5% of the total capital expenditure to NG over the next six years. The largest proportion of investment, over 75% is proposed in "Replacement" which relates to money invested in replacing ageing pipes.

KEY FINDINGS

- Peak demand is predicted to fall over the next ten years; however consultation shall be required to ensure infrastructure has capacity to deal with localised increases from future developments.

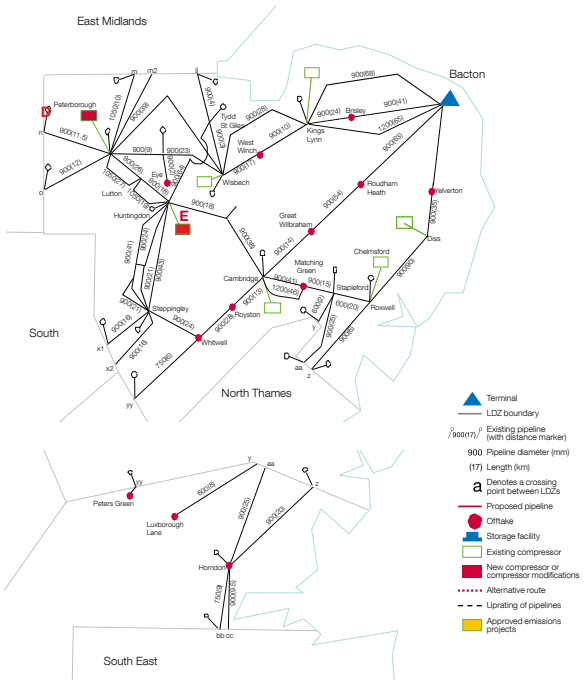
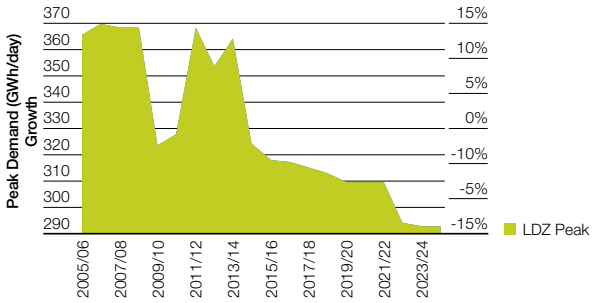
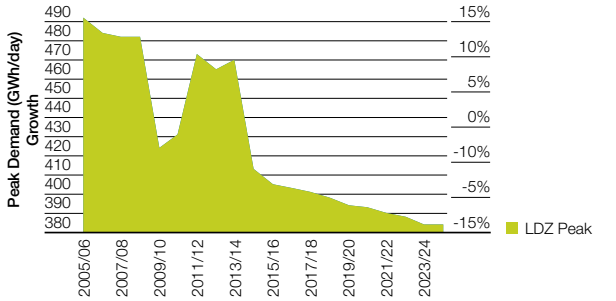


FIGURE 4.25 - EASTERN AND NORTH THAMES LOCAL DISTRIBUTION ZONES

Source: National Grid Gas 10 Year Statement & Long Term Development Plan (2015)



East Anglia LDZ Historical and Forecast 1 in 20 Peak Gas Demand



North London LDZ Historical and Forecast 1 in 20 Peak Gas Demand

COSTS AND FUNDING

Based upon theoretical benchmark modelling, the following development connection costs and funding have been identified:

Cost = £ 313,470,000

Estimated Funding Gap = £0

Costs are set out for each local authority in Section 5

ENERGY - RENEWABLES

CURRENT SITUATION

Distribution and supply of electricity in the Greater Essex area is managed by UK Power Networks. However renewable energy development will depend largely on the policies and strategies of the district and county councils.

UK Power Networks, particularly in the Eastern distribution area, are experiencing increasing enquires for distributed generation. In particular, onshore and offshore wind generation and solar farms, with connections required to be made to the 33kV and 132kV network.

EXISTING INFRASTRUCTURE CAPACITY AND ISSUES

A review has been undertaken of the Renewable Energy Planning Database (April 2016 version). This reveals that there are 44 operational large scale (>1MW) renewable energy schemes in the Greater Essex area. The largest of these include NextEnergy Solar Fund's Langenhow Solar Farm with a capacity of 21.2MW, Npower Renewables' Bradwell Onshore Wind Farm with a capacity of 20MW and Blue Energy's Middlewick Onshore Wind Farm with a capacity of 20.7MW.

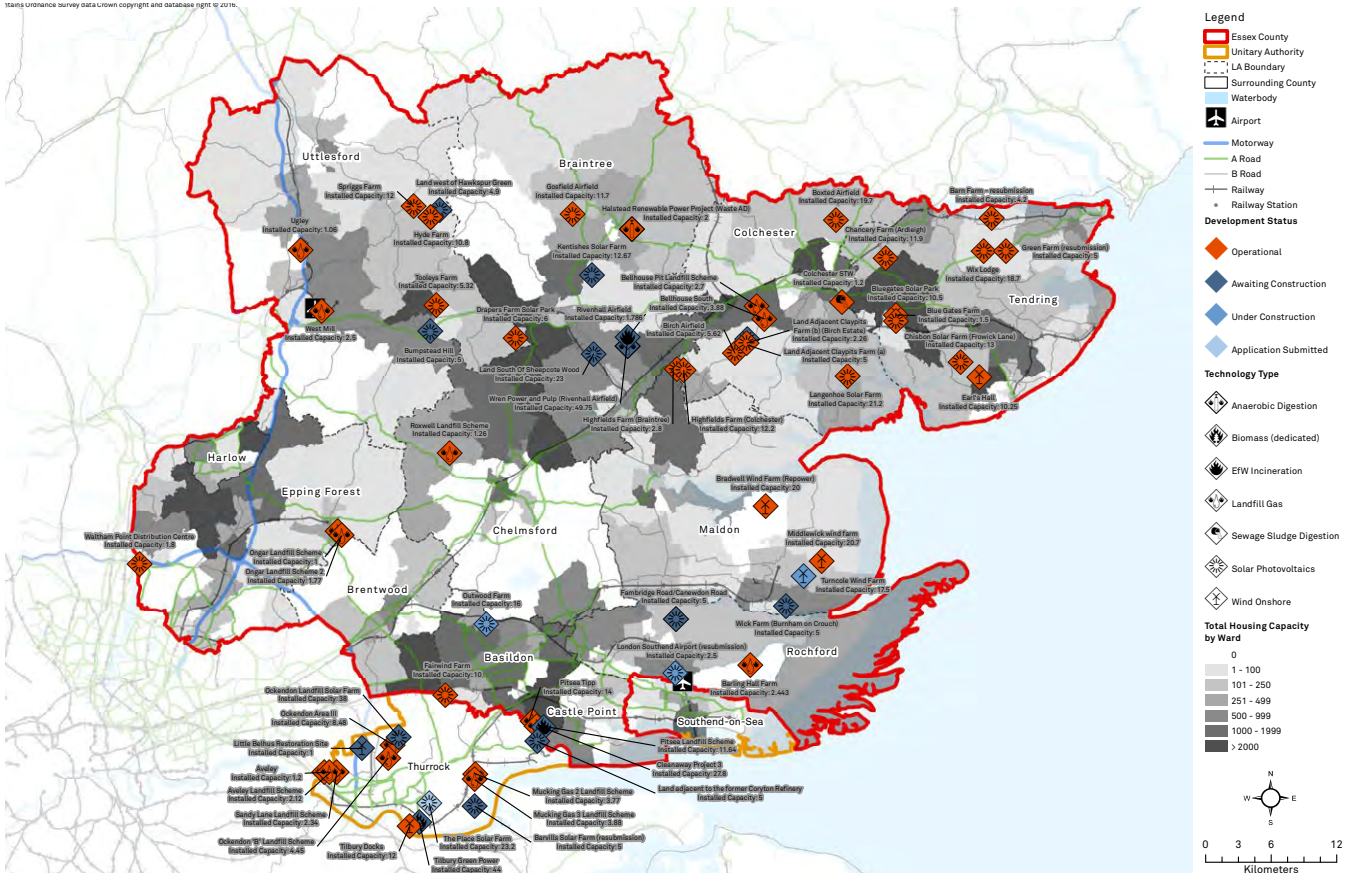
There are a number of additional facilities currently under construction or with planning approval with considerable capacity. The most significant of these are Tilbury Green Power Biomass plant with a capacity of 44MW, Cleanaway Project 3's Energy from Waste plant with a capacity of 27.8MW, Wren Power and Pulp (Rivenhall Airfield) Energy from Waste, capacity of 49.8MW, Ockendon Landfill Solar Farm with a capacity of 38MW, The Place Solar Farm, capacity 23.2 MW and the Cressing Solar Farm's Land South of Sheepcote Wood with a capacity of 23MW.

KEY FINDINGS

- There are a number of significant existing renewable energy sites within the Greater Essex area with further sites under construction or in the planning process. Studies have found, that potential exists for renewable energy to contribute to a proportion of Essex's energy needs, dependent on spatial constraints and any required upgrade / re-design of the electricity distribution network.

Figure 4.24

Installed Capacity in Renewable Energy Generation



Source: Renewable Energy Planning Database (April 2016 version)

BROADBAND

CURRENT SITUATION

The government has committed to ensuring that every premise in the UK has access to broadband with a minimum download speed in line with the defined Universal Service Obligation (USO) by the end of 2015. The USO is currently 2Mbps however will shortly be amended to 10Mbps under the Government's planned Digital Economy Bill.

In more remote locations where connection into BT Openreach / Virgin Media's broadband network to achieve these speeds is not possible, support and funding towards alternative connection technologies such as satellite broadband is offered.

Connection to superfast broadband throughout the Greater Essex area is continuously undertaken via commercial roll-outs by BT Openreach, Virgin Media and Gigaclear. Superfast broadband is now defined as speeds of 30Mbps or more; however this has recently been updated by Broadband Delivery UK (BDUK) from the definition of speeds of 24Mbps or more.

In addition, other commercial operators are active in Greater Essex and technology offering alternatives to the traditional fibre approach is expanding rapidly.

EXISTING INFRASTRUCTURE CAPACITY AND ISSUES

The first phase of the Superfast Essex programme, with a target to expand superfast broadband connectivity to 87% of premises in Essex overall, has been achieved and delivered earlier than programmed in 2016.

Uttlesford currently has a connectivity lower than the rest of Essex at 82%. While work has been successful in increasing coverage by utilising regional fixed wireless, further work is required to bridge the gap between Uttlesford and the rest of Essex.

Figure 4.26

Superfast broadband coverage

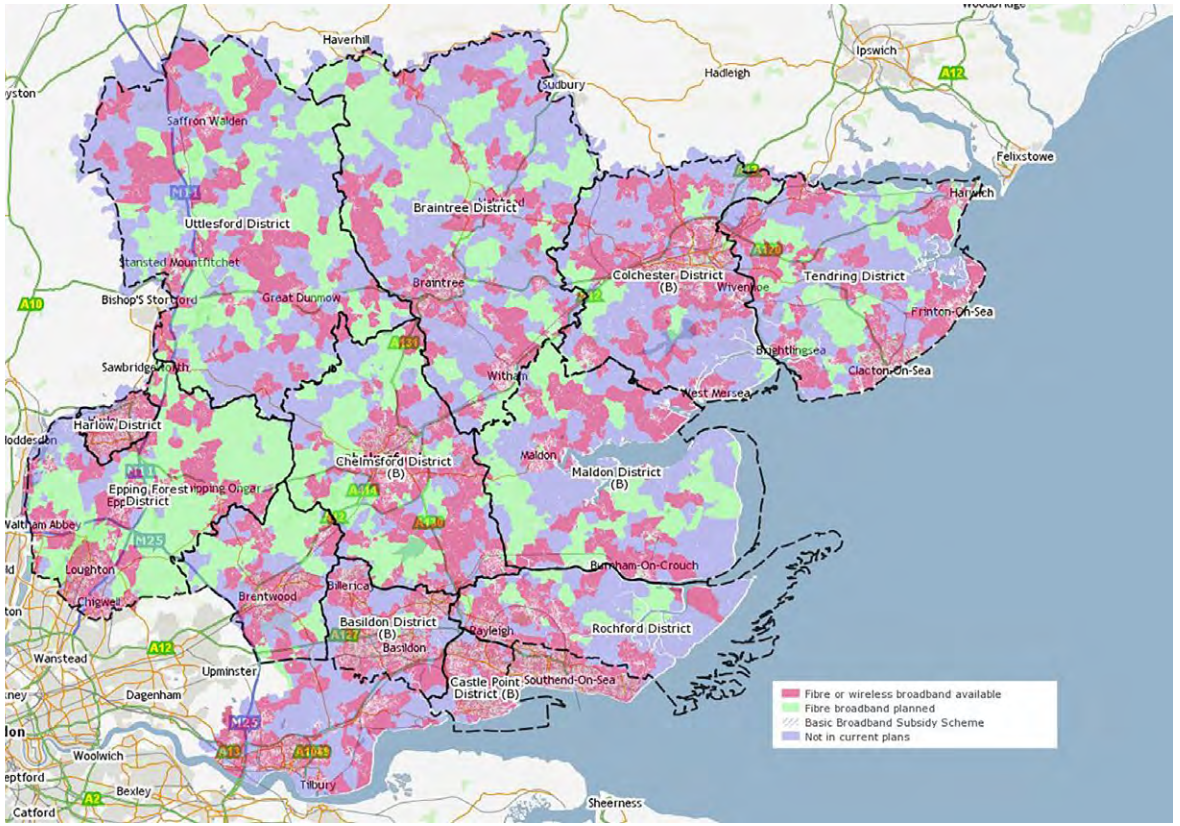


FIGURE 4.26 - SUPERFAST BROADBAND STATUS MAY 2016

Source: Superfast Essex (October 2016)

INFRASTRUCTURE REQUIRED TO SUPPORT GROWTH

Essex has now started further investment in a second phase of the Superfast Essex programme with the objective of reaching 95% coverage by 2019. This is based on the definition of 24Mbps or more, however shall be updated following the revision of the definition of Superfast Broadband. Essex are working in partnership with BT and Gigaclear to deliver Phase 2 of their Superfast Essex programme. Phase 2a, to be delivered by BT, and Phase 2b, being delivered by Gigaclear and looking at the more rural areas, started in 2015.

Superfast Essex programme is currently investigating and testing options for further coverage and ultrafast technology. Ultrafast is defined, depending on the supplier, as delivering between 300Mbps and 1,000Mbps. This work includes the Phase 2b - Gigaclear contract, which delivers ultrafast speeds, and initial supplier engagement with suppliers representing a variety of technologies including fixed wireless broadband, in preparation for commissioning further coverage. Superfast Essex is now planning a Phase 3 rollout which aims to provide superfast connectivity to at least 97% of Essex premises.

Essex is also looking at the development of ultrafast broadband provision to employment centres using Fibre to the Home (FTTP). The ambition would be to provide ultrafast coverage to all major business parks in the Greater Essex area.

A number of schemes including the Gigaclear contract and Dark Fibre Network schemes in Colchester and Southend are currently underway. Colchester Borough Council is working with its network operator partner County Broadband to provide fibre and connectivity to 850-900 businesses/business premises in Colchester Town Centre. This entirely new network will deliver previously unavailable asymmetrical down load - upload speed of up to 1,000Mbps.

BT Openreach and other providers offer superfast broadband connection for all new developments, either free of charge or as part of a co-funded partnership. Fibre to the Premises (FTTP) shall be provided free of charge to housing developments with one hundred or more dwellings. Developments smaller than this may have to provide contributions to ensure FTTP connection, or shall be provided copper connections for free.

Planning rules are being reviewed at both a local and national level, to ensure that new build properties are enabled with fast broadband and potentially ultrafast broadband, as part of the development. A number of councils (including Colchester Borough Council) are now including within their Local Plan a requirement for all new developments to have high speed connectivity. It is important that policies and arrangements are put in place to make superfast broadband provision the responsibility of developers (residential or commercial), in order to prevent the connectivity gap that has been narrowed by state intervention under the Superfast Essex programme from reoccurring.

KEY FINDINGS

- The Phase 1 target of ensuring 87% of premises in Essex are connected to superfast broadband by 2016 has been achieved, with Phase 2 to provide 95% coverage by 2019 currently underway.
- Schemes to provide ultrafast broadband to both residential and commercial properties are underway by means of Fibre to the Premises connections, with employment centres being a priority.
- Over the course of the planning period to 2036, future technology is likely to lead to demand for higher speeds in both residential and commercial premises. This in turn is predicted to lead to a continuous requirement for infrastructure improvements and investment to satisfy this.

COSTS AND FUNDING

Based upon ECC Estimates the following costs and funding have been identified:

Cost = £89,830,000

Estimated Funding Gap = £22,140,000

Costs are set out for each local authority in Section 5

WATER SUPPLY

CURRENT SITUATION

There are four water supply companies that are responsible for potable water in the Greater Essex area. These are: Thames Water, Essex and Suffolk Water, Anglian Water Services and Affinity Water.

These companies have all prepared Water Resource Management Plans (WRMP) that cover the period from 2015 to 2040. Each water company has strategies in place that define how they will meet customer demand over the next 25 years, accommodate the potential increase in demand from new development and manage the existing supply of water whilst accounting for future changes due to climate change. Water Resource Management Plans are updated every 5 years. The current review was completed in 2014.

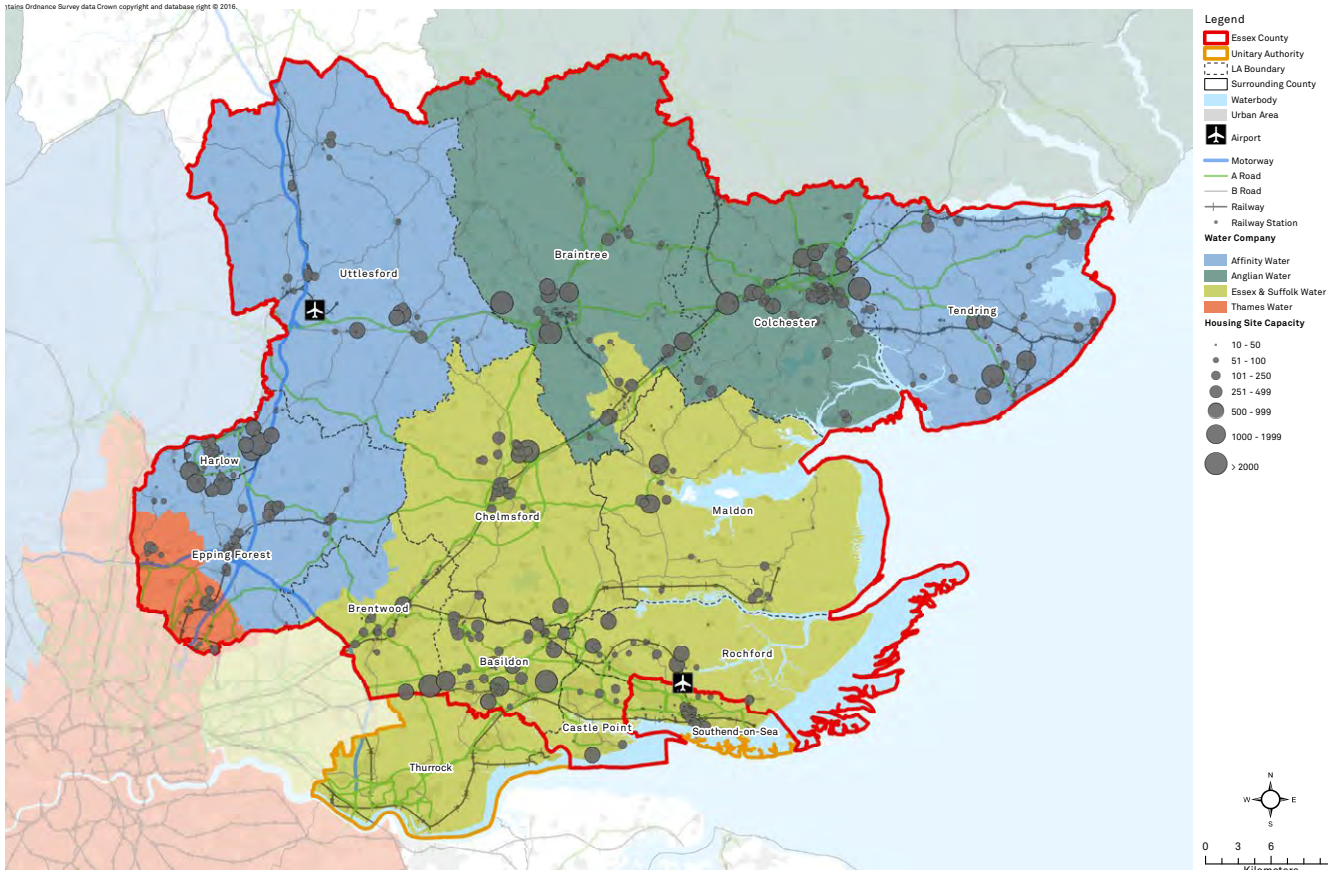
Table 4.15

Water Supply Providers

	THAMES WATER	ESSEX & SUFFOLK WATER	ANGLIAN WATER	AFFINITY WATER
Basildon		■		
Braintree			■	
Brentwood		■		■
Castlepoint		■		
Chelmsford		■		
Colchester			■	■
Epping Forest	■			■
Harlow				■
Maldon		■	■	
Rochford		■		
Tendring				■
Uttlesford				■
Southend		■		
Thurrock		■		

Figure 4.27

Water company coverage



Source: Thames Water / Essex & Suffolk Water / Anglian Water / Affinity Water

EXISTING INFRASTRUCTURE CAPACITY AND ISSUES

Thames Water

- Significant potential sustainability reductions on the Lower Thames and Lower Lee in London catchment. Forecast a growing deficit from the present day up to 2040 in this catchment.

Essex and Suffolk Water

- The population within the Essex water resource zone is forecasted to increase from 1.5 million to 1.67 million

by 2035. The region has a number of sources with an integrated supply network which increases flexibility.

- Sources include groundwater, rivers, reservoirs as well as water transferred from the Thames Water reservoirs in the River Lee catchment and the Ely Ouse to Essex Transfer Scheme.

- During the previous Asset Management Plan (AMP) cycle, Essex and Suffolk Water undertook the Abberton Scheme. This consisted with enlarging Abberton Reservoir as well as other improvements. This has ensured that the Essex water resource zone will be in surplus until 2040.

Anglian Water Services

- The WRMP states that over the 25-year period between 2015 and 2040, the supply-demand balance will be adversely affected by a combination of growth, climate change and the reductions in deployable output that they will need to make to restore abstraction to sustainable levels.

- In South Essex it is forecasted that there will be 1,400 additional properties each year. In addition climate change is expected to reduce the average daily output. There are no sustainability reductions in this area currently identified. It is forecasted in the WRMP that there will be a supply deficit in the South Essex region by 2040 in the baseline scenario with no investment works.

- In Central Essex it is forecasted that due to climate change and increase in population there will be a supply deficit in the South Essex region by 2030 without any further investment.

Affinity Water

- The WRMP identifies that sustainability reductions are the biggest challenge in their water resource planning. This includes 'confirmed' and 'likely' reductions of almost 70 Ml/d from the existing groundwater sources under average conditions (over 6% of available deployable output).

- Although the Brett catchment has an export agreement due to a surplus, the Stort water resource zone has existing agreements with both Essex and Suffolk Water and Cambridge Water. Affinity Water is importing water from Essex & Suffolk and Cambridge Water efficiency for residential and commercial properties

- Affinity Water has a supply - demand deficit in five of their eight zones at the beginning of the planning period and in seven zones by 2040. The Brett region, remains in surplus throughout the planning period and no water resources investment is required. The Stort Region starts in deficit and remains in deficit throughout the planning period.

INFRASTRUCTURE REQUIRED TO SUPPORT GROWTH

Thames Water

This will be mitigated by the following:

- Demand management

- Leakage reduction

- New raw water trading agreements with RWE N-Power and Essex and Suffolk Water

- Groundwater schemes between 2015-2020

Affinity Water

In order to ensure there is not a water deficit in the Central region during the planning period up to 2040, Affinity Water are currently implementing:

- Proposing universal metering by end of AMP7 (2024/25)

- Leakage reduction

- Water efficiency for airport

- Increase license in Stansted

- Source optimisation in Widford, Hempstead and Great Dunmow.

Anglian Water Services

In order to prevent a deficit during the planning period Anglian Water will need to relocate sources, transfer resources from areas of surplus to areas of deficit, increase the volume of water traded and reduce levels of leakage and consumption. Towards the end of the forecast period, they will also have to develop new resources.

In order to balance supply-demand for the South Essex region, an extension of the Ardleigh trading agreement is proposed in addition to additional leakage and water efficiency savings. Under the Ardleigh agreement, resources in the Colchester area are shared with Affinity Water. This option would increase the Anglian Water share of the available resource.

In order to balance with supply-demand in the Central Essex region, it is proposed to transfer water from the South Essex by 2030. This will require a new resource to be identified for the South Essex area.

KEY FINDINGS

- Thames Water, Anglian Water Services and Affinity Water will all have to make future investment in order to reduce environmentally unsustainable water abstractions, combat climate change and allow for future growth. The shortfall in deployable output is expected to be mitigated by reductions in leakage and demand management, however further investment may be required according to the level of growth expected.

WASTE WATER

CURRENT SITUATION

Thames Water and Anglian Water are responsible for waste water within the Greater Essex area. Table 4.16 shows their coverage across the region.

Waste Water assets are managed on a 5 year planned basis (current Asset Management Plan cycle is AMP6 (2015-2020)) and are informed by Local Authority Local Plan discussions. This gives early indications of the quantum of development that will affect their networks. In order to determine the impact of proposed development on the existing infrastructure, network modelling is normally required. For large scale developments this is normally carried out at the outline planning stage.

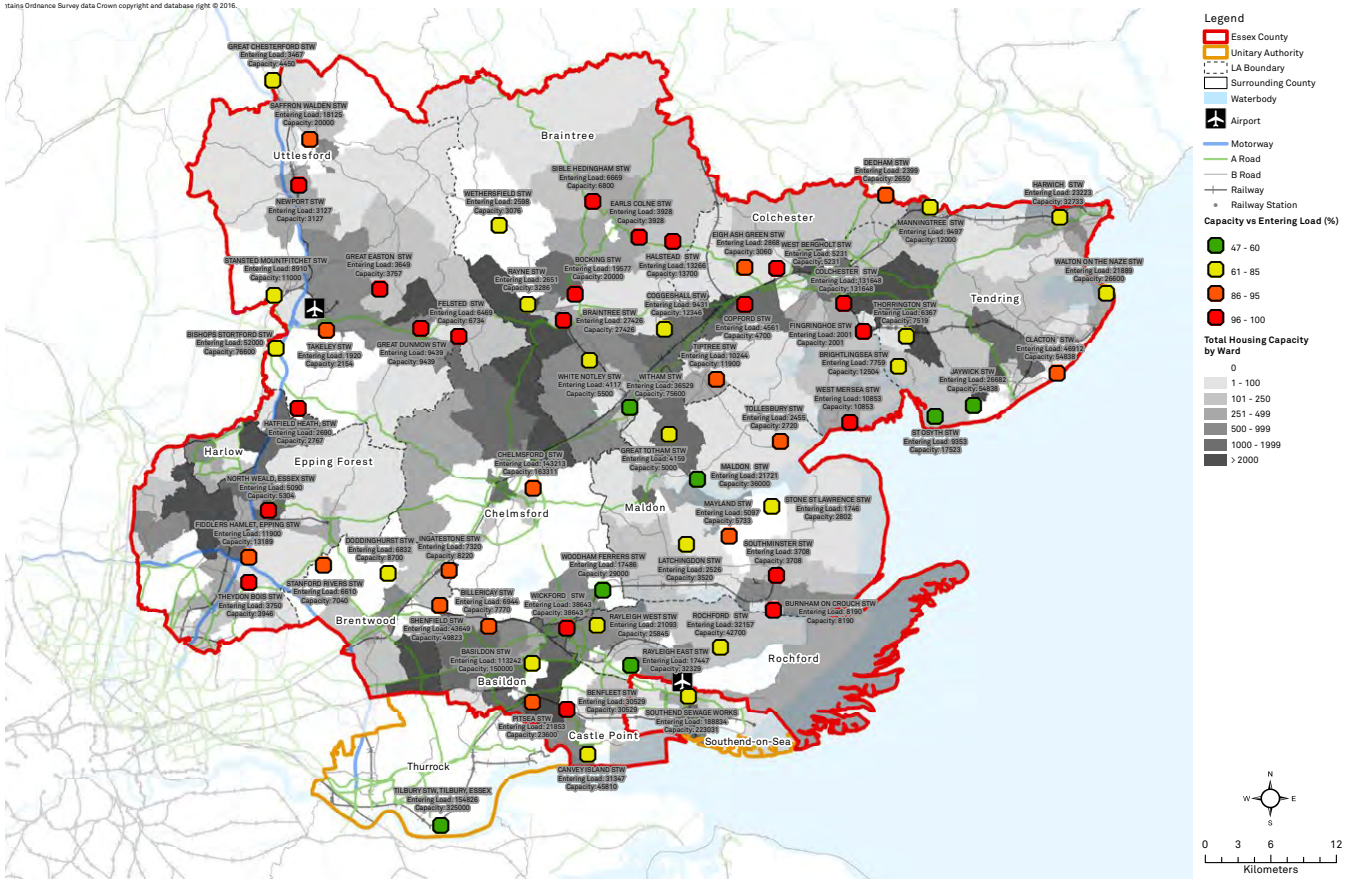
Table 4.16

Waste Water Coverage

	THAMES WATER	ANGLIAN WATER
Basildon		■
Braintree		■
Brentwood	■	■
Castlepoint		■
Chelmsford		■
Colchester		■
Epping Forest	■	
Harlow	■	
Maldon		■
Rochford		■
Tendring		■
Uttlesford	■	■
Southend		■
Thurrock		■

Figure 4.28

Waste Water Infrastructure



Source: European Environment Agency – Waterbase – UWWTD: Urban Waste Water Treatment Directive – reported data (22/03/2016)

The location of WwTWs across Essex together with their capacity versus entering load is shown in Figure 4.26. This information is taken from datasets reported by European member states under the Urban Waste Water Treatment Directive and illustrates the distribution of works as well as providing an indication of their capacity to accommodate growth. This data is a snapshot of the infrastructure provision at the time of its collation and thus subject to change. This data should be treated as an indication of capacity only as other factors will also affect the ability to accommodate growth.

EXISTING INFRASTRUCTURE CAPACITY AND FUTURE INVESTMENT REQUIRED TO SUPPORT GROWTH

The wastewater treatment network infrastructure consists of the sewerage network taking flows from properties and the Wastewater Treatment Works (WwTWs) that treat this and discharge it back into the watercourses. The capacity of both of these is important when considering whether constraints to growth are caused by the existing infrastructure.

Essex County Council, Southend and Thurrock Unitary Authorities are Lead Local Flood Authorities (LLFA). In accordance with the National Planning Policy Framework and under Schedule 3 of the Flood and Water Management Act 2010, following consultation with DEFRA in 2014 LLFAs in April 2015 were given the responsibility (previously held by the Environment Agency) to provide advice on Sustainable Urban Drainage Systems (SuDS) proposals for new development to the Local Planning Authorities (Districts/Borough/City Councils and Unitary Authorities) as part of the wider planning application approval process. Under this arrangement, LLFAs act as a statutory consultee in the planning process for major developments (sites over 1ha in area, 10 or more dwellings or sites over 0.5ha in area where the number of dwellings is not known) which have surface water drainage implications. The LLFAs also provide SuDS best practice guidance and pre-planning application advice in relation to SuDS proposals.

Thurrock District Council is not covered by the Waste Water Treatment Works Needs in Essex and Southend-on-Sea report, therefore the latest Water Cycle Outline Study, written by Scott Wilson in March 2010 is referred to regarding the capacity of WwTWs.

- The study considered development of 17,624 new homes between 2008 and 2025.
- Although the exact capacity and load at Tilbury WwTW was uncertain, it was likely that upgrades would be required to the works to accommodate any growth.

Table 4.17

Results of Waste Water Treatment Works Needs Report

Authority	Wastewater Treatment Work with insufficient capacity	Overall Constraint
Basildon	Billericay	■ The planned growth is large and will significantly exceed capacity
Braintree	None	
Brentwood & Chelmsford	Ingatestone	■ The planned growth will bring the WwTWs close to its limit. Additionally, the WwTWs must currently treat wastewater to a high standard which could potentially limit growth.
Castle Point	None	
Colchester	Copford	■ The planned growth will slightly exceed capacity. Additionally, the WwTWs must currently treat wastewater to a high standard which could potentially limit growth.
	Colchester	■ The planned growth will bring the WwTWs close to its limit.
Epping Forest	Fiddlers Hamlet	■ The planned growth will slightly exceed capacity. Additionally, the WwTWs must currently treat wastewater to a high standard which could potentially limit growth.
	Moreton	■ Already exceeds capacity, and the planned growth is significant which will further exceed capacity.
	Thornwood	■ The planned growth will bring the WwTWs close to its limit.
Harlow	Rey Mead	■ Capacity issue with investment required to extend capacity post 2026
Maldon	Maldon	■ The planned growth will bring the WwTWs close to its limit.
Rochford	None	
Tendring	Jaywick	■ The planned growth will bring the WwTWs close to its limit.
	Manningtree	■ The planned growth will bring the WwTWs close to its limit.
	St Osyth	■ Already exceeds capacity, and the planned growth is significant which will further exceed capacity.
Uttlesford	Felsted	■ Already slightly exceeds capacity, and the planned growth will further exceed capacity, but not significantly.
	Great Dunmow	■ The planned growth is large and will significantly exceed capacity. Additionally, the WwTWs must currently treat wastewater to a high standard which could potentially limit growth.
	Great Sampford	■ The planned growth will bring the WwTWs close to its limit.
	Newport	■ The planned growth will slightly exceed capacity.
	Saffron Walden	■ The planned growth will bring the WwTWs close to its limit.
Southend	None	

Table 4.18

Water Cycle Strategy Review

Authority	Water Cycle Strategy	Date	Housing Considered	Planning Period	Key Capacity Findings
Basildon	South Essex Water Cycle Study – Outline Report	Sept 2011	9,000-11,000	2011-2031	■ There are no significant constraints on planned growth due to the sewerage system.
Castle Point			3,000-4,550	2011-2031	
Rochford			3,800	2011-2031	
Braintree	Braintree District Water Cycle Study – Detailed Report	Jan 2011	4,608	2011-2026	■ Sewerage network requires significant upgrade to cope with increased flows from new development.
Brentwood	Brentwood Water Cycle Study – Scoping and Outline Report	Jan 2011	3,180	2010-2031	■ Network capacity problems are identified at two of the sub-catchments. These would require upgrade works to accommodate proposed development although this is not thought to be a constraint to growth.
Chelmsford	Chelmsford Water Cycle Study – Stage 1 Report (due to be updated 2016)	May 2011	10,275	2010-2021	■ Upgrade works and additional pumping stations are anticipated to be required around Chelmsford in order to reinforce the sewerage network to accommodate growth, however this is not thought to significantly constrain the development.
Colchester	Haven Gateway Water Cycle Study – Detailed Report	Nov 2009	17,100	2001-2021	■ The WCS identified that a number of areas in Colchester and Tendring have existing flooding, therefore it is likely that this will be made worse with any new development.
Tendring			8,500	2001-2021	
Epping Forest	Rye Meads Water Cycle Study – Detailed Report	Oct 2009	3,731	2007-2031	■ It is known that the sewerage network is known to be close to capacity in certain areas of the Rye Meads WwTW catchment. ■ The WCS identified that the proposed upgrades can accommodate the main planned growth in and around Harlow. Therefore, the capacity of the network will not constrain development in this location, providing the appropriate funding becomes available and the upgrades are implemented in a timely fashion. ■ No major strategic sewerage upgrades are anticipated to be required in Epping Forest.
Harlow			22,725	2007-2031	
Maldon	Maldon Water Cycle Study – Stage 1 Report	Mar 2010	2,400	2001-2021	■ There are existing capacity issues in the Maldon and Southminster catchment sewer networks. These will require further upgrade works to accommodate any future growth. This has been identified as being a major constraint in this area.
Uttlesford	Uttlesford District Water Cycle Study – Detailed Report	Nov 2012	3,300	2012–2028	■ Potential major constraints or significant infrastructure improvement related to sewerage capacity or wastewater treatment have been identified to accommodate the proposed development at, Great Dunmow, Newport, Saffron Walden, Great Chesterford and Thaxted, which need further consultation and investigation.
Southend	Essex Thames Water Cycle Study – Scoping Report	Mar 2009	3,500	2008-2021	■ A significant proportion of the sewerage network is combined, therefore increased flows are likely to lead to an increased frequency of diluted but untreated discharges into the Thames Tideway having a potential impact on the Bathing Water Directive. It was identified that post 2015 there would not be capacity in the network to take the level of planned development.
Thurrock	Thurrock Water Cycle Study – Outline Report (due to be updated 2017)	Mar 2010	17,624	2008-2025	■ There were known sewerage network capacity issues in some area. For example the London Gateway area until relatively recently had no connection to the foul network. There are a number of sub-catchments which shall require capacity upgrades post 2015. Anglian Water Services had plans to address these, particularly in the west of the borough, in the AMP 5 period.

** A number of local planning authorities are currently reviewing their existing water cycle studies (Braintree, Chelmsford, Colchester and Uttlesford). Therefore the information in this table may be subject to change dependant upon the outcome of these studies*

Water Cycle Strategies

There are a number of Water Cycle Strategies that have been prepared by the relevant districts / unitary boroughs across Essex. These vary from district to district in terms of detail and relevance with a number at different stages (scoping, outline or detailed) across the range. These provide some information on capacity of WwTWs and the sewerage network. Information on WwTWs is however superseded by the Essex and Southend-on-Sea wide Waste Water Treatment Works Needs report and therefore the data available on the sewerage network is summarised only.

KEY FINDINGS

- Investment to upgrade both WwTW and sewerage networks shall be required across the majority of catchments.
- WwTW upgrades will often be required to accommodate growth and consist of increases to the capacity to process flows and / or increase the maximum discharge allowance consented by the Environment Agency. In the planning period, upgrade work may also be required to allow improvements to water quality discharged to meet requirements of the Water Framework Directive. In the affected catchments, the demands of the WFD may result in the limits of the discharge consents becoming tighter in the future. A reduction in the volume of consented discharge or more stringent limits may impact on proposed development in the catchment. The technology required to meet more stringent quality standards in a discharge may be cost prohibitive and delay development.

COSTS AND FUNDING

Based upon theoretical benchmark modelling, the following development connection costs and funding have been identified for water supply and waste water:

Cost = £455,510,000

Estimated Funding Gap = £0

Costs are set out for each local authority in Section 5

MINERALS

CURRENT SITUATION

Essex County Council, Southend-on-Sea Council and Thurrock Council are the minerals and waste planning authorities covering Greater Essex. Each authority has the statutory responsiblity to plan for future mineral supply and waste management, and to determine mineral and waste planning applications.

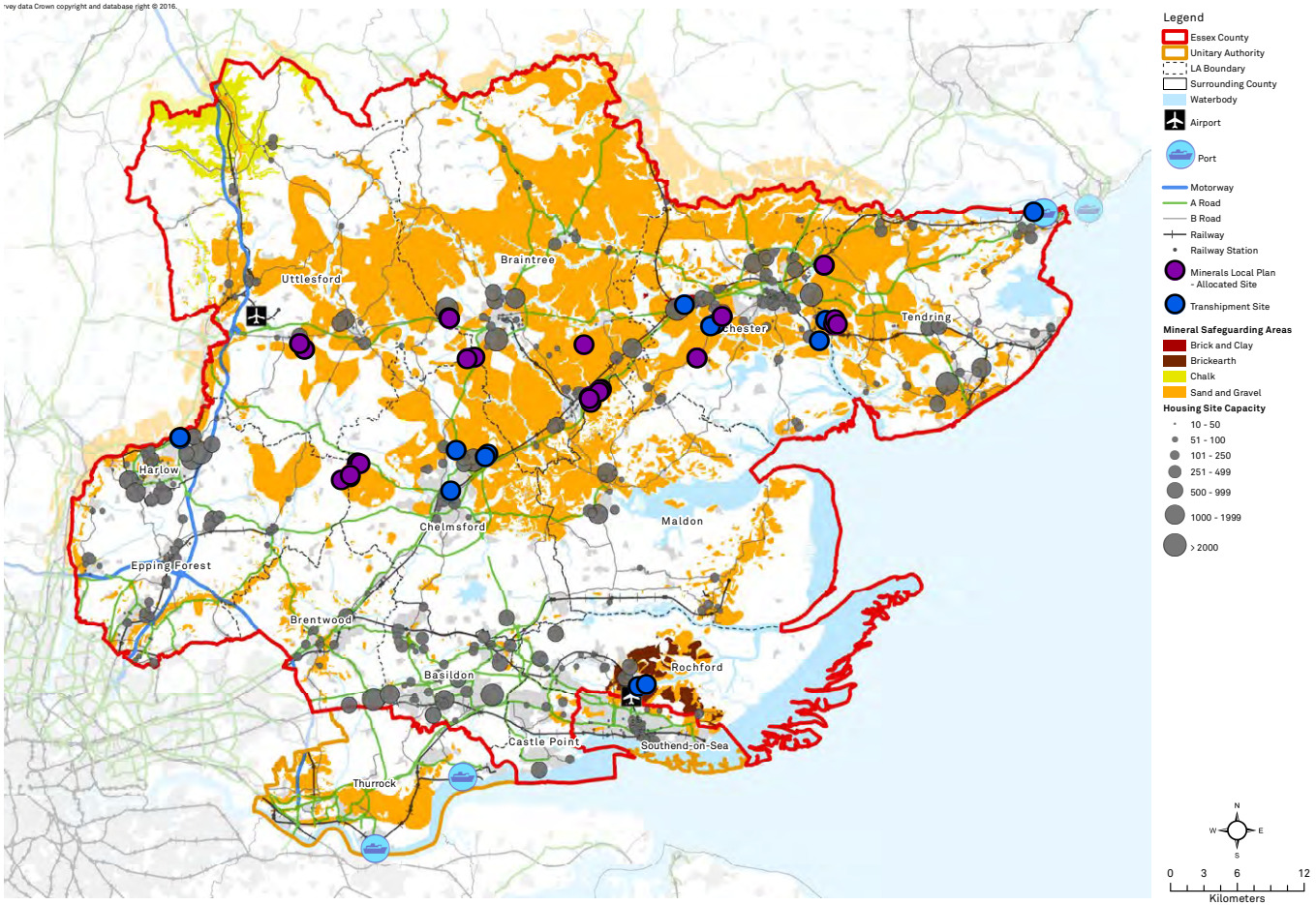
Minerals underpin infrastructure delivery across Greater Essex, as they provide the construction materials for houses, schools and offices as well as roads and rail links for future infrastructure development. It is therefore important to safeguard the access to sufficient quantities and type of resources. The minerals and waste planning authorities will ensure steady and adequate future supply and recognition of the elements which contribute to these, such as primary resource extraction sites, recycling and processing sites and transportation infrastructure such as wharves and rail depots.

KEY FINDINGS

- At the end of 2014, there were 20 sand and gravel quarries with permitted reserves in Essex, however two are non-operational;
- 5 new mineral reserves were granted permission in 2014/15;
- In 2014 in Essex, sand and gravel sales figures were 4.4 million tonnes (mt);
- At 2014, the Essex and Thurrock landbank for sand and gravel was equivalent to 8.11 years supply.

Figure 4.29

Mineral Sites across Greater Essex



WASTE

Greater Essex
751,000
tonnes of household waste per annum

Greater Essex
54%
of waste composted and recycled

CURRENT SITUATION

Greater Essex is covered by three waste planning authorities: Essex County Council, Southend-on-Sea Borough Council and Thurrock Borough Council. These authorities are responsible for determining planning applications for waste developments and preparing waste local plans to guide future development. Thurrock Borough Council will incorporate waste planning matters into its Local Plan; Essex County Council and Southend-on-Sea are preparing a Replacement Waste Local Plan, to be adopted in late 2016.

Responsibility for the management of Local Authority Collected Waste (LACW) is, for most of Greater Essex, split between two council tiers. The District, Borough and City Councils (lower tier) are responsible for the collection of LACW; whilst Essex County Council is responsible for the treatment and final disposal of the waste collected. The two council tiers work closely together to manage this system. In the Unitary Authority areas of Southend-on- Sea Borough Council and Thurrock Borough Council the councils are responsible for all aspects of collecting, treatment and disposing of LACW waste.

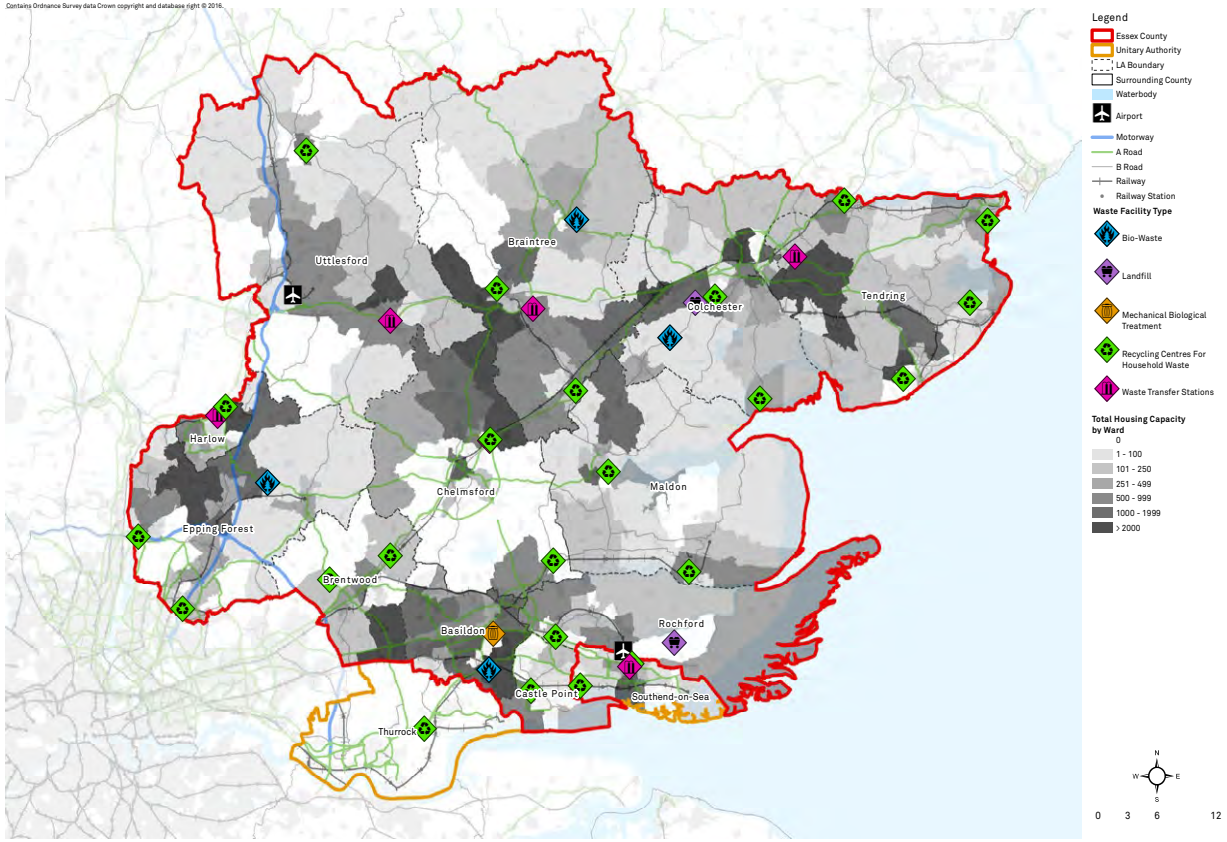
LACW makes up around 20% of the total waste arising in Greater Essex. Waste from other sources such as restaurants, factories, hospitals and building sites makes up the remaining 80% of the total waste created each year. This waste is managed by private operators rather than the three Greater Essex Authorities.

HEADLINES

- Greater Essex produced around 751,000 tonnes of household waste in 2014/15, or more than one tonne of annual waste per household. Around 54% of this was sent for recycling and composting, while around 46% was landfilled (ECC Minerals and Waste Annual Monitoring Report 2013/14; Thurrock Local Plan Monitoring Report 2013/14).
- The total amount of household waste managed has remained approximately stable over the past ten years. However, the share of household waste sent to landfill is steadily falling. In Essex County and Southend this fell from around 68% in 2004/05, to around 48% currently (ECC Minerals and Waste Annual Monitoring Report).
- Essex and Southend have a total of 115 waste transfer facilities and 183 waste treatment facilities (serving household and other waste streams).
- In Thurrock's 2009 Minerals and Waste DPD (Issues and Options) it is identified that there will be oveer 600,000 tonnes additional capacity required to 2021.
- The full cost of waste disposal is currently over £100 per tonne and is likely to rise further as landfill capacity decreases and there is a need to meet higher environmental standards

Figure 4.30

Waste processing capacity against housing growth



Source: ECC Dataset on Waste Facilities

- Greater Essex favours an approach led by waste minimisation, coupled with high levels of recycling and composting, whilst recovering value from any residual waste remaining.
- The recently opened Mechanical Biological Treatment (MBT) plant in Basildon has a treatment capacity of 416,000 tonnes of Local Authority Collected Waste per year, and is designed to treat Essex and Southend's residual household waste stream (following the removal of recyclable material) at a single site.

FUTURE REQUIREMENTS TO MEET GROWTH TO 2036

The volume of LACW waste arisings in Essex and Southend-on-Sea is predicted to rise by 823,040 by 2026/27. It is expected that this waste will be managed by a combination of residual waste treatment facilities, reprocessing facilities and composting facilities located both within and outside Greater Essex.

The MBT facility in Basildon, and its supporting network of waste transfer facilities will manage the treatment of all local authority collected residual waste from Essex and Southend together with the recycling centres for household waste. The outputs of the MBT facility (c.200,000 tonnes per annum) is currently exported from Tilbury Docks and is utilised in energy plants in the Netherlands. The long term options surrounding the final destination for this waste are being explored.

In relation to the waste created by businesses in Essex, evidence to inform the Replacement Waste Local Plan indicates that a significant amount of capacity currently exists at the waste processing infrastructure in Essex. However, by 2032 there are predicted to be waste management capacity gaps as follows:

- 217,000 tonnes of biological waste treatment;
- 1.5 million tonnes of inert waste treatment and disposal; and
- 50,250 tonnes of hazardous waste treatment and disposal capacity.

Essex and Southend's 2016 Replacement Waste Local Plan identifies 18 strategic waste management site allocations sufficient to meet the capacity gaps identified for both LACW and other waste created in Essex and Southend-on-Sea.

Table 4.19

Waste Facilities and Operating Capacity

	OPERATING, UNDER CONSTRUCTION, AND WITH PLANNING PERMISSION		*PLANNED THROUGH THE ESSEX AND SOUTHEND-ON-SEA REPLACEMENT WASTE LOCAL PLAN*
	NUMBER	*ESTIMATED CAPACITY (TONNES)*	*NUMBER*
Transfer Facilities	119	1,926,848	n.a
Non Inert Materials Recovery Facilities	125	3,006,963	0
Biological Treatment Facilities	17	402,926	4
Inert Materials Recovery Facilities	41	2,102,073	8
Energy Recovery Facilities	3	307,792	1
Disposal (Landfill) Facilities	15	19,424,802	8 (inert waste only)
Hazardous waste landfill	0	0	1
Total*	**201**	**25,244,556**	**22**

Source: ECC Minerals and Waste Annual Monitoring Report (2014/15)

Note - Table 4.17 above presents data for Essex County and Southend on Sea only.

4.8 FLOODING & DRAINAGE

FLOODING

Greater Essex
48,000
properties at risk from tidal flooding

Greater Essex
10,000
properties at risk from fluvial flooding

CURRENT SITUATION

Greater Essex is situated within three major catchment areas, namely the Combined Essex catchment, the Upper Lee catchment and the Roding, Beam and Ingrebourne catchment. The Combined Essex catchment includes the rivers Roach, Chelmer, Crouch, Blackwater, Colne and Stour, and the associated tributaries. At present, there are 108,000 properties at risk of flooding from all sources across Essex, taking into account the predicted increase in flood risk due to climate change.

Under the Flood Risk Regulations (2009) and the Flood and Water Management Act (2010), the Lead Local Flood Authority (LLFA) is responsible for developing, maintaining, applying and monitoring a strategy for flood risk management, including flood risk from surface runoff, groundwater and ordinary watercourses. The Environment Agency (EA) is responsible for flooding from main rivers, the sea and reservoirs, and also for the maintenance and operation of flood defence infrastructure. Flood risk from sewers is managed and monitored by the four water companies operating across Greater Essex.

EXISTING INFRASTRUCTURE CAPACITY AND ISSUES

Numerous flood defence schemes have been implemented across Greater Essex to mitigate the level of fluvial and tidal flood risk. Fluvial flood defence schemes have been constructed along the River Can, River Colne, River Roach and Prittlebrook, in addition to flood relief provisions on the River Chelmer and Blackwater, and flood storage provisions in Heybridge, Halstead, Basildon and Sible Hedingham.

The Essex coastline extends for over 300 miles and is largely low-lying. Therefore, to protect the coastal floodplain, grazing marshes and agricultural land, most of the coastline is protected by earth embankments. Additionally, concrete sea walls, promenades and beach control structures have been used to protect coastal communities such as in Harwich and Clacton. As part of the South Suffolk and Essex Shoreline Management Plan (SMP), three management units have been identified along the Essex coastline as being vulnerable to tidal flooding. This risk has been managed using a variety of coastal protection measures and flood defence structures.

Urban areas in south Essex are located within Flood Zone 3, and are still at risk from fluvial and tidal flooding, especially when taking into account the impact of climate change on the frequency of storm events. This is particularly pertinent for Canvey Island, where agencies are working together to deliver a six Point Plan. The impact of urban growth will also have a negative impact on flood risk in the short and long term. The facing page lists the flood management policies identified within Greater Essex

Table 4.20

Flood Risk Management Policies (Source: CFMP)

Authority	Risk across Authority	Flood Risk Management Policy	Significant Existing Flood Defences
Basildon	Moderate to High	May need action to keep pace with climate change.	Fixed tidal defences at Holehaven Creek, Vange Creek and East Haven Creek; Tidal level controlled by Fobbing Horse, East Haven and Benfleet tidal barriers.
Braintree	Low to Moderate	Flood risk is being managed effectively	Formal defences along River Colne, protecting Halstead and White Colne.
Brentwood	Moderate to High	May need action to keep pace with climate change	
Castle Point	Moderate to High	May need action to keep pace with climate change	Tidal defences at Benfleet Creek Barrier, East Haven Barrier, raised embankments East Haven Creek Hadleigh Marsh, concrete defences along Canvey Island.
Chelmsford	Moderate to High	Requires further action to reduce flood risk	Flood defences in Chelmsford downstream of Can/Chelmer confluence with a Standard of Protection (SoP) of 10% AEP
Colchester	Moderate to High	May need action to keep pace with climate change	Colne Barrier and flood defences along River Colne to protect from a 1.3% to 1%AEP fluvial event and against tidal surges.
Epping Forest	Moderate	Take action to store or manage run-off	Flood storage areas at Thornwood, Loughton Brook and Cripsey Brook, Lower Lee Flood Relief Channel, Upshire FAS (storage area and embankments)
Harlow	Moderate	Take action to store or manage run-off; Especially fluvial flooding on Canvey Island.	
Maldon	Moderate to High	Requires further action to reduce flood risk	Storage areas upstream of Heybridge and pumping of flood waters from River Can into the North Sea during high tide.
Rochford	Moderate to High	May need action to keep pace with climate change	Maintained channels on River Roach with SoP of 3.3% AEP, tidal seawall at Paglesham and clay embankment at Clements Marsh with SoP of 2% AEP.
Tendring	Low to Moderate	Generally reduce existing flood risk management actions	Towns of Harwich, Dovercourt, Walton on the Naze, Holland on Sea, Clacton and Brightlingsea are protected by coastal defence structures.
Uttlesford	Low to Moderate	Generally reduce existing flood risk management actions	
Southend	Moderate to High	Requires further action to reduce flood risk	Combination of sea frontage defences (embankments, barriers, formal walls) providing a SoP of up to 0.1% AEP (including climate change allowances).
Thurrock	Moderate to High	Requires further action to reduce flood risk	Thames barrier, tidal barriers at Tilbury Docks, Fobbing Horse Barrier at Vange Creek and Tidal outfall structures that discharge into the Thames.

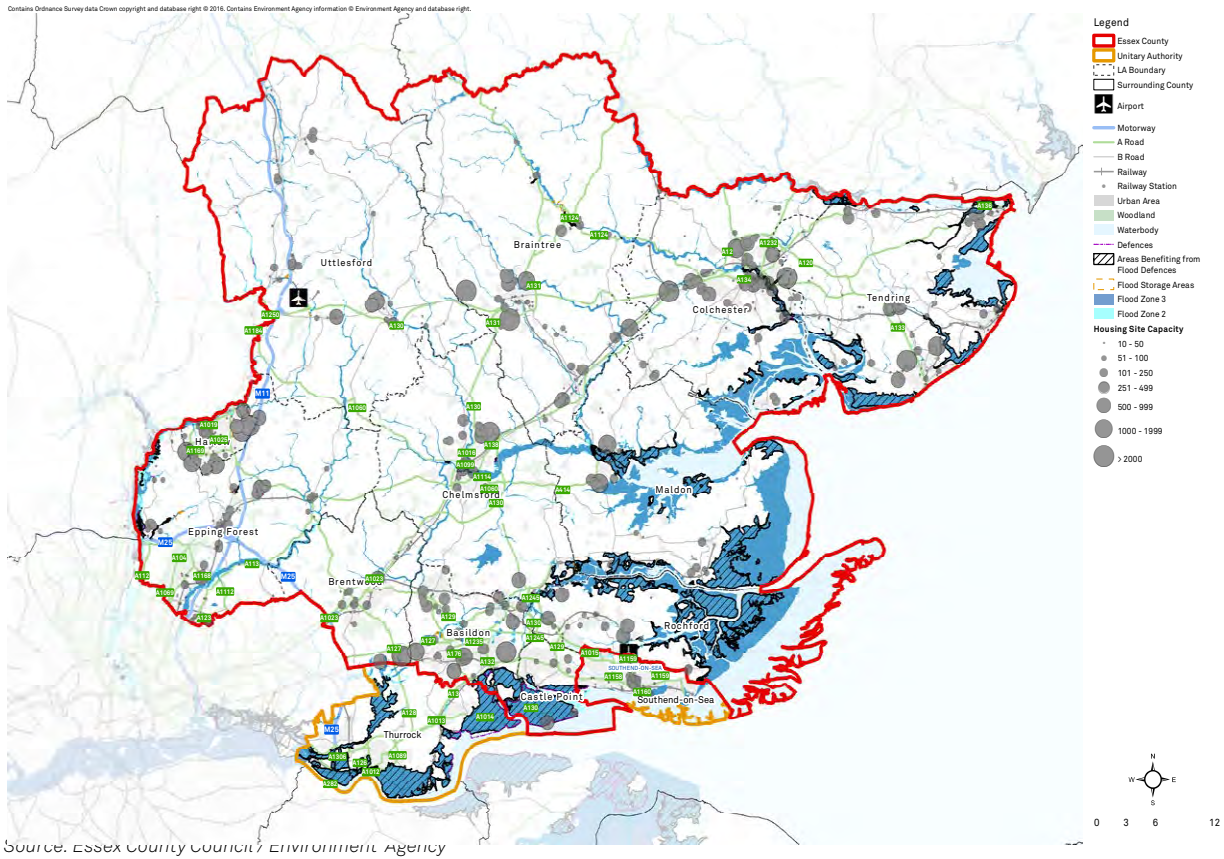
taken from the Catchment Flood Management Plans (CFMPs).

KEY FINDINGS

- Essex is at risk of flooding predominantly from fluvial, tidal and pluvial sources. Approximately 10,000 properties are at risk from fluvial flooding, as shown in Figure 4.31, with 50,000 properties at risk from pluvial flooding.
- Formalised flood defences are present throughout Essex. The Thames Estuary 2100 (TE2100) covers the tidally affected areas of Thurrock, Basildon, Southend-On-Sea and Castle Point. Additional coastal flood defences are presented in Rochford as well as the aforementioned four areas.
- There are no large-scale formalised flood defences in the areas of Uttlesford, Epping Forest and Harlow. The focus in these areas is to provide sufficient floodplain storage to mitigate up to a 1% Annual Exceedance Probability (AEP) flood event.

Figure 4.31

Risk of flooding and proposed housing sites



Source: Essex County Council / Environment Agency

THE THAMES ESTUARY 2100 PLAN

The Thames Estuary 2100 (TE2100) plan has been considered separately as the scope of the TE2100 (up to 2100) runs beyond the assessment period for this study (2016 to 2036).

The TE2100 plan covers the Thames Estuary from Teddington in the west to the mouth of the estuary at Shoeburyness and Sheerness. It provides a plan for tidal flood defences up to the year 2100, to ensure that current standards of flood protection are maintained or improved. Within Essex, the TE2100 plan covers Thurrock, Basildon, Southend-on-Sea and Castle Point. A Local Council Briefing Document has been produced by the EA to provide ideas on how flood risk management can be integrated with other objectives to deliver a well-planned riverside. This briefing document also provides a breakdown of cost estimates up to the year 2050, which has informed this study.

FUTURE REQUIREMENTS TO MEET GROWTH TO 2036

From the ECC and EA pipeline programmes, only infrastructure projects that have associated project cost estimates have been included as 'existing pipeline infrastructure'. Furthermore, projects that were indicated as maintenance or repair/refurbishment have not been included in the analysis, as these projects do not serve to facilitate growth.

The following projects represent examples of key investment identified to support growth:

- Tilbury Barrier - Tidal defence – lock gate, Thurrock
- Shoebury Common Flood Defence Improvement - Tidal defence – improvement to existing, Southend
- Jaywick Beach Recharge - Tidal defence, Tendring
- The Thames Estuary 2100 (TE2100) plan, Thurrock, Basildon, Southend-on-Sea and Castle Point
- Canvey Island Integrated Urban Drainage Model 6 Point Plan

DRAINAGE

Greater Essex

50,000
properties at risk from Pluvial flooding

CURRENT SITUATION

Essex County Council, Southend and Thurrock Unitary Authorities are Lead Local Flood Authorities (LLFA). In accordance with the National Planning Policy Framework and under Schedule 3 of the Flood and Water Management Act 2010, following consultation with DEFRA in 2014 LLFAs in April 2015 were given the responsibility (previously held by the Environment Agency) to provide advice on SuDS proposals for new development to the Local Planning Authorities (Districts/Borough/City Councils and Unitary Authorities) as part of the wider planning application approval process.

Under this arrangement, LLFAs act as a statutory consultee in the planning process for major developments (sites over 1ha in area, 10 or more dwellings or sites over 0.5ha in area where the number of dwellings is not known) which have surface water drainage implications. The LLFA's also provide SuDS best practice guidance and pre-planning application advice in relation to SuDS proposals.

EXISTING INFRASTRUCTURE CAPACITY AND ISSUES

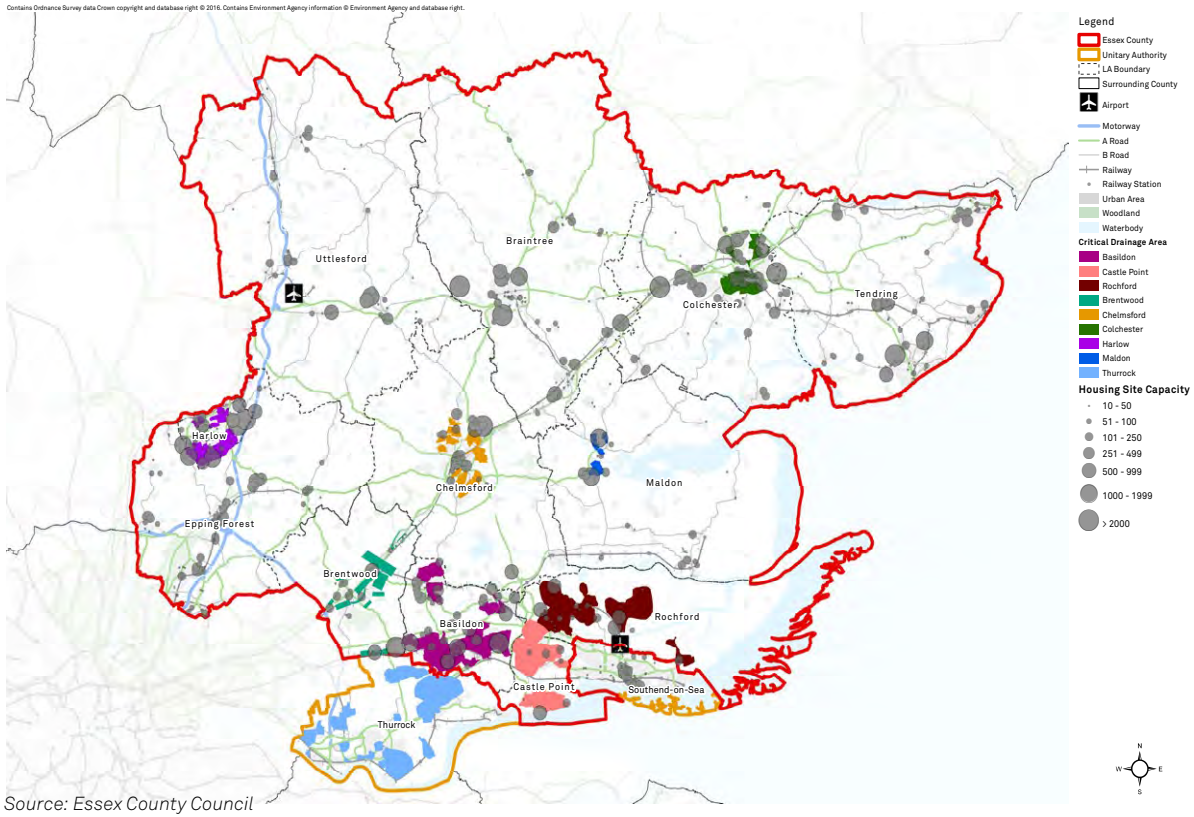
Across Greater Essex, up to 50,000 properties are at risk of flooding from surface water, with the critical drainage area comprising of the upstream catchment, the influencing drainage catchments, surface water catchments and where appropriate the downstream areas.

Examples of areas particularly susceptible in this sense include the larger urban areas to the south of Essex due to the greater proportion of impermeable areas and the north of Essex due to rapid runoff, especially in urban areas located at the head of the catchment.

On a localised scale, the use of Sustainable Drainage Systems is governed by site characteristics such as geology and spatial constraints. The SuDS hierarchy prioritises the use of infiltration and other source control features, which could include infiltration ponds and basins, followed by discharge to a watercourse, then to surface water sewers and lastly combined sewers. However each planning application will require its own detailed evaluation to determine the best SuDS solution.

Figure 4.32

Critical drainage areas and proposed housing sites



Source: Essex County Council

A desk study review suggests that large areas of Essex are underlain by London Clay geology, with drift deposits of sand and gravel present in coastal areas. Clay geology tends to be unsuitable for infiltration based SuDS, due to low permeability. Free draining soils are present in the north-west of the county, where there is likely to be greater suitability for infiltration based SuDS.

It is recommended that site specific assessments for new developments should be carried out to verify the geological suitability of infiltration SuDS before implementation.

Existing sustainable drainage features are predominately attenuation/detention basins located in the floodplain. Other than the post April 2015 planning application records there is currently no record of SuDS used on a site-wide basis across Essex, and it is therefore difficult to determine the extent to which sustainable drainage is in place across the county.

The Essex Flood Board provides an opportunity for a co-ordinated approach between water companies (Thames / Anglian Water), ECC and Local Planning Authorities to ensure a consistent and coordinated approach to the provision of sustainable drainage across Greater Essex.

KEY FINDINGS

- Across Greater Essex, up to 50,000 properties are at risk from surface water flooding. Larger urban areas in south Essex are particularly affected due to the greater proportion of impermeable area. In the north of Essex, urban areas located at headwaters of catchments are vulnerable to rapid runoff from storm events.
- Geological constraints across Essex limit the use of infiltration features. Open water features have been used in open floodplain areas to provide attenuation upstream of large urban areas.
- Existing sustainable drainage features are predominately attenuation/detention basins located in the floodplain. Other than the post April 2015 planning application records there is currently no record of SuDS used on a site-wide basis across Essex, and is therefore difficult to determine the extent to which sustainable drainage is in place across the county.
- There is no formal system of notification for new SuDS infrastructure outside of the planning application process. District/Borough/City Councils and Unitary Authorities do not have the resources to set up the verification stage and notify consultees about infrastructure. However, through the planning application process when dealing with “major” planning applications, consultees are notified of the SuDS infrastructure associated with new development.
- There is an opportunity for developers to work in coordination with the LLFAs, water companies and Local Planning Authorities to deliver SuDS to suit the catchment characteristics and surface water drainage limitations. This is particularly important for developments located within Contributing Drainage Areas (CDA) as the work could result in a reduction in flood risk not only for the development itself but for the wider area.
- On a local scale, site specific assessments should be carried out to determine the most feasible SuDS mechanisms to use, as well as appropriate site tests to determine the suitability of SuDS options, as recommended by the CIRIA SuDS hierarchy. The Essex Flood Board is a useful tool in providing an interface between ECC, Local Planning Authorities and water companies to ensure a co-ordinated approach to the design, construction and maintenance of SuDS across Greater Essex to ensure a co-ordinated approach to the designing, construction and maintenance of SUDs and Flood Alleviation Schemes across Greater Essex.

FUTURE REQUIREMENTS TO MEET GROWTH TO 2036

From the ECC and EA pipeline programmes, all projects revolving around the provision of open water features such as attenuation and detention basins, ponds, swales and involving no clear hard engineering infrastructure have been categorised as ‘sustainable drainage’ :

The following projects represent examples of key investment identified to support growth:

- Heybridge Wood Area - Maldon
- Colchester Town - Colchester
- The Hythe - Colchester
- West Passmores - Harlow
- Old Heath - Colchester
- Nettleswell - Harlow

COSTS AND FUNDING

Based upon information received from ECC and the Environment Agency, the following costs and funding have been identified for Flood Risk and Drainage projects:

Cost = £615,380,000

Estimated Funding Gap = £391,590,000

Costs are set out for each local authority in Section 5

05

DEVELOPMENT SUITABILITY ANALYSIS

This section analyses the infrastructure needs and costs identified in Section 4 on a geographic basis.

This section details a number of large projects that are not physically confined to infrastructure within Greater Essex, but will have an impact in and well beyond Greater Essex. These key regional projects are presented in Table 5.3.

This section also details a number of significant projects that will occur within Greater Essex, but will have an impact beyond a single local authority area. These key sub-regional projects are presented in Table 5.4.

These regional and sub-regional projects provide important context for reviewing the subsequent profiles each local authority area, which show:

- Major development sites and forecast demographic shifts
- Mapping of key infrastructure projects
- Spatial mapping of development sites against identified transport and social infrastructure capacity issues
- Topic specific summaries of identified infrastructure projects, associated cost and estimated available funding
- Key infrastructure capacity issues across each infrastructure type analysed

Each profile should be reviewed in conjunction with the universal legend to the right and the regional and sub-regional project lists, noting that these lists are not reflected in individual profiles.

While these profiles present theoretically modelled increases in demand for various services at an individual authority level, it is likely that much of this infrastructure will be provided at sites serving a number of local authorities.

The data presented in this section has been drawn from a variety of sources. Detail of the sources for project data is set out in Table 5.1 opposite and detail of the sources for statistical information is set out in Table 5.2.

Significantly, the results presented in this section are the outputs of modelling undertaken for this study. Accordingly, owing to differing methodologies, the information presented in this document is likely to differ from that presented in individual authorities' IDPs or Local Plans.

Universal Map Legend

Applicable to all maps from pages 109 to 139

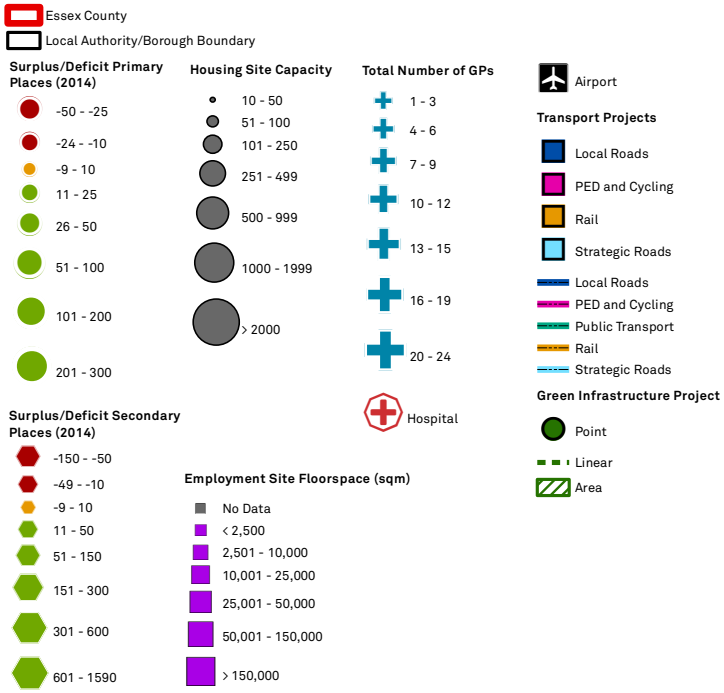


Table 5.1

Project List Source

		Key Source: LA IDP Project Schedule	Key Source: Essex County Council / TC / SBC	Key Source: AECOM Benchmark Modelling	Additional Sources
Transport	Motorways	Yes			Highways England RBS
	Highways	Yes	Yes		Local Transport Strategy Forward Programmes
	Public Transport	Yes	Yes		
	Rail	Yes			Anglia Route Study (Network Rail Projects Only) *
	Other Strategic	Yes			Wider Transport Plans
Education	Primary Education	Yes	Yes	Yes	
	Secondary Education	Yes	Yes	Yes	
	AE / FE / HE	Yes		Yes	FE and HE Providers
	Early Years	Yes	Yes	Yes	
Health and Social Care	Primary Healthcare	Yes		Yes	NHS England / CCGs
	Acute Healthcare	Yes		Yes	NHS England / CCGs / NHS Trusts
	Mental Healthcare	Yes		Yes	NHS England / CCGs / NHS Trusts
	Adult Social Services	Yes	Yes	Yes	Community HealthPartnerships & NHS Property Services
Community and Recreation	Libraries	Yes	Yes	Yes	
	Youth Services	Yes	Yes	Yes	
	Community Facilities	Yes		Yes	
	Sports Facilities	Yes		Yes	Sport England
	Open Space & Recreation	Yes		Yes	Sport England
Green Infrastructure		Yes	Yes	Yes	
Utilities & Waste	Energy (Electricity & Gas)	Yes		Yes	Service Provider Investment Plans
	Water and Sewage	Yes		Yes	Service Provider Investment Plans
	Waste	Yes	Yes		
	Broadband	Yes	Yes	Yes	Broadband Provider Plans
Flood Defences		Yes	Yes		Environment Agency
Emergency Services		Yes			Police / Ambulance and Fire Service

Table 5.2

Local Authority Key Statistics Source

Key Statistic	Source applicable to all Local Authorities
Homes Needed	*Strategic Housing Market Assessments (SHMA) as set out in table 3.1*
Homes Planned	*Supplied trajectories including under construction, planning permissions and allocations as set out in table 3.2*
New People	*2014-based Subnational Population Projections for Local Authorities, ONS*
New Jobs	*East of England Forecasting Model: 2016 baseline results, Cambridge Econometrics*

** The Anglia Route Study being an iterative strategy for the delivery of growth. Network Rail's funding means that they cannot commit to long term improvements and priorities a re-assessed on a regular basis to ensure the future demands for rail travel are met*

KEY REGIONAL PROJECTS SUPPORTING GREATER ESSEX

A series of regionally significant rail and road network projects have been identified as critical to facilitating growth across Greater Essex but impact and cross wider geographies than just Greater Essex. Whilst not physically confined to the Greater Essex area these will have a direct impact upon the economic growth of Greater Essex.

Total Infrastructure Costs: **£ 26,556,250,000**

Total Secured Funding: **£ 17,386,250,000**

Total Expected Funding: **£ unknown**

Total Funding Gap: **£ 9,170,000,000**

Funding as % of Costs: **65%**

Table 5.3

Regional Infrastructure Projects

Strategic Road Network Projects	Cost	Secured Funding
A14 Cambridge to Huntingdon widening	£1,460,000,000	£1,460,000,000
Lower Thames Crossing	£5,000,000,000	unknown
M11 Junctions 8 to 14 Technology Upgrade	£25,000,000	£25,000,000
M11 Peak Time Lorry Overtaking Ban	£250,000	£250,000

Rail Projects	Cost	Secured Funding
Anglia Traction Power Supply Upgrade	£11,000,000*	£11,000,000
Barking to Gospel Oak Electrification	£90,000,000*	£90,000,000
Bow Junction Improvements	£120,000,000*	unknown
Increasing Central Line Capacity	£1,000,000,000*	unknown
Crossrail 1	£14,800,000,000*	£14,800,000,000
Crossrail 2 including West Anglia Four Tracking	£3,000,000,000*	unknown
Digital Railway	unknown	unknown
Felixstowe to Nuneaton line improvements	unknown	unknown
GEML New Rolling Stock	£1,000,000,000*	£1,000,000,000
Line speed improvements on rail lines across Essex	£50,000,000*	unknown
London Liverpool Street Station Remodelling	unknown	unknown

**Estimated costs based upon Network Rail/Essex County Council/AECOM information*

KEY SUB-REGIONAL PROJECTS WITHIN GREATER ESSEX

A number of sub regionally significant projects have also been identified which are identified as necessary to support housing and economic growth across Greater Essex and not specifically within a single local authority area. These are primarily confined to transport projects, utilities, waste and flood defences.

It should also be noted that the framework has identified theoretical increases in demand for services such as Acute hospital beds at the local authority level, and whilst these have been presented as need at a local level, it is acknowledged that this provision is likely to be delivered at sites serving a number of local authorities.

Total Infrastructure Costs: **£ 4,682,500,000**

Total Secured Funding: **£ 623,860,000**

Total Expected Funding: **£ 2,961,030,000**

Total Funding Gap: **£ 1,097,620,000**

Funding as % of Costs: **77%**

Table 5.4

Sub-Regional Infrastructure Projects within Greater Essex

Strategic Road network Projects	Cost	Secured Funding
A12 Chelmsford to A120	£250,000,000	£250,000,000
A12 Colchester Bypass Widening	£250,000,000	unknown
A12 M25 to Chelmsford widening	£500,000,000	unknown
A12 Whole Route Technology Upgrade	£100,000,000	£100,000,000
A120 between Hare Green and Harwich	£200,000,000	unknown
A120 Braintree to A12	£500,000,000	unknown
A127 Corridor for Growth Route Based Strategy maintenance	£68,000,000	£8,000,000
A129 Route Based Strategy Improvements	£2,000,000	unknown
A127/A130 Fairglen Interchange - Long Term	£130,000,000	unknown
A127/A130 Fairglen Interchange - Short Term	£26,000,000	£17,000,000
A13 Widening	£28,140,000	unknown
A13 Widening between A128 and A1014	£85,000,000	unknown
A13 Five Bells to Pitsea Route Improvement	£100,000,000	unknown
A13 M25 to Sadlers Farm RBS improvements	£10,000,000	unknown
A130 Chelmsford to Canvey Island RBS improvements	£10,000,000	unknown
A130 Rayleigh Spur to Rettendon 3 lane dualling	£200,000,000	unknown
A130/A131 Chelmsford to Braintree RBS improvements	£7,500,000	£7,500,000
A1306 Corridor and Junction Improvements	£15,300,000	unknown
A131 Braintree to Sudbury RBS improvements	£8,000,000	£8,000,000
A133 Colchester to Clacton RBS improvements	£5,000,000	unknown
A414 Chelmsford to Maldon RBS improvements	£4,000,000	£4,000,000
A414 Harlow to Chelmsford RBS improvements	£8,000,000	£8,000,000
Chelmsford North East Bypass A130	£350,000,000	unknown
Long Term Improvements to M25 J30/31	£250,000,000	unknown
M11 J7 Improvements	£34,000,000	£34,000,000
M11 Jct 7a Improvement and Gilden Way widening	£80,560,000	£80,560,000
M11 Junction 8 - long term	£200,000,000	unknown
M11 Junction 8 - short term	£15,000,000	£6,800,000
M25 Junction 28 Improvements	£100,000,000	£100,000,000
Northern by-pass between new M11 j7a and A414	£400,000,000	unknown
Strategic Signing Review (A127/A130/A13)	£1,000,000	unknown

Rail Projects	Cost	Secured Funding
Passing loop north of Witham	£100,000,000*	unknown
Stansted Airport Rail Tunnel	£200,000,000*	unknown

**Estimated costs based upon Network Rail/Essex County Council/AECOM information*

Flood Defence projects	Cost	Secured Funding
Basildon - TE2100 plan	£80,000,000	unknown
Castle Point - TE2100 plan	£220,000,000	unknown
Southend - TE2100 plan	£110,000,000	unknown
Thurrock - TE2100 plan	£60,000,000	unknown

LOCAL PROJECTS

BASILDON

2016 - 2036:

17,060 homes needed

30,000 new people **(+16%)**

13,490 homes planned

13,250 new jobs **(+14%)**

Refer to Section 3.2 for explanation of housing figures presented above

2016 CAPACITY ISSUES

- ***A127 sub-standard design for volume of traffic and strategic function***
- ***A127/A130 Fairglen Interchange congestion***
- ***A13 corridor peak time congestion and susceptible to delays caused by M25***
- ***Congestion in Basildon town centre***
- ***Billericay town centre congestion***
- ***Patients per GP is very high in NHS Basildon and Brentwood CCG***
- ***Surplus primary and secondary school places in the south with shortage of capacity in Billericay and Wickford.***
- ***Acute hospitals working at 95% bed capacity in Basildon and Thurrock UH NHS Foundation Trust***

Total Infrastructure Costs: **£522,020,000**

Total Secured Funding: **£9,100,000**

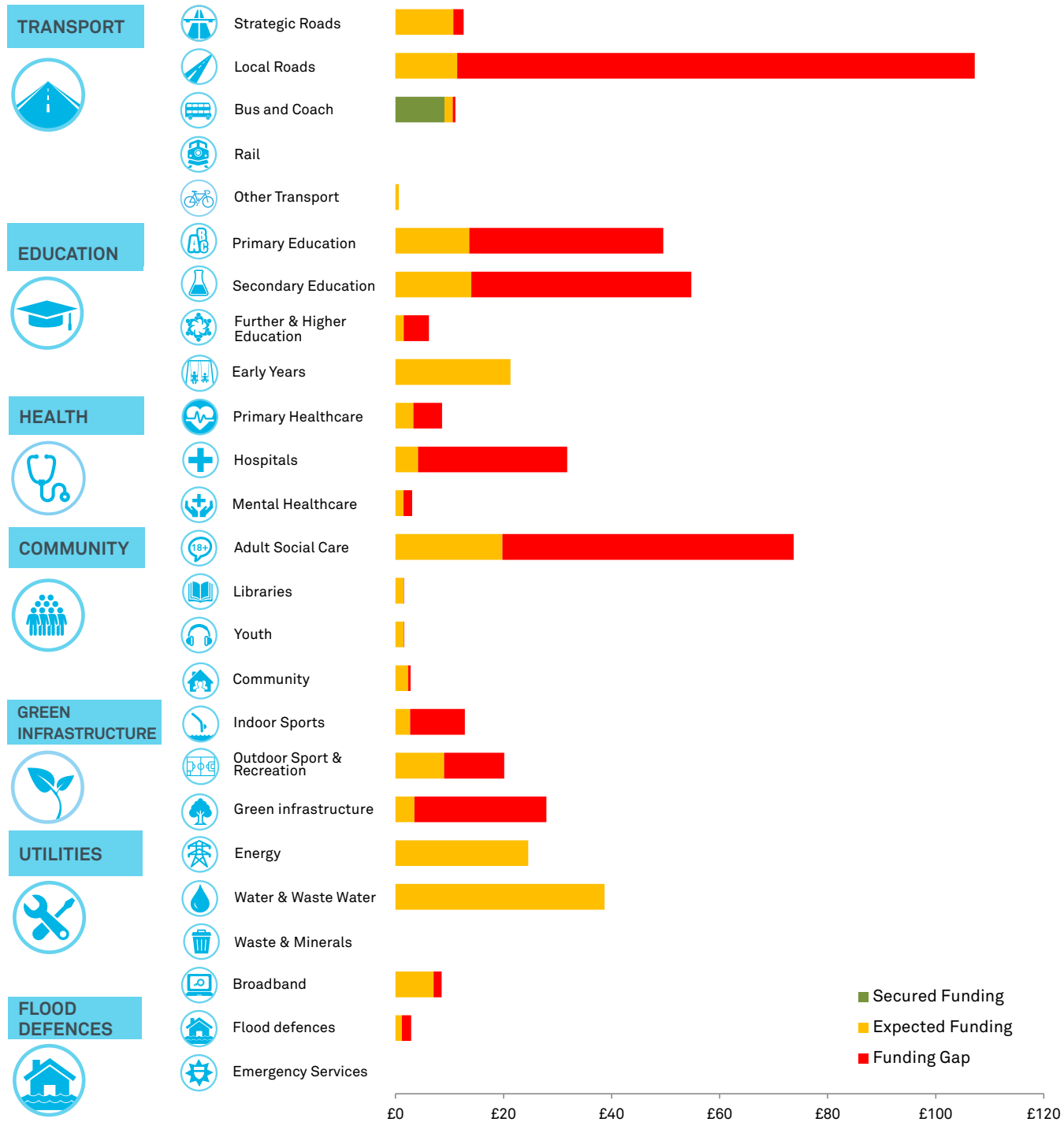
Total Expected Funding: **£195,530,000**

Total Funding Gap: **£317,400,000**

Funding as % of Costs: **39%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions

Projects Note - Any Regional or Sub Regional Projects Listed in Tables 5.3 and 5.4 and affecting this local authority are not included in costs and funding below



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)

MAJOR HOUSING DEVELOPMENT

- West Basildon Urban Extension
- Land south of Wickford
- Land North of Dry Street, Basildon
- Land West of Gardiners land South, Basildon
- Land East of Basildon
- West and South West of Billericay

COMMUNITY & GREEN INFRASTRUCTURE PROJECTS

- Healthcare Hub Project
- Town Centre Regeneration in Basildon, Pitsea, Laindon and Wickford.
- Pitsea Landfill Bird Sanctuary
- Watt Tyler Green Centre
- Ultrafast Broadband network in Colchester Town Centre

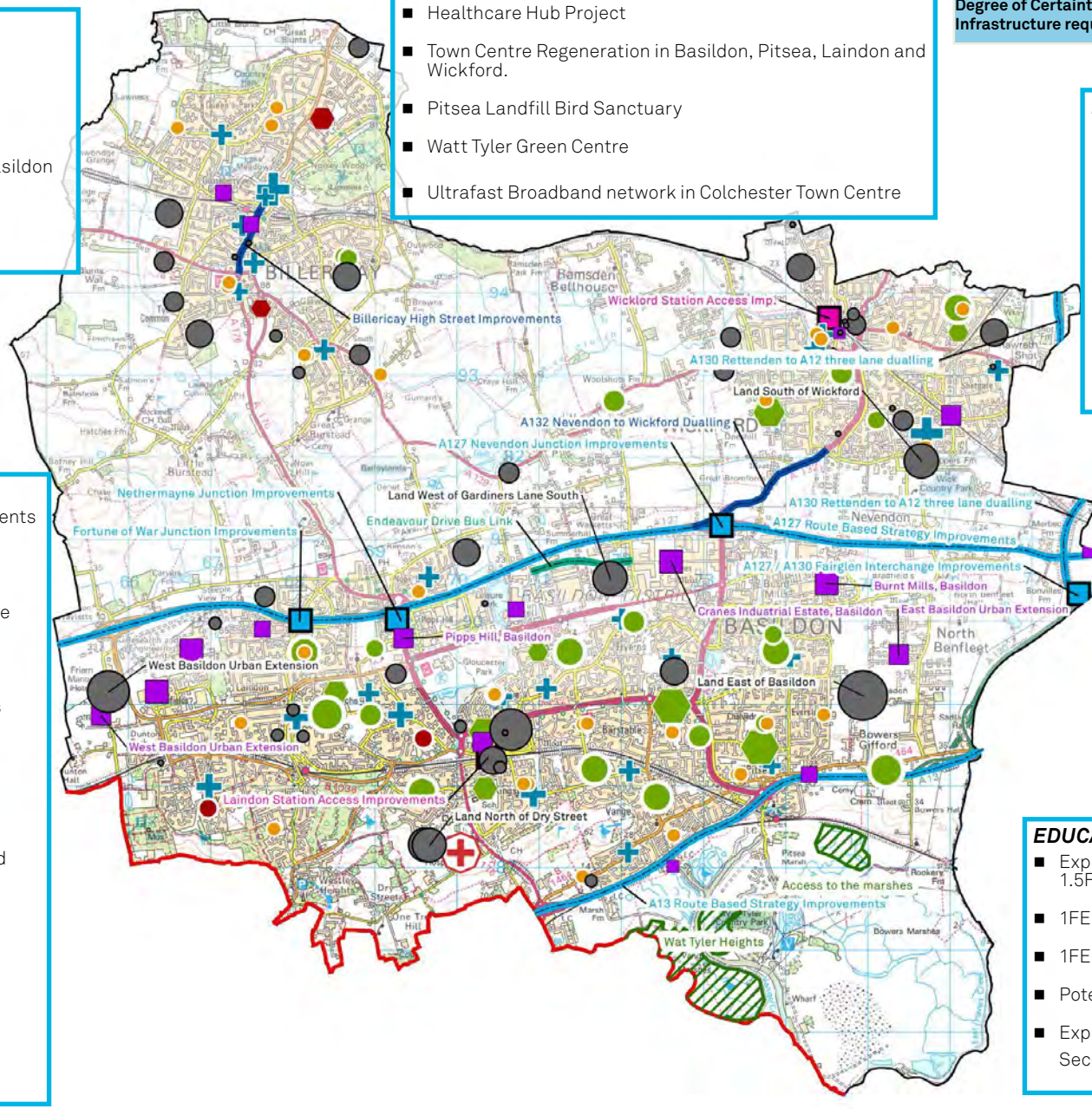
Degree of Certainty on Growth and Infrastructure requirements	Known

KEY EMPLOYMENT SITES

- A127 Enterprise Corridor – inc Cranes, Pipps Hill and Burnt Mills
- A127 Enterprise Corridor - Western and Eastern Extensions
- Land at Ford Dunton
- Land West of Gardiners Lane South
- Terminus Drive Pitsea
- Land to East of Burnt Mills

TRANSPORT PROJECTS

- A13 Route Based Strategy Improvements
- A127/A130 Fairglen interchange improvements
- A130 Rayleigh spur to Rettendon three lane dualling
- Wickford Southern Link Road
- Laindon and Wickford Station access improvements
- Southwest Billericay Relief Route
- Basildon Enterprise Corridor and Endeavour Drive Bus Link
- A127 Corridor for Growth Route Based Strategy Improvements
  - A127/A132 Nevendon junction improvements
  - A127 Fortune of War junction improvements
  - A127 Widening



FLOOD DEFENCES

- Thames Estuary 2100 Flood Defence
- Barstable Fryerns Detention Basin
- Bromfords Detention Basin

EDUCATION PROJECTS

- Expansion of Willows Primary School by 1.5FE
- 1FE expansion of Lee Chapel Primary
- 1FE Expansion of The Phoenix
- Potential new 5-6FE Secondary school
- Expansion of Basildon Lower Academy Secondary

SUMMARY OF DEVELOPMENT & KEY LOCAL PROJECTS FOR BASILDON

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

Projects Note - Any regional or sub-regional Projects Listed above and affecting this local authority are not included in local costs and funding on facing page.

LOCAL PROJECTS

BRAINTREE

2016 - 2036:

16,900
homes needed

21,300
new people **(+14%)**

16,250
homes planned

4,710
new jobs **(+7%)**

Refer to Section 3.2 for explanation of housing figures presented above

2016 CAPACITY ISSUES

- ***A120 Galleys Corner and Marks Farm congestion***
- ***Railway journey times and frequency on the Braintree brance line between Witham and Braintree***
- ***A120 Braintree to A12 congestion***
- ***A131 Braintree to Chelmsford and Braintree to Halstead congestion***
- ***A12 corridor congestion impacting local junctions***
- ***Localised primary and secondary school issues to the southeast of the district***
- ***Patients per GP is high across NHS Mid Essex CCG***
- ***Acute hospitals working at 96% bed capacity in Mid Essex Hospital Service NHS Trust***

Total Infrastructure Costs: **£420,770,000**

Total Secured Funding: **£14,200,000**

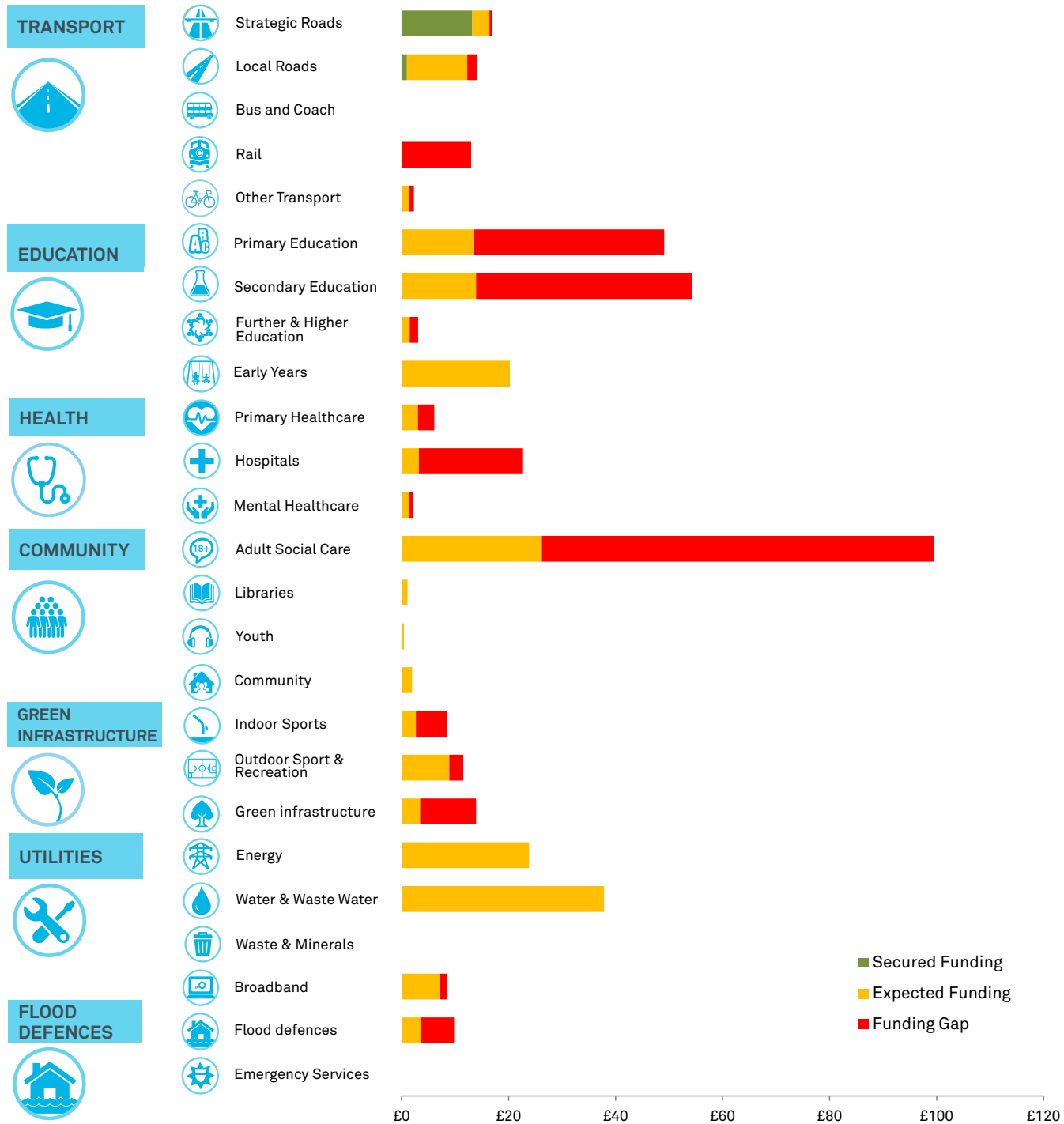
Total Expected Funding: **£189,920,000**

Total Funding Gap: **£216,650,000**

Funding as % of Costs: **49%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions

Projects Note - Any Regional or Sub Regional Projects Listed in Tables 5.3 and 5.4 and affecting this local authority are not included in costs and funding below



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)

Degree of Certainty on Growth and Infrastructure requirements	Partial

MAJOR HOUSING DEVELOPMENT

- West of Colchester Garden Community
- West of Braintree Garden Community
- Land east of Great Notley
- Land east of Broad Road
- Land south of Feering
- Former Towerlands Park Site
- Wood End Farm, West of Witham

COMMUNITY & GREEN INFRASTRUCTURE PROJECTS

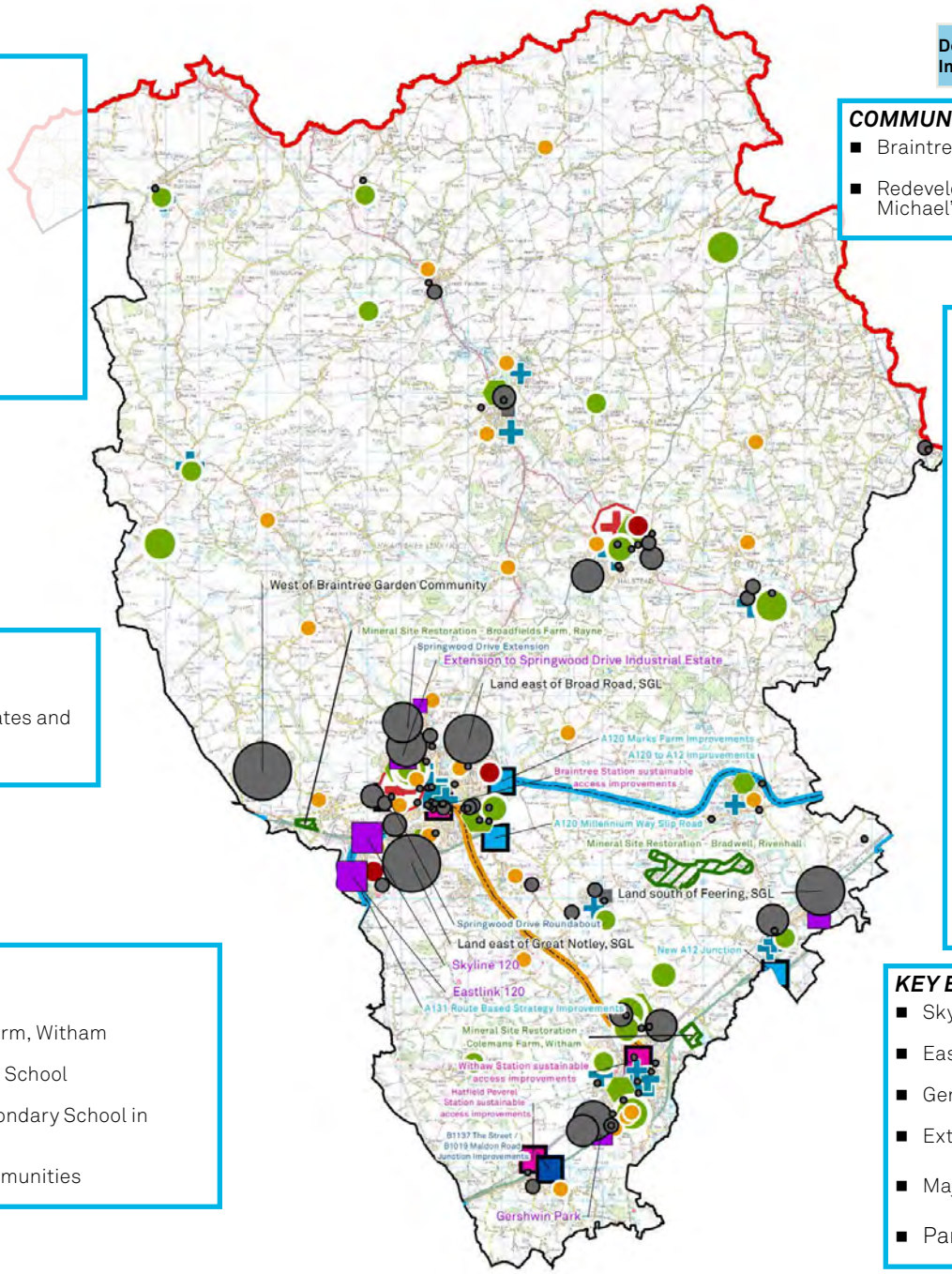
- Braintree Town Centre Regeneration
- Redevelopment of Braintree Community Hospital and St Michael's

TRANSPORT PROJECTS

- A12 Widening and technology improvements
- A120 Millennium Way slip roads
- A120 Galleys Corner iumprovements
- A120 Marks Farm improvements
- A120 Braintree to A12 improvements
- Braintree to Witham rail improvements
- Long term improvement - A12 New junction and bypass for Hatfield Peverel
- Springwood Drive Extension and Roundabout improvements
- Braintree, Witham and Hatfield Peverel Station sustainable access improvements
- Braintree Integrated Transport Package
- Braintree Town Centre improvements
- A131 Route Based Strategy improvements
- A1017 Braintree to Haverhill Route Based Strategy improvements

FLOOD DEFENCES

- Coggeshall and Kelvedon Flood Alleviation
- Halstead Mill Bypass - replacement of Mill Gates and new maintenance schedule



EDUCATION PROJECTS

- New 1FE Primary School at Halstead
- New 1FE Primary School at Lodge Farm, Witham
- 1FE expansion of Witham Secondary School
- 1FE expansion of undetermined Secondary School in Braintree
- New schools to support Garden Communities

KEY EMPLOYMENT SITES

- Skyline 120
- Eastlink 120, West of the A131
- Gershwin Park
- Extension to Eastways Industrial Estate, Witham
- Major Business Parks at both Garden Communities
- Panfield Lane Mixed-use Development

SUMMARY OF DEVELOPMENT & KEY LOCAL PROJECTS FOR BRAINTREE

Projects Note - Any regional or sub-regional Projects Listed above and affecting this local authority are not included in local costs and funding on facing page.

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

LOCAL PROJECTS

BRENTWOOD

2016 - 2036:

7,240
homes needed

14,400
new people **(+19%)**

7,270
homes planned

4,140
new jobs **(+10%)**

Refer to Section 3.2 for explanation of housing figures presented above

2016 CAPACITY ISSUES

- ***M25 junctions 28 and 29 Congestion***
- ***A12 peak time congestion approaching M25 Junction 28 and at Shenfield (Junction 12)***
- ***A127 substandard design for volume and strategic function***
- ***Overcrowding at Shenfield station in peak times***
- ***Brentwood town centre congestion (Wilsons Corner)***
- ***Localised primary school capacity issues exist around Brentwood urban area***
- ***Patients per GP is very high in NHS Basildon and Brentwood CCG***

Total Infrastructure Costs: **£195,140,000**

Total Secured Funding: **£ 0**

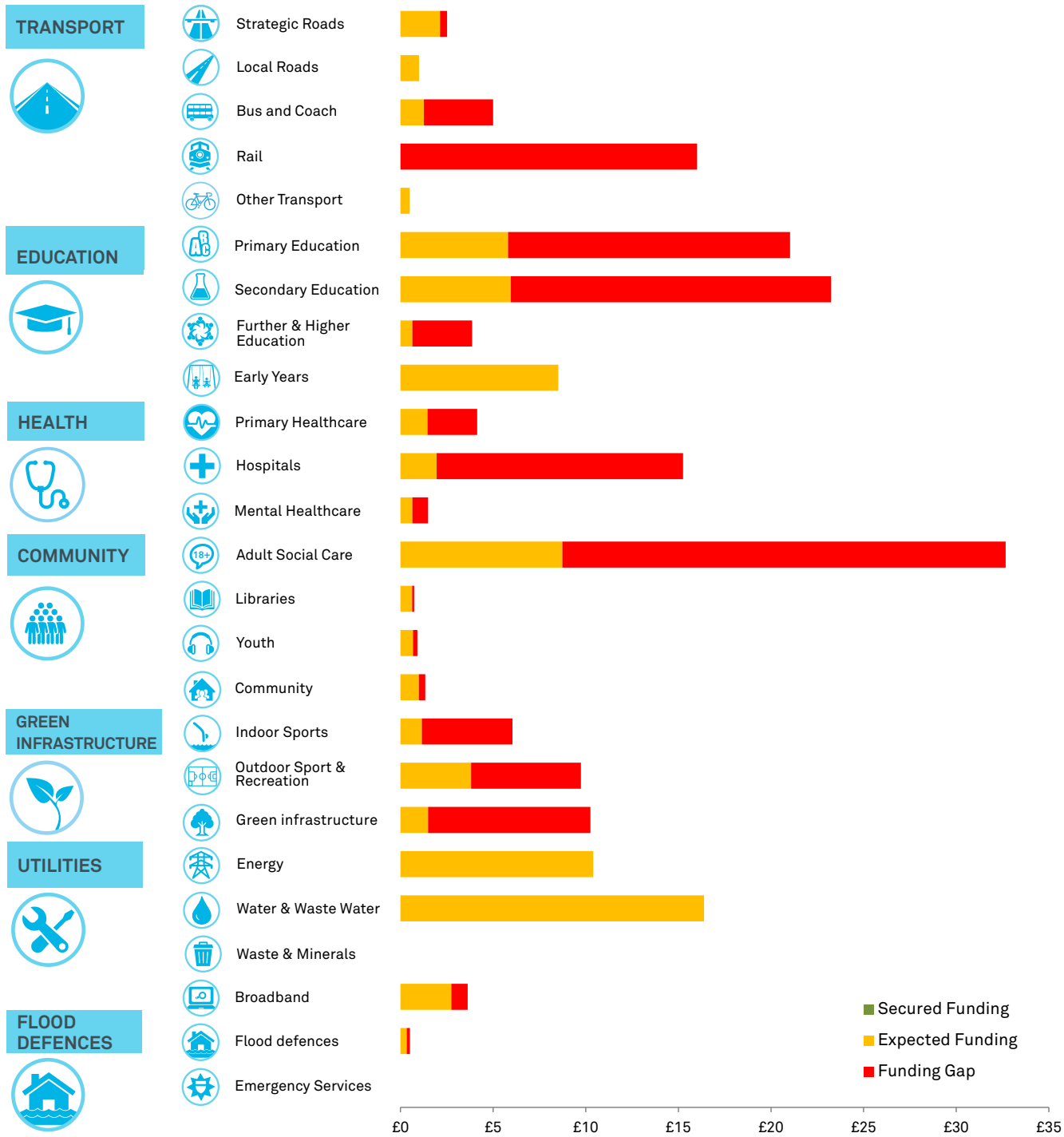
Total Expected Funding: **£77,190,000**

Total Funding Gap: **£117,950,000**

Funding as % of Costs: **40%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions

Projects Note - Any Regional or Sub Regional Projects Listed in Tables 5.3 and 5.4 and affecting this local authority are not included in costs and funding below



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)

Degree of Certainty on Growth and Infrastructure requirements	Known

FLOOD DEFENCES

- A12 and River Wid Flood Wall
- A12 Ingatestone bypass flood storage area
- Brentwood West Horndon SuDS retrofit
- Area Surrounding Brentwood Station SuDS retrofit

MAJOR HOUSING DEVELOPMENT

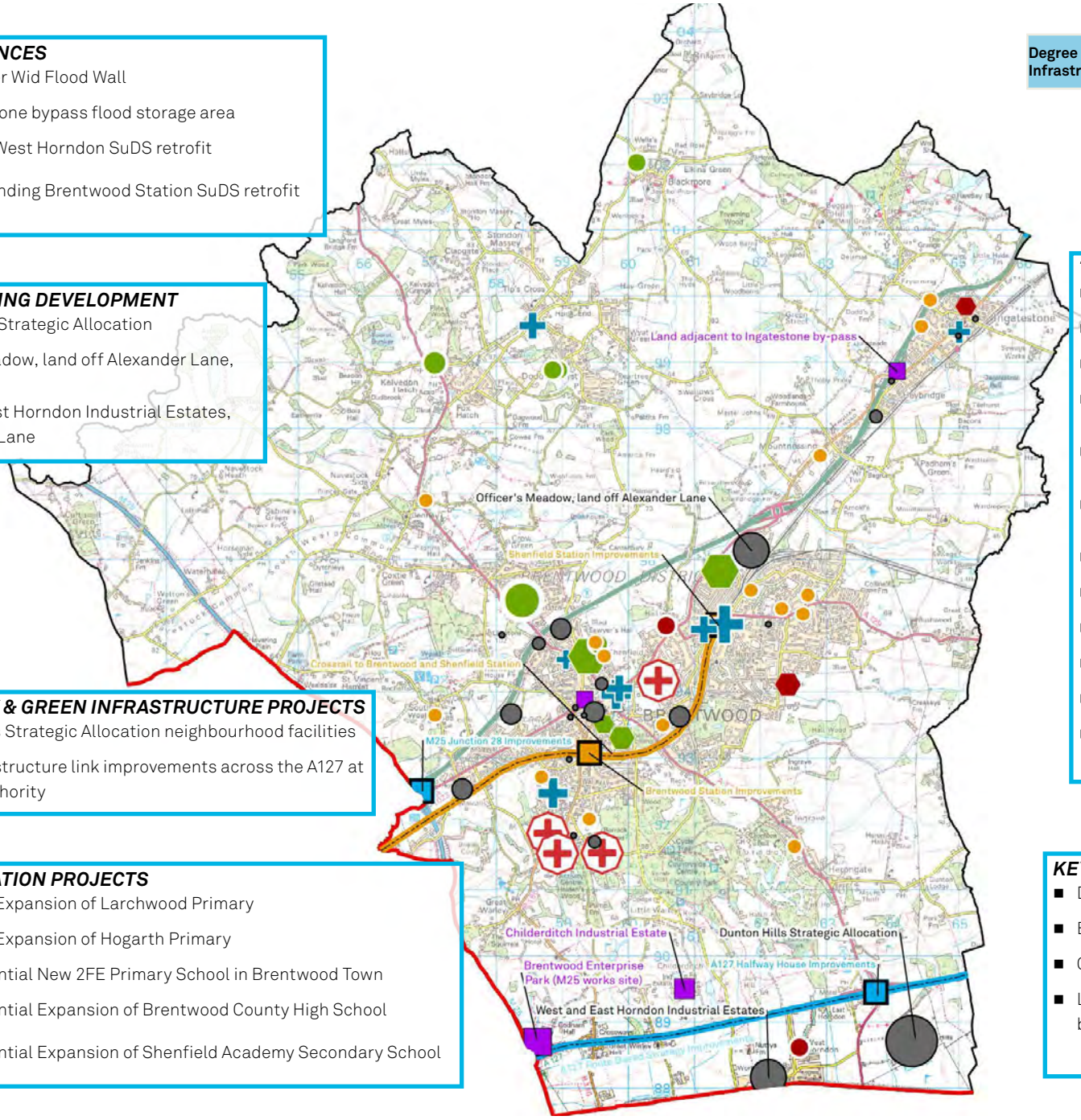
- Dunton Hills Strategic Allocation
- Officer's Meadow, land off Alexander Lane, Shenfield
- West and East Horndon Industrial Estates, Childerditch Lane

COMMUNITY & GREEN INFRASTRUCTURE PROJECTS

- Dunton Hills Strategic Allocation neighbourhood facilities
- Green Infrastructure link improvements across the A127 at south of authority

EDUCATION PROJECTS

- 1FE Expansion of Larchwood Primary
- 1FE Expansion of Hogarth Primary
- Potential New 2FE Primary School in Brentwood Town
- Potential Expansion of Brentwood County High School
- Potential Expansion of Shenfield Academy Secondary School



TRANSPORT PROJECTS

- A12 Widening and technology improvements
- M25 Junction 28 improvements
- Crossrail to Shenfield and Brentwood Stations
- Sustainable access improvements at Shenfield Station inc second entrance
- Sustainable access improvements at Brentwood Station
- Brentwood Public Transport Strategy and improvements
- A127 Corridor for Growth Route Based Strategy
- A127 Halfway House Junction improvements
- Brentwood Town Centre Masterplan
- Cycling Action Plan and improvements
- West Horndon Railway Station upgrades
- Sustainable transport corridors to / from Dunton Hills and Brentwood Enterprise Park

KEY EMPLOYMENT SITES

- Dunton Hills strategic allocation
- Brentwood Enterprise Park (M25 works site)
- Childerditch Industrial Estate
- Land adjacent to Ingatestone by-pass (part bounded by Roman Road)

SUMMARY OF DEVELOPMENT & KEY LOCAL PROJECTS FOR BRENTWOOD

Projects Note - Any regional or sub-regional Projects Listed above and affecting this local authority are not included in local costs and funding on facing page.

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

LOCAL PROJECTS

CASTLE POINT

2016 - 2036:

8,470
homes needed

8,800
new people **(+10%)**

2,000
homes planned

-200*
new jobs **(-1%)**

Refer to Section 3.2 for explanation of housing figures presented above

**as stated by EEFM whilst Local Plan estimates +2,000 additional jobs*

2016 CAPACITY ISSUES

- ***A127 sub-standard design for volume of traffic and strategic function***
- ***A127 / A130 Fairglen Interchange congestion***
- ***Transport access to Canvey Island constrained***
- ***Peak time congestion at Woodmans Arms: A129 Rayleigh Road / Daws Heath Road / Hart Road Double Mini Roundabout***
- ***Peak congestion at B1014 Somnes Avenue / Link Road***
- ***B1014 Canvey Road congestion***
- ***Access to Benfleet railway station from Canvey Island***
- ***Canvey Island flooding (6 point Plan)***
- ***Some localised primary school capacity issues***
- ***Patients per GP is high in NHS Castle Point and Rochford CCG with accessibility issues in West Canvey.***

Total Infrastructure Costs: **£588,270,000**

Total Secured Funding: **£0**

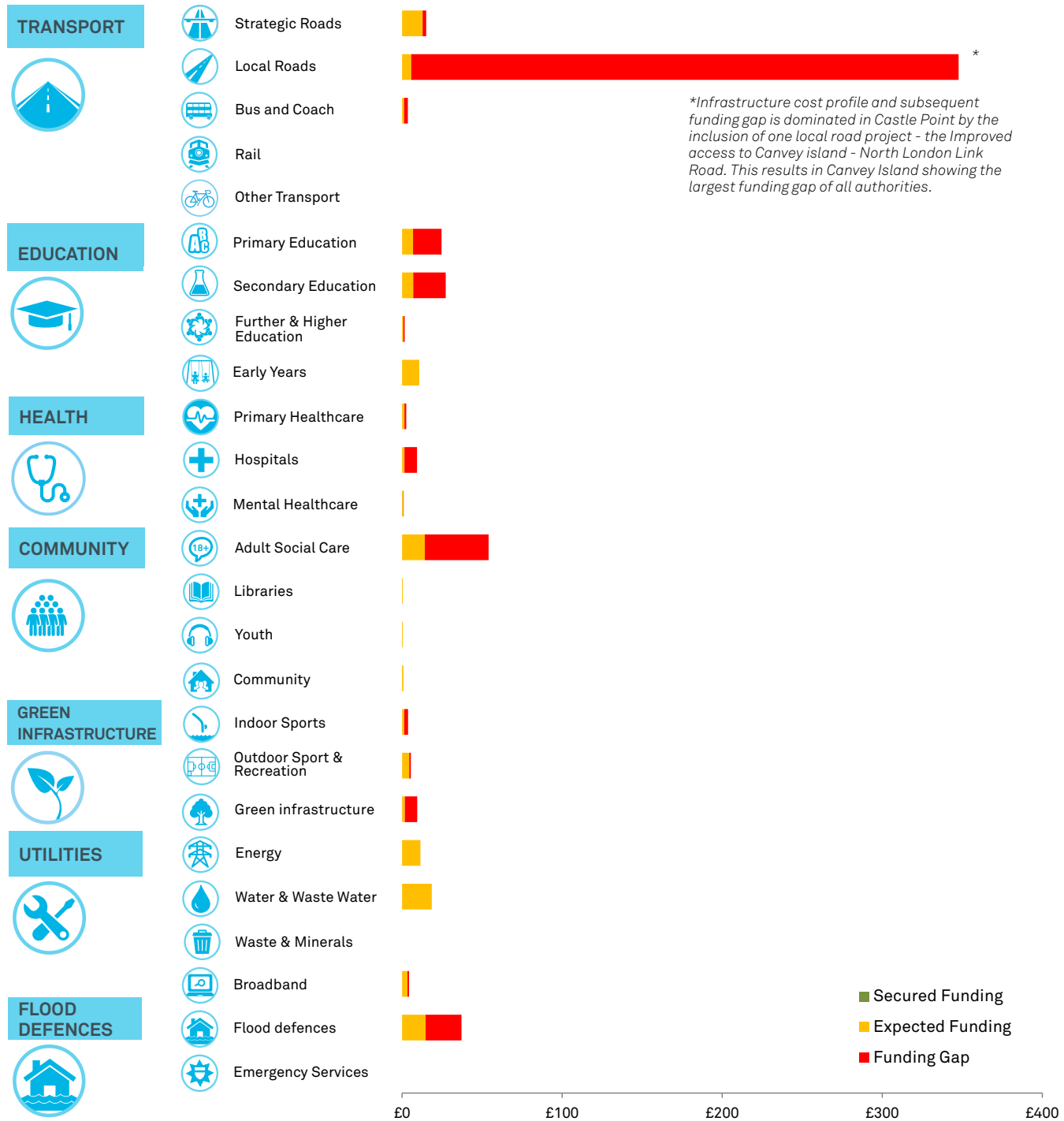
Total Expected Funding: **£119,440,000**

Total Funding Gap: **£468,830,000**

Funding as % of Costs: **20%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions

Projects Note - Any Regional or Sub Regional Projects Listed in Tables 5.3 and 5.4 and affecting this local authority are not included in costs and funding below



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)

EDUCATION PROJECTS

- Expansion of Northwick Park Primary School by 1FE
- Expansion of South Benfleet Primary School by 1FE
- 1FE expansion of Appleton Secondary School
- Potential 1FE expansion of King John Secondary School

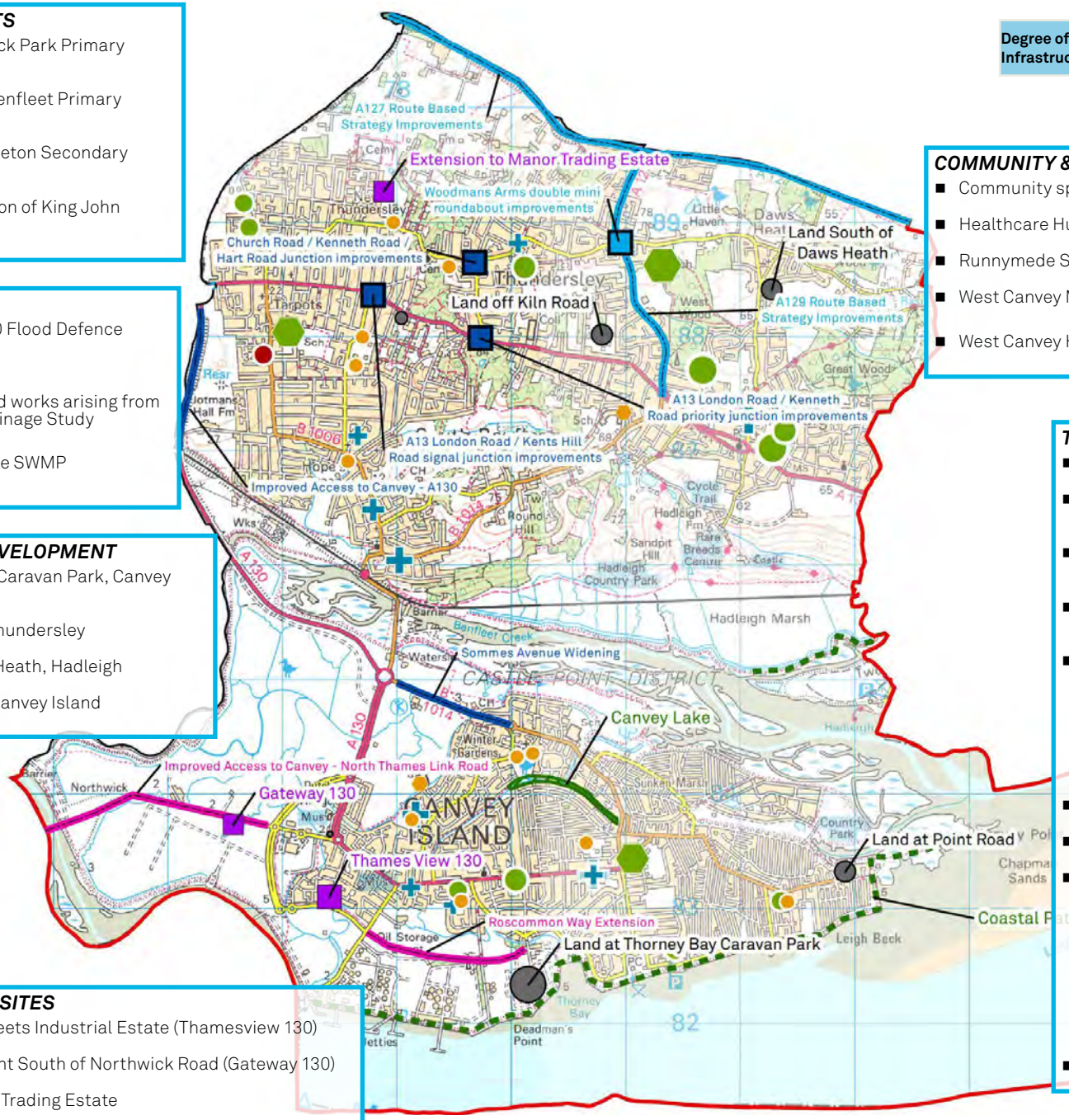
FLOOD DEFENCES

- Thames Estuary 2100 Flood Defence
- Canvey Six Point Plan
- Canvey Island IUD and works arising from Integrated Urban Drainage Study
- Works arising from the SWMP

MAJOR HOUSING DEVELOPMENT

- Land at Thorney Bay Caravan Park, Canvey Island
- Land off Kiln Road, Thundersley
- Land South of Daws Heath, Hadleigh
- Land at Point Road, Canvey Island

Degree of Certainty on Growth and Infrastructure requirements	Known



COMMUNITY & GREEN INFRASTRUCTURE PROJECTS

- Community sports hall within the Benfleet and Thundersley area
- Healthcare Hub & spoke model - Benfleet, Hadleigh, Thundersley
- Runnymede Swimming Pool
- West Canvey Marshes, Canvey Wick
- West Canvey Health Facility

TRANSPORT PROJECTS

- Roscommon Way Extension
- A13 London Road / Kents Hill Road signal junction improvement
- Minor junction improvements at both ends of Kenneth Road
- A13 London Road and Kenneth Road priority junction improvement
- Improved Access to Canvey:
  - A130 Access to Canvey
  - North Thames Link Road
  - Somnes Avenue widening
- Canvey Island Public Transport Strategy
- A127/A130 Fairglen Interchange improvements
- A129 and A127 Corridor for Growth Route Based Strategy improvements:
  - A127 Rayleigh Weir junction improvements
  - A127 Widening
  - A129 Rayleigh Road between Rayleigh Weir and Victoria House Corner improvements
- Castle Point Integrated Transport Package

KEY EMPLOYMENT SITES

- Extension to Charfleets Industrial Estate (Thamesview 130)
- Land for Employment South of Northwick Road (Gateway 130)
- Extension to Manor Trading Estate

SUMMARY OF DEVELOPMENT & KEY LOCAL PROJECTS FOR CASTLE POINT

Projects Note - Any regional or sub-regional Projects Listed above and affecting this local authority are not included in local costs and funding on facing page.

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

LOCAL PROJECTS

CHELMSFORD

2016 - 2036:

15,500 homes needed

23,700 new people **(+14%)**

19,320 homes planned

13,410 new jobs **(+13%)**

Refer to Section 3.2 for explanation of housing figures presented above

2016 CAPACITY ISSUES

- ***A12 peak time congestion and lack of alternative routes***
- ***City Centre network very close to capacity (96%)***
- ***Journey time reliability on Parkway and at Army and Navy***
- ***Journey time reliability on A414***
- ***Chelmsford Station overcrowding***
- ***Howe Green and Boreham A12 Junction peak congestion***
- ***Congestion contribution to AQMA***
- ***P&R peak hour capacity on buses***
- ***A131 Braintree to Chelmsford peak time congestion***
- ***Significant primary and secondary school capacity issues around Chelmsford urban area***
- ***Patients per GP is high***

Total Infrastructure Costs: **£546,170,000**

Total Secured Funding: **£30,250,000**

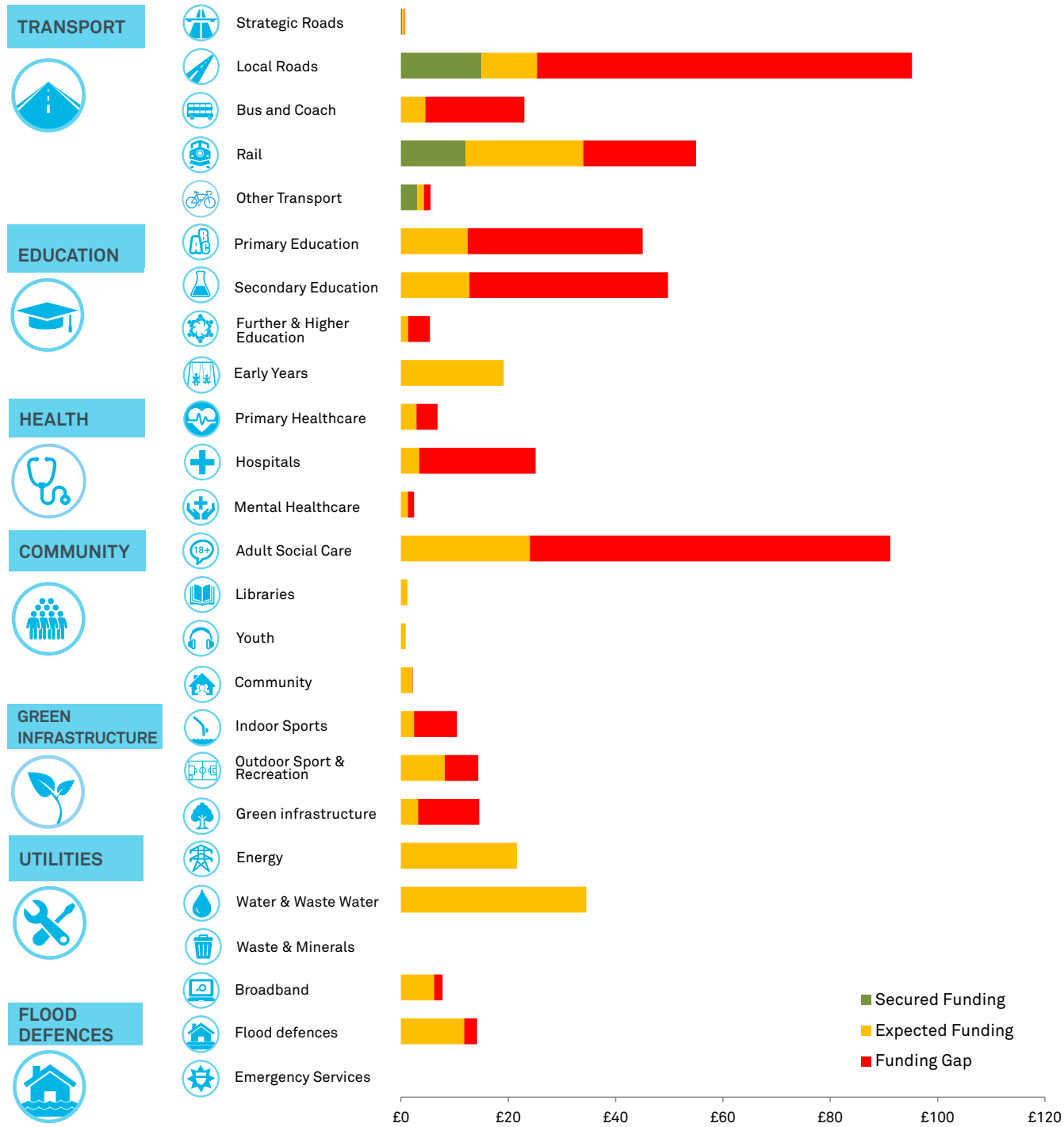
Total Expected Funding: **£208,110,000**

Total Funding Gap: **£307,810,000**

Funding as % of Costs: **44%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions

Projects Note - Any Regional or Sub Regional Projects Listed in Tables 5.3 and 5.4 and affecting this local authority are not included in costs and funding below



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)

MAJOR HOUSING DEVELOPMENT

- Beaulieu
- Channels
- Runwell Hospital
- Chelmer Waterside
- City Park West
- Essex Riverside
- Marconi Evolution

Post 2021 Significant further housing expected in urban and central Chelmsford, North and South Chelmsford.

COMMUNITY & GREEN INFRASTRUCTURE PROJECTS

- Redevelopment of Riverside Ice and Leisure Centre
- New Neighbourhood Centre and joint use sports centre at Beaulieu Park
- Potential new and redeveloped primary and community health facilities to support local growth

Post 2021, a range of new and improved social, cultural, recreational and community facilities.

Degree of Certainty on Growth and Infrastructure requirements		Partial

FLOOD DEFENCES

- Chelmsford Flood Alleviation Scheme
- Blenheim Close attenuation area

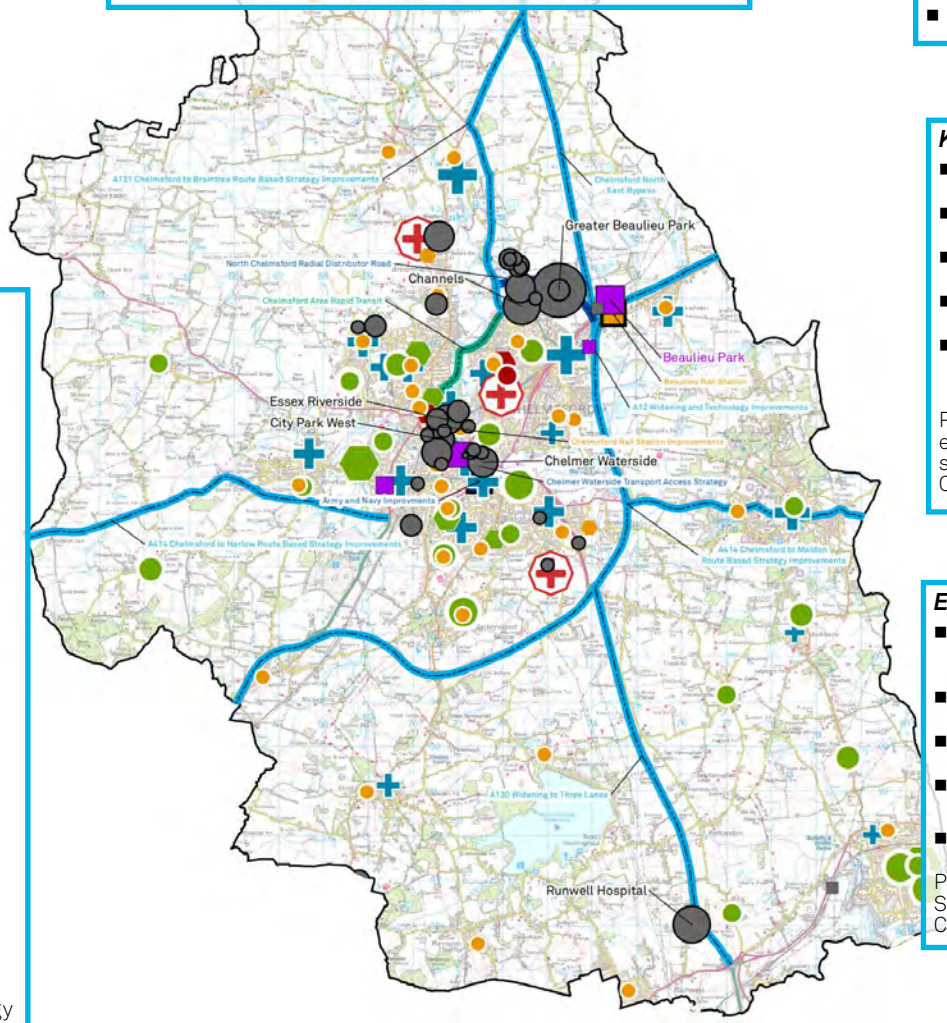
KEY EMPLOYMENT SITES

- Beaulieu Business Park
- Former Britvic Site
- Essex Regiment Way
- Springfield Business Park
- Chelmsford Office and Tech Park, West Hanningfield Road, Great Baddow

Post 2021, significant new employment development expected to be focused in urban, central, north and south Chelmsford including Anglia Ruskin Medtech Campus.

TRANSPORT PROJECTS

- A12 widening and technology improvements
- A12 Jct 17 improvement (Howe Green)
- A130 Rettendon to A12 three lane widening
- Chelmsford North East By-pass
- Chelmsford Area Rapid Transit
- Chelmsford City Growth Package
- A414 Route Based Strategy improvements
- Chelmsford Public Realm improvements
- Chelmsford Station improvements
- Beaulieu Park Rail Station
- Third Park and Ride and Parking strategy
- Cycle Network Improvements
- North Chelmsford radial distributor road
- Chelmer Waterside Transport Access Strategy
- Army and Navy improvements
- A131 Chelmsford to Braintree Route Based Strategy



EDUCATION PROJECTS

- 3 New 2FE Primary Schools at Greater Beaulieu Park as well as 3 early years and childcare facilities
- 1 new 2FE Primary School at Channels
- Expansion of Great Leighs Primary School
- Expansion of Springfield Primary School
- New 8FE Beaulieu Park Secondary

Post 2021, expansion of Chelmer Valley Secondary School, potential new 4FE Secondary School in Chelmsford and further early years provision.

Projects Note - Any regional or sub-regional Projects Listed above and affecting this local authority are not included in local costs and funding on facing page.

SUMMARY OF DEVELOPMENT & KEY LOCAL PROJECTS FOR CHELMSFORD

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

LOCAL PROJECTS

COLCHESTER

2016 - 2036:

18,400
homes needed

33,500
new people **(+18%)**

18,400
homes planned

18,560*
new jobs **(+19%)**

Refer to Section 3.2 for explanation of housing figures presented above
**EEFM data estimates +12,470 additional jobs*

2016 CAPACITY ISSUES

- ***Peak time congestion on A12 and A120***
- ***Peak time congestion on urban roads and junctions including Colne Bank roundabout, A134 Balkerne Hilland on Southway through town***
- ***Access to Colchester railway station by sustainable modes limited/compromised***
- ***Localised primary and secondary school capacity issues around major growth area of Colchester***
- ***Patients per GP is high across authority***
- ***Acute hospitals operating near capacity (93%)". For the last year, Colchester hospital has operated at over 98% capacity resulting in significant deterioration in performance.***
- ***Lack of brownfield land leading to need for garden community***
- ***High concentration of social care facilities around Colchester***

Total Infrastructure Costs: **£554,520,000**

Total Secured Funding: **£13,170,000**

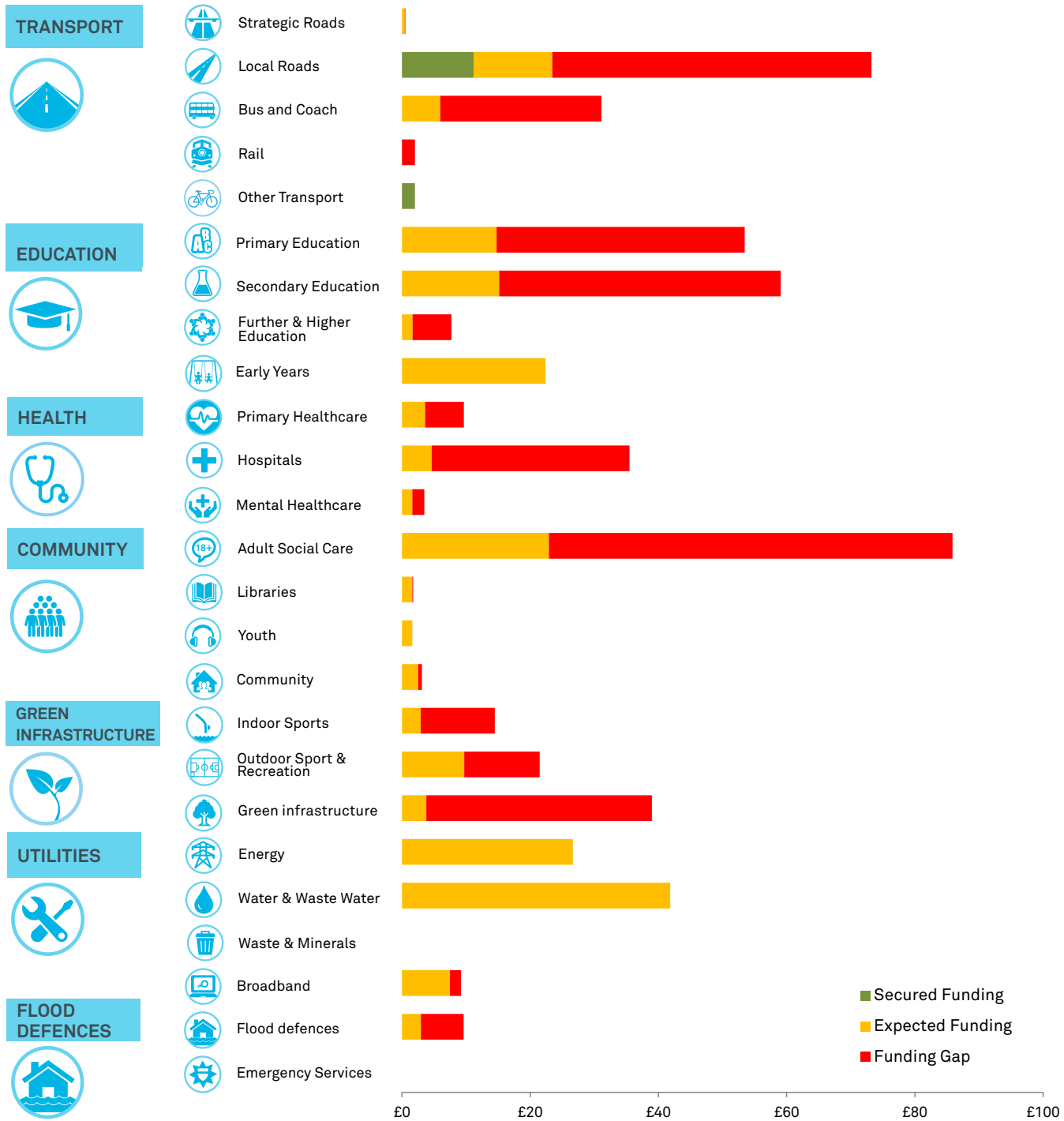
Total Expected Funding: **£206,320,000**

Total Funding Gap: **£335,030,000**

Funding as % of Costs: **40%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions

Projects Note - Any Regional or Sub Regional Projects Listed in Tables 5.3 and 5.4 and affecting this local authority are not included in costs and funding below



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)

Degree of Certainty on Growth and Infrastructure requirements	Partial

MAJOR HOUSING DEVELOPMENT

- West of Colchester Garden Community
- East of Colchester Garden Community
- Northern Growth Area Urban Extension (NGAUE)
- MOD Land Middlewick Ranges
- Former Severalls Hospital site
- East Colchester (Colne Harbour)
- Garrison

EDUCATION PROJECTS

- New 2FE Primary School part of Severalls Hospital Development
- New 1FE to 2 FE Primary School at Lakelands
- 2FE Secondary School expansion at Stanway
- Potential for new 8FE Secondary School in NGAUE
- New schools to support Garden Communities

KEY EMPLOYMENT SITES

- University Research Park/ Knowledge Gateway
- Whitehall Industrial Estate
- Stanway Strategic Economic Area
- Colchester Northern Gateway
- Colchester Business Park
- West of Colchester Garden Community
- East of Colchester Garden Community
- Town Centre

TRANSPORT PROJECTS

- A12 Widening and technology improvements
- A12 Eight Ash Green Junction improvements
- Colchester Town Centre Traffic and Access Package
- Colne Bank Avenue widening and roundabout improvements
- Northern Approach Road Phase Two Rapid Transit Route
- Colchester North Station Forecourt improvements
- A120 to A133 Link road as part of new Garden Community
- Stanway Phase Two Bypass
- East Transit Route 'Bus Rapid Transit'

FLOOD DEFENCES

- SuDS infrastructure in Colchester urban area
- The Hythe attenuation and swale to collect overland flows
- Distillery Pond outlet upgrades, Old Heath area

COMMUNITY & GREEN INFRASTRUCTURE PROJECTS

- Colchester Orbital (Green links)
- North Gateway social infrastructure including sports and expansion of healthcare surgeries in Stanway
- New Primary Care Hub to support East of Colchester Garden Community and University population increase

SUMMARY OF DEVELOPMENT & KEY LOCAL PROJECTS FOR COLCHESTER

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

Projects Note - Any regional or sub-regional Projects Listed above and affecting this local authority are not included in local costs and funding on facing page.

LOCAL PROJECTS

EPPING FOREST DISTRICT

2016 - 2036:

10,280
homes needed

27,600
new people **(+21%)**

12,780
homes planned

1,670
new jobs **(+3%)**

Refer to Section 3.2 for explanation of housing figures presented above

2016 CAPACITY ISSUES

- ***Peak period capacity on Central Line to/from London***
- ***Peak time congestion into London on M11***
- ***Epping town centre congestion***
- ***Some localised capacity issues with primary and secondary school places within the district***
- ***Patients per GP is high across authority***

Total Infrastructure Costs: **£313,200,000**

Total Secured Funding: **£ 0**

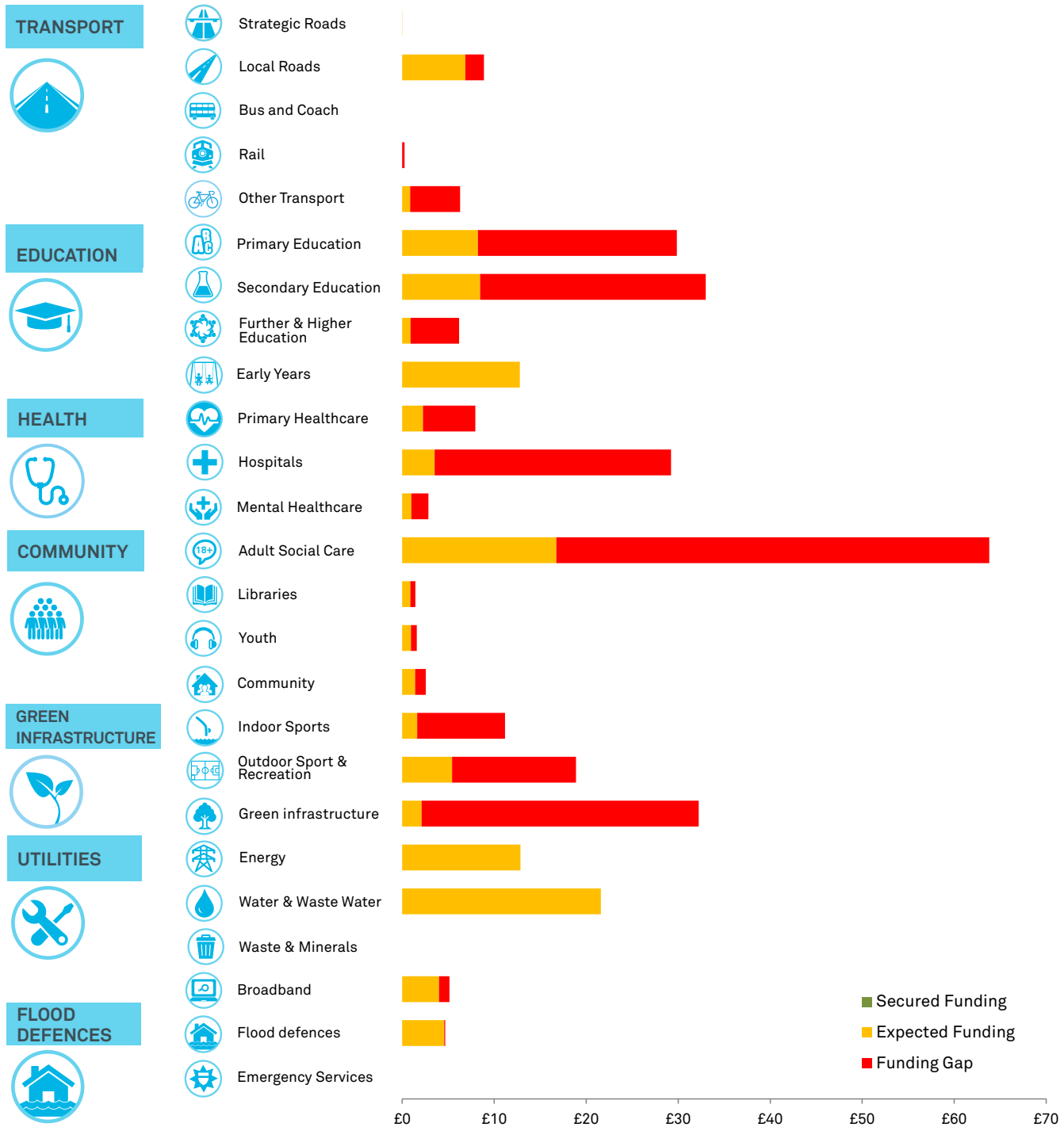
Total Expected Funding: **£ 117,060,000**

Total Funding Gap: **£196,130,000**

Funding as % of Costs: **37%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions

Projects Note - Any Regional or Sub Regional Projects Listed in Tables 5.3 and 5.4 and affecting this local authority are not included in costs and funding below



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)

EDUCATION PROJECTS

- Expansion of White Bridge Primary School, Loughton by 1FE
- Expansion of St Andrews CE by 0.5FE
- Expansion or New Secondary School in Loughton
- Expansion of West Hatch / Debden Park Secondary School, Loughton by 2FE
- New Free School Secondary at Ongar

TRANSPORT PROJECTS

- Central Line capacity upgrades and rolling stock
- M11 junctions 7 and 7a improvements
- M25 junction 26 improvement
- Loughton, Epping, Theydon Bois and Debden stations sustainable access package
- Epping-Ongar Railway Integration (for leisure use only)
- High Road, Loughton Phase 4 public realm improvements

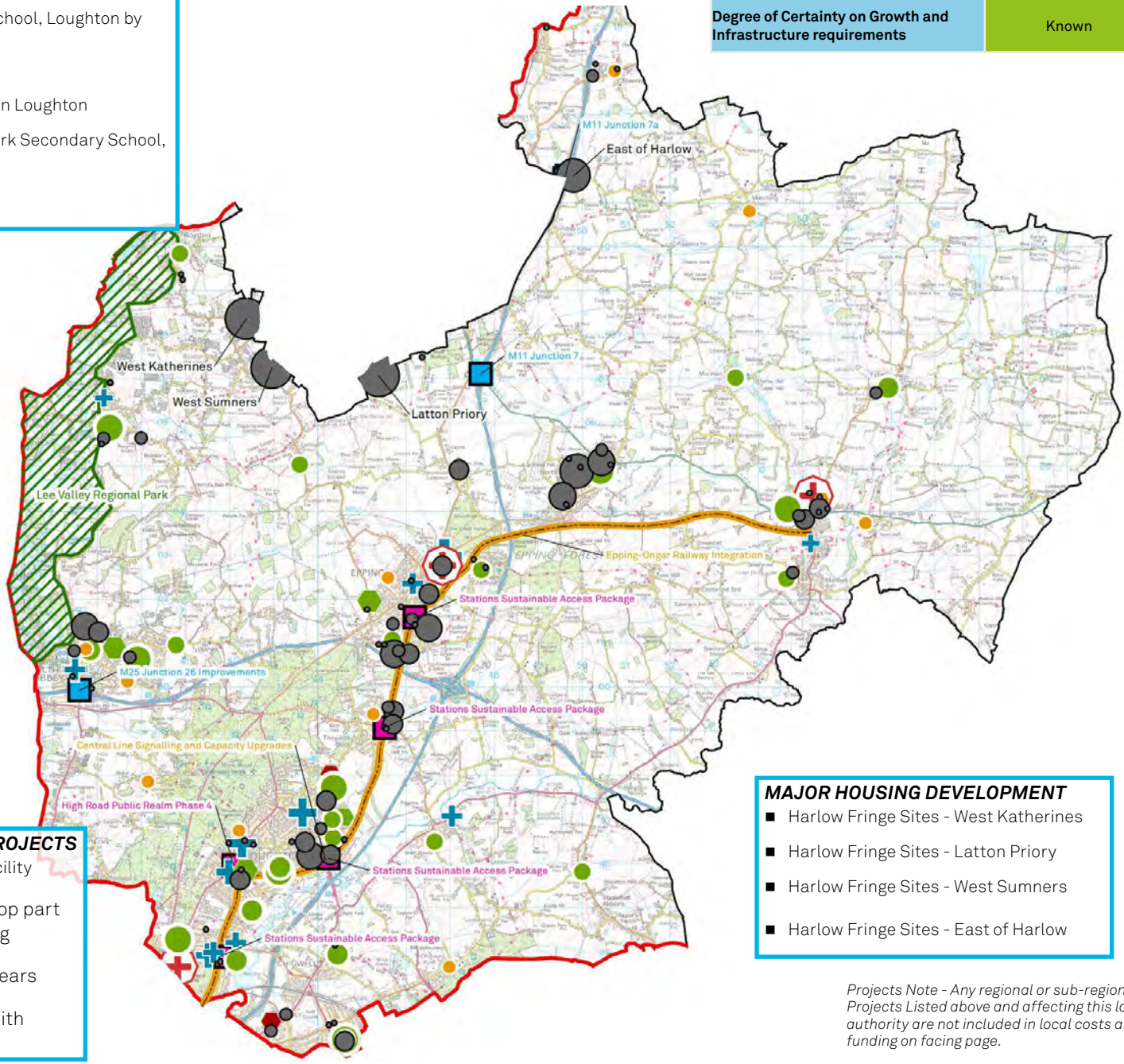
FLOOD DEFENCES

- Shonks Mill Flood Alleviation Scheme
- Nazeing Flood Alleviation Scheme
- Sustainable drainage arising from Loughton Surface Water Management Plan

COMMUNITY & GREEN INFRASTRUCTURE PROJECTS

- Hill House - Potential Care, health and leisure facility
- ST Margaret's Hospital – seeking to redevelop part of the site and release some land for housing
- Reproviding some health facilities over 5+ years
- Waltham Abbey – new Health facility joint with leisure

Degree of Certainty on Growth and Infrastructure requirements	Known



MAJOR HOUSING DEVELOPMENT

- Harlow Fringe Sites - West Katherines
- Harlow Fringe Sites - Latton Priory
- Harlow Fringe Sites - West Sumners
- Harlow Fringe Sites - East of Harlow

Projects Note - Any regional or sub-regional Projects Listed above and affecting this local authority are not included in local costs and funding on facing page.

SUMMARY OF DEVELOPMENT & KEY LOCAL PROJECTS FOR EPPING FOREST DISTRICT

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

LOCAL PROJECTS

HARLOW

2016 - 2036:

5,360
homes needed

14,800
new people **(+17%)**

7,770
homes planned

2,340
new jobs **(+6%)**

Refer to Section 3.2 for explanation of housing figures presented above

2016 CAPACITY ISSUES

- ***M11 Junction 7 congestion***
- ***Harlow town centre congestion (First Avenue)***
- ***A414 corridor peak time congestion***
- ***Peak time congestion into London on M11***
- ***Bus service quality, connections to employment areas and London Stansted Airport***
- ***Some localised capacity issues related to primary schools***
- ***Patients per GP is high across West Essex CCG***
- ***Acute hospitals operating near capacity (96%) in Princess Alexandra Hospital NHS Trust***
- ***Limited land to deliver required housing to support economic growth***
- ***Harlow Enterprise Zone has significant additional power needs and also new water supply requirements***

Total Infrastructure Costs: **£280,560,000**

Total Secured Funding: **£12,200,000**

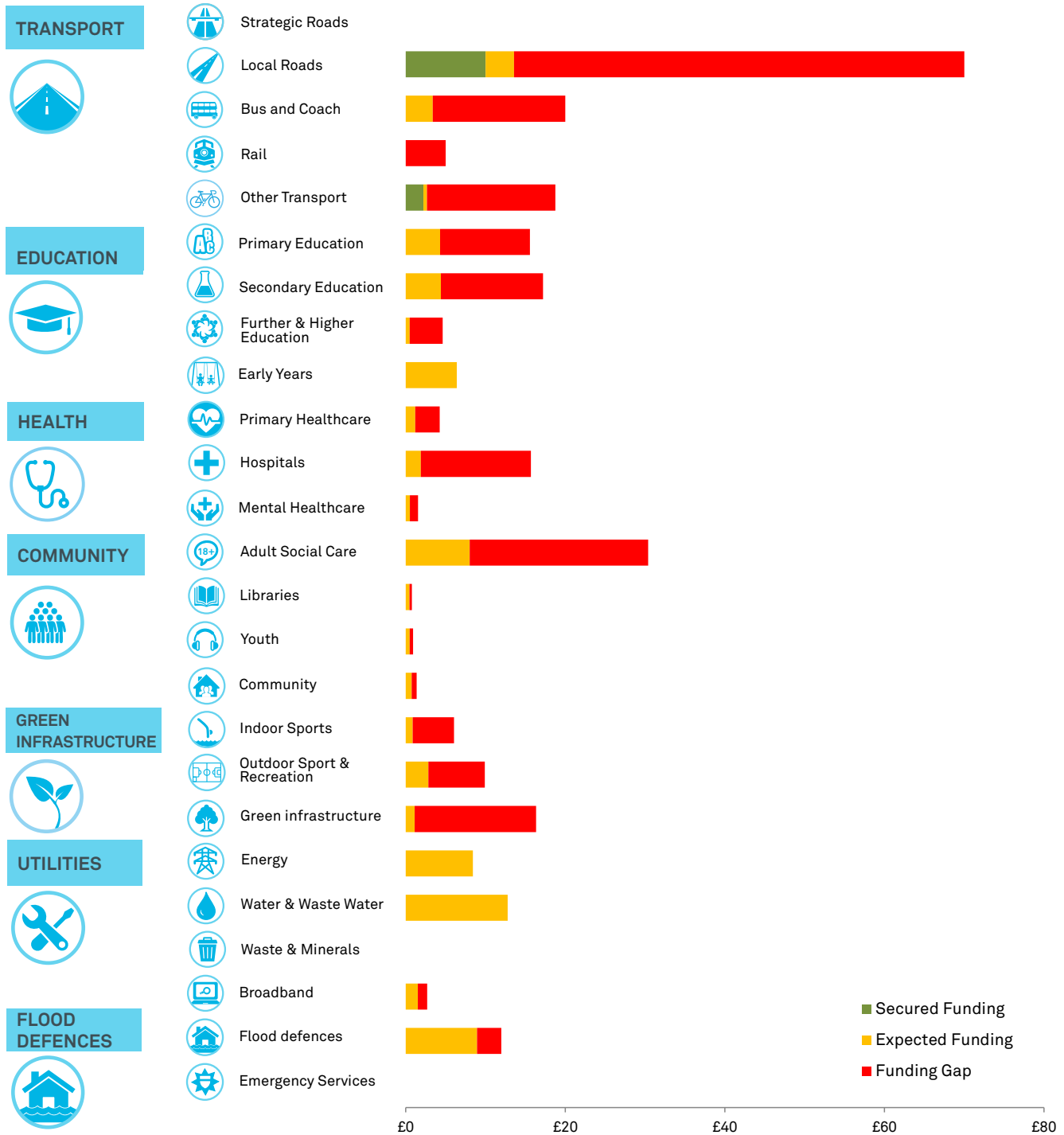
Total Expected Funding: **£72,680,000**

Total Funding Gap: **£195,680,000**

Funding as % of Costs: **30%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions

Projects Note - Any Regional or Sub Regional Projects Listed in Tables 5.3 and 5.4 and affecting this local authority are not included in costs and funding below



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)

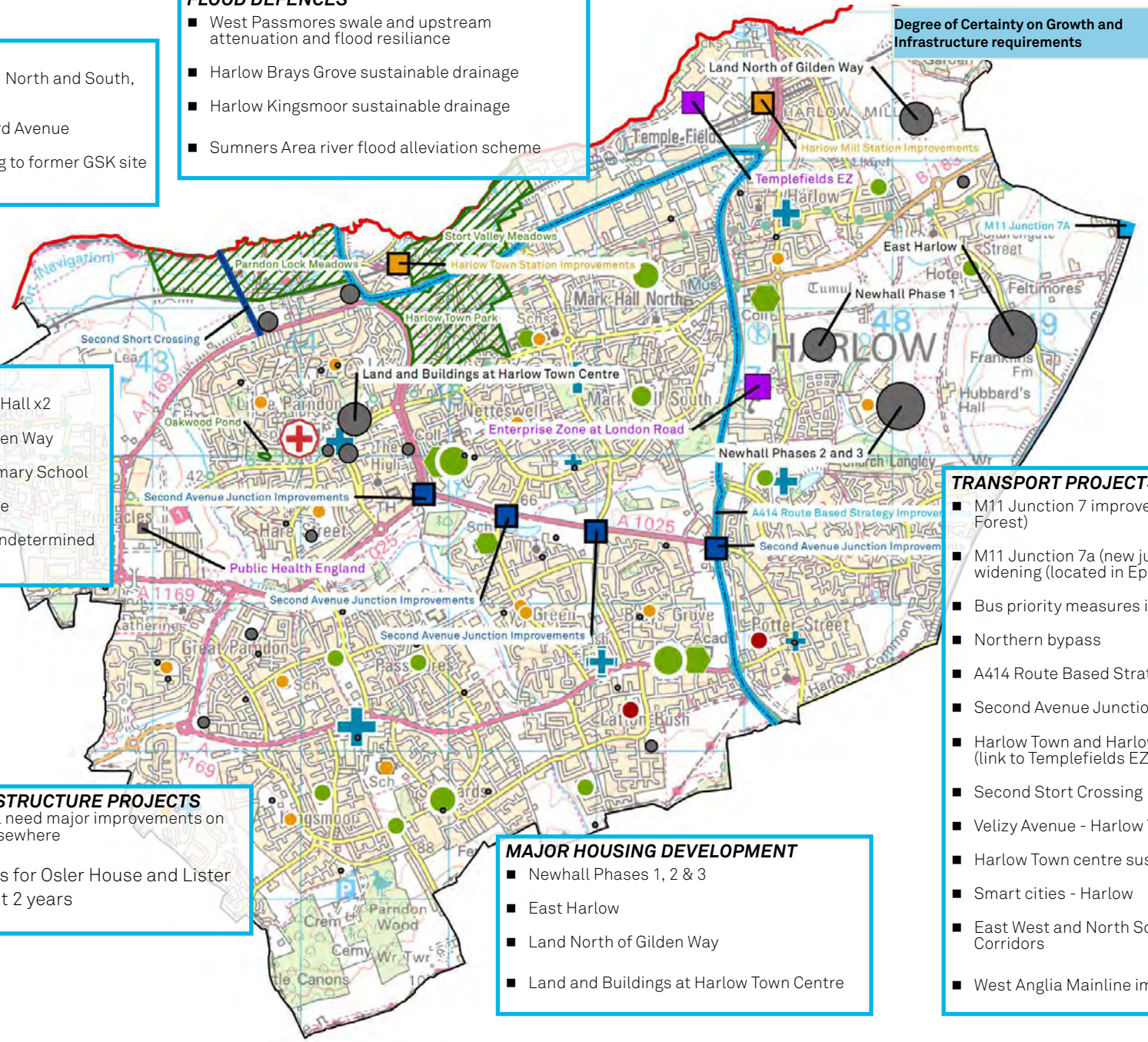
KEY EMPLOYMENT SITES

- Enterprise Zone at London Road North and South, and Templefields
- Glaxosmithkline South Site, Third Avenue
- Public Health England relocating to former GSK site (northern part only)

FLOOD DEFENCES

- West Passmores swale and upstream attenuation and flood resiliance
- Harlow Brays Grove sustainable drainage
- Harlow Kingsmoor sustainable drainage
- Sumners Area river flood alleviation scheme

Degree of Certainty on Growth and Infrastructure requirements	Known



EDUCATION PROJECTS

- New 2FE Primary School at NewHall x2
- New 2 FE Primary School at Gilden Way
- 1FE Expansion of Longwood Primary School
- New Secondary at Passmore Site
- New 4FE Secondary School at undetermined location

TRANSPORT PROJECTS

- M11 Junction 7 improvements (located in Epping Forest)
- M11 Junction 7a (new junction) and Gilden Way widening (located in Epping Forest)
- Bus priority measures in Harlow
- Northern bypass
- A414 Route Based Strategy improvements
- Second Avenue Junction improvements
- Harlow Town and Harlow Mill station improvements (link to Templefields EZ Site)
- Second Stort Crossing
- Velizy Avenue - Harlow Town centre improvements
- Harlow Town centre sustainable transport package
- Smart cities - Harlow
- East West and North South Sustainable Transport Corridors
- West Anglia Mainline improvements

COMMUNITY & GREEN INFRASTRUCTURE PROJECTS

- Princess Alexandra Hospital will need major improvements on its existing site or reprovision elsewhere
- Replacement Health facilities for Osler House and Lister House surgeries – within next 2 years

MAJOR HOUSING DEVELOPMENT

- Newhall Phases 1, 2 & 3
- East Harlow
- Land North of Gilden Way
- Land and Buildings at Harlow Town Centre

SUMMARY OF DEVELOPMENT & KEY LOCAL PROJECTS FOR HARLOW

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

Projects Note - Any regional or sub-regional Projects Listed above and affecting this local authority are not included in local costs and funding on facing page.

LOCAL PROJECTS

MALDON

2016 - 2036:

6,200
homes needed

6,700
new people **(+11%)**

4,900
homes planned

1,960
new jobs **(+8%)**

Refer to Section 3.2 for explanation of housing figures presented above

2016 CAPACITY ISSUES

- ***Journey time reliability on A414 corridor between Chelmsford and Maldon***
- ***Lack of public transport serving some villages and towns***
- ***Capacity issues at some early years and childcare facilities, primary and secondary schools***
- ***Patients per GP is high across NHS Mid Essex CCG***

Total Infrastructure Costs: **£200,880,000**

Total Secured Funding: **£ 0**

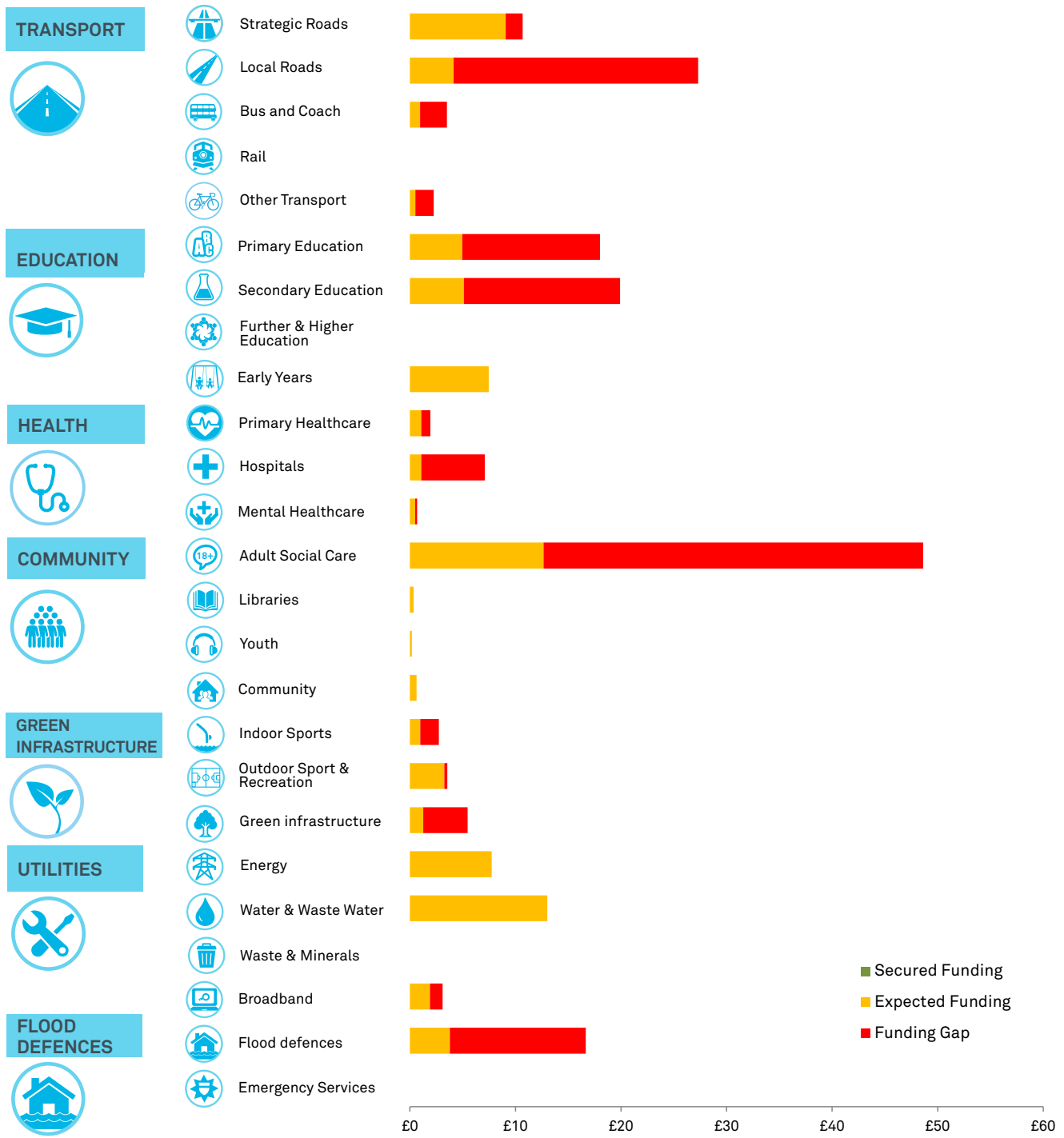
Total Expected Funding: **£ 80,650,000**

Total Funding Gap: **£ 120,240,000**

Funding as % of Costs: **40%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions

Projects Note - Any Regional or Sub Regional Projects Listed in Tables 5.3 and 5.4 and affecting this local authority are not included in costs and funding below



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)

KEY EMPLOYMENT SITES

- Regeneration of the Causeway, Maldon/Heybridge
- Extension to Burnham Business Park
- South of Limebrook Way
- Wycke Hill South and North
- Potential significant future employment associated with Bradwell B Nuclear Power Plant - status unconfirmed.

MAJOR HOUSING DEVELOPMENT

- North Heybridge Garden Suburb
- South Maldon Garden Suburb
- Burnham-on-Crouch Strategic Allocations

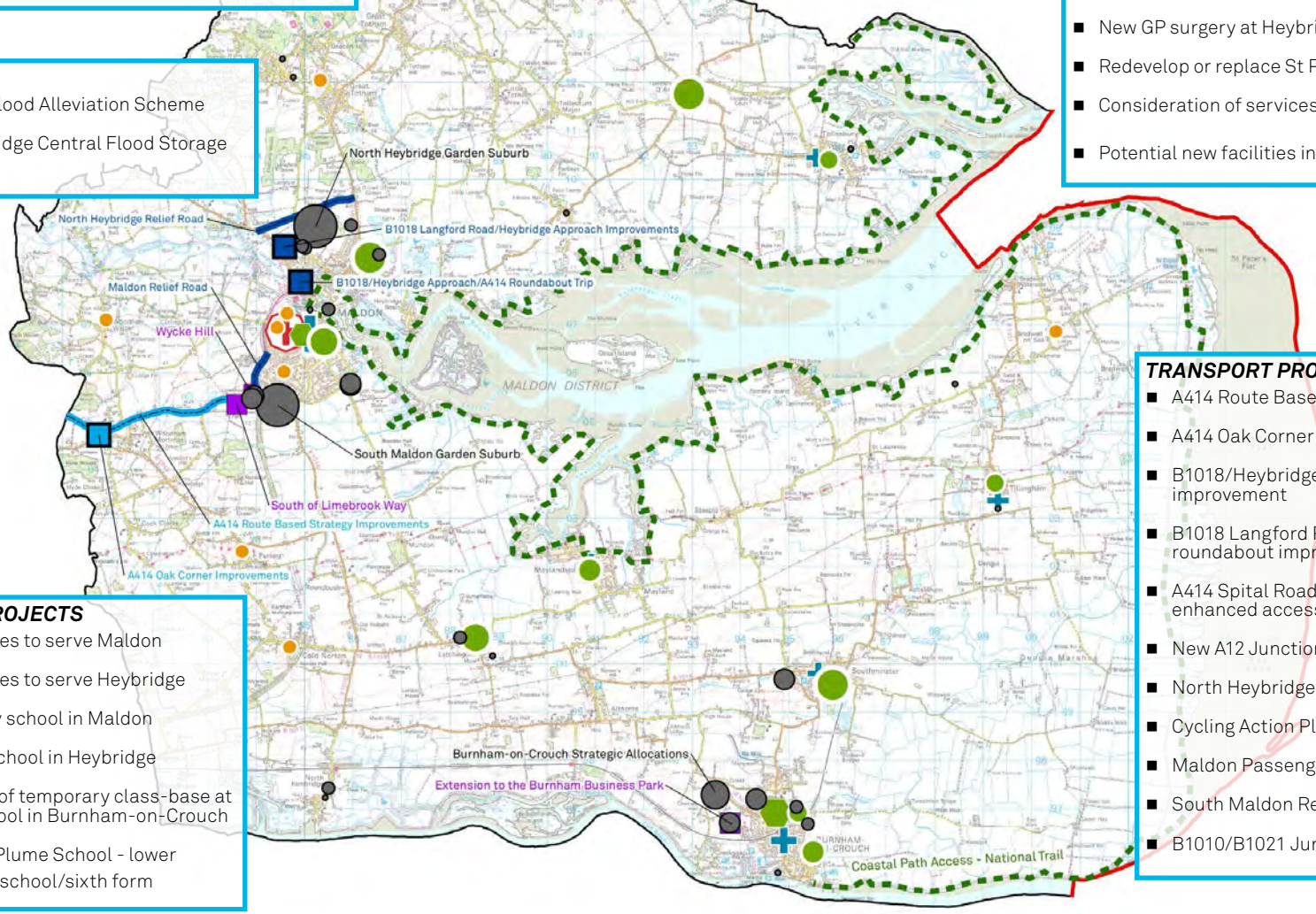
Degree of Certainty on Growth and Infrastructure requirements	Known

COMMUNITY & GREEN INFRASTRUCTURE PROJECTS

- Coastal Path project and associated Cycle Network
- New GP surgery at Heybridge Garden Suburb
- Redevelop or replace St Peter's Community Hospital
- Consideration of services on the Dengie
- Potential new facilities in South Woodham Ferrers

FLOOD DEFENCES

- North Heybridge Flood Alleviation Scheme
- Maldon and Heybridge Central Flood Storage Areas'



TRANSPORT PROJECTS

- A414 Route Based Strategy improvements
- A414 Oak Corner Junction improvement
- B1018/Heybridge Approach/ A414 roundabout improvement
- B1018 Langford Rd/Heybridge Approach roundabout improvement
- A414 Spital Road roundabout improvements and enhanced access to Maldon
- New A12 Junction
- North Heybridge Relief Road
- Cycling Action Plan
- Maldon Passenger Transport improvements
- South Maldon Relief Road
- B1010/B1021 Junction, Burnham-on-Crouch

EDUCATION PROJECTS

- 2 EY&C facilities to serve Maldon
- 2 EY&C facilities to serve Heybridge
- 1.5 FE primary school in Maldon
- 1FE primary school in Heybridge
- Replacement of temporary class-base at St Mary's School in Burnham-on-Crouch
- Expansion of Plume School - lower school, upper school/sixth form

SUMMARY OF DEVELOPMENT & KEY LOCAL PROJECTS FOR MALDON

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

Projects Note - Any regional or sub-regional Projects Listed above and affecting this local authority are not included in local costs and funding on facing page.

LOCAL PROJECTS

ROCHFORD

2016 - 2036:

7,990
homes needed

9,400
new people (**+11%**)

3,150
homes planned

1,200
new jobs (**+4%**)

Refer to Section 3.2 for explanation of housing figures presented above

2016 CAPACITY ISSUES

- ***Access to London Southend Airport constrained and not legible***
- ***Congestion in and around Rochford, Rayleigh and Hockley town centres***
- ***A127/A130 Fairglen Interchange congestion***
- ***Congestion on approaches to A127 corridor***
- ***Poor sustainable transport links to Southend Airport***
- ***Poor connectivity East-West across district***
- ***Poor sustainable transport links to RSPB Wallasea Island***
- ***Rayleigh Air Quality Management Area (AQMA)***
- ***Some localised school capacity issues related to primary schools in the west of the local authority***
- ***Patients per GP is high across the local authority***
- ***Relatively high acute and mental illness bed capacity across the local authority 88% and 94%, respectively***

Total Infrastructure Costs: **£209,450,000**

Total Secured Funding: **£9,840,000**

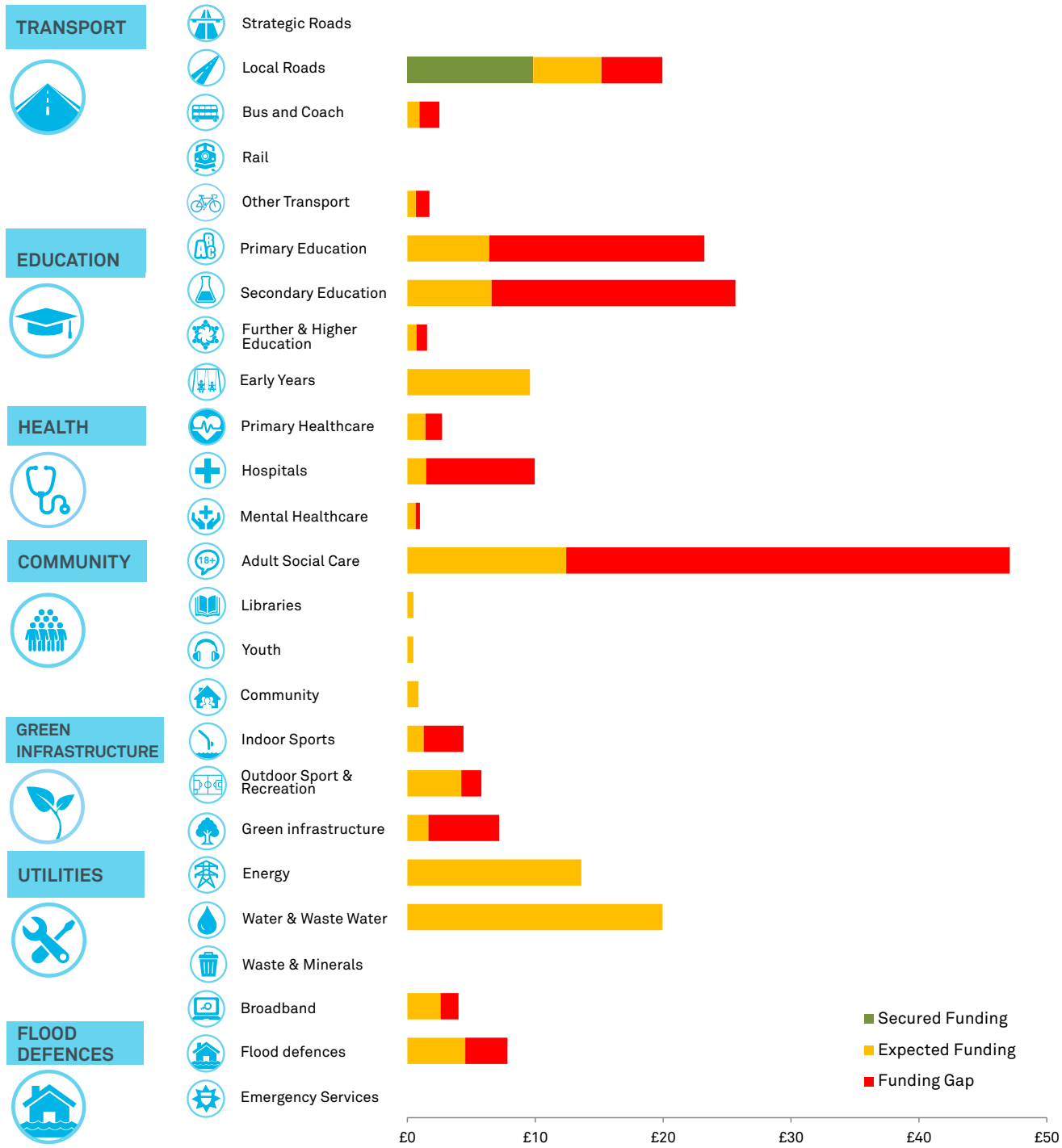
Total Expected Funding: **£95,760,000**

Total Funding Gap: **£103,850,000**

Funding as % of Costs: **50%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions

Projects Note - Any Regional or Sub Regional Projects Listed in Tables 5.3 and 5.4 and affecting this local authority are not included in costs and funding below



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)

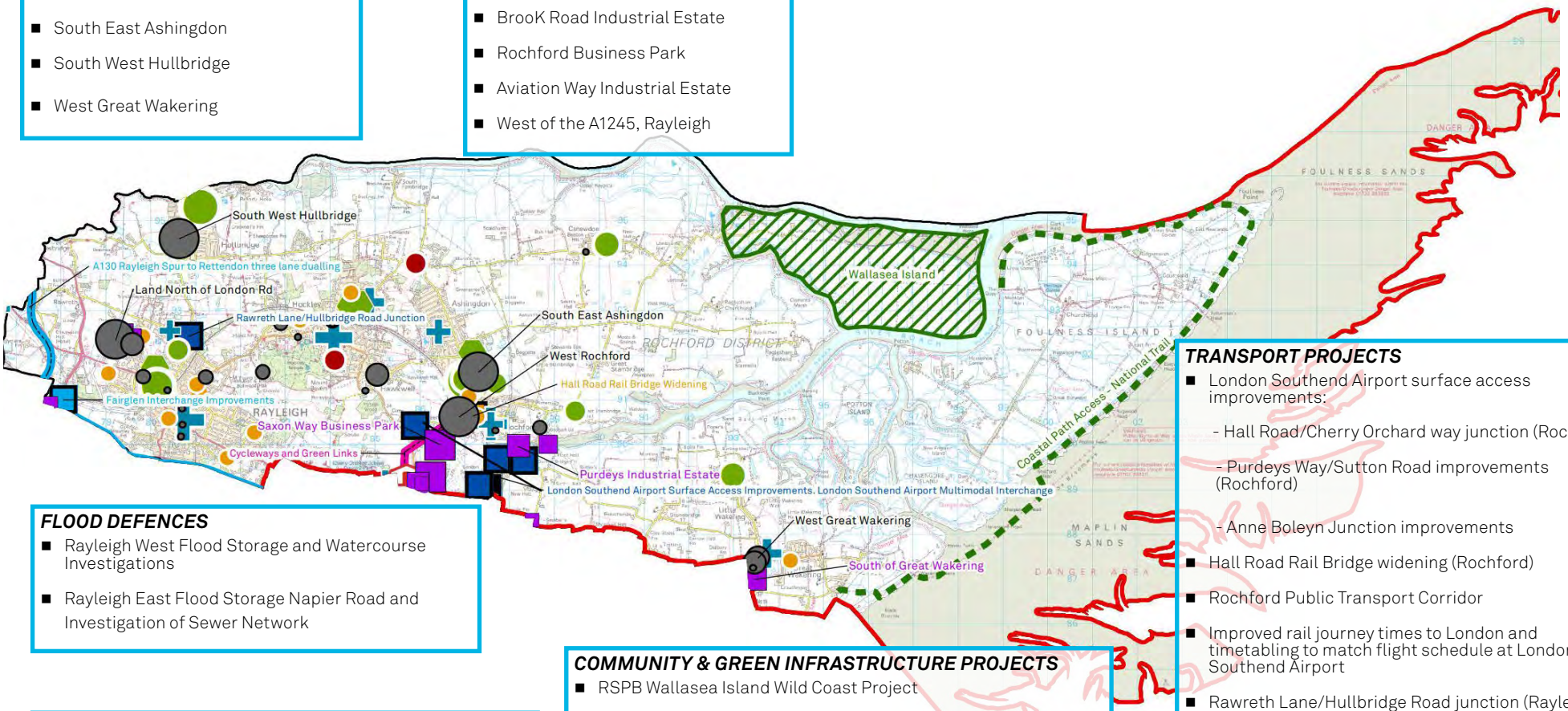
Degree of Certainty on Growth and Infrastructure requirements	To Be Determined

MAJOR HOUSING DEVELOPMENT

- West Rochford
- North of London Road
- South East Ashingdon
- South West Hullbridge
- West Great Wakering

KEY EMPLOYMENT SITES

- New Saxon Business Park
- Purdeys Industrial Estate
- BrooK Road Industrial Estate
- Rochford Business Park
- Aviation Way Industrial Estate
- West of the A1245, Rayleigh



FLOOD DEFENCES

- Rayleigh West Flood Storage and Watercourse Investigations
- Rayleigh East Flood Storage Napier Road and Investigation of Sewer Network

EDUCATION PROJECTS

- New 1FE Primary School on land west of Rochford
- New 1FE Primary School to the north of London Road, Rayleigh
- 1 to 2 FE expansion of Greenward Secondary School, Hockley
- Potential expansion of King Edmund School in Rochford
- Potential 1FE expansion of Sweyne Park Secondary School, Rayleigh

COMMUNITY & GREEN INFRASTRUCTURE PROJECTS

- RSPB Wallasea Island Wild Coast Project
- Cherry Orchard Jubilee Country Park
- Hockley Woods
- Development of greenways and improved cycling connectivity
- Creation of hubs using redeveloped or new facilities in Rayleigh and Rochford

TRANSPORT PROJECTS

- London Southend Airport surface access improvements:
  - Hall Road/Cherry Orchard way junction (Rochford)
  - Purdeys Way/Sutton Road improvements (Rochford)
  - Anne Boleyn Junction improvements
- Hall Road Rail Bridge widening (Rochford)
- Rochford Public Transport Corridor
- Improved rail journey times to London and timetabling to match flight schedule at London Southend Airport
- Rawreth Lane/Hullbridge Road junction (Rayleigh)
- Green link between new Saxon Business Park and Cherry Orchard Jubilee Country Park and into Southend
- Rochford Integrated Sustainable Transport Package
- London Southend Airport Multimodal interchange
- A127/A130Fairglen Interchange
- Rochford Intergrated Transport Package
- A133-A120 link road

SUMMARY OF DEVELOPMENT & KEY LOCAL PROJECTS FOR ROCHFORD

Projects Note - Any regional or sub-regional Projects Listed above and affecting this local authority are not included in local costs and funding on facing page.

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

LOCAL PROJECTS

TENDRING

2016 - 2036:

11,600
homes needed

21,200
new people **(+15%)**

10,420
homes planned

3,880
new jobs **(+8%)**

Refer to Section 3.2 for explanation of housing figures presented above

2016 CAPACITY ISSUES

- ***A120 capacity from Hare Green to Harwich and safety issue due to frequency and types of junctions***
- ***A133 corridor to/from Clacton congestion***
- ***Seasonal congestion caused by holiday traffic***
- ***Rail frequency to/from London and wider network***
- ***Primary and secondary capacity issues along the coastal towns***
- ***Patients per GP is high across authority***
- ***Colchester Hospital University NHS Foundation Trust operating at 93% acute bed capacity***

Total Infrastructure Costs: **£353,290,000**

Total Secured Funding: **£3,000,000**

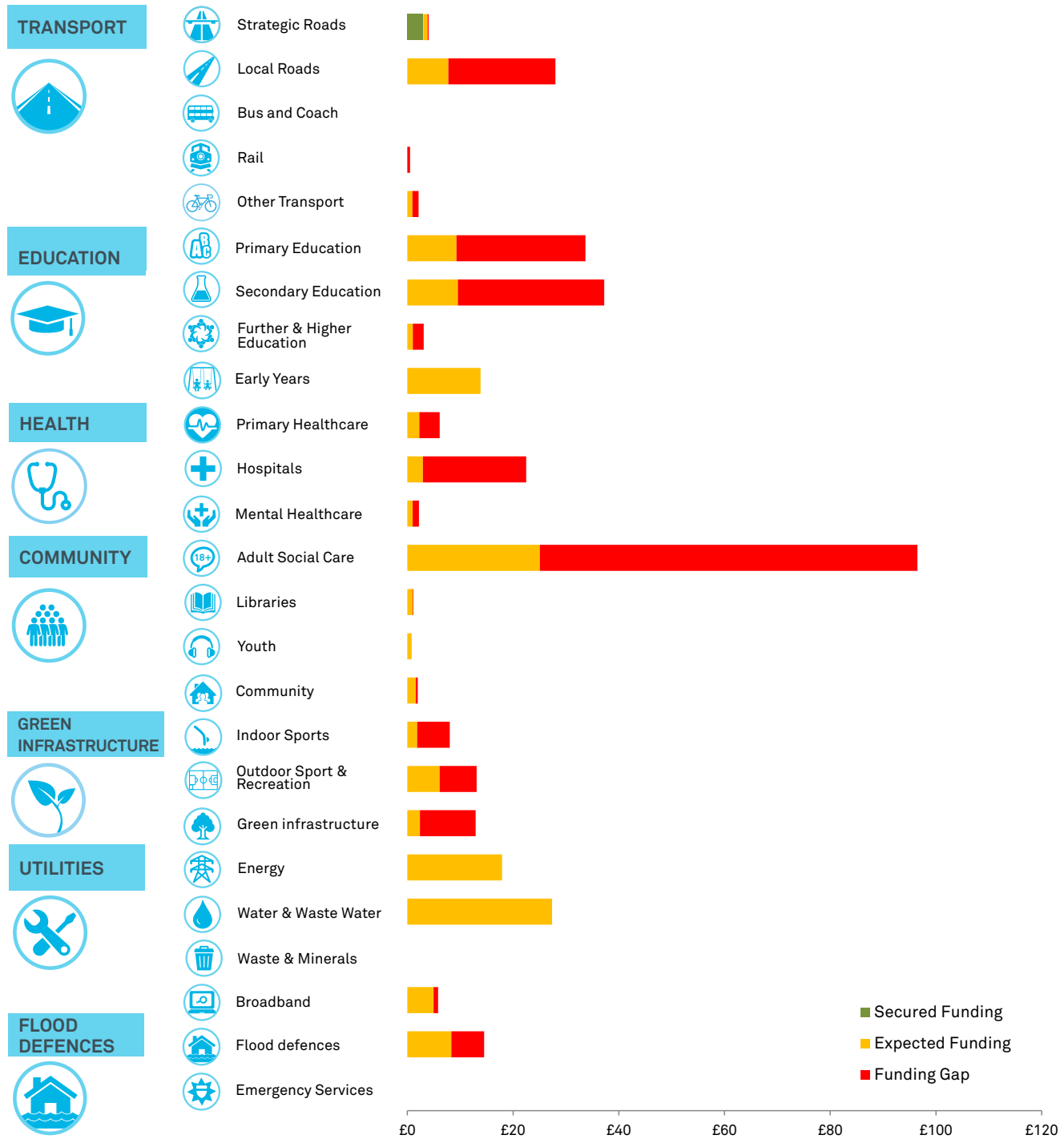
Total Expected Funding: **£146,860,000**

Total Funding Gap: **£203,430,000**

Funding as % of Costs: **42%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions

Projects Note - Any Regional or Sub Regional Projects Listed in Tables 5.3 and 5.4 and affecting this local authority are not included in costs and funding below

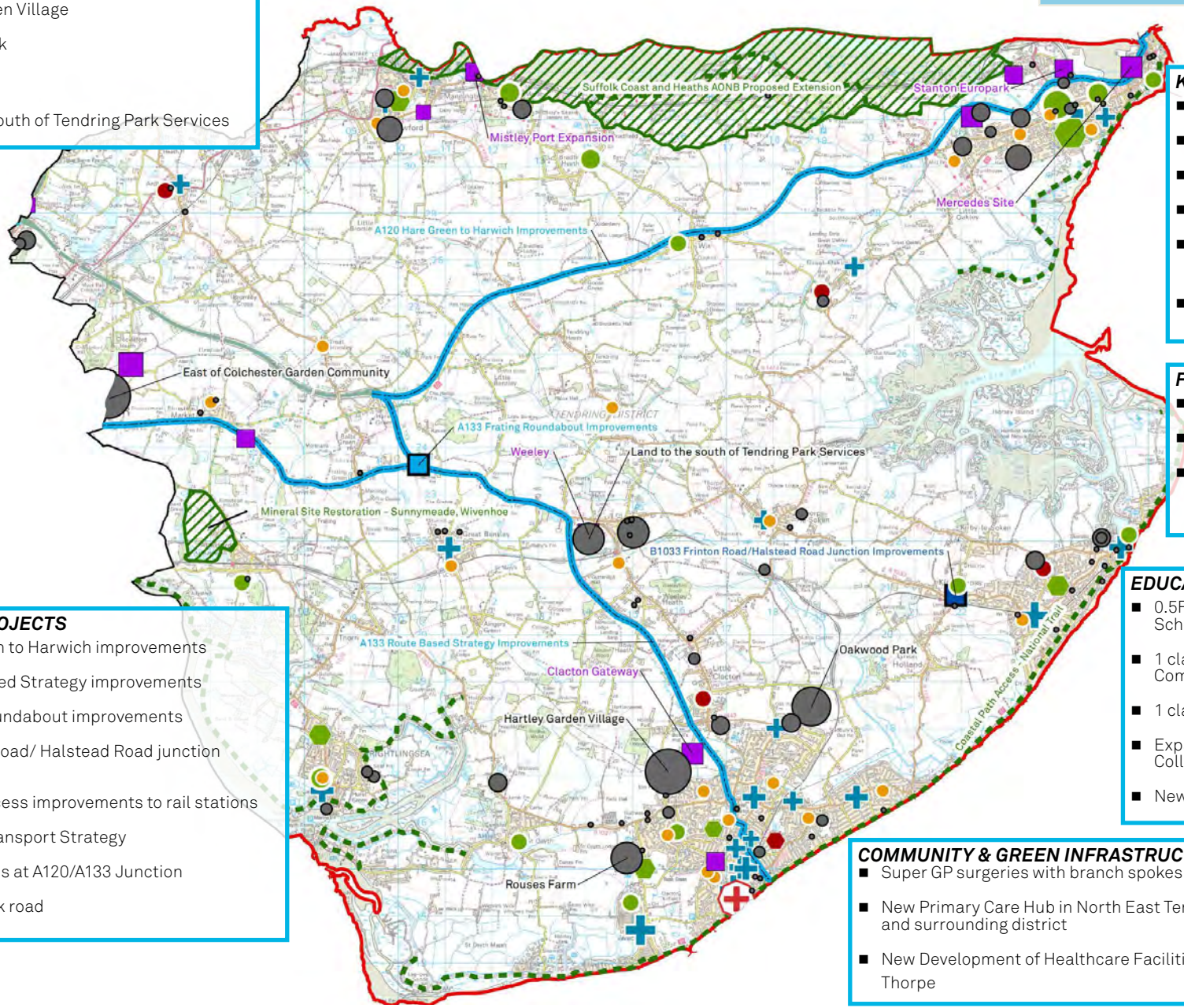


SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)

MAJOR HOUSING DEVELOPMENT

- East of Colchester Garden Community
- Hartley Garden Village
- Oakwood Park
- Rouses Farm
- Land to the south of Tendring Park Services

Degree of Certainty on Growth and Infrastructure requirements	Partial



KEY EMPLOYMENT SITES

- East of Colchester Garden Community
- Weeley
- Mercedes site, Harwich
- Clacton Gateway
- Harwich Haven Port / Mistley Port Expansion
- Stanton Europark

FLOOD DEFENCES

- Jaywick Beach Recharge tidal defence
- Seawick Sea tidal defence
- West Clacton to Jaywick Sea tidal defences

TRANSPORT PROJECTS

- A120 Hare Green to Harwich improvements
- A133 Route Based Strategy improvements
- A133 Frating roundabout improvements
- B1033 Frinton Road/ Halstead Road junction improvement
- Sustainable access improvements to rail stations
- Manningtree Transport Strategy
- East Facing Slips at A120/A133 Junction
- A120 to A133 link road

EDUCATION PROJECTS

- 0.5FE expansion of Ravens Academy Primary School
- 1 class bulge expansion at Burrsville Community Infant School
- 1 class bulge expansion at Brightlingsea Infant
- Expansion of Colne Community School and College
- New schools to support Garden Communities

COMMUNITY & GREEN INFRASTRUCTURE PROJECTS

- Super GP surgeries with branch spokes - i.e West Clacton
- New Primary Care Hub in North East Tendring covering Harwich and surrounding district
- New Development of Healthcare Facilities for Walton, Frinton and Thorpe

SUMMARY OF DEVELOPMENT & KEY LOCAL PROJECTS FOR TENDRING

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

Projects Note - Any regional or sub-regional Projects Listed above and affecting this local authority are not included in local costs and funding on facing page.

LOCAL PROJECTS

UTTLESFORD

2016 - 2036:

11,360
homes needed

22,200
new people **(+26%)**

5,460
homes planned

1,160
new jobs **(+3%)**

Refer to Section 3.2 for explanation of housing figures presented above

2016 CAPACITY ISSUES

- ***M11 link speeds and journey times constrained by HGV traffic between junctions 8 and 9***
- ***M11 Junction 8 peak time congestion impacting route choice***
- ***Rail journey times to London from London Stansted Airport and train operating hours not compatible with flight schedule***
- ***Rail connections to/from London Stansted Airport***
- ***Surplus primary and secondary places, however some deficit in provision in rural areas***
- ***Patients per GP is high across authority***
- ***Acute hospital provision, operated by the Princess Alexandra Hospital NHS Trust is running at near capacity (96%)***

Total Infrastructure Costs: **£329,180,000**

Total Secured Funding: **£ 0**

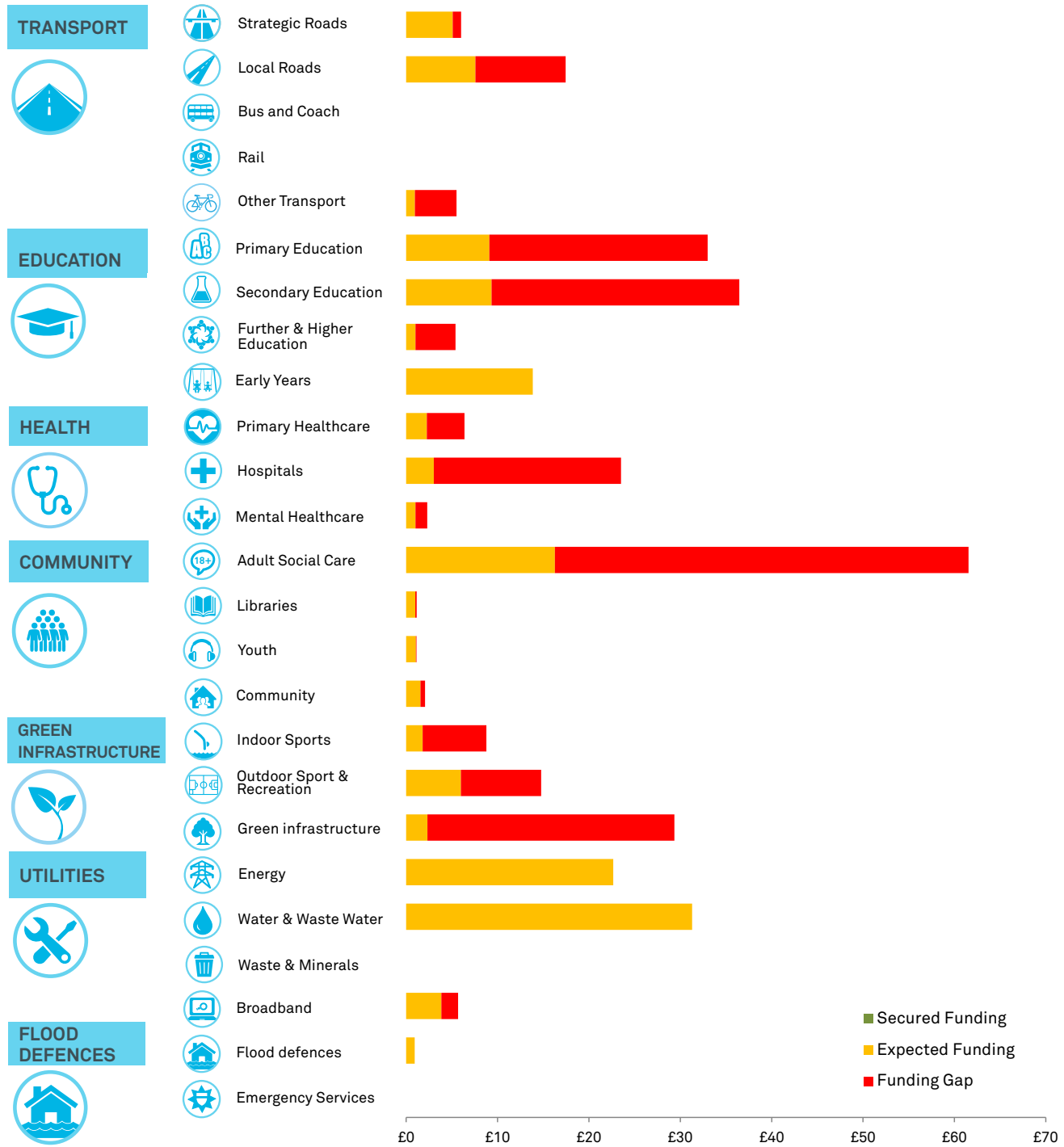
Total Expected Funding: **£141,930,000**

Total Funding Gap: **£ 187,250,000**

Funding as % of Costs: **43%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions

Projects Note - Any Regional or Sub Regional Projects Listed in Tables 5.3 and 5.4 and affecting this local authority are not included in costs and funding below



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)

Degree of Certainty on Growth and Infrastructure requirements	Known

MAJOR HOUSING DEVELOPMENT

- Great Dunmow: Woodlands Park Sectors 1 - 4
- Great Dunmow: West of Woodside Way
- Saffron Walden: North and South of Radwinter Road
- Stansted Mountfitchet: Elms Farm / Walpole Farm
- Elsenham: North and South of Stansted Road
- Newport: Bury Water Lane

FLOOD DEFENCES

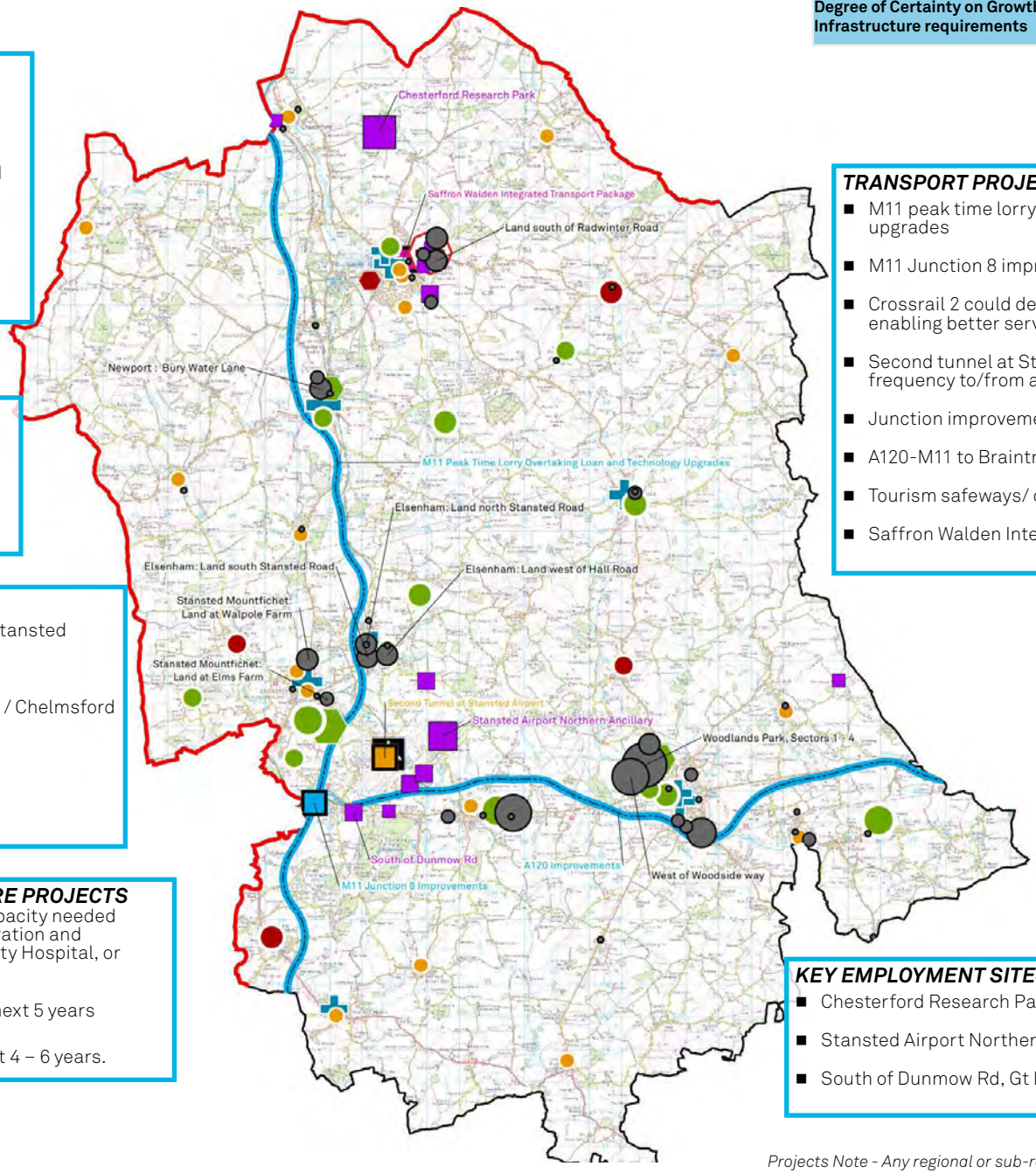
- Stansted Mountfitchet fluvial flood defences
- Little Hallingbury flood investigation site
- Thaxted flood investigation site

EDUCATION PROJECTS

- New 1FE Primary School (Magna Carta Primary) in Stansted
- New primary school in Saffron Walden
- New primary school in Great Dunmow (Smith's Farm / Chelmsford Road)
- Relocation of Helena Romanes Secondary School
- Expansion of Joyce Frankland Secondary Academy

COMMUNITY & GREEN INFRASTRUCTURE PROJECTS

- Saffron Walden; Increased Primary Care capacity needed to meet growth. This may include reconfiguration and redevelopment of Saffron Walden Community Hospital, or other options.
- Thaxted – new Primary Care facility within next 5 years
- Elsenham – new Primary care facility in next 4 – 6 years.



TRANSPORT PROJECTS

- M11 peak time lorry over-taking ban and technology upgrades
- M11 Junction 8 improvements
- Crossrail 2 could deliver additional capacity enabling better services to/from Stansted airport
- Second tunnel at Stansted to facilitate higher train frequency to/from airport
- Junction improvements in Saffron Walden
- A120-M11 to Braintree improvements
- Tourism safeways/ cycling and horseriding trails
- Saffron Walden Integrated Transport Package

KEY EMPLOYMENT SITES

- Chesterford Research Park
- Stansted Airport Northern Ancillary
- South of Dunmow Rd, Gt Hallingbury

SUMMARY OF DEVELOPMENT & KEY LOCAL PROJECTS FOR UTTLESFORD

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

Projects Note - Any regional or sub-regional Projects Listed above and affecting this local authority are not included in local costs and funding on facing page.

HAVEN GATEWAY

2016 - 2036:

53,100
homes needed

82,700
new people **(+15%)**

49,970
homes planned

23,020
new jobs **(+10%)**

Refer to Section 3.2 for explanation of housing figures presented above

BRAINTREE

COLCHESTER

TENDRING

MALDON

Total Infrastructure Costs: **£1,529,460,000**

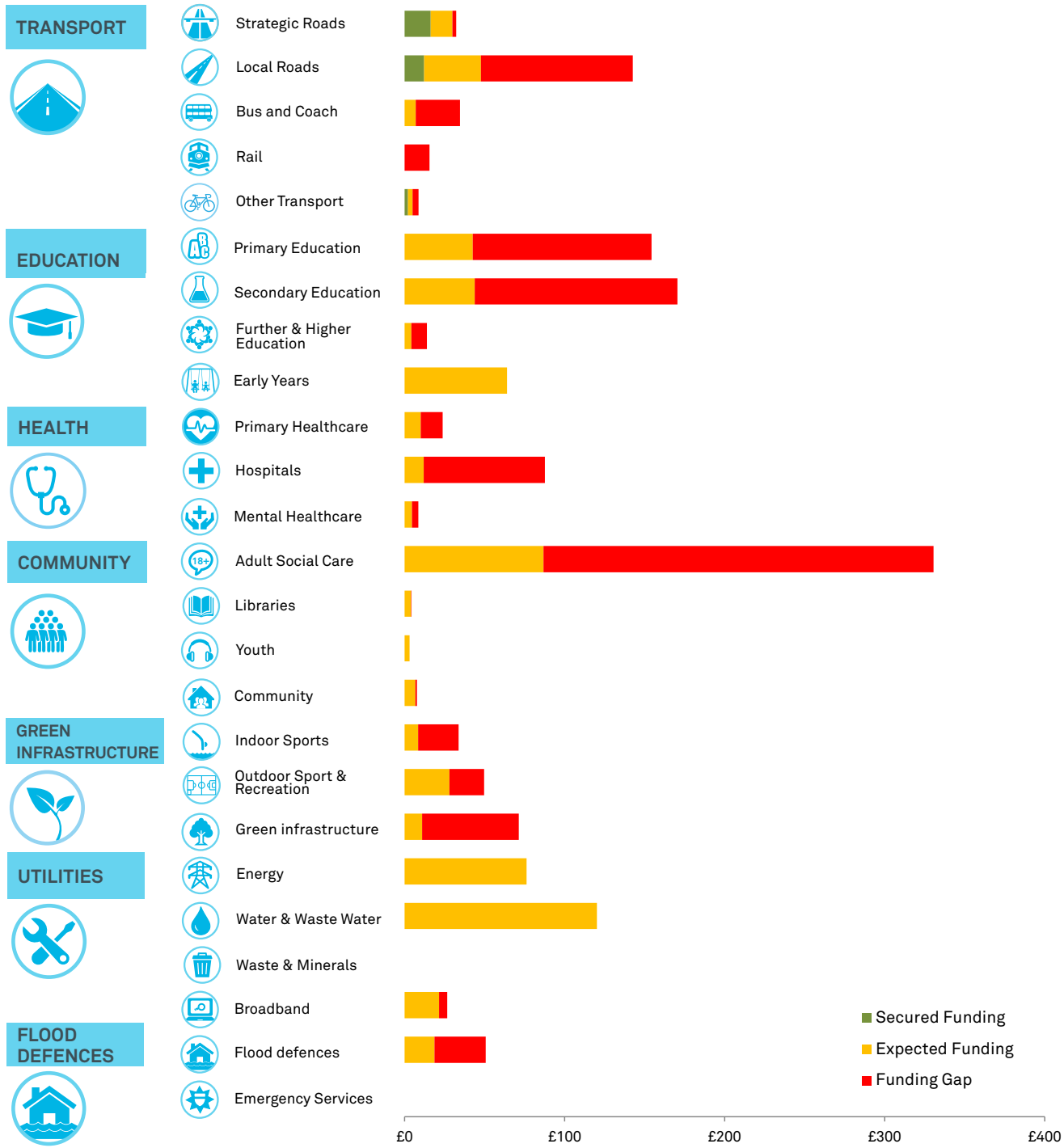
Total Secured Funding: **£ 30,370,000**

Total Expected Funding: **£ 623,750,000**

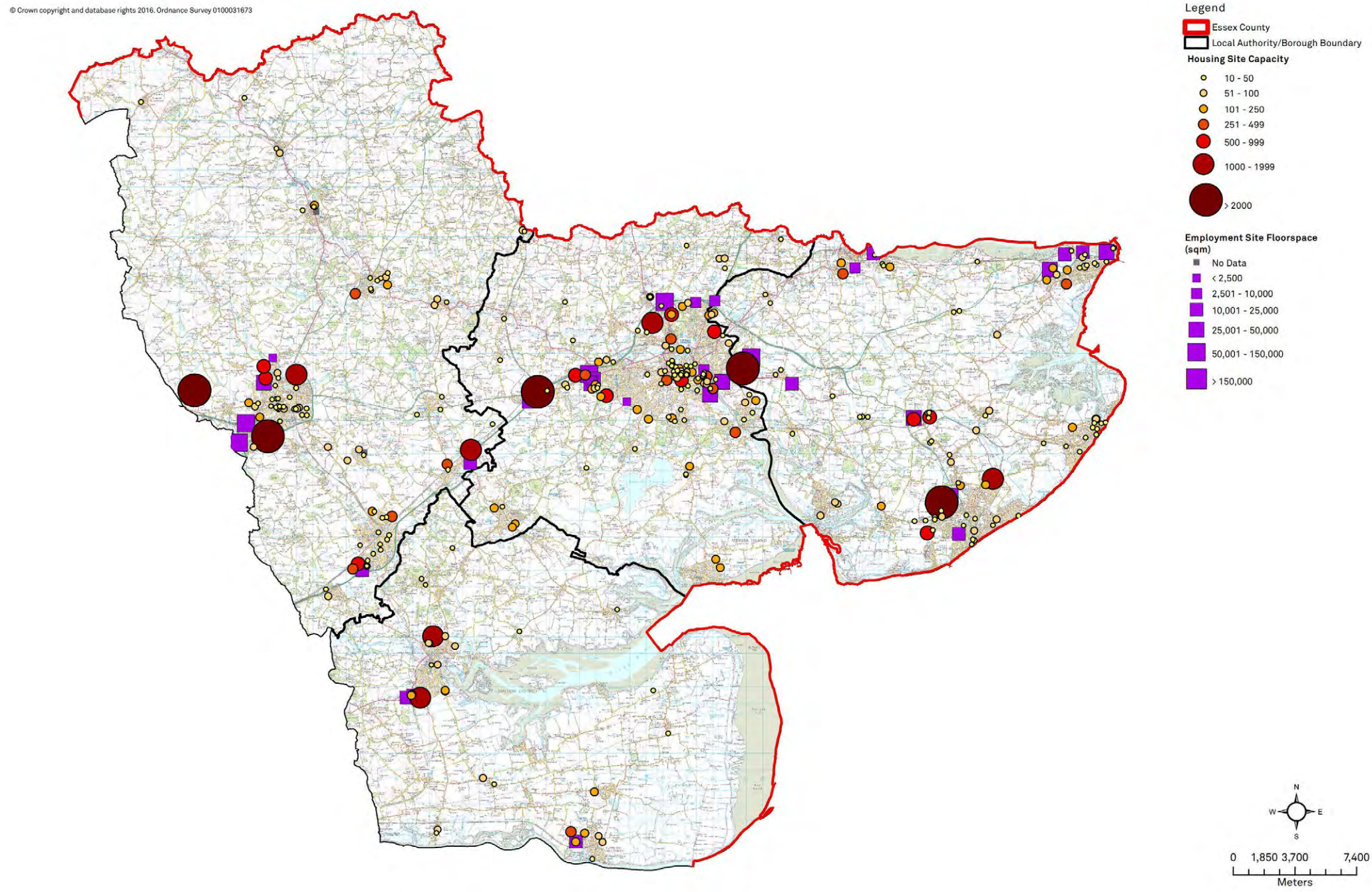
Total Funding Gap: **£ 875,350,000**

Funding as % of Costs: **43%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)



SUMMARY OF DEVELOPMENT FOR HAVEN GATEWAY

HEART OF ESSEX

2016 - 2036:

15,500
homes needed

23,700
new people **(+14%)**

19,320
homes planned

13,410
new jobs **(+13%)**

Refer to Section 3.2 for explanation of housing figures presented above

CHELMSFORD

Total Infrastructure Costs: **£546,170,000**

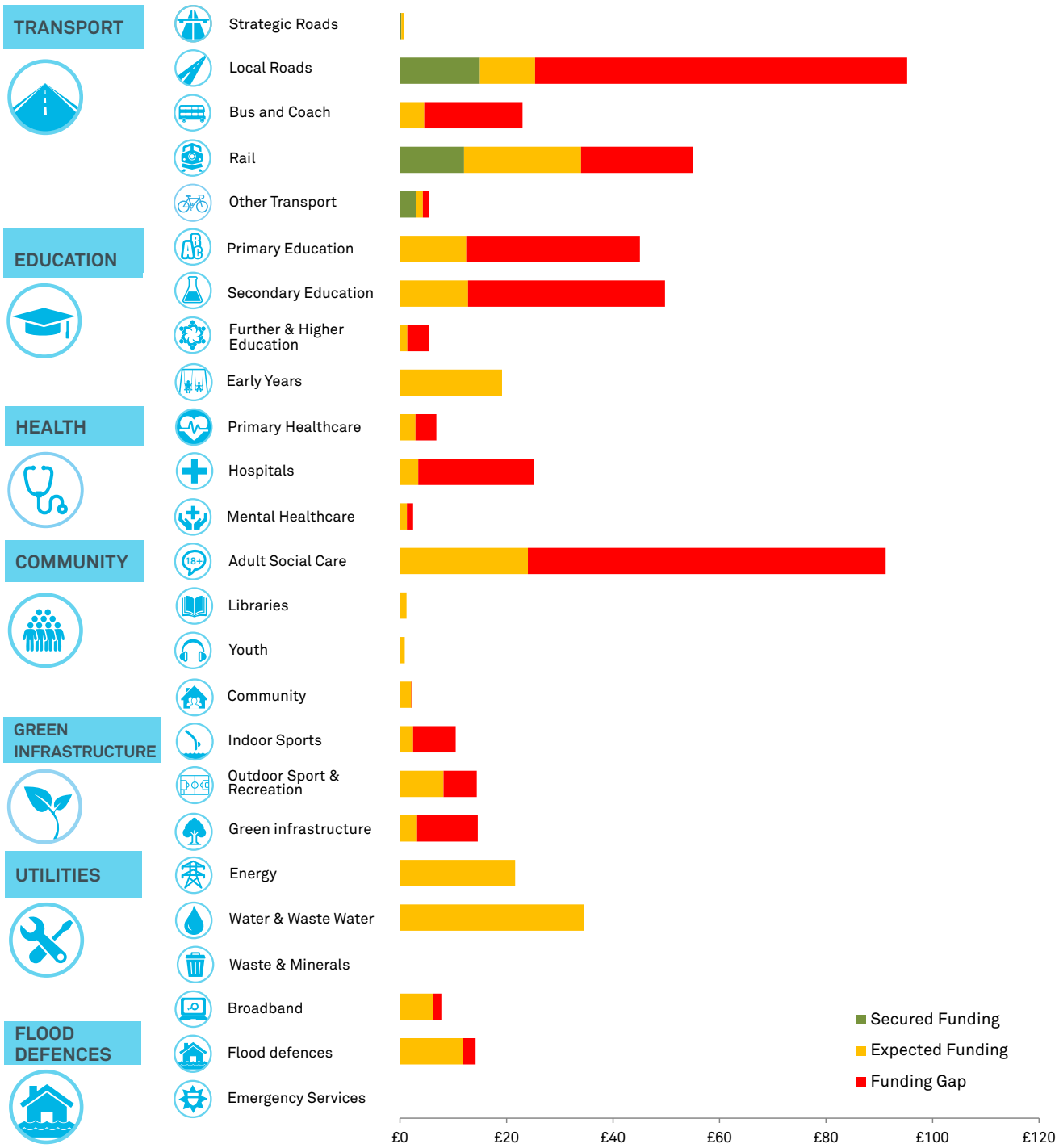
Total Secured Funding: **£30,250,000**

Total Expected Funding: **£208,110,000**

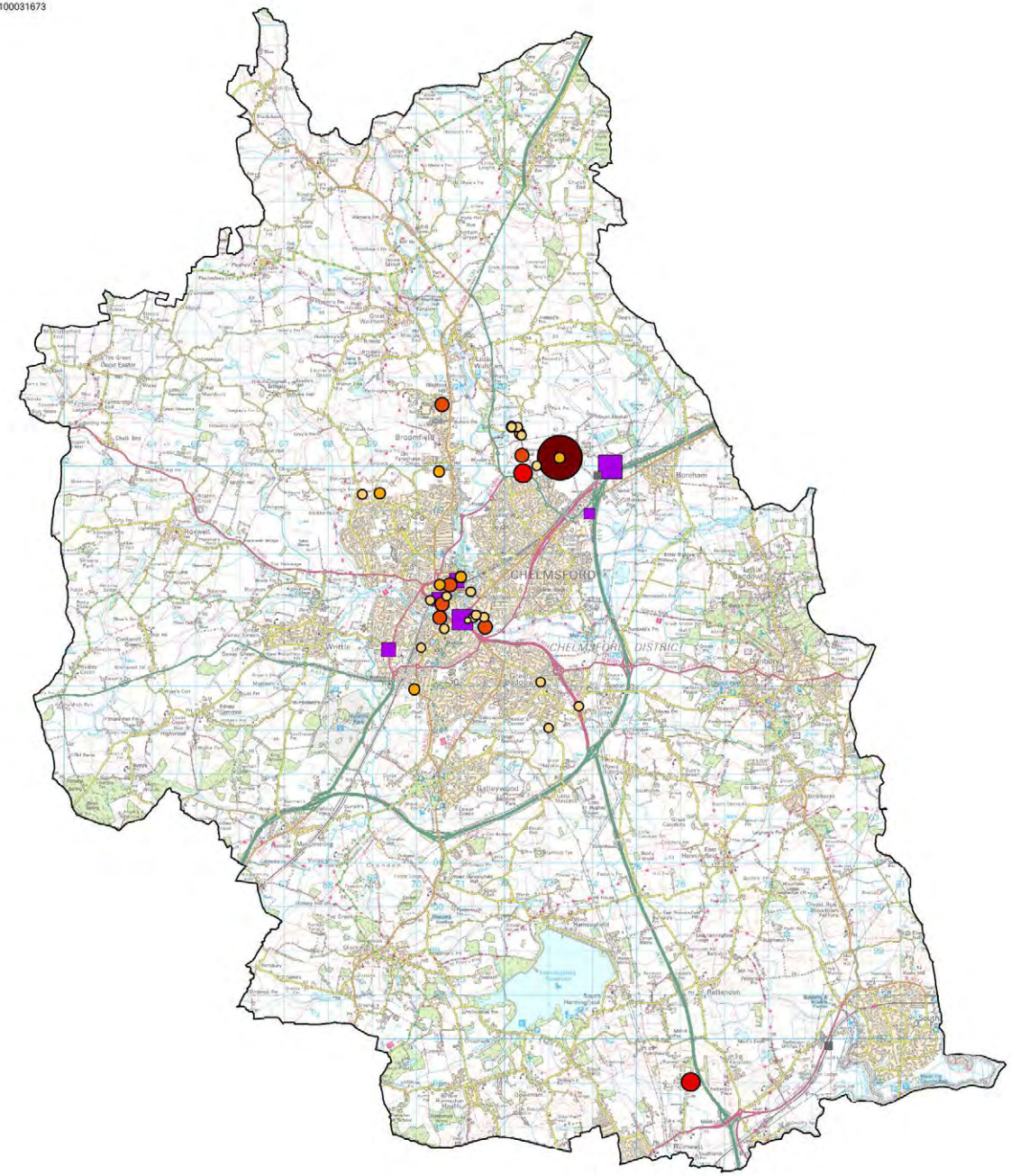
Total Funding Gap: **£307,810,000**

Funding as % of Costs: **44%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)



Legend

Essex County

Local Authority/Borough Boundary

Housing Site Capacity

- 10 - 50
- 51 - 100
- 101 - 250
- 251 - 499
- 500 - 999
- 1000 - 1999
- > 2000

Employment Site Floorspace (sqm)

- No Data
- < 2,500
- 2,501 - 10,000
- 10,001 - 25,000
- 25,001 - 50,000
- 50,001 - 150,000
- > 150,000

N W E S

0 950 1,900 3,800

Meters

SUMMARY OF DEVELOPMENT FOR HEART OF ESSEX

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

SOUTH ESSEX

2016 - 2036:

76,820
homes needed

113,300
new people **(+16%)**

35,090
homes planned

33,150
new jobs **(+11%)**

Refer to Section 3.2 for explanation of housing figures presented above

BASILDON

CASTLE POINT

ROCHFORD

SOUTHEND

THURROCK

Total Infrastructure Costs: **£2,455,380,000**

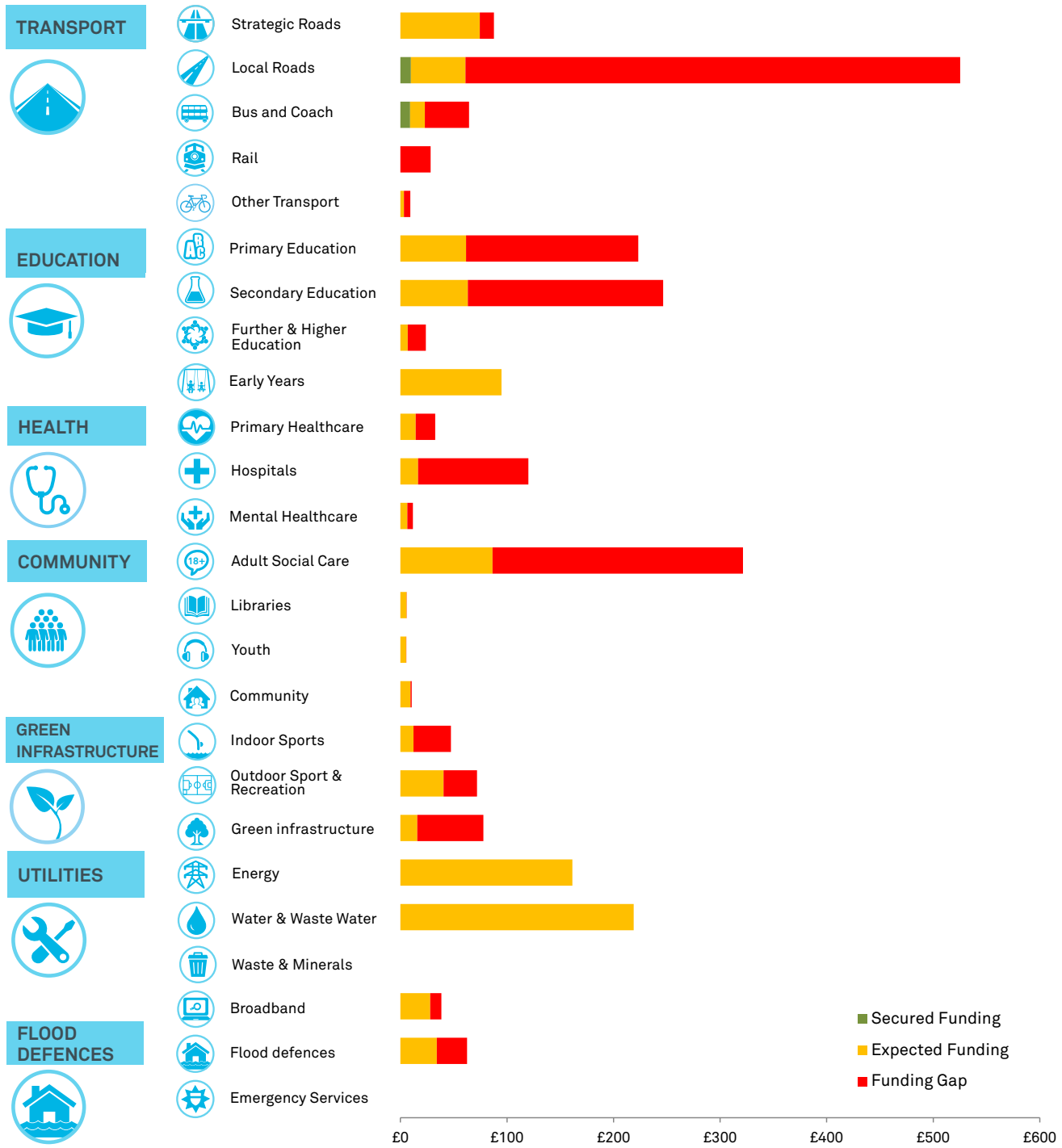
Total Secured Funding: **£18,940,000**

Total Expected Funding: **£1,023,770,000**

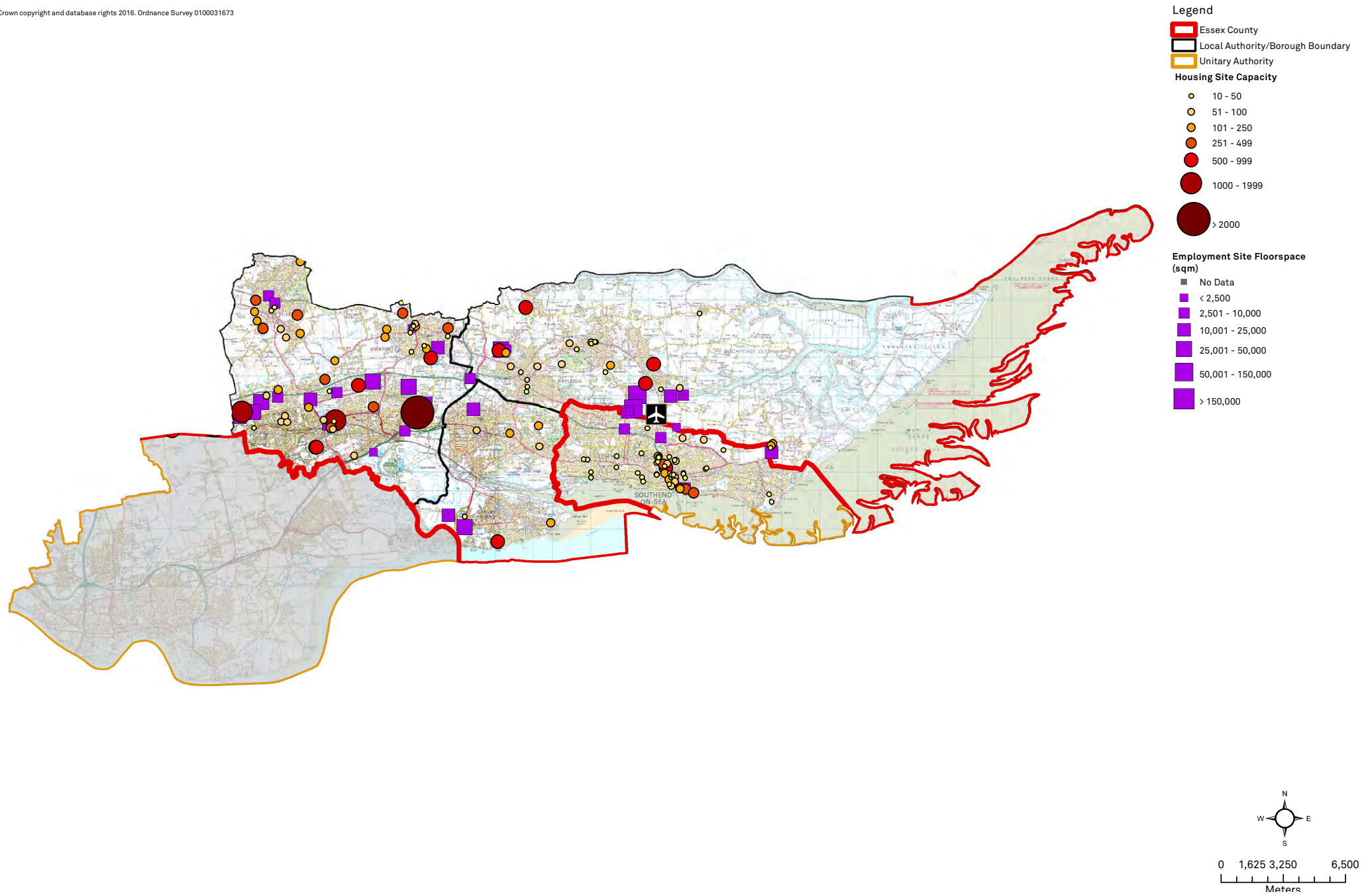
Total Funding Gap: **£1,446,330,000**

Funding as % of Costs: **42%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)



SUMMARY OF DEVELOPMENT FOR SOUTH ESSEX

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

WEST ESSEX

2016 - 2036:

34,240
homes needed

79,000
new people **(+21%)**

33,290
homes planned

9,310
new jobs **(+5%)**

Refer to Section 3.2 for explanation of housing figures presented above

EPPING FOREST

HARLOW

UTTLESFORD

BRENTWOOD

Total Infrastructure Costs: **£1,118,080,000**

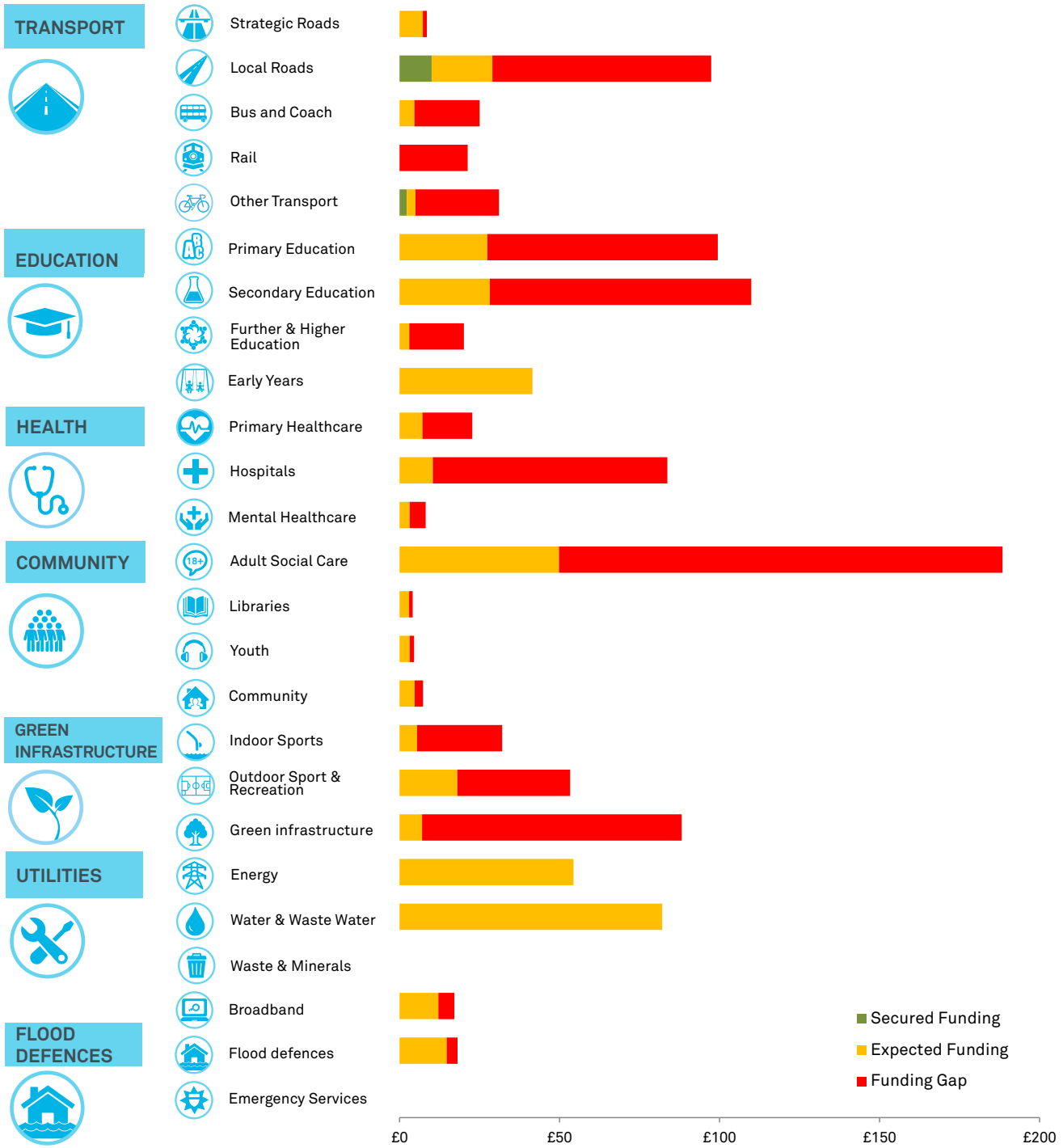
Total Secured Funding: **£12,200,000**

Total Expected Funding: **£408,860,000**

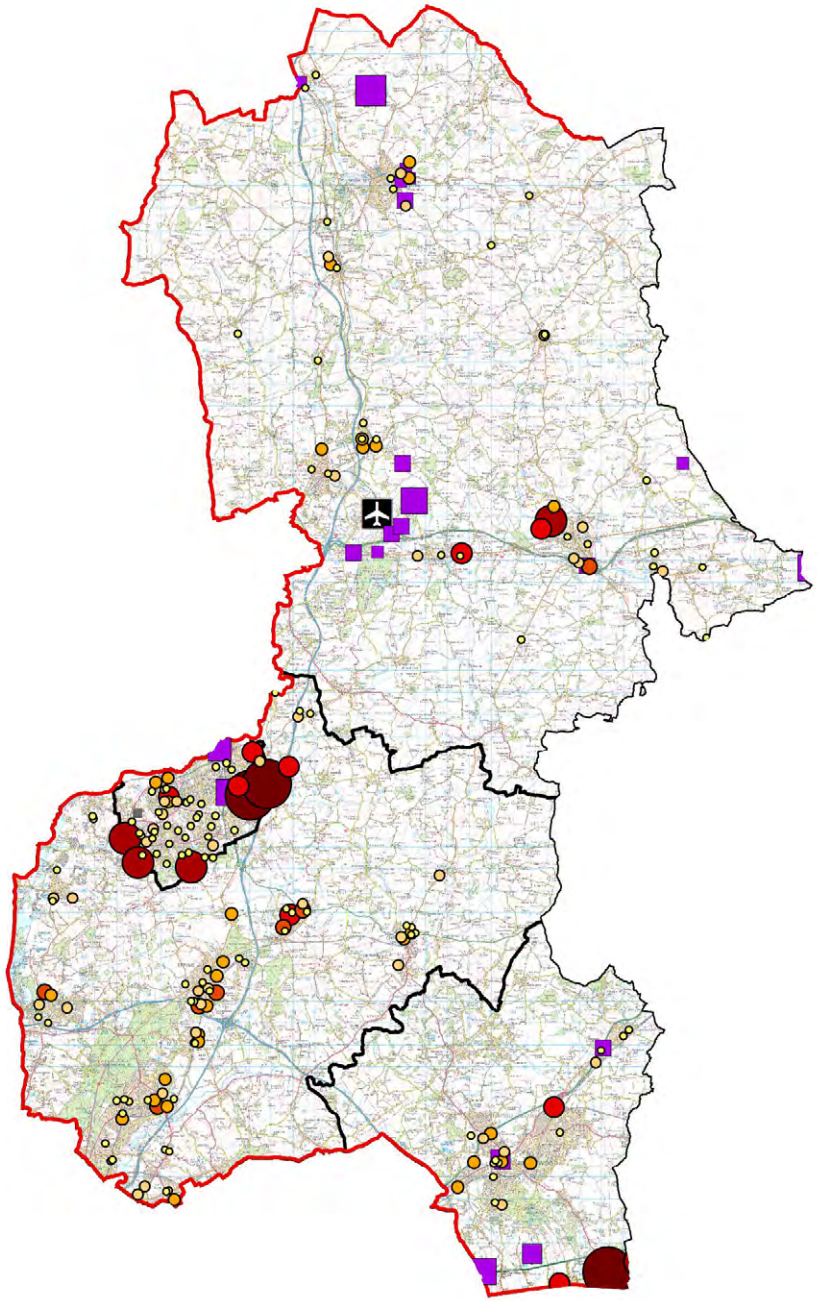
Total Funding Gap: **£697,010,000**

Funding as % of Costs: **38%**

Refer to Section 8.3 & 8.4 Cost and Funding Assumptions



SUMMARY OF INFRASTRUCTURE PROJECT COSTS AND FUNDING GAPS (2016-2036)



Legend

Essex County

Local Authority/Borough Boundary

Housing Site Capacity

- 10 - 50
- 51 - 100
- 101 - 250
- 251 - 499
- 500 - 999
- 1000 - 1999
- > 2000

Employment Site Floorspace (sqm)

- No Data
- < 2,500
- 2,501 - 10,000
- 10,001 - 25,000
- 25,001 - 50,000
- 50,001 - 150,000
- > 150,000

N W E S

0 2,100 4,200 8,400

Meters

SUMMARY OF DEVELOPMENT FOR WEST ESSEX

Refer to Universal Legend at start of Chapter 5 to interpret Map icons

06

FUTURE FUNDING AND DELIVERY

FUNDING IS THE BIGGEST RISK TO THE DELIVERY OF INFRASTRUCTURE PROJECTS. THE CURRENT FUNDING ENVIRONMENT IS COMPLEX AND IS BEING CONSTANTLY RE-SHAPED. CLOSING THIS FUNDING GAP IN GREATER ESSEX, WILL REQUIRE A BROADER AND MORE SOPHISTICATED APPROACH TO INFRASTRUCTURE FINANCING THAN CURRENTLY EXISTS

As indicated in Section 5, there is a significant gap between the cost of the infrastructure Greater Essex is likely to need by 2036 and the funding Greater Essex expects to be available to deliver it.

This section explores the traditional and emerging sources of funding for the infrastructure required in Greater Essex and outlines emerging opportunities which may help to fill the significant funding gap

Funding is the biggest risk to delivery, so Greater Essex authorities and infrastructure providers will need to work together to explore every option to secure the necessary funding.

This section sets out the three usual sources for funding infrastructure:

1. Public sector funding – ultimately, declining

2. Private sector funding – already limited

3. Developer contributions – limited by land values

This section also sets out a range of potential alternative options to secure funding for the infrastructure needed, for consideration by Greater Essex local authorities.

These will need regular review to take account of changing circumstances

Total Infrastructure Costs: **£10,365,240,000**

Total Secured Funding: **£715,610,000**

Total Expected Funding: **£5,225,530,000**

Total Funding Gap: **£4,424,100,000**

% of Infrastructure Funded: **57%**

The funding situation outlined in this section reflects current knowledge of approaches to the delivery and funding of infrastructure. However, an important point to note is that over the document time period (to 2036) at least three general elections will take place. This makes it difficult to predict the policy towards various types of infrastructure (health, education, transport etc.) in five years' time.

To illustrate this point, 10 years ago, a local education authority planning for additional secondary school needs in 2016 would have been unaware of the forthcoming creation and subsequent abolition of the Building Schools for the Future programme and the introduction of Academies and Free Schools. Essex local authorities can only work with what is currently known which highlights the need for flexibility - essential to accommodate the inevitable changes to delivery and funding over the planning period.

6.1 ORGANISATIONS WITH ACCESS TO PUBLIC FUNDING

AS IDENTIFIED IN EARLIER CHAPTERS THERE ARE A WIDE RANGE OF ORGANISATIONS RESPONSIBLE FOR THE DELIVERY AND FUNDING OF INFRASTRUCTURE WITHIN GREATER ESSEX. THIS SECTION PRESENTS AN OVERVIEW OF THESE ORGANISATIONS AND THE MAIN SOURCES OF PUBLIC FUNDING BY BROAD THEME.

Since 2011 all local authorities in Britain have seen year on year reductions in their funding from Central Government. The influence of local authorities on infrastructure funding varies considerably depending on the role played by Central Government and the private sector in each segment of the infrastructure market. This will reflect current and evolving policy and practice over which types of funding mechanisms are deemed most appropriate for different types of infrastructure. For instance, much social infrastructure, including the education, health, and general community facilities, is the responsibility of the local authority with funding provided by both Central Government grants and local taxation. These services are public goods which meet social objectives that cannot feasibly be paid for by market mechanisms, other than where a proportion of funding is required from a developer through S106 as a result of the grant of planning permission.

On the other hand, some forms of infrastructure are delivered by a mixture of non-governmental public bodies and private companies within strongly regulated markets (e.g. rail,) and most utilities are delivered in semi competitive markets by highly regulated private companies.

This section provides a summary of these various roles and responsibilities with a focus on the mainstream public grants for capital funding for local infrastructure from the public sector as listed in Table 6.1 and described in this section.

TRANSPORT

Transport infrastructure funding comes from a range of sources depending on the nature of the asset and its strategic status.

Roads & local strategic projects
Capital funding for strategic roads is the responsibility of Highways England (HE), a publicly owned corporation since April 2015. Within Essex, Highways England is responsible for the A12, A120 and M11, M25 and part of the A13.

Highways England reports to the Department for Transport and has responsibility for managing the Strategic Road Network in England. It operates a variety of information services, liaises with other government agencies as well as providing staff to deal with incidents on its roads.

Highways England's responsibilities most relevant to the infrastructure framework include undertaking large scale improvements through a programme of major schemes, carrying out routine maintenance of roads, structures and technology to make the network safe, serviceable and reliable and making sure traffic can flow easily on major roads and motorways.

Investment decisions are prioritised through HE's cyclical Road Investment Strategy (RIS) which sets out a long-term programme for UK motorways and major roads. Local Authorities need to lobby and produce the business case for investment to Central Government / HE to include projects for delivery within the RIS.

Between 2015 and 2020, the RIS will see £15.2 billion invested in over 100 major schemes to enhance, renew and improve the network nationwide. Recent Government announcements have confirmed a £1.4 billion package of 18 new road schemes in London and South East of England.

Local roads in the county are the responsibility of the three highways and transportation authorities: Essex County Council, Southend Borough Council and Thurrock Council. These transport authorities are responsible for planning and delivering the majority of the transport-related infrastructure to support development proposals in each local authority within Essex.

Other local transport projects to support economic growth and development have less well defined funding and delivery processes. Aside from local authority capital investment budgets, Local Enterprise Partnerships are the main public source of capital grant funding through the Local Growth Deals and Large Local Major Schemes Fund. Schemes currently allocated funding as part of the South East LEP Growth Deal with Central Government include the Colchester and Chelmsford Integrated Transport Packages and the Southend and Rochford Growth Hub project. Department of Transport (DfT) also allocates funding via competitive bid processes to specific types of project; for example the recent Pinch Point Fund.

The main source of capital funding for local roads is through Councils' borrowing although other instruments are available to local authorities to finance transport investment, e.g. the Public Works Loan Board. In addition, funding can be secured through business rate retention and municipal bonds. These are presented in Section 6.3.

Rail
The rail network is the responsibility of Network Rail (an arms-length public body). Network Rail owns the infrastructure, including the railway tracks, signals, overhead wires, tunnels, bridges, level crossings and most

stations, but not the passenger or commercial freight rolling stock. Although it owns over 2,500 railway stations, it manages only 19 of the biggest and busiest of them, all the other stations being managed by one or other of the various train operating companies.

Projects for capital investment in the local rail network need to meet the Governance for Railway Investment Projects (GRIP) process to be planned / funded within a 5-year Control Period. Similarly to the strategic road network, a sound business case needs to be presented for projects to be included in a Control Period. The current delivery plan period covers 2014 to 2019.

In recent years TfL has acquired responsibility for much of the rail network within London and is responsible for the delivery and operation of Crossrail 1 and Crossrail 2.

EDUCATION

Capital funding for primary and secondary education is raised from Local Authority borrowing capital funding own resources and the Basic Need Central Government grant scheme to ensure that Local Authorities can provide adequate school spaces for the populace. Funding is currently mapped out until 2019.

Essex County Council has set aside a 2016/17 capital allocation of £64m for education infrastructure which is expected to deliver new early years, primary and secondary school places within its boundaries. In particular, over 2,000 primary school places will be delivered in 2016/17, around a quarter of which will delivered by the construction of a new Primary School in North Colchester, with further capital investment in 5 other schools. Over the next 20 years, several primary and secondary schools will be needed to support the planned Garden Communities.

The Priority School Building Programme (PSBP) has also been in place since 2011, replacing the previous Building Schools for the Future Programme. PSBP provides funds via the Education Funding Agency (EFA) either in the form of a capital grant or through a private finance contract. Schools across England were invited to bid for the fund and awards were allocated to those deemed most in need of rebuilding or maintenance. Two schools in Essex have received funding via the scheme, the Lawford Mead Primary School and the Edith Borthwick School.

HEALTH

Depending on the service, NHS commissioning is either undertaken by local Clinical Commissioning Groups (CCGs) or by NHS England regional groups. Most healthcare services are commissioned by the CCG, but primary care services and other specialist services, such as offender healthcare, are commissioned by NHS England.

The NHS recognises that there is no single geography across which all services should be commissioned: some local services can be designed and secured for a population of a few thousand, whilst for rare disorders, services need to be considered and secured nationally. In Essex therefore, there is no single commissioning body that adheres to the County boundary; rather seven CCGs cover the area. The CCGs and NHS England receive direct funding for commissioning from the Government. In some instances they may also be recipients of developer contributions or other sources of local funding.

NHS Trusts and Foundation Trusts are key providers in most health systems and will utilise a portfolio of facilities, some of which will be owned and others leased from a variety of organisations. They will also have access to funds, sometimes self-generated or as a result of bids to the centre. All of these organisations, led by CCGs have developed local health economy Strategic Estates Plans over the last year. Together with the emerging STPs these are identifying the capital investment likely to be needed in the coming years. Following the Health and Social Care Act in 2013 and the changes to governance, commissioners generally no longer have specific estate functions. Strategic estates planning support is therefore provided by Community Health Partnerships and NHS Property Services, organisations wholly owned by the Department of Health, which have complementary roles in the health system providing actual facilities and technical expertise.

Adult social care is means tested (unlike NHS services which are free at the point of use). This means that approximately 75% of care is self funded and approximately 25% is funded by the local authority through council tax, although currently partly supported by the Revenue Support Grant, the Social Care precept and the Better Care Fund. The Better Care Fund is presently over £100m in Essex, the purpose of which is to help meet Government objectives for more social care to take place outside of hospitals, reducing the burden on admissions and readmissions.

The Local Authority has a capital allocation to spend £30m over the next 3 years on adult social care infrastructure, including 60 specialist housing schemes totalling 360 units of additional accommodation. The aim of the investment is to provide accommodation which, in combination with other social care revenue programmes, will enable vulnerable adults to live independently without needing to enter long term care.

EMERGENCY SERVICES

Police service
The main source of funding for the police force is the Central Government grant made available through the annual Home Office Police Grant Report. Police and Crime Commissioners can also raise additional revenue funding through council tax precepts. All police forces in the UK have been subject to reductions in funding in recent years. The Government has consulted on proposals for new funding arrangements for police forces in England and Wales. It is generally accepted that the existing formula is no longer appropriate and the Government wants to replace the existing funding formula with a simplified formula. However, following statistical errors having been discovered in the funding proposals, the Government has decided to delay changes to police funding for 2016/17

Fire and rescue
The Fire and Rescue Service generally provides its services for free, although there are some special services that can be charged for, and some additional services that can be paid for. The service is free to the end user in the case of an emergency. Funding for the fire service comes from two principal sources: a Central Government grant, and a levy (precept) on the local council tax. From 2010-11 to 2015-16, funding for fire and rescue authorities has fallen for stand-alone authorities by 28%. Once council tax and other income is taken into account, the average reduction in total income ('spending power') is 17% in real terms.

Ambulance services
The ambulance service is the emergency response wing of the National Health Service. The ambulance service across the UK has two main functions: an accident and emergency paramedical function, and the Patient Transport Service function which transfers immobile patients to and from their hospital appointments. Services are provided by the East of England Ambulance Service (EEAS) across Greater Essex. Funding for this organisation is from the National Health Service rather than Central Government (in contrast to the other two emergency services) and has experienced reductions in overall funding in recent years.

COMMUNITY SPORTS AND LEISURE

Most Community Services, including the running and development of leisure centres, museums and galleries, as well as waste and refuse collection and other local services are the responsibility of the District and Unitary Authorities within Essex. The management of libraries is under the jurisdiction of Essex County Council for those that fall within the boundary of the Districts, with the Unitary Authorities managing their own.

Local Parish and Town Councils have powers to provide some facilities themselves, or they can contribute towards their provision by others. There are large variations in the services provided by parishes, but they can include: support and encouragement of arts and crafts; provision of community and village halls; recreation grounds, parks, children's play areas, playing fields and swimming baths; cemeteries and crematoria; public conveniences; provision of cycle and motorcycle parking; acquisition and maintenance of rights of way. Parish Councils also have the power to raise money locally through the precept, the parish council's share of the council tax. This is an increasingly important source of local funding which is available to support valued local services. The precept demand goes to the billing authority - the local authority - which collects the tax for the Parish Council. Beyond their budgets, Parish councils may also secure support from a range of specialist organisations such as Sports England, the Arts Council or the Lottery Fund.

GREEN INFRASTRUCTURE

Natural England is the non-departmental public body responsible for providing advice to ensuring that England's natural environment, including its land, flora and fauna, freshwater and marine environments, geology and soils, are protected and improved. Natural England is promoting the concept of green infrastructure as a way to deliver a wide range of benefits for people and the natural environment together. It believes that green infrastructure should be delivered via the spatial planning system, as an integral part of new development everywhere, and also forms a key part of proposals to regenerate existing urban areas.

UTILITIES

Utilities infrastructure delivery and funding of it is largely the responsibility of the relevant utility companies, with connections to services for new sites also funded by through site developers. For future development, it is will be important to clarify the procedure by which these utility companies consider development sites and how these are included within their own programme and investment strategies.

Utility Providers are regulated by OFGEM and OFWAT; in principle, neither regulator supports installing new infrastructure on a speculative basis, rather they are reactive to providing supply services to new developments once a scheme has received consent. However, if a robust business case that gives a good level of certainty that development will take place in a definite timescale is put to the Regulators, advance funding may be approved. This is an unsatisfactory situation and changes in the way utility services are provided is an important issues to consider further.

It important to highlight the fact that Water Companies will soon commence the preparation of the next Water Resource Management Plans (WRMP) and Business Plan. Local Plan growth targets and the timing of sites will be a key source of information to inform these plans.

Water providers, as natural monopolies, are obligated in the requisitioning or provision of self-lay connections by

developers or their contractors and subject to regulation under the 1991 Water Industry Act. This stipulates that they must provide necessary infrastructure and supply given the attainment of certain conditions and costs by the developer. The main water supplier in Essex is Essex and Suffolk Water (part of Northumbria Water Ltd), and waste water and sewerage services are provided by Anglian Water and Thames Water, which also provide water supply. Affinity and Veolia (with owner of Three Valleys Water and Tendring Hundred Water) are also suppliers in the area. There is currently no direct competition for supply in the water market as switching is not possible.

Water recycling centre upgrades (previously referred to as sewage or wastewater treatment works), required to provide for additional growth, are wholly funded by the water companies through their Asset Management Plan. Foul network improvements are generally funded/ part funded through developer contribution via the relevant sections of the Water Industry Act 1991. The cost and extent of the required network improvement are investigated and determined when the service company is approached by a developer and an appraisal is carried out. Similarly water infrastructure provision will be dependant on location and scale of the development and contributions for upgrades or strategic schemes will be obtained through provisions in the Water Industry Act 1991.

Waste and refuse collection is the responsibility of the district and unitary authorities. These services are largely contracted out to the private sector and funded from local budgets. Essex County Council and the unitary authorities have responsibility for domestic waste disposal. Commercial waste is dealt with by the private sector.

FLOOD PROTECTION & DRAINAGE

Essex County Council and Thurrock and Southend Councils are known as Lead Local Flood Authorities (LLFAs). This means that They are able to receive Central Government funding for Flood and Coastal Erosion Risk Management (FCERM). Funding can be delivered via a range of routes, including via DEFRA, DCLG the Environment Agency, or other bodies that have been devolved funding responsibilities such as LEPs. £735m has been allocated by Central Government in 2016 / 17 for these purposes.

In return, the LLFA s have a range of responsibilities including to: prepare and maintain a strategy for local flood risk management in their areas, coordinating views and activity with other local bodies and communities through public consultation and scrutiny, and delivery planning; maintain a register of assets –i.e. physical features that have a significant effect on flooding in their area; investigate significant local flooding incidents and publish the results of such investigations; provide statutory planning advice for establish approval bodies for design, building and operation of Sustainable Drainage Systems (SuDS) in relation to major (10 plus homes) planning applications.; issue consents for altering, removing or replacing certain structures or features on ordinary watercourses; and play a lead role in emergency planning and recovery after a flood event.

Internal Drainage Boards (IDBs) are responsible for managing water levels in low-lying areas. They are independent bodies with elected members and Local Authority representatives, funded by drainage levies raised on Local Authorities and local land owners.

FUTURE OUTLOOK FOR PUBLIC FUNDING

The Local Government Finance Act came into force in April 2013, giving Local Authorities the power to retain up to half of the proceeds of any growth in business rates income within their jurisdiction. The devolution of this key funding source came against a background of austerity budgets since 2011 in which Central Government grant funding to Local Authorities, via the Revenue Support Grant, has been sharply reduced year on year.

Over this same period a devolution agenda has also been followed by Government, through which many traditional sources of funding to Local Authorities were pooled into the Single Local Growth Fund and reallocated to Local Enterprise Partnerships as part of Local Growth Deals. The implication of these changes means that Local Authorities have reducing budgets and have to work with these new systems and mechanisms in order to find and apply for funding to deliver services and new infrastructure. There are changes however since the Autumn Statement 2015, when the Government signalled a change in the local government funding settlement, with the full localisation of business rates (national non-domestic rates) by 2020, compensating for the phasing out of the Revenue Support Grant - delivering a 13.1% real increase in local government funding by 2020.

The picture of public funding for infrastructure in England is an evolving one which will need to be monitored constantly in order to ensure that local authorities remain aware of the opportunities available to finance their infrastructure requirements.

The current trend towards reducing public resources with the ending of the Government's Rate Support Grant in 2020/21, the use of competitive funds and a greater reliance on private sector sources is likely to continue. On the other hand some structural changes may occur as a result of emerging Devolution deals and the eventual exit of the UK from the EU.

EU funding has been a significant component of locally determined delivery of employment and skills and business support. The LGA fears that due to delayed sign offs by government, only 50% of the £5.3 billion will be agreed before the UK leaves the EU - leaving a shortfall in the delivery of EU Structural and Investment Fund Plans. For example, in the SELEP area, at least 8,000 apprenticeships depend on this funding.

Table 6.1

Overview of funding responsibilities and major public funding streams for capital investment in infrastructure

INFRASTRUCTURE THEMES	MANAGEMENT BODY	REMIT	PUBLIC FUNDING STREAM(S)
TRANSPORT			
Strategic road network	**Highways England**	Operates, maintains and improves England's motorways and major A roads. In Greater Essex, the A12, A120, M11,M25, A13 (part) and A1089 are Highways England's responsibility. Highways England Delivery Plan 2015-2020, published in response to the Government's Road Investment Strategy RIS2, sets out Highways England's main activities, strategic outcomes and describes how it will deliver the Investment Plan.	Highways England, set for 2015-2020
Local road network & transport projects	**Essex County Council & Unitary Authorities**	The County Council is responsible for the delivery of the Local Transport Plan. Local authorities' responsibilities include: traffic management improvements; tackling congestion; safer roads (including casualty reduction); public Rights of Way improvements; local road maintenance.	Local authority budget; DfT competitive funds e.g. Pinch Point Fund; Local Highways Maintenance Challenge Fund.
	South East Local Enterprise Partnership (LEP)	Funding for major local transport schemes was devolved to LEPs as part of the Single Local Growth Fund in 2015. In Essex a number of transport projects have been identified in the South East LEP Growth Deal.	Local Growth Deal
Rail	**Network Rail**	Network Rail is the monopoly owner and operator of the national rail network and its assets – such as track, bridges and signaling. Network Rail's income comes from three sources: direct grants from the Department for Transport and Transport Scotland); charges for track access to train operating companies; income from commercial property.	Government funding to Network Rail is allocated for a five-year period for the CP5 (2014 to 2019). MOU agreed between NR and DfT post CP5 to set out the governance around delivering future enhancements.
Airports	**Private companies**	Stansted and Southend airport are run by private companies but some public funding may be accessible to Southend Airport as part of a Government initiative to support small airports.	DfT Regional Air Connectivity Fund for small airports
Ports	**Private companies**	Operate on a commercial basis	n/a
Integrated transport (buses, cycling, walking)	**Essex CC & Unitary Authorities**	The County Council is responsible for the delivery of the Local Transport Plan. Local authorities' responsibilities include: cycling schemes; walking routes; passenger transport improvements.	Local authority budget; DfT competitive funds e.g. Access Fund for Sustainable Travel
	LEP	The South East LEP Growth Deal includes some cycling improvement schemes.	Local Growth Deal
	Bus companies	The area is served by a number of bus and coach companies providing part subsidised services.	n/a
EDUCATION			
Early years & childcare, primary education, second education, sixth form education	**Essex CC & unitary authorities**	Local authorities have a duty to ensure that there are sufficient school places in their area. The Education Funding Agency provides grants to local authority maintained schools and academy trusts for building maintenance, refurbishment and rebuilds.	A number of funding streams are provided by the Department for Education / Education Funding Agency for capital investment in schools: Basic Need capital allocations, school condition funding, Priority School Building Programme.
Higher Education (HE), Further Education (FE), Adult learning	**Colleges, universities, education providers**	Investment in FE and HE is decided by Central Government and education providers.	The Skills Capital Fund from the Skills Funding Agency for further education capital investment; the Higher Education Funding Council for England for higher education capital investment.
HEALTH & SOCIAL CARE			
Primary care services	**Clinical commissioning groups (CCGs), NHS Property Services, Community Health Partnerships**	NHS England has the commissioning responsibility for primary care services. As part of this they provide some funding for improvement to premises and manage specific capital initiatives. Most significant funding is now secured from private equity either via public sector vehicles such as NHS LIFT and PPP or borrowing from private funds. In addition there are occasional primary care schemes that are funded by a partnership, social enterprise, or commercial enterprise.	NHS England (Estates and Technology Transformation Fund – competitive)
Hospitals & mental health	**CCGs, NHS England, NHS Property Services, Community Health Partnerships**	Services in these sectors are commissioned by local Clinical Commissioning Groups, NHS England and specialist national groups. Some central capital funding is available for premises, IT and equipment replacement as well as from the two NHS property organisations, NHS Property Services and Community Health Partnerships. Foundation Trusts and non-NHS providers may borrow from private equity either via public sector vehicles such as PFI, NHS LIFT and PPP or borrowing from private funds.	Department of Health programmes and a range of alternative funding sources
Adult social care, public health and well-being	**Essex CC & unitary authorities**	Under the Care Act 2014 local authorities have new responsibilities in social care. The Act makes clear that local authorities must provide or arrange services that help prevent people developing needs for care and support or delay health deterioration and reduce the requirement for ongoing care and support. Local authorities also provide other health and well-being services e.g. related to smoking, weight management, family support and mental health.	Local authority budget; Better Care Fund; Social Care Precept, which allows Councils with Social Care responsibilities to increase council tax by an additional 2% to meet these new duties.

INFRASTRUCTURE THEMES	MANAGEMENT BODY	REMIT	PUBLIC FUNDING STREAM(S)
EMERGENCY SERVICES			
Police service	**Essex Police**	The funding for the police service comes from two main sources. Around two thirds of the police budget comes from a Central Government grant whilst the remaining one third is provided through the council tax as the policing precept.	Central Government, Essex County Council
Fire service	**Essex County Fire and Rescue services**	Funding for fire and rescue services comes from two main sources: a proportion of the council tax precept and Central Government grant	Central Government, Essex County Council
Ambulance service	**East of England Ambulance Service NHS Trust (EEAST)**	Ambulance services are funded by NHS England through their commissioning arrangements, except for air ambulances which are charitably funded.	East of England Ambulance Service NHS Trust (EEAST)
COMMUNITY, SPORTS & LEISURE			
Library services	**Essex CC & unitary authorities**	Libraries within the boundary of the District authorities fall under the responsibility of the County Council, whilst the two Unitary Authorities, Southend and Thurrock fund, run and manage their own library services.	Local authority budget
Community & youth services	**District councils & unitary authorities**	Leisure Centres and sports facilities are managed by the district councils and unitary authorities from their own budgets.	Local authority budget, Sports England, Arts Council, Lottery Fund
Outdoor sports, parks & recreation	**Districts / boroughs, parish councils**	Essex County Council funds the maintenance of the County Parks. District councils and parishes also have responsibilities for local parks and recreation areas. Some areas of strategic environmental interest are under the responsibility of charities and public organisations.	Local authority budget and other potential sources of funding for specific projects e.g. Essex Wildlife Fund, Environment Agency.
UTILITIES & WASTE			
Energy	**Gas network operators, UK power network**	Utilities infrastructure delivery and funding is largely the responsibility of the relevant private utility companies with new connections to services also part-funded through site developers.	Private operators, although Central Government programmes may be available to encourage investment in renewable energy at local level.
Broadband	**BT Open Reach and other Commercial Operators (i.e Virgin Media)**	A large share of the investment in broadband infrastructure has been implemented by commercial operators. The public sector is also providing funding in order to achieve 95% coverage of the population by 2017/18.	Central Government funding, EU match-funding
	Essex CC	The County Council is delivering capital investment in broadband infrastructure to support large scale commercial development including the installation of a Superfast broadband network. The capital programme is also supporting projects for further education colleges that will deliver skills centres focussed on the teaching of science, technology, engineering and maths.	Local Authority Budget
Water & waste water	**Water companies**	Water recycling centre (previously referred to as sewage or wastewater treatment works) upgrades required to provide for additional growth are wholly funded by the water companies through their Asset Management Plan. Foul network improvements are generally funded/part funded through developer contribution via the relevant sections of the Water Industry Act 1991. The cost and extent of the required network improvement are investigated and determined when the service company is approached by a developer and an appraisal is carried out. Similarly water infrastructure provision will be dependant on location and scale of the development and contributions for upgrades or strategic schemes will be obtained through provisions in the Water Industry Act 1991	n/a
Waste	**Districts & Unitary Authorities**	Waste and refuse collection is the responsibility of the Districts, County and Unitary Authorities. These services are largely contracted out to the private sector and funded from local budgets.	n/a
FLOOD PROTECTION & DRAINAGE			
Flood risk	**Essex CC & Unitary Authorities**	Essex County Council and the two Unitary Authorities are the organisations responsible for Flood and Coastal Erosion Risk Management (FCERM), receiving grant funding from Central Government and the Environment Agency The County Council is committed to spend £3m on the Flood Prevention Capital Programme aimed at minimising the harm caused by flooding and reducing the level of flood risk.	Central government funding
Drainage	**Internal Drainage Boards**	Internal Drainage Boards (IDBs) are responsible for managing water levels in low-lying bodies. They are independent bodies with elected members and Local Authority representatives.	Drainage rates collected from agricultural land and buildings within the Internal Drainage District; Special Levies issued on District and Unitary Authorities within the Internal Drainage Distri ct; Contributions from the Environment Agency.

6.2 DEVELOPER CONTRIBUTIONS

IN RECOGNITION OF THE PUBLIC COSTS BORNE BY LOCAL AUTHORITIES IN PROVIDING INFRASTRUCTURE TO SUPPORT NEW DEVELOPMENTS, THE TOWN PLANNING PROCESS PROVIDES THE MEANS FOR DEVELOPERS TO CONTRIBUTE TO THE COST OF NECESSARY SUPPORTING INFRASTRUCTURE. THESE ARRANGEMENTS VARIOUSLY TAKE THE FORM OF PLANNING CONDITIONS, SECTION 106 AGREEMENTS BETWEEN LOCAL AUTHORITIES AND DEVELOPERS AND A COMMUNITY INFRASTRUCTURE LEVY (CIL).

SECTION 106 AGREEMENTS

Section 106 of the Town and Country Planning Act 1990 allows a LPA to approve a development proposal that would not otherwise be acceptable on planning grounds, on various conditions set out in agreements negotiated between local authorities and developers. These commonly include an obligation for developers to provide affordable housing (of various types and at various times) and to secure financial contributions and land from developers for all types of supporting infrastructure.

The Community Infrastructure Levy Regulations specify that Section 106 agreement can be concluded, only where such an agreement is:

- necessary to make the development acceptable in planning terms
- directly related to the development; and
- fairly and reasonably related in scale and kind to the development.

Section 106 agreements should be focused on specific measures to mitigate the planning issues which would otherwise lead to refusal of the planning application. Accordingly, funding received by an LPA under a Section 106 agreement must be spent on the infrastructure agreed to be delivered, pursuant to a developer contribution agreement.

COMMUNITY INFRASTRUCTURE LEVY

The Community Infrastructure Levy is a fixed, tariff-based planning charge, which allows LPAs to require developers of particular types of development to pay a levy based on the size of the development (per square metre). In setting the CIL, the LPA must specify a list of projects or types of infrastructure which the CIL will fund (known as a Regulation 123 list). The levy is intended to recognise the costs to LPAs in providing infrastructure to support development. LPAs can determine whether or not to institute such a levy and the per square metre rates used for different development types. The National Planning Policy Framework recommends that, where possible, Community Infrastructure Levy rates should be developed alongside an LPA's Local Plan.

Funds raised through the CIL must be applied to provide the infrastructure specified on an LPA's Regulation 123 list.

Since the relevant provisions of the Planning Act 2008 came into force in 2010, only two LPAs in Greater Essex have adopted a CIL. Chelmsford has a residential development charge of £125 per square metre and Southend-on-Sea charges between £20 and £60 per square metre, depending on the nature of the land use. These are illustrated in Figure 6.1.

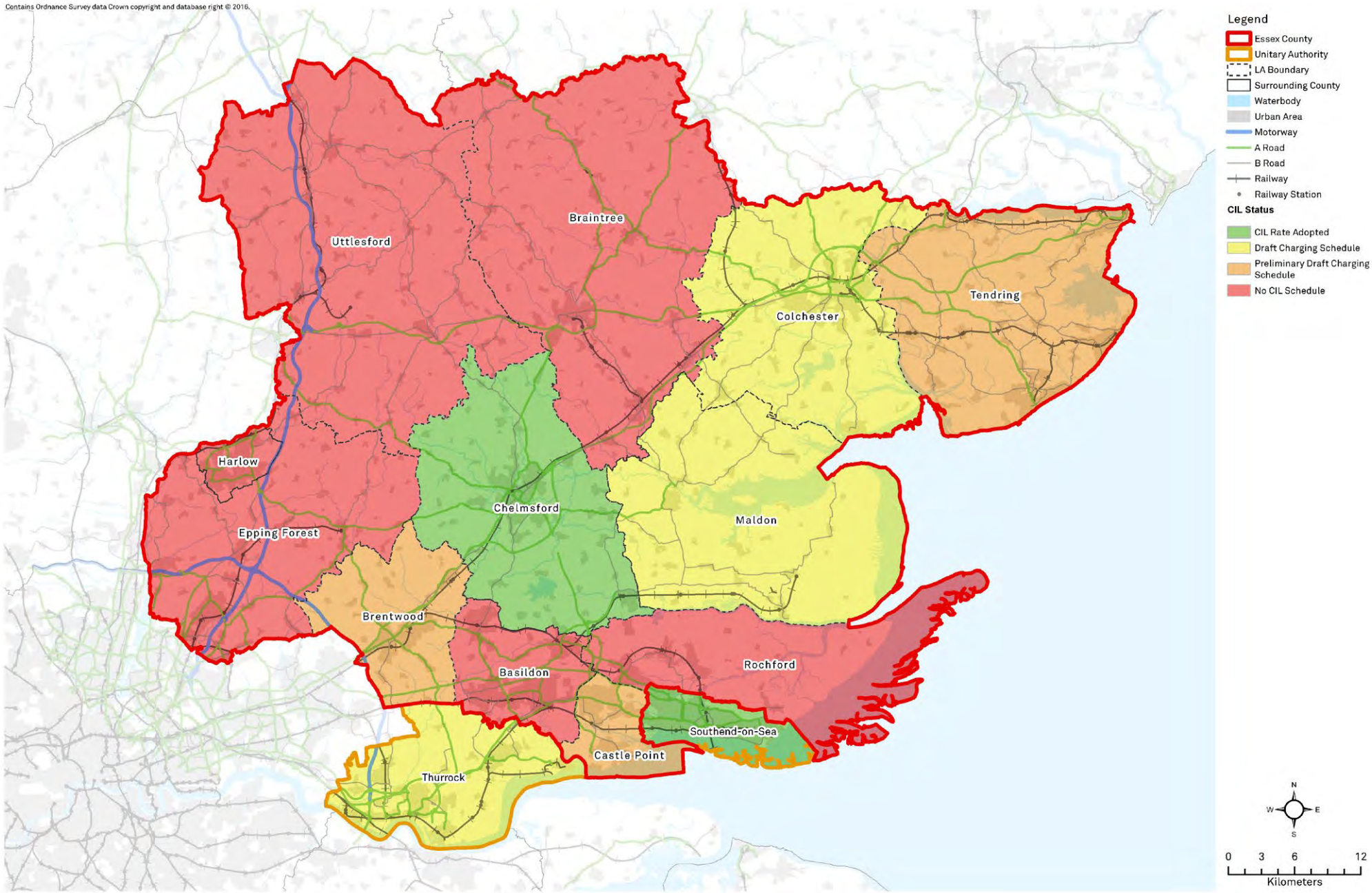


FIGURE 6.1- ADOPTED AND DRAFT RESIDENTIAL CIL RATES ACROSS GREATER ESSEX

Source: Local Authority Published Draft and Adopted CIL Charging Schedules

Relationship between CIL and Section 106

There should be no circumstances where a developer is paying a CIL and contributing under a section 106 agreement in relation to the same infrastructure.

While Section 106 agreements for developer contributions to infrastructure should be focused on specific measures to mitigate the planning issues which would otherwise lead to refusal of the relevant planning application, CIL is intended to be levied to address the broader impacts of development on specified types of infrastructure.

Historically, LPAs pooled funding for Section 106 agreements of separate but complementary developments to fund large scale infrastructure such as roads and schools. The Community Infrastructure Regulations 2010 introduced CIL restrictions which limit the maximum number of Section 106 agreements that can be pooled for a single projects to five (CIL) restrictions have been instituted, in the supporting Community Infrastructure Regulations 2010, limiting to LPAs to pooling developer contributions from a maximum of five section 106 agreements towards a single project.

DEVELOPMENT VIABILITY

Any contribution by a developer to infrastructure (through an agreement) is dependent on the proposed development being commercially viable. The viability of prospective developments is sensitive to the value of the land on which the development is to be built and the level of contributions sought from developers to fund infrastructure. Higher land values indicate a greater prospect that a development will be able to contribute towards costs of the required infrastructure while remaining viable.

According the Valuation Office Agency (VOA) 2014 estimates*, the average price per hectare in each local authority in Greater Essex varies from £1,130,000 per hectare in Tendring to £5,225,000 in Epping Forest. Unsurprisingly, the local authorities with best connectivity to London (Epping Forest, Brentwood, Basildon and Chelmsford) have the highest land values. Values for Greater Essex are comparable with England (excluding London), which has an average value of £1,958,000 per hectare, but significantly lower than England when London is included, which has an average value of £6,017,000.

**The VOA data represents an estimate of land values, prepared on a consistent theoretical basis, to support a comparison across Greater Essex. These estimates do not represent true land values and do not accurately indicate variation or conurbations within each local authority area.*

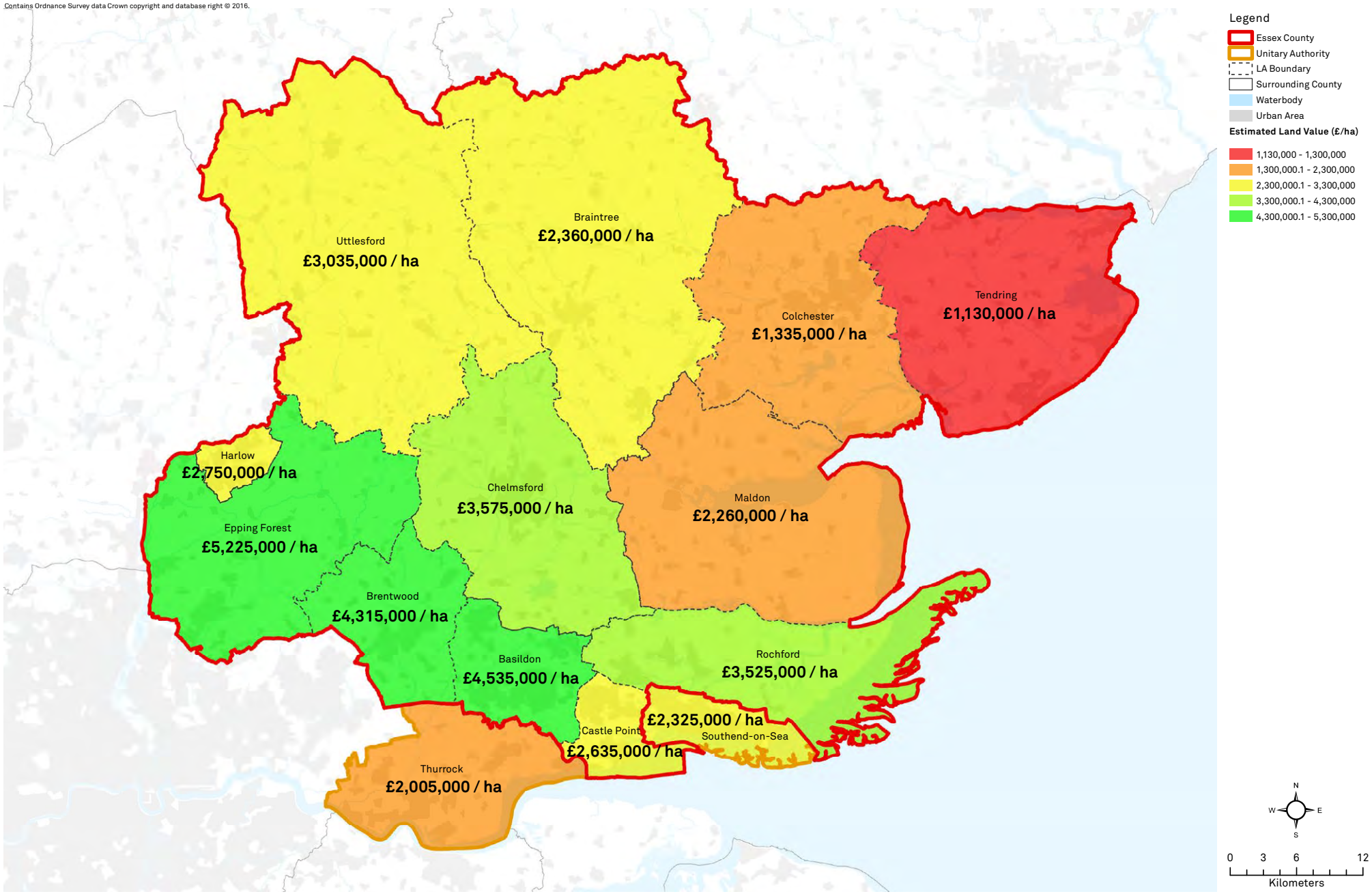


FIGURE 6.2 - LAND VALUES ACROSS LOCAL AUTHORITY AREAS IN GREATER ESSEX

Source: The Valuation Office Agency (VOA)

Further detailed local area land value analysis is available from local authority whole plan viability reports

6.3 GAP FUNDING OPTIONS FOR CONSIDERATION

GIVEN THE LIMITATIONS OF CIL AND SECTION 106 TO FULLY FUND INFRASTRUCTURE ACROSS GREATER ESSEX, CONSIDERATION MUST BE GIVEN TO WIDER (AND MORE INNOVATIVE) FUNDING MECHANISMS THAT ARE BEING DEVELOPED BY THE PUBLIC AND PRIVATE SECTORS

In a context of significant projected population growth combined with constrained financial resources, Greater Essex will need to explore ways to secure additional funding, beyond mainstream public sector grants (Section 6.1) and developer contributions (Section 6.2), in order to meet its infrastructure needs.

This section provides an overview of current options for such alternative funding drawing on the experience of local authorities across the UK but bearing in mind that funding sources evolve over time with emerging priorities and changes in regime either at local, regional or national level.

Table 6.2 provides a summary of these main options and the type of projects they may be suitable for. It focuses on key sources but is by no means exhaustive.

Whilst Section 6.1 outlined the main sources of public sector grants available to pay for infrastructure, the funding gap will require the use of other instruments including a range of financial and market-based mechanisms.

BORROWING

PUBLIC WORKS LOAN BOARD OR 'PWLB'

The public sector can borrow from the Public Works Loan Board (PWLB) at rates determined by HM Treasury to fund its spending and represents a key source of finance which could be used to fund infrastructure. This is the main direct funding source for local authorities and interest rates are currently low in comparison to other funding sources.

Local authorities can borrow to invest in capital works and assets so long as the cost of borrowing is affordable and in line with the principles set out in a professional Prudential Code. This means that local authorities must use various prudential indicators to judge whether their capital investment plans are affordable, prudent and sustainable.

Prudential borrowing represents a key source of affordable finance which could be used to meet the upfront costs of key infrastructure. It has the benefit of being a relatively reliable source of finance, not being subject to commercial market appraisals in the way that a bank financed project would be.

Example - Croydon Council
The current Croydon Growth Zone is a billion pound delivery programme of infrastructure development to enable the Central Opportunity Area (COA) to accommodate the delivery of 23,600 new jobs with a further 5,100 jobs created during the construction phase, the creation of at least 10,500 new homes and the wholesale renewal of the retail core. It is planned to be funded through a TIF funding model using the retention of enhanced Business Rates to pay back the Public Works Loan Board (PWLB) loan of around £300 million. The project is forward funded by a grant of £7m from the Government to fund the early years interest repayments.

However, whilst this could help meet the upfront costs of infrastructure, it will increase the overall costs due to the need to service debt on the loan and it does place the local authority in a position of risk in terms of repaying the whole value of infrastructure from resources, if revenue or value through the schemes to come forward cannot be captured.

LOCAL AUTHORITY BONDS

Bonds allow local authorities to raise substantial sums of capital immediately, on the basis of promises to repay the capital with interest at a specified point in the future.

Local authorities' borrowing limits will be related to the revenue streams available to them, which influence their ability to repay the debt. Local authorities are prevented by law from using their property as collateral for loans.

It would be possible for a local authority to issue bonds as part of a TIF process. Money would be obtained up-front by selling the bonds (instead of approaching financial institutions), and they could be repaid by the additional tax revenues resulting from the public investment.

If the future tax revenues do not materialise and the local authority is thus unable to repay the bonds, this will of course cause financial problems for the local authority.

As of 2016, a new UK Municipal Bonds Agency has been established. It is owned by some 56 shareholding local authorities. The purpose of the agency is to facilitate the issuing of bonds by smaller local authorities, and to obtain a competitive price for their bonds within the conventional bond market in order to reduce councils' capital costs over the long term. It will do this by: raising money on the capital markets through issuing bonds; arranging lending or borrowing directly between local authorities; sourcing

funding from other third party sources such as banks, pension funds and insurance companies.

It aims to lend to eligible councils at a lower rate than the PWLB or than if the councils were to issue their own bonds. This lower rate will be attained by: achieving a sovereign-like credit rating through a joint and several guarantee (see section 6 of the business case); issuing bonds in benchmark sizes of £250 million to £300 million; and sourcing capital at low interest rates from third parties, such as the European Investment Bank.

Example: Warrington Council
In August 2015, Warrington Council issued £150 million in bonds, with a 40-year repayment period. The majority of the funding is to be used to redevelop Warrington town centre. The council will seek to repay the bonds via the proceeds from this redevelopment, whether in the form of business rates revenue, or the sale and rental of the properties in question.

Example: Greater Cambridge City Deal
An agreement set up between a partnership of local organisations and Central Government, to help secure future economic growth and quality of life in the Greater Cambridge city region. The agreement set up with Central Government will provide up to £500 million worth of funding over the next 15 years. The partnership aim to generate a further £500 million through other funding streams, bringing in a total investment of £1 billion

The Municipal Bonds Agency will be open both to shareholder authorities and other authorities.

BORROWING AGAINST LOCAL REVENUE

In recent years a number of alternative borrowing mechanisms have been trialled in the UK, using local revenue streams as a basis for long-term lending. However, take-up of each of these mechanisms has been limited so far.

TAX INCREMENT FINANCING (TIF)

TIF schemes were approved by the 2010-1015 Coalition Government as a new mechanism for forward funding infrastructure and capital development. Tax Increment Financing allows local authorities to capture the value of uplifts in local taxes (business rates) that occur as a result of infrastructure investment. Specifically it enables local authorities to borrow against the value of the future uplift in order to deliver the necessary infrastructure. Tax increment financing schemes in England have so far been based on business rate revenues, as this is the only local authority tax the revenues of which are likely to be directly affected by infrastructure projects.

Borrowing for Tax Increment Financing schemes falls under the prudential system, allowing local authorities to borrow for capital projects against future predicted increases in business rates growth, provided that they can afford to service the borrowing costs out of revenue resources. However, such borrowing can only take place if local authorities and developers have a degree of certainty about the future tax revenue streams and whether there are sufficient guarantees that they will be retained within the authority.

Examples: Northern Line Extension
London Underground's Northern Line extension to Battersea involves an extra 3.2 km of track that will run from Kennington to the site of the disused Battersea Power Station, via Nine Elms. An innovative finance package to deliver the Northern Line Extension was developed by TfL, the GLA, Wandsworth Borough Council and Lambeth Council. It was agreed that the lion's share of Section 106 and Community Infrastructure Levy contributions from sites in the Nine Elms Enterprise Zone, within which Battersea Power Station sits, would be ring fenced to help fund the tube line extension. A Tax Increment Financing (TIF) deal was also agreed to provide additional funding for the Northern Line Extension. The GLA is taking out a loan of up to £1 billion to fund the project, with a repayment guarantee provided by the UK government. Loan repayments are due to be paid back, in part, through future growth in business rates revenue within the Nine Elms Enterprise Zone. The CIL and s106 revenues will also be used to pay back the loan.

BUSINESS RATE RETENTION

The Business Rates Retention (BRR) scheme was introduced in April 2013 and provides the opportunity for councils to retain a proportion of business rates revenue as well as growth on the revenue that is generated. The scheme could be used to meet the cost of infrastructure as and when the revenue is received, or it could be used to raise finance to meet up-front infrastructure costs.

Under the BRR scheme local authorities are able to pool together on a voluntary basis to generate additional growth and smooth the impact of volatility in rates income across a wider economic area. Business rates would generate

funds which could be used to pay for a range of needs. Their use to help meet the funding of infrastructure would need to be carefully considered against other council funding objectives.

Under current Government plans Local authorities will retain 100% of business rates within the sector by the end of this Parliament and how the system will operate is not yet clear. Its design and the implications for certainty of longer term income may impact on local authorities' willingness to invest in longer term projects such as infrastructure.

This will therefore require a concerted effort for local authorities to pro-actively to bring forward new business land and premises using all the available powers and financial interventions at their disposal to facilitate business expansion opportunities and also secure a higher proportion of inward investment businesses, particularly taking advantage of any displaced businesses from London and Cambridge.

Minimise the Impact of Permitted Development Rights

In order to minimise the impact of permitted development rights, which permit the conversion of office floorspace to residential development, an option worth considering is that of introducing an Article 4 Direction for the areas needing to be protected. By applying an Article 4 Direction to an area, this takes away permitted development rights, thereby giving the local authorities an additional safeguard to protect office accommodation from being lost through permitted development, particularly within Town Centres.

Good quality office accommodation is in short supply in Essex, protection of this resource is essential to the growth of professional service sector jobs in Essex. The impact of the permitted development rights has had an impact in Essex, particularly in Chelmsford.

DRAWING VALUE FROM THE LOCAL AUTHORITY'S OWN ASSETS AND RESOURCES

LOCAL ASSET BACKED VEHICLES (LABV)

Local Asset Backed Vehicles (LABV) allow local authorities to use their assets (usually land) to lever long-term investment from the private sector for regeneration projects. They are designed to bring together a range of public and private sector partners in order to pool finance, planning powers, land and expertise; to ensure an acceptable balance of risk and return for all partners; and to plan and deliver projects more strategically.

There is no uniform method for designing LABV arrangements. In fact, given the varying capacity, assets and ambitions of local authorities across the country, each LABV must be specifically tailored to the individual needs of a local authority or city-region. Nevertheless, there are certain phases that all LABVs are likely to go through in their formation. Generally, when attempting to establish a LABV, local authorities and other public sector bodies will first collaborate to identify a portfolio of assets and a pipeline of regeneration projects which require funding. Finding the right mix of assets is important, and they should be bundled together specifically with the aim of attracting particular private sector partners. In order to simplify the public-private relationship and make it easier to attract private investment, this collaboration is then formalised into one company with a single governance structure – the LABV. Any number of specialist partners can be introduced further down the line, whether they are developers, infrastructure delivery companies, contractors or other bodies.

Example: Sunderland Council
As part of a strategy to support city centre regeneration, the former Vaux brewery site was acquired by the council with plans to create jobs and enhance city centre attractiveness by developing high quality office space with complementary residential, retail and leisure uses. This site was packaged together with housing developments in Chapel Garth and Seaburn seafront sites into a joint Local Asset Backed Vehicle (LABV) called Siglion with the council and Carillion, managed by Igloo Regeneration. In addition, the council had to agree to take on the head lease on the first building delivered at the Vaux site in order to make development viable.

The value of entering a LABV to Sunderland has been to improve the ability of the portfolio to support employment, resulting in improved rents and rental income back to the council. The LABV model enabled partners to focus on acquiring sites and building with low occupancy or a poorer offer and improving their performance. In Sunderland, the formal partnership between the public and private sector matches the expertise and finance available in the private sector, with the de-risking through planning that the public sector can bring.

Example: Alconbury Enterprise Zones
The Alconbury Enertprise Zones in Cambridgeshire has provided a long term future funding commitments from the accrued business rates secured. This forward funding NNDR commitment which along with other local authorities' funding commitments was sufficient to secure Central Government financial backing to fund upgrade of the a key stretch of A14 in Cambridgeshire.

While LABVs can be an effective tool to unlock brownfield or underdeveloped sites, they also present a range of challenges including:

- securing political buy-in. This can be a challenge for multiple reasons including reluctance to relinquish control of local authority assets; scepticism of the private sector; need for cross-party, and cross-boundary working;
- getting the governance right given the LABV would bring together a diverse range of partners, each with different objectives;
- the capacity of local authorities to set up and manage their own LABV arrangements, and to manage risk;
- the need to maintain stakeholder support;
- the cost of setting up and operating the LABV. Procurement, preparing and agreeing legal documentation, require significant officer and external advisor time.

STRATEGIC ASSET MANAGEMENT

The combined impact of the recession and local government funding cuts has made publicly owned land and property assets an increasingly important tool for local authorities to support economic growth, as well as to generate revenue funding.

The response to these shifts has meant a greater focus on treating public assets more strategically at local level. Government policy in this area has tended to focus on disposal of publicly owned land and property, as well as reducing costs and improving the public service delivery through co-location. But the priorities for local authorities, and the opportunities that public assets present in terms of supporting local growth, are quite different. Publicly owned land and property can be both a strategic as well as financial asset to local authorities. It can enable them to capitalise on existing assets to deliver more housing or employment space to support economic growth (or improve public service delivery), as well as providing a revenue funding stream in the context of reducing budgets.

Example – One Public Estate
Starting in 2013 One Public Estate is a pioneering initiative delivered in partnership by the Cabinet Office's Government Property Unit and the Local Government Association (LGA). It is about local government working with central government and public sector partners locally on land and property initiatives to deliver four core objectives: create economic growth; more integrated and customer-focused services; generate capital receipts; and reduce running costs. Programmes with 32 of the largest land and property owning councils in England are aiming to create an additional 20,000 jobs, 9,000 homes, and raise £129 million from land and property sales over a five year period.

While disposal of land and property might remain the right response in some cases, strategies that include investing to refurbish old assets or acquire new ones in the right places are also appropriate responses for cities seeking to proactively to support economic growth and regeneration, as well as generate revenues.

Three broad approaches to managing and optimising the value of public sector assets can be found across UK local authorities:

- Leading development: in places where the market is too weak to deliver physical development and regeneration without public sector intervention and funding. Partners are purchasing and/or using the existing asset base to pump-prime development that will support economic growth
- Shaping development: in other places, the private sector property market (residential or commercial) is stronger. The focus for partners is on using the public asset base to influence how and what kind of development takes place in ways that align with their vision for the city.
- Unlocking development: localities focus on removing the barriers to particularly difficult individual sites and projects, by working together to formally to coordinate asset management and investment within cities (across local authorities and public sector agencies), which creates new opportunities for releasing valuable land in strategic locations within urban areas.

Strategic Asset Management is therefore much more than just a potential funding stream for local authorities and must be approached as a mechanism to support regeneration, place making and local development.

PUBLIC FUNDS

EUROPEAN FUNDING

European funding for the UK is still available for the short term from the European Regional Development Fund (ERDF), European Social Fund (ESF) and part of the European Agricultural Fund for Rural Development (EAFRD) which are combined into a single 'EU Structural Investment Funds (ESIF) Growth Programme' made available to Local Enterprise Partnerships (LEPs) on a competitive basis.

The Programme runs from 2014 to 2020 and focuses on:

- Skills, Employment Support and Promoting Social Inclusion (ESF)
- research and innovation, IT and broadband, business support, low carbon, climate change, environment, transport, social inclusion, technical assistance (ERDF)
- support for rural businesses (EAFRD)

EU funds require match-funding from either public or private sources. They must be additional to, and not replace, existing national funding. Opt-in arrangements are encouraged to ensure a closer integration with local and national programmes, sources of guaranteed match funding, and provide a low level of risk in delivery. Delivery of the programme is through a variety of routes. These are open calls for projects, opt-ins, possibly financial instruments, and commissioning through tendering for delivery contracts.

The South East LEP has secured funds totalling around €200m under the 2014-2020 programme and produced an EU Structural and Investment Fund Strategy setting out priority areas for investment. Under the ERDF funding stream, the most relevant source for capital projects, SELEP's notional allocation for the 2014-2010 programme is £74.1m, of which:

- 16% has already been contracted to deliver seven projects within and across the SELEP area;
- 27% is notionally allocated to another seven projects, which are currently at various stages of appraisal;
- 57% remains unallocated, with the potential to be awarded to new projects that can help deliver economic growth across the South East.

The Essex Growth Programme which provides a support service and capital grand scheme to pre-start up and new SMEs in Essex, Thurrock and Southend-on-Sea is an example of investment which has benefited from European Funding.

A number of other European funds can support infrastructure investment including: Connecting Europe Facility for road and rail infrastructure with significant EU added value; CIVITAS for the implementation of ambitious, integrated, sustainable urban transport strategies; LIFE for measures to mitigate and adapt to climate change; Natura 2000 to protect the EU's most valuable and threatened species and habitats; ELENA which supports councils in preparing and implementing sustainable energy plans for their area. In addition, the European Investment Bank (EIB) lends to individual projects where the total investment cost exceeds EUR 25m.

The future extent and role of European Funding in infrastructure investment in the UK will depend on the arrangements agreed for the exit of UK from the European Union. Government has agreed to continue to fund EU projects post Brexit if they meet national needs. The Government may need to provide additional national funding as a replacement for any EU funding lost to Greater Essex and to ensure that the local economy can adapt and respond to new challenges to our trading relationships. The absence of a national replacement to EU funding would exacerbate existing local funding gaps identified in the GIF.

THE LOCAL INFRASTRUCTURE FUND AND LARGE SITES FUND

The Local Infrastructure Fund has been established to deliver short, medium and long term economic growth through targeted investments into large scale land, property and commercial projects which can offer financial and economic returns to the taxpayer. The fund offers repayable finance for upfront infrastructure investment and other site preparation works that will support economic growth, jobs and homes.

The Fund has the following key objectives:

- To promote economic activity by investing in large scale land and property projects, which have local support, to deliver the infrastructure required to unlock housing and commercial development;
- Recoverability: investments made by the fund will be recovered by the Homes and Communities Agency, according to the principles of the investment instruments;
- Flexibility: the Fund will be flexible in how it invests, enabling bespoke packages of support to be developed where needed.

The Local Infrastructure Fund (LIF) is administered by HCA with repayments from successful applicants being made to the HCA.

The first bidding round for LIF has closed and it is uncertain when the next round will open. To date, the Local Infrastructure Fund has provided support to deliver the infrastructure needed to boost Enterprise Zone schemes and accelerate locally-supported large scale housing developments.

As part of Autumn Statement 2013 the Chancellor announced a £1bn extension of the Local Infrastructure Fund for large scale housing sites, to unlock around 250,000 homes over 6 years. This is in addition to the funding being invested through the current round of the Local Infrastructure Fund.

NEW HOMES BONUS

The New Homes Bonus (NHB), which commenced in 2011, creates an incentive for local authorities to deliver housing growth in their area. It is based on central government match funding the Council Tax raised for new homes and properties brought back into use, with an additional amount for affordable homes, for the following six years to ensure that the economic benefits of growth are returned to the local area. This can however be viewed as a reallocation of funding that was previously allocated to local authorities through the Central Government Local Authority Financial Settlements. From 2015 NHB included a requirement that some resources are pooled to support LEP growth plans.

Example: Braintree District Council
Braintree District Council is using their New Homes Bonus to part fund the District Investment Strategy including infrastructure projects and provision of affordable homes. Components of that strategy include town centre redevelopment, business starter units, and support for the North Essex Garden Communities.

The Government has conducted a consultation on options for 'Sharpening the Focus' of the Bonus. These options included significant reductions in the availability and distribution of the Bonus for some local authorities. The Government is yet to provide a formal Government response and the future of the Bonus remains uncertain.

PRIVATE FINANCE INITIATIVE

Private Finance Initiatives (PFIs) are a form of Public-Private Partnership (PPP), first introduced in 1992. Under a PFI, the private sector will typically design, build, finance and maintain infrastructure facilities under a long-term contract. The public sector body which uses the infrastructure repays the debt over a long period, often 25-30 years.

As PFI contracts allow a local authority to embark on large capital projects with little upfront commitment of resources, it has been a popular option for capital financing in the past although since 2010, the number of new PFI projects has fallen sharply.

In December 2012, the Government announced the replacement of 'PFI' with 'PF2', which sought to address widespread concerns with the Private Finance Initiative and the recent changes in the economic context. The key reforms are as follows:

- Public sector equity: the public sector will take an equity stake in projects and have a seat on the boards of project companies, ensuring taxpayers receive a share of the profits generated by the deal.
- Encouraging more investors with long-term investment horizons - The use of funding competitions will be introduced to encourage institutional investors such as Pension Funds to compete to take equity in a PF2 project after the design stage. This is significant in terms of risk as Pension Funds are unlikely to invest in projects that are insufficiently developed.
- Greater transparency - Companies will have to disclose actual and forecast annual profits from deals. The new PF2 structure will curb gains to be made from refinancing and unutilised funds in lifecycle reserves.
- More efficient delivery - An 18 month limit on procurement will be introduced. Failure to meet this limit will see the respective public sector body lose funding.
- Future debt finance - the tender process will require bidders to develop a long-term financing solution where bank debt does not provide the majority of the financing requirement. Institutional investment will, therefore, become an important source of finance for PF2.

The first confirmed programme to which PF2 has been applied is the £1.75 billion privately financed element of the Priority Schools Building Programme (PSBP). While the immediate PF2 pipeline is focused on accommodation projects, an asset class which has been a particular focus of the PFI reforms, the Government wants to ensure that all suitable projects take advantage of PF2. Looking forward the Treasury will work with departments to assess which future projects are eligible for PF2.

LOCAL GOVERNMENT PENSION FUNDS

The Local Government Pension Scheme (LGPS) is a funded, statutory, public service pension scheme. DCLG is responsible for the scheme's stewardship and maintaining its regulatory framework. It is administered and managed by local pension fund authorities.

The primary responsibilities of Local Government Pension Scheme (LGPS) administering authorities regarding investments are to deliver the returns needed to pay scheme members' pensions, and to protect local taxpayers and employers from high pension costs. Thus pension funds do not represent large additional sources of capital expenditure that could be made freely available to local government.

However, the potential role of the LGPS in infrastructure funding is evolving. A number of recent studies have found there to be scope for LGPS funds to do more to invest for wider social and economic benefit. In 2012, DCLG carried out a consultation on possible changes to the investment regulations. As a result of the consultation, it amended the investment regulations to increase the proportion of the capital value of a fund that could be invested in partnerships.

In October 2015, the Chancellor of the Exchequer announced an intention to work with councils to create half a dozen British Wealth Funds able to invest in infrastructure.

At the 2016 Budget, the Government announced that it would work with LGPS authorities to establish a new "Local Government Pension Scheme infrastructure investment platform".

INSTITUTIONAL INVESTORS

The UK, particularly the London region, offers an extensive set of infrastructure investment opportunities, including in the regulated utility, power generation and transportation sectors. The UK's longstanding track record of private ownership and robust rule of law makes it amongst the most attractive jurisdictions for infrastructure investing.

There is strong interest in the UK infrastructure market from overseas investors (e.g. Middle East and Far East wealth funds) and from 'pension funds seeking higher financial returns and annual cash yields from investments in real assets at a time of low interest rates.

However, despite the strong interest in the UK market among investors, there are still hurdles to overcome as institutional investors attempt to marry their responsibilities and duties within tight legal and regulatory frameworks that vary across borders. Infrastructure debt competes for attention with other asset classes, and strong competition might see investors move their investment allocations away from the UK's infrastructure assets towards other asset classes.

CROWDFUNDING

Crowdfunding is the practice of funding a project or venture by raising monetary contributions from a large number of people, typically via the internet. The crowdfunding model is fuelled by three types of actors: the project initiator who proposes the idea and/or project to be funded; individuals or groups who support the idea; and a moderating organization (the "platform") that brings the parties together to launch the idea. There are two primary types of crowdfunding:

- Rewards Crowdfunding: entrepreneurs pre-sell a product or service to launch a concept without incurring debt or sacrificing equity/shares.
- Equity Crowdfunding: the backer receives shares of a company/project, usually in its early stages, in exchange for the money pledged. The company/project's success is determined by how successfully it can demonstrate its viability

Several dedicated civic crowdfunding platforms have emerged in the UK, some of which have led to the first direct involvement of local governments in crowdfunding. Notable examples include Bristol, Mansfield and London.

However, most projects funded through crowdfunding are highly local and small with typical campaigns generating funding around the tens-of-thousands mark. This would not be enough to support large projects that local government is involved with, such as transport infrastructure and educational projects. However, it may be the case that crowdfunding represents a potential funding stream for the smaller social infrastructure and desirable local level projects that can often be overlooked when allocating limited funding across a range of infrastructure requirements.

Example: London
The Mayor's Civic Crowdfunding Programme aims at supporting local projects that boost quality of life and the economy by helping Londoners to crowdfund innovative project ideas on Spacehive.

In 2015, local community groups – such as Town Teams, Business Improvement Districts or Resident and Trader associations – were asked to pitch ideas on how to make their local high streets better places to visit, live and do business using the Spacehive website. These groups could then use Spacehive alongside social media, email and events to build local support for their ideas in order to reach their funding target.

Selected projects received match of funding up to £20,000 from the Mayor. So far, the Mayor has pledged £600,000 towards 37 projects over two rounds of funding. These projects made up a diverse mix including the Peckham Coal Line, Good Food Catford, Wood Street Walls, The Community Kitchen and more.

CONCLUSIONS

A wide range of alternative sources of funding are available to Greater Essex in order to meet its infrastructure need. However, each source has its strengths and weaknesses and it will be important for Greater Essex to devise a tailored and integrated package of funding sources and delivery mechanisms that meet the needs of different areas and types of infrastructure. Greater Essex will have to prioritise clusters or portfolios of projects, which will have the greatest impact, as well as those which would be attractive to investors. A package of funding sources may need to be compiled to deliver a series of major projects.

This will require further analysis to assess: which funding sources are appropriate for Essex; how different strands of funding can be brought together to secure long-term infrastructure delivery e.g. through mechanisms such as revolving investment funds; and the Greater Essex authorities' capability and capacity to develop and manage such instruments.

Table 6.2

Selected options for additional infrastructure funding

	DESCRIPTION	PROJECT TYPES	MATURITY	POSITIVE ATTRIBUTES	NEGATIVE ATTRIBUTES
Prudential borrowing	Loans at low rates from the Public Works Loan Board (PWLB) under prudential principles.	Any	Mature	Low rates Reliable Prudential approach determined by local authorities	Availability of revenue funding to repay the loan Political appetite for borrowing
Local authority bonds	A fixed- interest bond, repayable on a specific date, used by a local authority in order to raise a loan and similar to a Treasury bond. Could be used as part of a TIF scheme.	Any	Re-emerging, with the implementation of a UK Municipal Bonds Agency	Reliable Stable repayment amounts over time	Ability to repay the loan
Business Rates Retention (BRR)	Local authorities can retain a proportion of business rates revenue as well as growth on the revenue that is generated. The scheme could be used to meet the cost of infrastructure as and when the revenue is received, or it could be used to raise finance to meet up-front infrastructure costs.	Any	Emerging	No cost to the local authority Potential track record with Enterprise Zones	Use of funds from BRR for infrastructure must be weighed against other local authority needs Allocation issues if cross-boundary receipt
Tax increment financing (TIF)	Enables local authorities to borrow against the value of the future uplift in order to deliver the necessary infrastructure (usually based on BRR)	Sites / areas where substantial business rate growth is a realistic prospect.	Emerging	Prudential system	Ability to repay dependent on achievement of predicted growth in value
Local asset backed vehicle	Local Asset-Backed Vehicles (LABVs) allow local authorities to use their assets (usually land) to lever long-term investment from the private sector for regeneration projects.	Contaminated or under-developed urban areas; housing projects.	Developing	Unlocking value from previously undeveloped / unused local assets. Brings in funding and expertise from private sector to develop the asset.	Need to securing political buy-in. Difficulty and cost of implementation: working across a range of partners; managing risks; stakeholder engagement; operation costs; procurement and legal requirements.
Strategic Asset Management	Maximising the contribution of local authority assets as sources of long-term funding through a combination of: refurbishing and repurposing buildings in order to make better use out of them and ready them for sale; selling off to generate receipts, or liabilities to reduce costs; acquiring new assets to meet local council or civic needs, to deliver where the market cannot or to grow the investment portfolio.	Revenue from SAM can be used for any purpose	Mature	Limited costs Maximises value of local authority assets Facilities working across the public sector locally Some dedicated funds to support (e.g. Open Public Estate)	Difficulty in aligning objectives of different public sector owners Need to adopt an entrepreneurial approach, working to commercial timescales and accepting risk Tensions and trade-offs between short-term financial gain and long-term economic growth benefit
European Funding	A range of EU funds are accessible to local authorities in the forms of loans, grants or equity funding. The main source is the 'EU Structural Investment Funds (ESIF) Growth Programme' made available to Local Enterprise Partnerships. Also discounted borrowing through EIB for major schemes (e.g. light rail)	Projects meeting eligibility criteria e.g. for ERDF, projects relating to Innovation, ICT, SME competitiveness, Low Carbon, Climate Change Adaptation, Environmental Protection, and	Mature	Provides additional source of funding to national / local streams. This is one of the criteria for eligibility.	Requires match-funding There may not be a pipeline of projects ready to apply for funding The quality of proposals may not be sufficiently high. Uncertainty of the impact of Brexit on UK access to EU funds (and national successor funding) beyond 2020.

	DESCRIPTION	PROJECT TYPES	MATURITY	POSITIVE ATTRIBUTES	NEGATIVE ATTRIBUTES
Local Infrastructure Fund	The fund offers repayable finance for upfront infrastructure investment and other site preparation works that will support economic growth, jobs and homes.	Any	Mature	Additional funding for site-based development	Limited life cycle and strict eligibility criteria
New Homes Bonus	The New Homes Bonus is a grant paid by central government to local councils to reflect and incentivise housing growth in their areas. It is based on central government match funding the Council Tax raised for new homes and properties brought back into use, with an additional amount for affordable homes, for the following six years	Local councils can decide how to spend the NHB.	Mature	Clear financial incentive for local authorities to permit new housing Bonus is relatively easy to calculate	Limited impact on planning applications and decisions Uncertainty about the long-term future of the policy
Private Finance Initiative (PFI)	Under a PFI, the private sector will typically design, build, finance and maintain infrastructure facilities under a long-term contract. The public sector body which uses the infrastructure repays the debt over a long period, often 25-30 years.	Generally linked to buildings (e.g. schools, hospitals)	Mature	Enables a local authority to embark on large capital projects with little upfront commitment of resources	Higher costs and risks than conventional funding Business case for PFI can be weak Local authority's ability to manage risk and achieve appropriate contract
Local Government Pension Funds	The Local Government Pension Scheme (LGPS) is a funded, statutory, public service pension scheme. The LGPS may be able to invest part of its fund in supporting the development of local communities across the UK.	Any	Emerging	Source of investment with a long-term view and interest in the UK infrastructure market.	Scope for involvement of LGPS currently evolving
Institutional investors	Sovereign wealth funds and pension funds show a growing interest in the UK infrastructure market as a place to invest.	Any	Emerging	Large operators with long-term view of investment.	Likely limited potential as infrastructure debt competes for attention with other asset classes Has to perform against other competing assets classes on risk / reward basis
Crowd funding	Funding a project or venture by raising monetary contributions from a large number of people, typically via the internet.	Small projects (e.g. community gardens)	Emerging	Direct link with local population and their need Ability to address gaps in funding for small projects which contribute to well-being and sense of place Dynamic and grass-rooted	Small scale funding

07

CONCLUSIONS

Greater Essex is a place of opportunity. Currently home to 1.8 million people, with a further 300,000 forecasted to live in the area within 20 years.

Expected growth on such a substantial scale is testament to the economic strength and quality of life offered by the towns and villages within Greater Essex. But to be successful, growth requires infrastructure, and infrastructure needs investment.

To understand the scale of the infrastructure challenge better, all of the local authorities in Essex commissioned AECOM to prepare a Growth and Infrastructure Framework (GIF) for the county and two unitary authorities. The framework presents an overview of growth patterns to 2036, evidences the infrastructure required, and estimates likely costs and funding gaps.

This report 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 toward their delivery and the funding gap for the period up to 2036. The framework has been produced by AECOM based upon an analysis of available evidence provided by local authorities throughout Essex and augmented by a desk based assessment of additional published information. The framework was then verified through further engagement with all the Essex local authorities and with other infrastructure providers.

It provides a “snapshot” reflecting the position in October 2016. It is not intended to supersede or replace local studies, some of which use different metrics that may better reflect local circumstances. Findings are based on common funding and cost assumptions and modelling work that may differ from those used in individual local infrastructure delivery plans and documents.

KEY FINDINGS FROM THE GIF

The following key findings have been established:

- Greater Essex authorities are required to accommodate housing and economic growth over the 20 year period to 2036 delivering on average **8,980 dwellings per annum, or 179,660 dwellings over the 20 year period.** This compares to average annual completions of 4,630 dwellings per year across Essex from 2004 to 2015.
- ONS Population projections forecasted a **population increase of 298,700 people (an increase of 17%**).
- **79,000 additional jobs** are forecast by the East of England Forecasting model (2016 run), an increase of 10%
- Local authorities across Greater Essex have identified **housing supply trajectories for approximately 137,660 homes** between 2016 and 2036
- Delivering the necessary infrastructure to support that growth from now to 2036 is **estimated to cost at least £10.4 billion** in 2016 terms. This represents an estimate of capital delivery costs only and does not include the additional annual revenue requirements and maintenance costs.
- The study has reviewed the potential costs of delivery alongside currently identified secured funding, potential funding from public, private and developer contributions highlighting a **remaining funding gap estimate of over £4.4 billion** at 2016 prices.

INFRASTRUCTURE ASSESSMENT

The study has examined a comprehensive scope of infrastructure topics and has highlighted a number of key infrastructure issues facing Greater Essex including:

- Growth in Greater Essex over recent decades has created a deficit in existing infrastructure.
- In particular the growth in journeys by road and rail has not been matched by sufficient government investment to enhance the network. The framework has identified that **major transport projects need to secure £26.5 billion (regional) and £5.5 billion (cross-boundary) funding. These projects currently have a funding gap of around £11 billion.**
- Infrastructure capacity within Greater Essex will also be affected by housing and economic growth in neighbouring areas. In particular the influence and reach of the London City Region, and the over-heating Cambridge economy will impact in different ways on localities within Essex. The emergence of the new London Plan is expected to displace housing and employment from London along strategic growth corridors into Essex. Equally, major developments planned outside Essex but within the region including the Gilston area north of Harlow, Ebbsfleet Garden City Kent, Northstowe New Town and the expansion of new Garden Settlements surrounding Cambridge will all have an impact.
- Infrastructure planning in Greater Essex must take into consideration the demands and capacities of infrastructure across the region as a whole, including for example major development in East Herts and in the Thames Gateway. Major infrastructure investment is proposed on the regional strategic road network (M25, M11, A12, A14 in Cambridgeshire and the third Thames Crossing) and rail network which will have direct impacts on the sub regional and local network. The long-term uncertainty of some of these major infrastructure projects makes it difficult to plan effectively to support that infrastructure and accommodate growth. For example the additional Thames Crossing and uncertainty about its route makes spatial planning particularly difficult in the South of Essex.
- Education demand will expand considerably over the next twenty years driven by the scale of housing growth planned. A number of new secondary schools will need to be built, in addition to those required by population growth and policy changes. The limitations of the Community Infrastructure Levy (CIL) make it impossible to secure sufficient funding from developers, particularly to cover the full cost of building new secondary schools. Consequently, for the strategic development sites, the Education Authorities look for a zero CIL rating to ensure the correct level of developer funding is capable of being secured. This particularly applies to the strategic development sites and new Garden Settlements, which will each require new secondary school provision.

- To stay healthy, more residents and employees need to walk and cycle, and take fewer journeys by car. We need to invest in a transport system that enables this change. The principles of planning for public health benefits will need to be applied through carefully crafted Local Plan policies and land allocations. The concept of planning for healthy new settlements will equally to need to apply to the larger scale site allocations including the new Garden Settlements.

- Pressure on the existing health and social care sector is acute and will continue to grow. There is also a drive to reconfigure acute hospital beds, and transfer further significant services into the community, promoting realignment of community and primary care facilities to benefit the need of the changing population demographics. This will require a different approach to facilitate co-location of public services and other community facilities. At the time of drafting the Growth and Infrastructure Framework the local health economies have been developing Sustainable Transformation Plans (STP) collaboratively with key stakeholders through the Clinical Commissioning Groups. The STP's will be the key documentation guiding strategic planning and change to the healthcare system.

- Greater Essex is shown to have a diverse, high quality landscape with numerous natural assets. Impacts from planned housing and economic growth will need to be mitigated through the provision of new strategic sites and also by enhance the quality of existing sites, improving access and wider landscape management practices. Options for infrastructure provision and delivery may be limited by environmental constraints. Essex is within an area of acute water stress and development costs may be considerably higher where habitats/species are water dependent.

- Any future decision to proceed with the potential nuclear power station, Bradwell B in the Maldon District, would have a significant impact on infrastructure needs locally and across Greater Essex. A potential construction project lasting many years and generating up to 6,000 jobs would have major impacts on the transport network and local social infrastructure requirements. As no decision has been taken at the time of publication, these impacts are not within the scope of this study. The timetable for a potential power station at Bradwell B is unknown at this stage.

INFRASTRUCTURE FUNDING

- Existing funding will not deliver the scale of infrastructure investment identified in this framework. Developer contributions (whether s106, s278 or CIL), local authority capital programmes or current public sector funds and grants will fall short.

- All local authorities in Essex need to work together to devise an integrated package of funding sources and delivery mechanisms that meet the needs of different areas and types of infrastructure. Section 6 of this framework document presents a summary of potential options and the benefits and limitations of each.

- The challenge will need to be met in part through approaches that achieve the demands of residents and businesses through innovative services that require less capital investment. This change has already begun across many sectors, through integrated services, technological advances and redirecting service demand, for example to more cost effective solutions such as community healthcare and outpatient services to relieve pressure on acute hospitals.

- Given the funding gap, Greater Essex will have to prioritise infrastructure investment with the greatest impact. This requires further analysis to assess which projects are most important, and which funding sources are appropriate for Essex. Authorities need to consider the potential for investment mechanisms, such as Local Delivery Vehicles and revolving investment funds, in the light of their capability and capacity to develop and manage such instruments.

- The GIF recognises the invaluable work undertaken by the local authorities, LEP and its partners across Greater Essex to produce its latest Growth Bid document and the level of work required to arrive at a 'shortlist' of priority projects chosen to facilitate growth and deliver the greatest returns on investment. This approach may be one model to follow when determining prioritisation.

FUTURE ACTIONS FROM THE GIF

Greater Essex and its partners have identified the following actions to take the Growth and Infrastructure Framework forward:

- Enable the wealth of information and GIS mapping data collated in the production of this Growth and Infrastructure Framework to be accessed by all relevant partners to inform their respective infrastructure planning work and to enable partners to understand and interrogate the data held within the GIF databases. It is currently envisaged that this will be enabled through integration of the GIF data into one of the existing online platforms operated by Essex County Council.
- Revisit the evidence base behind this study on a regular basis in collaboration with partners to maintain a rolling understanding of the infrastructure landscape and funding priorities. Consideration of the desired review and update mechanism for the GIF information sharing and analysis and how frequently this is undertaken will need to be considered by the Greater Essex authorities. Future iterations of the GIF will need to use Infrastructure Delivery Plans prepared by the local authorities, a number of which are currently updating these documents.
- Consider the commissioning of detailed infrastructure topic specific assessments of infrastructure supply and demand modelling for the medium and long term to provide a more robust evidence base when planning over 20 year timeframes which often exceed any organisation's planning horizon. This would support effective planning past the 5 - 10 years as is currently undertaken.
- Continued joint working between the Greater Essex authorities through sub regional partnerships such as the South Essex Growth Partnership and the Haven Gateway Partnership and work with the Local Enterprise Partnerships and other local authorities in the South East on strategic issues and priorities. This may include linkages to London and routes to better connect the wider sub region. In addition, considering the impacts of major infrastructure proposals such as the Lower Thames Crossing and the Crossrail extension.
- The potential for an organised GIF Engagement Forum between the Greater Essex authorities and relevant external partners such as the health sector, utility companies, Environment Agency, Highways Agency, Network Rail and other operators to consider greater integration on long term growth and infrastructure planning.
- Consider the joining up of infrastructure modelling across a much larger geography, principally the East and wider South East regions, for subjects including transport models, waste water modelling, and social infrastructure models. Including holistic consideration of cross border requirements and aligned to planning and funding bid timetables.
- Use the evidence provided within the GIF and subsequent updated versions of it, to help review existing capital programmes to shape, prioritise and sense check project pipelines across a range of infrastructure work streams to optimise outcomes. The sequencing of capital infrastructure expenditure is very important, if this is done well it can offset future capital expenditure.
- Use the study as a tool for engagement with Central Government and the National Infrastructure Commission (NIC) in demonstrating the challenges faced in supporting growth across Greater Essex and continue dialogue with the GLA, DCLG, BEIS and other government departments on wider issues including the growth of London.
- Use the study as a tool for engagment with adjoining authorities including the Co-operation for Sustainable Development Boards in Essex through which West Essex, for example, engages with East Herts authorities.
- Consider the implications of infrastructure provider's decisions both now and in the future. This study has used standard metrics to determine requirements for some infrastructure elements (such as healthcare, libraries, community and leisure, youth services, social care accommodation etc.), but the actual requirements will be heavily dependent on service decisions on new delivery models which are affected by regulatory, financial and technological changes.
- Explore further links between sub regional infrastructure planning as presented within the Greater Essex GIF and opportunities and synergies between the requirements identified in this work and the continued review of local authority assets as part of the One Public Estate programme.

08

ASSUMPTIONS, BENCHMARKS & CAVEATS

8.1 HOUSING TRAJECTORY CAVEATS

This study aims to present a vast amount of information in as simple and digestible format as possible. AECOM has received data from a number of stakeholders and partners and this section sets out key caveats that have been supplied alongside that data which should be taken into account when considering the figures presented in the GIF.

BASILDON BOROUGH COUNCIL

The major caveat to achieving the housing trajectory is for the Council to adopt a sound plan in 2018. A significant amount of development in this trajectory is reliant upon green belt release in order to come forward in the period up to 2034. The housing trajectory is also based on information taken from the Basildon Five Year Land Supply position which is due to be updated. The Final caveat relates to the Strategic Housing Allocations contained within the Draft Local Plan. These contain either one or more sites contained within the HELAA and the potential yield / densities may be subject to change following the results of the Regulation 18 consultation earlier this year.

BRENTWOOD BOROUGH COUNCIL

The trajectory is based on the information contained within the Brentwood Draft Local Plan 2016 which covers a 20 year period from 2013-2033. The total objectively assessed need for the 20 year period is 7,240 dwellings. It was assumed that for the final two periods 2034/35 and 2035/36 that the OAN figure of 362 would be met in full. The total housing number identified includes extant planning permissions (444), a permitted development allowance for 2015/16 (300) and a windfall allowance (958).

All of these figures have to be considered as in draft and are subject to potential change as the plan progresses towards the adopted version.

Significant local detailed data work is being undertaken on a new IDP and this will be reflected more fully in further editions of this more general strategic infrastructure document.

CASTLE POINT BOROUGH COUNCIL

The position for Castle Point Borough Council is derived from the Council's New Local Plan 2016, which was submitted for Examination in August 2016.

The GIF data sources presented identify minus 200 jobs and high out commuting from the Borough. However the Council is seeking to rebalance the level of out flow of the labour force and has identified an additional 2,100 jobs to be provided within the Borough over the plan period.

CHELMSFORD CITY COUNCIL

At this point in time, Chelmsford City Council cannot forecast a precise housing pipeline based on sites beyond 2021/22. The Council is in the process of replacing its Local Development Framework (LDF) which covers the period to 2021. The Council's OAN figure of 805 homes per annum plus a 20% buffer has therefore been provided for 2022/23 onwards. The 20% buffer reflects that tested in the most recent version of the emerging new Local Plan, the Issues and Options Consultation Document published in November 2015. The new Local Plan is expected to be adopted in 2018.

We cannot provide accurate information on phasing, so the total number of units for these sites are listed in 2021/22 as this falls just outside of our 5 year housing supply. This does not mean that this number of dwellings will come

forward at this time or all in one year should an approval be secured. With regard to an additional site the figures up to and including 2021/22 are considered reasonably accurate as these have been provided by the developer. Beyond this we have worked on an average build out rate of 275 dwellings per annum.

HARLOW COUNCIL

The OAHN from the Strategic Housing Market Assessment from 2011-33 has been extended for this study beyond 2033 at same rate. Local Plan progress has yet to allocate SHLAA sites or promote a housing strategy and housing requirement; this is expected by autumn this year. SHLAA sites are not included in draft trajectory in compliance with the template. Likely significant development to the north of Harlow in Hertfordshire, which will have major impact on Harlow's infrastructure requirements.

MALDON DISTRICT COUNCIL

The objectively assessed housing need figure for Maldon District is based on strategic housing market assessment evidence to support the Maldon District Local Development Plan (LDP). The LDP has a plan period to 2029. For the purposes of the Growth and Infrastructure Framework, housing need figures have been rolled forward beyond the end of the plan period (post 2029) (see Parameters of the Study) but there has been no corresponding roll forward of supply; this explains the discrepancy between 'homes needed' and 'homes planned' on the Maldon District profile. In reality, housing need figures for the period after 2029 will be determined through a future local plan review and the local plan review will seek to meet this need through allocations.

Additional housing and employment allocations for the rural area of the Maldon District are currently being developed for the Site Allocations Development Plan Document (DPD). Development proposals in the Site Allocations DPD may inform future reviews of the Greater Essex Growth and Infrastructure Framework.

ROCHFORD DISTRICT COUNCIL

The Council adopted its complete local development plan (including Core Strategy, Allocations Plan, Development Management Plan and four Area Action Plans) by October 2015. The local development plan, which runs to 2025, is in the early stages of being reviewed to take into account changes at both the national and local level. A number of sites identified in the Allocations Plan are beginning to be delivered through the development management process. The housing trajectory provided therefore covers the current plan period, and the review will look at extending this period further into the future following the publication of the South Essex Strategic Housing Market Assessment 2016. Consequently projected housing delivery and the objectively assessed housing need figures referred to in the GIF do not currently align.

SOUTHEND-ON-SEA BOROUGH COUNCIL

The housing need figure included in this Framework for Southend-on-Sea does not represent an adopted housing target or requirement, and has not been tested at examination by an independent planning inspector. The Southend Core Strategy target is the adopted target. A new target for housing will be developed through the planning preparation process for the new Local Plan, in line with the requirements of the National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG). The objectively assessed need figure used in the Framework, taken from the South Essex Strategic Housing Market Assessment (May 2016), does not take into account any environmental constraints, supply side factors and other matters that would need to be considered to derive a realistic and deliverable housing target, which may be included in a Local Plan in accordance with the NPPF and PPG.

The housing supply figures provided herein may not represent all housing supply in the Borough, as this Framework only provides a snapshot, and will have been dependent on the stage reached with the monitoring process when figures were requested for the GIF. Southend Borough Council's monitoring documents should be the only documents referred to, to provide the most up to date and accurate picture of housing supply for the Borough.

TENDRING DISTRICT COUNCIL

The objectively assessed housing need for Tendring includes the shortfall in delivery that already exists for the authority.

UTTLESFORD DISTRICT COUNCIL

Objectively Assessed Housing Need (OAHN) from Strategic Housing Market Assessment from 2011 - 2033 has been extended for this study beyond 2033 at the same rate. Local Plan progress has yet to allocate development sites. A distribution strategy for residential development which distributed development across new settlement(s), towns and villages was approved by full Council in July. The location for the new settlement(s) has not yet been determined.

WEST ESSEX HOUSING AUTHORITIES

The Housing Need figures presented in section 3 of the report specific to Epping Forest, Harlow and Uttlesford is based upon the 2015 SHMA figure. It should be noted that these three authorities (working with East Herts District Council) are seeking to provide an uplift to reflect the latest CLG household projections.

8.2 INFRASTRUCTURE NEED BENCHMARKS

Estimates of infrastructure need by type presented in Section 4 are informed by estimates of future needs resulting from growth identified in Section 3 of this report.

For clarity the following infrastructure topics have been assessed using benchmarks (which are subsequently presented in Tables 8.1 to 8.6):

- Early Years
- Primary and Secondary Education
- Sixth Form and Adult Learning
- Primary, Acute and Mental Healthcare
- Social Care Accommodation
- Community, Library and Youth Spaces
- Indoor and Outdoor Sports facilities
- Open Space Provision
- Green Infrastructure

Each of the benchmarks set out in the following Tables has been applied to either:

- The projected increase in population to 2036, sourced from ONS population projections, as outlined in Section 3.1; or
- The number of necessary additional dwellings to 2036, derived from Strategic Market Housing Assessments and Objectively Assessed Need data, as outlined in Section 3.2.

Table 8.1

Greater Essex Educational Infrastructure Benchmarks

Topic	Details	Benchmark	Benchmark Source
Early Year Facilities	Early year demand per 2 bed+ Flat	0.045	Essex County Council - Developers' Guide to Infrastructure Contributions 2016
	Early year demand per 2 bed+ House	0.090	Essex County Council - Developers' Guide to Infrastructure Contributions 2016
	places per nursery	56	Essex County Council - Developers' Guide to Infrastructure Contributions 2016
	Sq.m per 56 place nursery	337	Essex County Council - Developers' Guide to Infrastructure Contributions 2016
Primary Schools	Pupil Demand per 2 bed+ Flat	0.150	Essex County Council - Developers' Guide to Infrastructure Contributions 2016
	Pupil Demand per 2 bed+ House	0.300	Essex County Council - Developers' Guide to Infrastructure Contributions 2016
	Primary School Pupils in 1 Form Entry	210	Department for Education
Secondary Schools	Pupil Demand per 2 bed+ Flat	0.100	Essex County Council - Developers' Guide to Infrastructure Contributions 2016
	Pupil Demand per 2 bed+ House	0.200	Essex County Council - Developers' Guide to Infrastructure Contributions 2016
	Secondary School Pupils in 1 Form Entry	150	Department for Education
Sixth Form	Proportion of 16-17 year olds in Sixth Form	32%	Calculation of Sixth form roll 2016 against 16-17 population

Table 8.2

Health and Social Care Infrastructure Benchmarks

Topic	Details	Benchmark	Benchmark Source
Primary Health Care	People per GP	1,800	Planning Benchmark Standard
	GP per 1000 people	0.56	Planning Benchmark Standard
	Sq.m per GP	165	NHS Healthy Urban Development Model
Dental Practices	People per Dentist	1,760	Ratio of Dentists to England population 2016 (based on General Dental Council 2016 Data)
	Dentists per 1000 people	0.57	Ratio of Dentists to England population 2016 (based on General Dental Council 2016 Data)
	Sq.m per Dentist	50	AECOM Cost Consultants benchmark data
Acute Hospitals	Beds per 1000 people	1.96	Ratio of Hospital Beds to England population 2016 (based on NHS England Data)
	Sq.m per Acute Bed	160	AECOM Cost Consultants benchmark data
Mental Health Hospitals	Beds per 1000 people	0.40	Ratio of Hospital Beds to England population 2016 (based on NHS England Data)
	Sq.m per Bed	85	AECOM Cost Consultant Benchmark data
Adult Social Care - Elderly	Nursing Home bedroom per 1000 persons over 75	25	The Housing Learning and Improvement Network (LIN) SHOP TOOL - Demand levels based prevalence rates from "More Choice, Greater Voice".
	Residential Care bedroom per 1000 persons over 75	65	
	Extra Care bedroom per 1000 persons over 75	45	
	Nursing Home demand change 2016-2036	-46%	ECC Social Care Data - Review of change in demand places from 2010 - 2015 extrapolated forward (logarithmic trendline)
	Residential Care demand change 2016-2036	-82%	
	Typical Nursing Care Unit Bed Number per facility	80	Kent and Medway Social Care Research - Estuary View Medical Centre Plans for Expansion (whilst not in Essex this is a comparable benchmark for use in Greater Essex).
	Typical Residential Care Unit Bed Number per facility	80	
	Typical Extra Care Unit Bed Number per facility	80	AECOM Cost Consultants Extra Care Facility Planning Guidelines 2015

Table 8.3

Greater Essex Community Infrastructure Benchmarks

Topic	Details	Benchmark	Benchmark Source
Community Space	sq.m per 1,000 person	65.00	Aggregate figures based on comparable project research
Art & Cultural Space	sq.m per 1,000 person	45.00	Arts Council (Previously Museums, Libraries and Archives Council (MLA))
Library Space	sq.m per 1,000 person	30.00	Essex County Council - Developers' Guide to Infrastructure Contributions 2016 Edition
Adult Learning	Proportion of population in Adult Learning	0.01	Essex County Council - Developers' Guide to Infrastructure Contributions 2016 Edition
	Adult Learning Space Per FTE Student	2.33	Essex County Council - Developers' Guide to Infrastructure Contributions 2016 Edition
Youth Services	Clients per 1,000 children 0-15	26.00	Aggregate figures based on comparable project research
	Clients per Youth Facility	60.00	Essex County Council - Developers' Guide to Infrastructure Contributions 2016 Edition

Table 8.4

Local Authority Specific Sport Facility Benchmarks

	Swimming Pools	Sports Halls	Indoor bowls rinks	Artificial Turf Pitches	Benchmark Source
	Population per Lane	Population per Court	Population per Rink	Population per Artificial Turf Pitch	
Basildon	4,942	3,526	16,453	31,673	Sport England Facility Calculator 2016 - Local Authority Specific Metrics
Braintree	5,032	3,646	14,688	34,197	Sport England Facility Calculator 2016 - Local Authority Specific Metrics
Brentwood	5,043	3,666	15,278	34,214	Sport England Facility Calculator 2016 - Local Authority Specific Metrics
Castle Point	5,191	3,774	12,109	36,146	Sport England Facility Calculator 2016 - Local Authority Specific Metrics
Chelmsford	4,992	3,550	15,392	32,540	Sport England Facility Calculator 2016 - Local Authority Specific Metrics
Colchester	4,945	3,419	16,449	29,004	Sport England Facility Calculator 2016 - Local Authority Specific Metrics
Epping Forest	5,054	3,672	14,604	34,430	Sport England Facility Calculator 2016 - Local Authority Specific Metrics
Harlow	4,900	3,480	17,773	30,881	Sport England Facility Calculator 2016 - Local Authority Specific Metrics
Maldon	5,153	3,763	12,656	36,543	Sport England Facility Calculator 2016 - Local Authority Specific Metrics
Rochford	5,128	3,711	13,339	34,562	Sport England Facility Calculator 2016 - Local Authority Specific Metrics
Tendring	5,379	3,945	11,010	40,059	Sport England Facility Calculator 2016 - Local Authority Specific Metrics
Uttlesford	5,062	3,739	14,330	35,454	Sport England Facility Calculator 2016 - Local Authority Specific Metrics
Southend	5,058	3,623	15,161	33,243	Sport England Facility Calculator 2016 - Local Authority Specific Metrics
Thurrock	4,863	3,448	18,071	30,568	Sport England Facility Calculator 2016 - Local Authority Specific Metrics

Table 8.5

Greater Essex Open Space and Recreation Benchmarks

Topic	Details	Benchmark	Benchmark Source
Outdoor Sports & Recreation	Playing Fields - ha. per 1,000 people	1.20	NPFA (Fields in Trust) standards (from 1.6 ha standard which includes 0.4ha for Parks which are covered under green infrastructure)
Children's play	Informal - sq.m per 1,000 Children (0-16)	6.90	GLA Play Space Standards - Recognised best practise superseding NPFA approach with 69% of requirement informal
	Designated Equipped sq.m per 1,000 Children (0-16)	3.10	GLA Play Space Standards - Recognised best practise superseding NPFA approach with 31% of requirement formal

Table 8.6

Local Authority Specific Green Infrastructure Benchmarks

	Natural & Semi-Natural	Parks & Gardens	Amenity greenspace	Allotments	Benchmark Source
	ha Per 1000 people	ha Per 1000 people	ha Per 1000 people	ha Per 1000 people	
Basildon	2.62	1.82	1.33	-	PPG17 Open Space Assessment Part I; Draft PPG17 Open Space Assessment Part II (2010)
Braintree	2.00	1.20	0.80	-	Braintree Green Spaces Strategy (2008)
Brentwood	2.00	-	-	0.18	Brentwood Open Space Strategy 2008-2018
Castle Point	2.38	3.04	0.58	0.06	Castle Point Open Spaces Strategy 2008-2013
Chelmsford	1.00	1.65	0.40	0.30	A PPG17 Open Spaces Assessment for Chelmsford Borough Council
Colchester	5.00	1.76	1.10	0.20	Colchester Parks & Green Spaces Strategy (2008); Green Infrastructure Strategy (2011)
Epping Forest	8.45	0.32	0.32	0.33	Epping Forest Open Space, Sport and Recreation Assessment (2009)
Harlow	2.50	2.25	2.00	0.25	Harlow Open Space and Green Infrastructure Study (2013)
Maldon	-	1.16	1.16	0.20	Maldon District Green Infrastructure Study (2011); Children's Play Strategy 2007-2012
Rochford	3.00	-	0.30	0.20	Open Space Study 2009
Tendring	2.00	1.00	0.75	0.25	Tendring Open Spaces Strategy (2009)
Uttlesford	7.00	-	1.00	0.25	Uttlesford Open Space, Sport Facility and Playing Pitch Strategy (2012)
Southend	1.00	1.00	-	0.21	Parks and Green Spaces Strategy 2015-2020
Thurrock	2.00	0.70	0.80	0.16	Open Spaces Strategy 2006-2011

8.3 INFRASTRUCTURE COSTING SOURCES AND CAVEATS

The following infrastructure topic costs are based primarily on the following sources although this list is not comprehensive:

- Highways - ECC / Local Authority IDPs
- Motorways - Highways England / ECC / Local Authority IDPs
- Rail - Network Rail / ECC / Local Authority IDPs
- Public transport and other transport - ECC / Local Authority IDPs
- BDUK Broadband - ECC
- Flood Defences - ECC / Environment Agency

AECOM costing estimates are provided within this document and should be caveated as high level estimates given a lack of detailed scheme information and in many cases applied to long term demand forecasts to 2036.

These cost caveats apply to the following topics within this report:

- Early years
- Education
- Adult Learning
- Healthcare
- Social Care Accommodation
- Community, Library and Youth Spaces
- Open Space Provision
- Indoor and Outdoor Sports facilities
- Green Infrastructure
- Electricity Connections
- Gas Connections
- Potable, Waste and Surface Water Infrastructure
- Communications

The following caveats apply to all costing provided by AECOM:

- The information on which the cost estimates are based is very limited. As such, all costs are to be treated as "indicative" of the type of works stated rather than a specific estimate of the actual works.
- The works are assumed to relate to level greenfield sites with good access and no abnormal restrictions in respect of working hours and the like. AECOM has excluded all land purchase, demolition and site preparation that may be required.
- In respect of ground conditions, AECOM has excluded the impact of encountering archaeological remains, contamination, high water table level, major "soft spots" and underground obstructions. Costings also exclude encountering and diverting existing utilities and drainage.
- As AECOM does not have sufficient details of the individual sites that will be developed, we have excluded any allowances for external works i.e. all works outside of the building footplate.
- All costs are based on a notional project that starts and completes in June 2016 and therefore all inflation costs are excluded.
- AECOM has excluded professional fees and survey works and all other consultants fees and planning / building regulation costs that would apply to the works.
- AECOM has excluded all phasing and temporary works that could apply to the works, all maintenance and operational costs.
- AECOM has excluded all loose fixtures, fittings and equipment and in particular specialist equipment.
- AECOM has excluded all VAT.

8.4 ASSUMPTIONS ON EXPECTED FUNDING

To prepare this document a significant quantity of data on future infrastructure projects and costs has been obtained from a variety of sources, including ECC officers, LPA IDPs (at various stages of finalisation) and other infrastructure providers. Where data has not been available, actual project data has been supplemented with theoretical modelling about the quantity and average cost of infrastructure required based on accepted benchmarks (see Section 8.2).

Significantly less certainty and reliable data is available about the likely sources of future funding for these projects. Where this data has not been available, actual funding data has been supplemented with theoretical modelling based on assumptions about the likely contribution of various funding sources.

Accordingly, caution should be applied in interpreting these estimates, in particular where infrastructure need has been determined theoretically, then costed using average benchmark costings, and funding need attributed on the basis of assumptions about likely funding availability.

We recommend that future iterations of this study are informed by further data, research and analysis to refine and improve these assumptions.

Public & Private Sector Funding Assumptions

The study estimates likely funding towards infrastructure from various public and private sector infrastructure providers and partners, for the purpose of estimating the scale of the gap between the cost of needed infrastructure and likely available funding to 2036.

As the exact level of public and private sector funding is impossible to forecast, a rule of thumb percentage approach has been used. The percentage rates applied in the study are set out in Table 8.7.

A detailed analysis of potential public and private sector sources, undertaken in partnership with the relevant LPAs, is required to further refine these assumptions on expected funding levels.

Table 8.7

High level Funding Assumptions for Modelling

Infrastructure Projects	Working Assumption on Expected Source after Developer funding	% Funded
Strategic Roads	Central Government (DFT)	85%
Public Transport	Private Operators / DFT	10-15%
Education (Schools)	Central Government (DFE)	0-10%
Early Years	Private Sector Investment	100%
Healthcare	National Health Service (NHS)	10%
Social Care	Private Sector Investment	25%
Energy	Utility Companies	100%
Water and Sewage	Utility Companies	100%
Waste	Private Operators	50%
Flood Defences	Environment Agency	36.5%

Developer Contributions

The study also estimates likely funding towards infrastructure from developer contributions, for the purposes of estimating the scale of the gap between the cost of needed infrastructure and likely available funding to 2036.

The level of developer contributions attributed to the 'funded component' of the forecast infrastructure costing, assumes that:

- Developers will contribute £7,500 per dwelling. This rate has been derived from a high-level analysis of typical developer contribution requirements and actual receipts recorded in South East local authorities (including Kent County, Medway Council, Surrey County, West Sussex County and Essex County). While this provides an average figure for the Greater Essex area, the actual level of contributions in each LPA will vary to reflect the number of large-scale developments (and associated Section 106 or Section 278 agreements) in that LPA area, land values and whether or not a CIL is levied in that LPA.
- All the dwellings needed in the aggregated Greater Essex housing need trajectories (set out in Section 3) will be built.

This estimate of contributions from developers should not be treated as secured funding, rather a source of expected funding for the purposes of the estimates in this study.

A detailed analysis of potential contributions incorporating Section 106 and CIL rates undertaken in partnership with the relevant LPAs is required to refine these assumptions on expected funding levels further.