ESSEX COUNTY FIRE AND RESCUE SERVICE

STRATEGIC ASSESSMENT OF RISK

Author	
Version	V1 (of new document style)
Authorised By	
Authorisation Date	
Review Date	………. 2022
Document Location	

Table of Contents

Introduction

The Police Fire and Crime Commissioner (PFCC) has now had responsibility for governance of Essex County Fire and Rescue Service (ECFRS) since October 2017. March 2019 saw the publication of the first Fire and Rescue Plan (F&RP) which set out the priorities for ECFRS until 2024. A pictorial overview of governance assurance arrangements can be found in the Service's Risk Management Strategy, and the scheme of delegation provide more substantial detail on the Service's governance arrangements.

In chronological order, the main legislative arms under which a Fire and Rescue Authority and a Service operate are:

- The Health and Safety (H&S) at Work etc. Act (1974) and accompanying H&S regulations
- Reservoirs Act (1975)
- Water Resources Act (1991)
- The Human Rights Act (1998)
- The Fire and Rescue Services Act (2004)
- The Civil Contingencies Act (2004)
- The Regulatory Reform (Fire Safety) Order (2005)
- Emergency Services (Obstruction) Act (2006)
- The Fire & Rescue Services (Emergencies)(England) Order (2007)
- Policing and Crime Act (2017)
- Data Protection Act (2018)

One of the key aspects to the statutory duties above, is under section 21 of the Fire and Rescue Services Act 2004, the Secretary of State must prepare a Fire and Rescue National Framework[1]. This sets out priorities, objectives and guidance relating to Fire and Rescue Service's (FRS) functions that the Secretary of State considers appropriate. Every FRS must have regard to the Framework in carrying out their functions. With each FRS publishing an annual statement of assurance of compliance with the Framework.

More specifically to this document, one of the priorities in the 2018 Framework are '***to identify and assess the full range of foreseeable fire and rescue related risks their areas face'.*** The Framework also sets out that the Service must produce an Integrated Risk Management Plan, (IRMP) which must '*reflect up to date risk analyses including an assessment of all foreseeable fire and rescue related risks that could affect the area of the authority'.* The IRMP operationalises the F&RP.

What underpins the IRMP (Integrated Risk Management Plan) is the Strategic Assessment of Risk (SAOR). The SAOR considers the legislative requirement above and considers information from a variety of sources, including the National Security Risk Assessment and Essex Resilience Forum, and understand the issues and future trends of demography, house building, industry, and transport infrastructure within Essex via the Greater Essex Growth and Infrastructure Framework (GIF) 2016-2036[2] (February 2017) and other locally sources documents. The SAOR identifies risks, the mitigations in place to assist with the identification of any gaps in capabilities or capacity.

---

[1] https://www.gov.uk/government/publications/fire-and-rescue-national-framework-for-england--2?utm_source=e64fb916-2c23-40f3-920a-f1f46f357d28&utm_medium=email&utm_campaign=govuk-notifications&utm_content=immediate

[2] The-Final-GIF-document-Feb-2017-print-version.pdf (activeessex.org)

The Service's current IRMP sets out its key areas of work through to 2024 and identifies a number of core documents which establish a framework for delivery of the F&RP through the IRMP. These are strategy documents which established core objectives for delivery across the remits of People, Prevention, Protection, Response, and Digital and Data .

Protection and Prevention activities seek to reduce risk to the Essex communities and minimise the requirement for emergency response, in the cases were these activities fail or are unable to prevent a risk materialising the Service will ensure through effective planning, that appropriately trained and led Firefighters, with the right equipment, in the right place, at the right time are able to respond.

This SAOR provides a wider context on the challenges that the Service faces in Greater Essex, using the most up-to-date data available at the time of publication. The SAOR should be used by service personnel in, but not limited to:

- Informing the Strategic Risk Register.
- Gap analysis and the identification of improvements to capabilities.
- Future demands or reduction on the Service.
- The preparation of the Service's IRMP.
- The preparation of operational and procedural documents.
- The business-planning processes.
- Engagement with key partners.

Monitoring of Performance

The Service produces an Annual Report and Statement of Assurance, this provides commentary on the Service's performance against the objectives of the F&RP and its success or challenges on some of the risk mitigations listed in this report.

The Service's key documents are approved at the Strategic Board and the Service's performance against those plans are completed by the PFCC via the Performance and Resources Board, and an Audit Committee is established to provide additional scrutiny. The activities that are required to enable delivery of the IRMP are incorporated within the Service's Annual Plan. The Service's performance against these and its strategies are reported on within the Service's Annual Report.

Fire and rescue services are also subject to inspection from Her Majesty's Inspectorate of Constabulary and Fire & Rescue Services, (HMICFRS) and ECFRS' first inspection took place in July 2019, with a revisit in November of that year. The Service was also inspected, with other Fire and Rescue Services on its response to COVID-19 in November 2020. The Service's next inspection is due in 2021.

Management of Risk

ECFRS manages risk as part of a continuum of risk management which takes into account the work conducted at a National and Local Level through the National Security Risk Assessment, the Essex Resilience Forum's (ERF) Community Risk Register (CRR) and finally to organisational strategic, tactical and operational risk registers.

The Government published its National Security & Risk Assessment (NSRA) in 2019. This is an Official – Sensitive document with limited access. The NSRA is of vital operational importance as it focuses contingency planning requirements and provides a national context for risk management decision making.

The NSRA includes 131 malicious and non-malicious risks, reflecting the current national risk profile, risks fall into ten risk categories. The ERF will amend the CRR to reflect any changes to risk data and numbering system in the NSRA due to EU Exit and Covid-19 pressures this is likely to be completed 2022/23.

How the Service manages risk is set out in the Risk Management Strategy. The accuracy of identified risks relies heavily on the use of risk information gathered from a range of risk sources.

Internal Sources	External Sources
- Historic risk information - Historic results from KPIs (Key Performance Indicators) - Audit Outcomes - Quality Assurance Outcomes - Lessons Learned and Deep Dives - Compliments and Complaints from within the organisation. - Peer review - Business Continuity Exercising	- Professional Bodies - External Consultants - International Organisations such as the World Health Organisation and The World Economic Forum, - Government agencies and associated guidance - Relevant Legislation and Regulations - Risk Events from similar organisations for example Grenfell, Manchester Bombings - Case Reviews

Table 1 Sources of Risk Information

The Service uses a range of methods to analyse this information including but not limited to PESTLE (Political, Economic, Societal, Technological, Legislative and Economic analysis), which is the preferred tool for analysing external risk, in particular those risks arising at a global and national level. PESTLE analysis is strengthened by the use of a Hazard and Risk Model (HARM) which identifies sources of risk at the local level through the use of data and trends. When analysing external risk factors the Service considers; -

- What the world around us looks like.
- What drivers and trends are important?
- What are the expectations of our external stakeholders; and,
- How do we engage with other originations?

This is then considered against the established risk criteria as set out in the Risk Management Strategy. Risks identified through the Risk management process are recorded, managed and monitored though the risk recording software JCAD Core.

The following table provides a breakdown of PESTLE using current global and national risk information.

Political	Increased tension between world leaders results in greater risk of military conflict either physically or digitally.
	Exit of European Union continues to create uncertainty and impacts on border controls and creates difficulties in obtaining supplies and increases costs.
	Increasing polarization and extremist ideas spread through the internet and supported or encouraged by governments for political purposes increases the risk of terrorist activity to purse perceived differences.
	Political discord/conflict between National and Regional elected members impacting on funding (caps on Council Tax)
	Political tensions within all political parties on government handling of COVID-19 slowing decision making.
	Police, Fire and Crime Commissioner Review and new government white paper of fire reform
	Local elections changing pollical environment within Essex.
Economic	Covid 19 has a major financial impact on the national debt, and this could impact on the funding of public services. Unemployment levels have also been impacted, which will impact upon collection rates for council tax and national non-domestic rates
	Uncertain in future as no medium-term Comprehensive Spending Review.
	Failure to invest in or upgrade our infrastructure limits our ability to provide the type of service expected by stakeholders and increase accidents/incidents.
	Budget constraints result in reduced investment in our People.
	Tax increases/decreases in funding contributions (pensions/Section 31 grants)
	Financial difficulties experienced by businesses due to the pandemic results in lack of investment in fire safety.
	Changes to pay and conditions of staff increase costs.
	Firefighter pension scheme remedy/adjustments increasing employer costs.
	Changes to legislation or incident volumes leads to increases On-Call costs
	Due to its location to Europe, the impact of EU Exit on the Essex economy and border controls.

Societal	The spread of infectious diseases such as COVID -19, incidents of such diseases may increase creating widespread societal changes.
	Increased pressure of National Health resources through changes population (aging) which require more interaction with Health and Welfare professions and COVID-19 challenges – including outstanding/delayed treatments due to COVID-19.
	Potential for civil unrest expressed through protests and/or rioting, leading to fractured/disengaged who are more difficult to engage with communities
	Increase in extremism racism due to isolation and other prolonged effects of COVID-19 and migration compounded by EU Exit.
	Higher unemployment leading to increase deprivation in Essex communities.
	Challenges to funding of third sector organisations, or lack of support due to redirecting resources to COVID-19, leading to less support groups within communities.
	Water shortages due to climate change may have profound impact upon daily living or residents, health, and the way we fight fires.
	More diverse communities more difficult to reach and not represented within the Service.
	Increase in new dwellings may present challenges if the supporting infrastructure does not keep pace with the associated population increase in these areas.
Technological	Increasing dependence on cyber technology increases our vulnerability in the event of power outages.
	The increase in home workers mixing personal and work devices to carry out tasks increase the risk of cyber-attack and/or data breach.
	Impact on the Emergency Services Mobile Communications Programme from COVID-19 leading to continual delay to the programme.
	Budgetary constraints hinder the replacement of legacy systems creating vulnerabilities to be exploited particularly for Malware and shadow IT.
	Increases in dependance on Information, Communications and Technology leads to challenges for business continuity where suitable alternatives few (i.e. alternatives available when internet access fails)

Legal	Increasing number of protocols and regulations provide additional burdens which impact on budgets and diverting time from other activity if not carefully managed.
	The inability to effectively manage our legal responsibilities leaves the Service open to legal challenge with possible criminal penalties or fines.
	Legal challenges may be brought by employees who do not feel protected during the pandemic.
	Non-compliance with the Civil Contingency Act as Business Continuity arrangements not effective leading to inability to deliver core functions.
	New legislation/regulation from Grenfell and Manchester Bomb inquests require additional investment.
	The cost of insurance increases as claims increases due COVID-19/theft/more vehicle incidents.
	Impact of changes as a result of the Fire Safety Bill and non compliance of buildings with unsafe cladding
Environmental And Ethical	There is the potential for an increase in incidents due to damage to property and serious injury due to extreme weather events in Essex.
	We may be at risk of reputational damage if we are not seen to be an environmental conscious organisation.
	The continued use of older, non-electric fleet may incur financial penalties in the near future.
	Increase road traffic continues to impact on response times.
	Failure to manage our supply results risks being associated with human rights abuses and financial loss.
	Climate change impacting the incident profile of the Service and increases equipment and training requirements.
	An inability to limit damage to the environment when carrying out response activities causes increased scrutiny and possible fines for the Service.

Table 2 PESTLE

Risk Mitigations

Along with the strategy documents, there are various key mitigations which the Service adopts, these are listed below. Further detail on the financial context in which the Service Fire and Rescue Plan and IRMP are operating within, can be found in its Medium Term Financial Plan (2020-24). In the context of 2021, there are two key risks that impact upon the Service, but the extent to which is

currently difficult to quantify currently is the long-term impact from COVID-19 and the UK's exit from the European Union.

In addition. along with other Fire and Rescue Service's, the Service is responding to Grenfell Tower Inquiry, with phase one recommendations being released in October 2019. The Service has engaged with the National Fire Chief Council (NFCC) and completed a gap analysis on those recommendations, the progress on which is reported to the PFCC. In addition the Service is undertaking a building risk review of high rise premises with a view towards understanding the inherent risks which these premises may pose as a result of the failure in the building safety systems highlighted by Dame Judith Hackett.

Other elements that underpin the Service's planning are -

National Fire Chiefs Council (NFCC)

The NFCC is currently undertaking a programme of work to create a specific community risk framework[3] to guide fire and rescue services in ensuring consistency of approaches across services to their IRMP process. Initially consulted on in 2020, the standard is expected imminently.[4]

The NFCC (National Fire Chiefs Council) and has also has recently published the first professional standards[5] which will provide a set standard to attain in service delivery, and another programme of work is the National Operational Guidance (NOG) Programme[6], to which every Fire and Rescue Service (FRS) subscribes, sets out to provide FRSs with sufficient knowledge about the potential hazards personnel could encounter when attending incidents. Though adapted local these guidance document set out well the hazards experienced by Service's within their day-today activities.

Collaboration

A duty under the Policing and Crime Act (2017) created a statutory duty on fire and rescue authorities, police forces to collaborate. Following the change in governance for ECFRS, the Essex Emergency Services Collaboration (ESC) Programme was formalised between Essex Police and Fire, also including the East of England Ambulance Trust. Projects within the programme are both tactical and strategic.

Joint Emergency Services Interoperability Programme (JESIP7)

The aim of JESIP (JOINT EMERGENCY SERVICES INTEROPERABILITY PROGRAMME) is that; -

"Blue light services are trained and exercised to work together as effectively as possible at all levels of command in response to major or complex incidents (including fast moving terrorist scenarios) so that as many lives as possible can be saved."

It provides the platform for a common approach to risk management, information sharing and communication at the scene, with joint training and exercising delivered for all levels of command across the services.

---

[3] CRP (nationalfirechiefs.org.uk)

[4] Community Risk Management Planning Fire Standard Consultation | Fire Standards Board

[5] Fire Standards Board

[6] National Operational Guidance Homepage | NFCC CPO (ukfrs.com)

[7] JESIP - Working together, Saving Lives

National and Regional Response

In April 2013, the Government published the revised "Responding to Emergencies. The UK Central Government Response Concept of Operations"[8], which sets out arrangements for responding to, and recovering from, emergencies. It sets out the relationship between the central, regional and local tiers within England, as well as covering the relationship between UK central government and the devolved administrations.

Directly relevant to the Concept of Operations is the Statutory Guidance under the Civil Contingencies Act (2004) which requires Category 1 responders to maintain plans to ensure that they can continue to exercise their functions in the event of an emergency so far as is reasonably practicable. The duty relates to all functions, not just their emergency response functions.

In 2019, the Home Office published, the "National Coordination and Advisory Framework"[9] (NCAF), as an adjunct to the National framework and supports everyday assistance and collaboration between fire and rescue services, including the provision of specialist assistance or additional resources where an unforeseeable incident demands it because it is likely to overwhelm or is overwhelming a service's own resources.

Cross Border Arrangements

The Service has arrangements with neighbouring FRS for cross-border cooperation and mutual aid, which are formalised via Section 13 and 16 agreements. Structured meetings are also in place to support regional working, and there is a formal group established with London Fire Brigade to discuss cross border interoperability.

Incident Command[10]

The Health and Safety Executive (HSE)[11] acknowledges that FRS personnel operate in a dynamic and sometimes often hazardous environment through it FRS framework[12]. The HSE[13] also acknowledges some activities that may take place in the more extreme incidents which operational firefighters may be faced with. That said, ECFRS recognises its responsibility, under legislation and Regulations, for developing policies and procedures, and to provide information, instruction, training and supervision to its personnel about reasonably foreseeable hazards and the control measures used to reduce the risk arising from them.

The Service has adopted nationally agreed management framework which, complemented by JESIP, assists to provide appropriate command and control arrangements to the most dynamic and challenging of incidents.

Essex Resilience Forum[14]

The Essex Resilience Forum (ERF) is a multi-agency group of Category 1 & 2 responders that oversees the resilience of Essex should a significant event (natural hazard, industrial accident or threat) materialise. Currently, the Chief Constable is the Chair of the Executive Programme Board of the ERF. This provides strategic direction. The Planning Assurance Group, (PAG), sits directly under the Programme Board. This group deals with capability and capacity and provides the plans and

---

[8] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/192425/CONOPs_incl_revised_chapter_24_Apr-13.pdf

[9] The National Coordination and Advisory Framework (NCAF) England (publishing.service.gov.uk)

[10] Incident command | NFCC CPO (ukfrs.com)

[11] Striking the balance between operational and health and safety duties in the Fire and Rescue Service (hse.gov.uk)

[12] HSFrameworkJunecombined.pdf (publishing.service.gov.uk)

[13] HSE - Heroism in the fire and rescue service

[14] Home - Essex Resilience Forum (essexprepared.co.uk)

exercises required in order to ensure Essex responds appropriately to a significant event identified through analysis by the Risk Intelligence Group (RIG) of the ERF. The RIG compiles the Community Risk Register (CRR), which localises national risks from the national risk assessment guidance to Essex. The high and very high risks in the CRR are highlighted within the report.

The ERF has been fundamental in planning and mitigating risk from COVID-19 to the public of Essex. The overarching plan for the ERF is the Combined Operating Procedures for Essex (COPE), which provides a multi-agency response and recovery framework.

Risk and HARM Model

ECFRS have developed the Harm and Risk Model (HARM), in consultation with Process Evolution, to enable risk to be identified. The current and first iteration of HARM incorporates incident data from ECFRS, RTC related information from Essex Police/CRASH and open-source data to create a model which shows the areas of Essex that contain comparatively more risk than other areas. The data is presented in a visual format at Lower Super Output Area (LSOA) level with a drill-up/down capability for wider exploration at different geographic levels, as well as filtering by risk metric/families. The organisation is using HARM to inform and develop local level risk plans which will drive activity, ensuring that we target our resources to areas that have relatively more risk than others and engage accordingly with communities within these small areas.

Risk Based Inspection Programme

The Risk Based Inspection Programme RBIP allows the Service to identify and target risk from fire in premises across Essex which are regulated under the Regulatory Reform (Fire Safety Order) 2005. The Service identifies quantifies the risk that premises pose considering the historical Likelihood of fire, vulnerability of occupants and buildings that are identified as high risk under our operational risk information (PORIS). This then establishes the nature of the inspections that the Service carries out.

Provision of Risk Information System (PORIS)

In addition to this ECFRS collates Site Specific Risk Information (SSRI) on defined premises, with the guidance for this set out in Operational Risk Information which provides robust yet flexible guidance on developing and maintaining a consistent approach to managing, processing and using strategic and tactical operational risk information.

Essex Fire and Rescue Service

Our Service

ECFRS covers the county of Greater Essex, which includes Essex County Council and the two unitary authorities of Southend and Thurrock. Based on incident volumes, ECFRS is the 9th largest FRS in the England and Wales. There Service has 50 fire stations, 10 wholetime (WT), 2 WT and On-Call (OC), 3 Day-crewed (DC)[15] and the rest being OC. In addition to a number of specialist appliances, the Service also has an Urban Search and Rescue (USAR) station, which is a national asset.
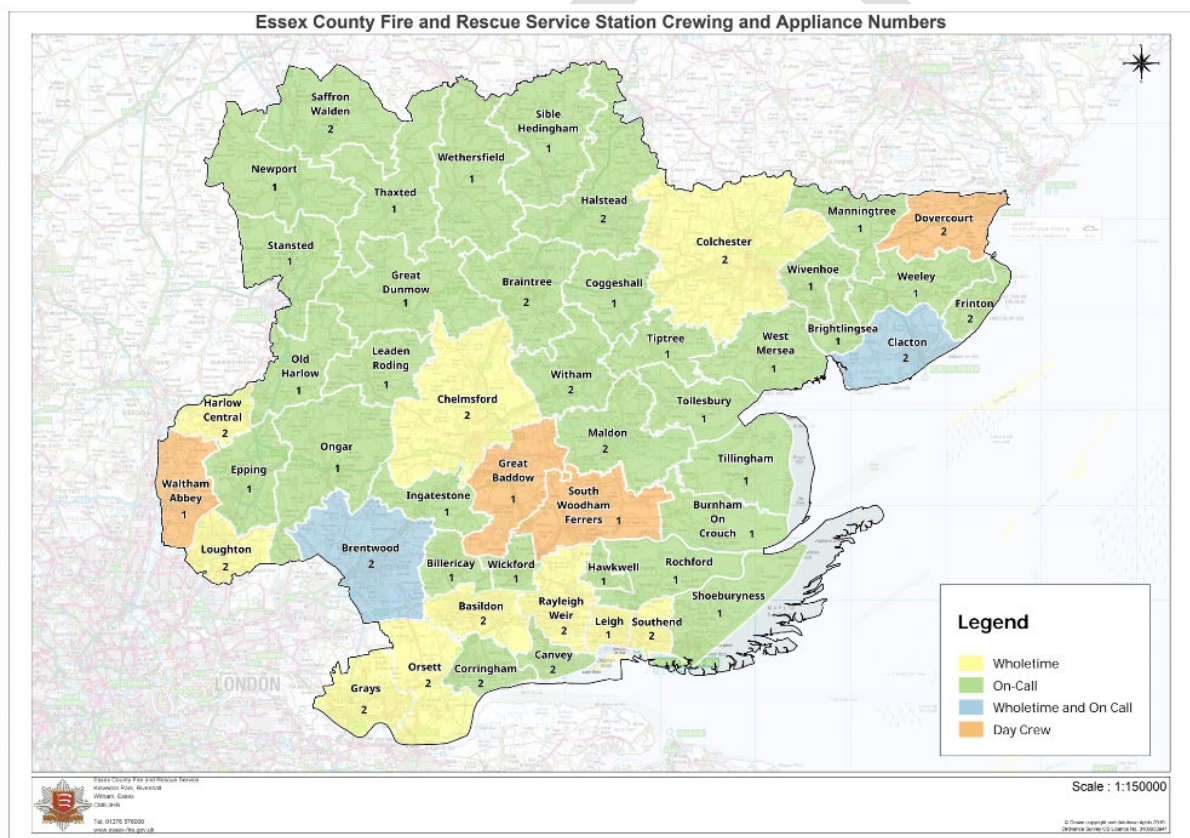
Figure 1. ECFRS Cover for Greater Essex

The Service had a report completed by Process Evolution, which looked at the Service's data in 2019. Key point from the report were that; -

- The Service is not currently meeting its response standards, those being.
  - ECFRS response standards are -
    - First attendance to potentially life-threatening incidents within 10 minutes (on average) – 10.4 in 2019

---

[15] In line with the Service IRMP 2016-20, these are due to convert to OC in 2021-22

- First attendance to all incidents within 15 minutes on 90% of occasions from time call was received - 87% in 2019.

- Operational incidents declined by 3.4% in 2019, following 3 years of increase, to 15,170 incidents. These incidents led to 23,770 deployments (down 5.3%)
- A third of all calls in 2019 were deemed to have potential threat to life (had increased substantially in 2018 to 40% from 28% in 2017)
- The Service has seen a large increase in Special Service calls since 2015, the total being 4,435 in 2019, compared to 3,273 in 2015.
- False alarms still take up the highest proportion of calls, averaging around 40% of all calls since 2016.
- Peaks in the last 5 years have been in the summer of 2016 and most notably in July 2018 when 2000+ incidents were logged.
- 22:00 to 0700 are notably quieter response periods.
- The distribution of operational resources against risk appears proportionate in that the busier stations have WT resources allocated to them, with the Service 6 WT 2-pump stations areas being by far the busiest, their appliances accounting for over 45% of all deployments.
- On-Call availability is below target (90%) with them being off the run-on average over a quarter of the time (26.5%), daytime cover in particular being the most challenging time
- Travel time has increased since 2015.
- The most operationally utilised appliance in 2019 was Basildon's Water Tender, 6.6% of the time
- The busiest time for deployments in 2019 were 30 deployments in one hour.

Further research within the Service have identified the following:

- In 2018/19 58% of all Accidental Dwelling Fires happened in the kitchen
- Research and analysis have identified certain groups as being at greater risk of accidental dwelling fires and of kitchen fires in particular (the main cause of accidental fire in the home, both in Greater Essex and nationwide), these are -
    o Householders on low incomes living in social housing.
    o Transient singles.
    o Poorer elderly householders living in social housing.
    o Couples and young singles in modern starter homes.
    o Owner – occupiers in older style housing.
    o Wealthier older households in rural locations and on town edges
- Fire fatalities occur all over Essex. Serious and slight injury tends to be more clustered and linked directly to volume. As a result, Basildon, Colchester, Southend, and Harlow have the most.
- In 2018/19, 29% of all Emergency Special Services were attributed to Road Traffic Collision incidents and 22% assisting another agency.
- The table below shows the fire fatality overview for England in 2019/2020. Comparing figures for Essex with National Data sets is crude due to differences in volume. For the same time period ECFRS had 2 fire related fatalities of which 100% were male and both were in identified vulnerable groups[16].

---

[16] ECFRS are working with the Essex Centre for Data Analytics (ECDA) to understand our risk profile for fire related fatalities and casualties

Key results

- There were **243 fire-related fatalities** in 2019/20; this year's figure is the lowest number in the annual series (from 1981/82).

- **82 per cent (199)** of fire-related fatalities were in **dwelling fires** in 2019/20.

- For every million people in England, there were **4.3 fire-related fatalities** in 2019/20. The fatality rate was highest among older people: 8.4 people per million for those aged 65 to 79 years old and 16.9 for those aged 80 years and over (Figure 2.1). The fatality rates for age bands within 54 years and younger were all below 5 fatalities per million population.

- **Men have a greater likelihood of dying in a fire than women.** The overall fatality rate per million population for males in 2019/20 was 5.5 while the rate for females was 3.1 per million. For men aged 65 to 79 the fatality rate was 10.6 per million while the equivalent rate for women was 6.4 per million. For those aged 80 and over, the rate for men was 22.6 per million and for women was 13.1 per million.

- The most common cause of death for fire-related fatalities in 2019/20 (where the cause of death was known) was '**overcome by gas or smoke**', given in 30 per cent (73) of fire-related fatalities.

- In 2019/20, there were **2,998 rescues from primary fires**. This was virtually unchanged compared with 2018/19 (2,987) and a decrease of six per cent from five years ago in 2014/15 (3,184).

- In 2019/20, there were **5,172 primary fires that involved an evacuation**. This was a decrease of eight per cent compared with 2018/19 (5,650) and a decrease of 25 per cent from five years ago in 2014/15 (6,867).

Figure 2 Key Results

Our People

The Service has 51 fire stations (including an Urban Search and Rescue team) and roughly 1,500 staff and volunteers: 657 wholetime firefighters, 505 On-Call firefighters, 38 control staff, 328 control staff. Our Service Headquarters is based at Kelvedon Park and administrative functions operate across the County.

The impact of COVID has led to the Service needing to adopt new ways working in order to continue to deliver it core functions. The Service will continue to respond to current situation in line with COVID-19 Concept of Operations and the Service's Infectious Disease Business Continuity Plan. The impact on the Service financially over the coming years is not fully known however, it is expected that there will be increased pressure on the funding of public services going forward, and FRS will not be protected from that pressure. The key people issues facing the Service are -

- Diversity – The Service is taking positive action to recruit a more diverse workforce, particularly as the role of the Services continues to evolve in response to Community needs. Figures as at the end of 2020 are in the table below.

The following table presents the Service's headline diversity metrics as at 31 Dec 2020.

EE Group	Gender % that are Female[1]	Majority Age Band	% LGBT[1]	% Ethnic Minority[1]	% Disability
Wholetime	7.3%	46-55	6.3%	4.1%	3.6%
On-Call	2.4%	25-35	3.6%	2.0%	3.2%
Control	86.8%	25-35	4.0%	2.9%	0.0%
Support	52.4%	46-55	6.0%	2.6%	5.8%
Overall	**18.2%**	**46-55**	**5.4%**	**3.0%**	**3.9%**

Note 1: reflects the proportion of those individuals that explicitly self-identified their gender, sexual orientation, or ethnicity.

Table 3 Diversity Metrics

- Culture - We are committed to having a positive and kind culture. This is so we encourage a modern, forward-looking and innovative environment where we work together to anticipate and deliver the changing needs of our communities. The Service has a **Continued Cultural Improvement Plan** which sits alongside the Service's People Strategy.

- Wellbeing – The last year has increased our focus on creating better working lives by having a safe workforce where we value health and wellbeing. We know this is critical to making Essex a safe place to live, work and travel. Investing in wellbeing helps us achieve better performance and increased productivity.

- Resourcing - Recruitment and retention of firefighters in the on call duty system continues to prove challenging for the Service, with commitment requirement balance with earning potential being among the key reasons for leaving. On-Call availability is considered to be a key contributory factor in the Service not currently meeting its response standards.

- A recent European legal ruling on stand-by duty has opened potential challenge to employees providing OC cover which could potentially be deemed to be in positive hours. This could affect our OC, flexi-duty officers, but most significantly the Day-crewed model.

- Leadership Development – **Workforce planning** means that we are aware of the need to develop more leaders of the future. We have invested in this area to support addressing a potential national and local skills gap.

- Pension – There have been changes to the provision of firefighter pension schemes. This has an impact on our staff. The process of implementing a remedy, which includes some personnel reverting back to the firefighter 1992 pension scheme, is currently being worked through. Also, changes to pensions tax regulations are exposing officers at lower levels to additional tax liability, which may prevent individual from seeking promotion.

- Training - In order to provide assurance of the competence of our firefighters, we have invested in operational training and competency recording. Aside from day-to-day watch-based training the service has specific assurance requirements for Core Skills, Incident Command, Driving and Breathing Apparatus.

Our Service and Our People Risk Summary

- Though noticeably increasing in 2017, incidents have been reducing, but the Service has not been meeting its response standards.
- Proportionately Special Service calls are increasing, leading to a more diverse type of operational incidents to plan for.
- OC availability is well below target has been consistently under target for a number of years, reflective of changes to high streets and primary employment opportunities in more remote areas of Essex.
- Lack of diversity of personnel leading to the Service not being reflective of the communities it serves.
- Increase funding pressure on the Service leading to the Service needing to identify efficiencies in future years.
- OC recruitment and retention challenges
- There could be potential challenges to OC elements of the Service's current Contracts which could impact upon On-Call, Day-crewed and flexi-duty contracts.
- Succession planning over the coming years will be challenging with allot of experience leaving the Service.
- Changes to pension schemes and tax liability attached to pension may discourage individuals from seeking promotion and also lead to a higher turnover of staff than previously experienced.

Our Service and Our People Current Risk Mitigation

- Service quarterly performance report
- The Services Medium Term Financial Plan and Reserves strategy
- People Strategy – Fair, kind, and inclusive workplace and Equality Objectives
- Dignity at work policy
- People Strategy – Wellbeing, safety, and health
- People Strategy – Resourcing
- People Strategy – Leadership and Development
- People Strategy – Training
- The Culture Change Strategy
- Operational Training Strategy
- On-Call development Programme
- People strategy action plan
- Service Business Continuity Plans

PEOPLE AND PROPERTY

The Greater Essex Growth and Infrastructure Framework 2016-2036[17] identified the following key findings; -

- 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.
- The Office of National Statistic (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.
- A significant risk due to the changes in the built environment that have been identified post Grenfell. What we previously knew about the built environment may not now be the case and the risks from our buildings has increased.

Greater Essex

Greater Essex has an estimated population of 1.84 million people (mid-2019), 3.3% of the population of England, an increase of 6.8% (117.5k) since the 2011 census (1.72 million people). ONS projections suggest Greater Essex could grow by 298,700 people between 2016 and 2036 (GIF; p26). This 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.

Age

The average median age for the population of Greater Essex is 43, which is higher than the East of England region (41.7) and England average (40)[18]. 51% of the Essex population is female whilst 49% are male, meaning that there are 38,217 more women living in Greater Essex than men (*ibid*). This is just above the average for females in England (50.6%). When comparing ages to gender when slit into 5 years, most notably there are more males in the ranges up to 29, whilst there are more females aged for all the ranges past 65.

---

[17] The-Final-GIF-document-Feb-2017-print-version.pdf (activeessex.org)

[18] ONS, Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland - Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland - Office for National Statistics (ons.gov.uk)

Projections for age proportions up to 2043 suggest higher proportions in +65 age group meaning Greater Essex will have an ageing population[19]. 2019 population estimates indicate that 19.9% of Greater Essex's population are estimated to be over 65 and 2.7% are over 85. This is projected to increase to 24% aged 65 and over, and 4.44% over 85 by 2035 (*ibid*). Essex's old age dependency ratio[20] (OADR), 327.7, is higher than the England average (286.6), equating to 3 work age people to every person over 65, the OADR is expected to rise to over 400 by 2040 in greater Essex. With increasing age, higher proportions of people are living alone, especially women. Lesbian, gay, bisexual, and transgender (LGBT) elderly people are less likely to be married, less likely to have children and are more likely to live alone.

According to the Institute of Public Care[21], the total population aged 65 and over that is predicted to live alone in 2020 in Greater Essex is 436,930 and expected to increase to 596,392 by 2035.

Ethnicity

Currently the diversity with the Essex Communities is spread out throughout Essex. 93% of the resident population of Greater Essex that responded to the 2011 Census self-identified as white and 6% self-identified as Black, Asian or Mixed/Multiple Ethnic (BAME)[22]. ONS currently does not produce modelled population estimates by ethnic group at local authority level for the years between censuses; caution is advertised when generalising to the current population[23]. The GIF (p27) states; -

'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.'

As the communities of London are more diverse, continuation of this is likely to increase diversity within Greater Essex.

Deprivation in Essex[24]

GIF (p29) provided the map below (Figure 2). This shows Tendring has some of the highest levels of relative deprivation, with Jaywick identified as one of the most deprived in the UK, while the urban areas of Harlow, Colchester, Chelmsford, Basildon, Southend and Thurrock also have pockets of deprivation.

---

[19] ONS, population projections for local authorities: Table 2, Population projections for local authorities: Table 2 - Office for National Statistics.

[20] OADR stands for the old-age dependency ratio is the population ages 65-plus divided by the population ages 16-64, a formula used by ONS - Living longer - Office for National Statistics (ons.gov.uk)

[21] Based on data sourced from Institute of Public Care (IPC) via Projecting Older People Population Information (POPPI) - Projecting Older People Population Information System (poppi.org.uk), accessed circa October 2020.

[22] ONS, Regional ethnic diversity - GOV.UK Ethnicity facts and figures (ethnicity-facts-figures.service.gov.uk), specific spreadsheet: https://www.ethnicity-facts-figures.service.gov.uk/uk-population-by-ethnicity/national-and-regional-populations/regional-ethnic-diversity/latest/downloads/ethnic-population-by-local-authority.csv

[23] ONS - Population estimates by ethnic group - Office for National Statistics (ons.gov.uk)

[24] English indices of deprivation 2019 - GOV.UK (www.gov.uk)
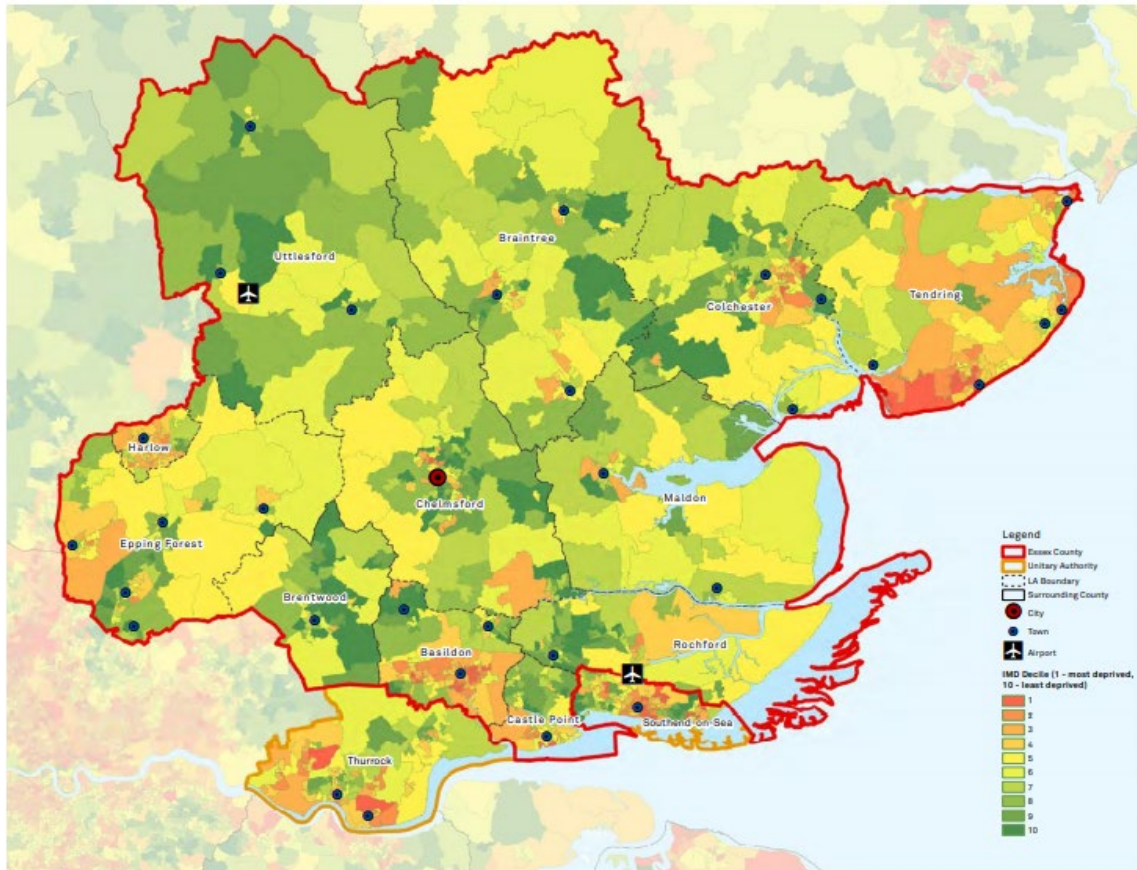
Figure 2 INDEX OF MULTIPLE DEPRIVATION ACROSS GREATER ESSEX (2016)

How each individual local authority in Essex is impacted by this is represented in table One below, further detail can also be found at various sources detailed[25].

District / Unitary Authority	Area (sq. km)	People per sq. km	Projected Population 2025	Projected Population 2040	Median Age	OADR 2019	OADR predicted 2040
Basildon	110	1702	192,537	204,014	39.3	279.3	325.5
Braintree	612	249	154,464	160,561	43.6	337.2	468.7
Brentwood	153	503	76,282	78,002	43.3	334.4	400.1
Castle Point	45	2023	91,654	95,041	46.9	440.9	512.2
Chelmsford	339	527	186,966	201,404	41.6	312.0	379.5
Colchester	328	593	206,470	225,086	37.8	270.0	322.4
Epping Forest	339	388	134,898	141,036	42.7	321.6	425.2
Harlow	31	2851	88,958	92,217	37.5	248.7	308.3
Maldon	358	181	67,489	72,756	49.2	434.4	592.8
Rochford	167	522	91,069	97,958	46.2	389.8	478.9

---

[25] ONS, Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland - Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland - Office for National Statistics (ons.gov.uk) and Population projections for local authorities: Table 2, Population projections for local authorities: Table 2 - Office for National Statistics. OADR calculated based on estimates published by ONS and rationale - Living longer - Office for National Statistics (ons.gov.uk).

Southend-on-Sea	42	4394	190,424	203,587	41.8	319.2	409.6
Tendring	336	436	155,297	172,352	50.8	554.9	696.1
Thurrock	164	1064	185,247	202,327	36.9	219.5	265.8
Uttlesford	641	142	96,781	106,972	43.9	324.7	460.0

Table 4 Local Authority Population Metrics

Property

Household Composition

A household can contain one person living or a group of people (not necessarily related) living at the same address who share cooking facilities and share a living space. Households can consist of a single family, more than one family or a group of un-related people.

Of the 27.8 million in households in the UK in 2019, two thirds were one family households with just under 30% being one person households[26]. Of the remaining 2.8% were households with two or more unrelated adults and the remaining 1.1% were multi-family households[27]. It is estimated that Greater Essex had 763,287 households in 2019 and is expected to contain around 896k by 2043, an increase of over 17%.

The proposed increase in housing will certainly lead to other infrastructure and environmental impacts, such as the provision of roads, drinking water, sewage, and power. Key sector growth should lead to an internal improvement to the Essex economy, if Essex Local Authorities provide or facilitate suitable infrastructure improvement to meet demand. GIF identified (p28); -

- *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%)*

The map below (figure 1.8) was provided by GIF (p35) and demonstrates potential future housing development, what is noteworthy is the location of the potential larger developments with the key road infrastructure (A120, A12 and M11).

---

[26] ONS, Families and households in the UK: 2020 - Families and households in the UK - Office for National Statistics (ons.gov.uk).

[27] ONS, Families and households - Families and households - Office for National Statistics (ons.gov.uk)
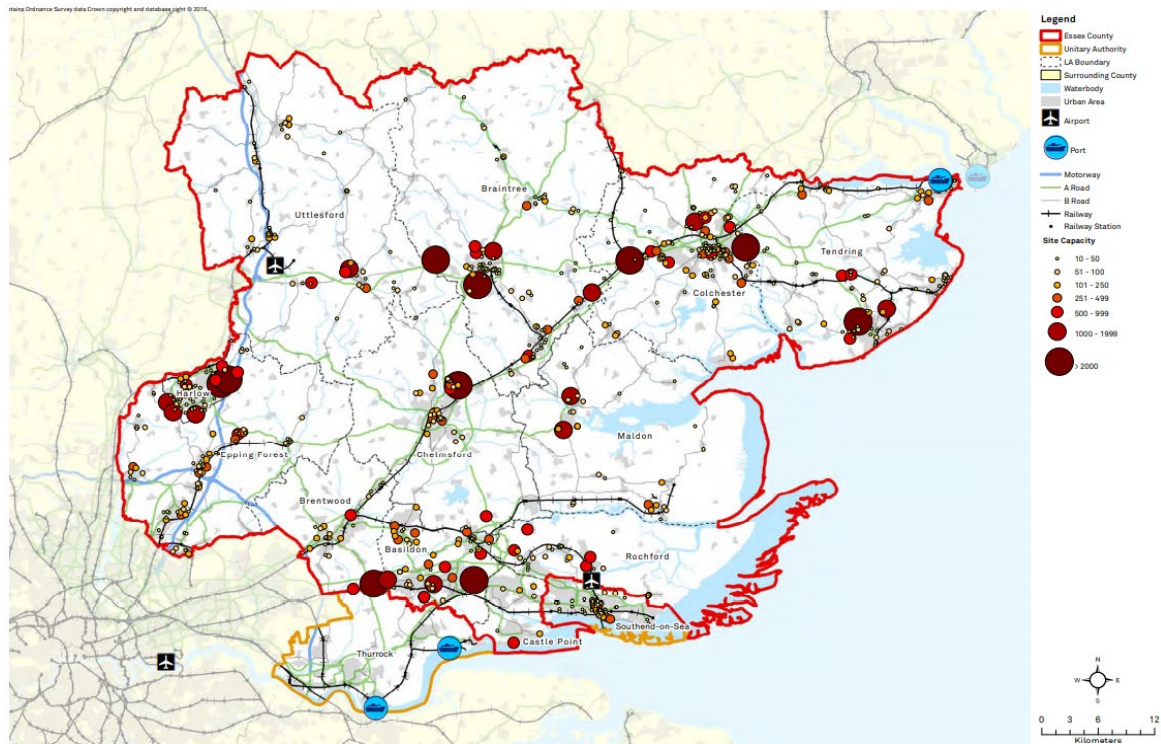
FIGURE 3 - IDENTIFIED HOUSING SITES IN GREATER ESSEX TO 2036

Strategic Housing Developments

The East of England will be one of the three fastest growing regions in England[28], with the main driver being the increased levels of activity in the ICT and service sectors[29]. The projected percentage population change for the region is 5%, (same as England average), which equates to approximately 311,000 residents by 2028[30]. This can be broken into three key elements: approximately 52k additional residents from natural change, 116k residents from UK-based migration and 141k from international migration (*ibid*). Whilst there has been an increase in the number of new homes in England for several years, there is still lower than estimated need, with estimates as high as 340k new homes required per year to 2031[31].

Further housing developments are planned until 2037. The Thames Gateway South Essex is a national priority area for growth and regeneration. 45,000 new homes to be built in "growth corridors" (see map below, 7,200 expected to be built by 2021[32]. Developments will occur in the following areas (with approximate numbers):

- o Basildon – 17k – 19k
- o Castle Point – 7k – 9k
- o Rochford – 7k – 9k
- o Southend-on-Sea – 21k – 26k

---

[28] Ernst & Young, February 2020 - https://emeia.ey-vx.com/4838/138354/landing-pages/ey-uk-regional-economic-forecast-february-2020.pdf
[29] Ernst & Young, February 2020 - HYPERLINK "https://www.ey.com/en_uk/growth/ey-regional-economic-forecast-2020"Regional Economic Forecast - Levelling up – Rebalancing 2.0 | EY UK
[30] ONS, Subnational population projections Subnational population projections for England - Office for National Statistics
[31] House of Commons Library, May 2018 pg.10 - Tackling the under-supply of housing in England (hqnetwork.co.uk)
[32] TGSE_South_East_LEP_-_Growth_Deal_and_Strategic_Economic_Plan_WEB-7.pdf

o   Thurrock – 32K, up to 46k if dwelling shortfall elsewhere.

Other projected new housing in Essex

- o   Brentwood - 7,600k
- o   Chelmsford – 22k by 2037
- o   Colchester - 14,720 by 2033
- o   Epping Forest – 12k (2011 – 2033)
- o   Harlow – 13k (see below) (2011 – 2033)
- o   Maldon - 4,650 by 2029
- o   Tendring – 10k – 11k (by 2031/32)
- o   Braintree – 16k – by 2033
- o   Uttlesford – 13k (2011 – 2033)

Other housing developments

In the current urban areas, and in particular town centres there is a move to have the areas pedestrianised, with plans to increase in high rise accommodation in these areas. These also include a higher reliance on public transport, with other vehicles access being restricted.

There were a number of possible housing development sites identified within the GIF (2017: p24) which are proposed in neighbouring authorities and are considered likely to impact on the strategic infrastructure that also serves Greater Essex, in particular transport, those are -

- 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

There is also the potential for requests from London planner for Essex to accommodate additional housing. The one with the most potential to impact upon the Service is the Gilston Development is to be built just north of Harlow but just in Hertfordshire. The development will involve 10,000 new homes over 20 years, representing a significant project. This will also involve a new junction, 7A, on the M11. The Service has been in discussions with Hertfordshire Fire and Rescue Service since 2018. It is agreed that there will be a high reliance on Harlow appliances being called on as part of the Section 13/16 arrangements.

Figure below provides a summary of the above and strategic planning location for Essex Local Authorities.
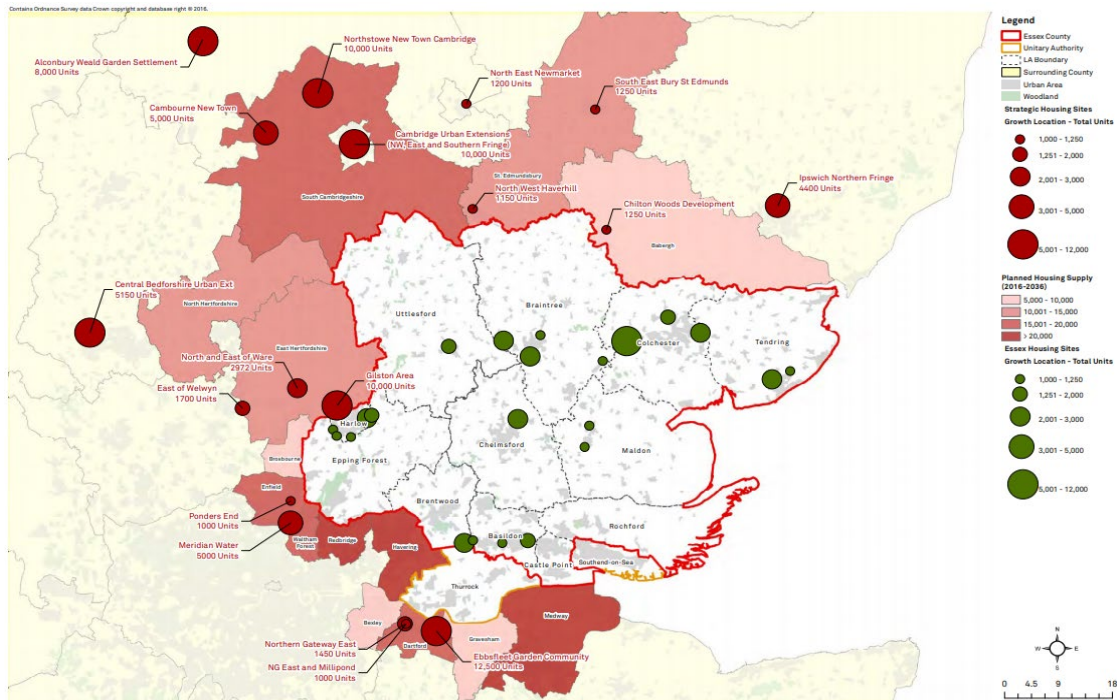
Figure 4 - Estimated Planned Housing Supply and Strategic Sites for Local Authorities Surrounding Greater Essex[33]

People and Property Risk Summary

- There in a notable increase in dwellings anticipated through until 2036 (nearly double that compared to 2004-2015) leading to an increase demand on services, and in particular consultations on new building developments. Biggest growth areas are in Thurrock, Colchester, and Basildon
- There is a significant funding gap identified required to meet int infrastructure requirement to support the increase in dwellings. An increased demand on infrastructure, in particular roads, leading to increased response times.
- The population is also going to steadily increase, proportionally more so those 65 and older, greater demand for Prevention, Protection and Response services
- An increase in the number of immigrants/migrants living and working in Essex including BAME increasing the diversity of persons living in Essex and requiring ECFRS services.
- Essex already has a higher age profile (compared to regional and National figures), this will be increasing leading to the potential of greater demand for smaller dwelling and accessible apartments, greater strain on health and welfare services and a higher proportion of people leaving on their own.
- Future house prices influenced by elderly residents not downsizing leading to a lack of availability of larger family homes, more residents needing of social housing.
- Future proposed regeneration of urban areas and need to increase property leading to an increase in high rise accommodation.

People and Property Current Risk Mitigation

- Attendance at Community Safety Partnerships
- Attendance at Local Strategic Partnerships
- Prevention Strategy – Live Safe

---

[33] GIF page (2017:25)

- Prevention Strategy – Safeguarding
- Protection Strategy – Consultation and Licensing Arrangements
- Attendance at the Essex Chamber of Commerce.
- Development of the HARM model and targeting resources based on this.
- Partnership research into accidental dwelling fire causation and victimology
- Partnership volunteering work
- Attendance at Southend, Essex and Thurrock Domestic Abuse Board (SETDAB)
- Attendance at Safeguarding Boards
- Attendance at Safer Essex meetings

Additional Control Measures for consideration
- More research and planning required on how to mitigate risk to those dwellings which cannot be reached within the Service current response standards, also to include future property builds.

HEALTH

Personal/Self Care and Mobility

Activities of Daily Living (ADLs) are activities relating to personal care and mobility around the home that are basic to daily living, i.e., having a bath/shower. Instrumental Activities of Daily Living (IADLs) are not fundamental to functioning but are important aspects of living independently, i.e., routine housework. The ability to perform ADLs and IADLs is dependent upon cognitive, motor and perceptual capabilities and thus used to measure functional status and health.

Within Greater Essex over 53k[34] people aged 18-64 are predicted to have a moderate or serious personal care disability, 18% having a serious personal care disability. Similarly, it is estimated that 61k people within Greater Essex (in 2020) are predicted to have impaired mobility. This means that a person is likely to experience moderate, severe or complete difficulty with mobility. In each instance Basildon, Chelmsford, Colchester, Southend-on-Sea and Thurrock have the highest numbers.

It is estimated by POPPI (People Population Information)[35] that 107k people aged 65 and over who need help with at least one self-care activity (ADLs) within Greater Essex in 2020. Approximately 30k of these are females, aged 80 and over, for comparison, less than half of this are males aged over 80. Tendring, Southend-on-Sea and Chelmsford having the highest numbers, 11.8%, 9.8% and 9.3% respectively, whereas the lowest number of people reside in Harlow (3.7%). There are similar patterns for the number of people aged 65 and over within Greater Essex in 2020 who need help with at least one domestic task (IDALs), although there is an estimated 217k people that require this, over double that of the ADL's.

Projections of people aged 65 and over who require help with both ADLs and IDALs by district and authority up to 2035 suggest Tendring and Southend-on-Sea will have the largest number of people aged 65 and over who will need help with ADLs and IDALs by 2025. Districts such as Colchester, Braintree, Chelmsford and Basildon will also have high numbers of people, with them having similar numbers of people as Tendring by 2030, Epping Forest will also see a gradual increase until 2035.

Mobility in older people (aged 65 and over) is measured by identifying those who are unable to manage at least one mobility activity on their own, i.e., going outdoors and walking down the road. It is estimated by POPPI that over 69k people aged 65 and over within Greater Essex in 2020 are unable to manage at least one mobility activity on their own, 66% of these being females. Again, Tendring and Southend-on-Sea have the highest estimations in this area. In projections through to 2035, Uttlesford will have the largest percentage increase.

Limiting Long-Term Conditions and Multi-Morbidity

Long term conditions or chronic diseases are conditions for which there is currently no cure (limiting an individual's daily activities) and are managed with drugs and other treatment. An estimated 5.1 million people aged 65 and over in England have a limiting long-standing illness and this is expected to increase to 7 million people by 2035.

Multi-morbidity is when a person has two or more long term conditions or diseases at the same time. Long term conditions on their own present challenges for the National Health Service but combinations of these conditions further increase complexity, amidst a growing number of people

---

[34] Based on data sourced from Institute of Public Care (IPC) via Projecting Adult Needs and Service Information (PANSI) - Projecting Adult Needs and Service Information System (pansi.org.uk), accessed circa October 2020.
[35] Based on data sourced from Institute of Public Care (IPC) via Projecting Older People Population Information - Projecting Older People Population Information System (poppi.org.uk), accessed circa October 2020.

with one or more conditions that require treatment. Research to date indicates that such conditions are more prevalent in older people and among deprived populations, especially those that includes a mental health problem. Tendring has the highest estimated number of people in Essex over 65 and 'limited a lot', projections suggest over 15.5K by 2035, over 4K more than any other district[36].

Frailty

Frailty refers to a person's mental and physical resilience or their ability to recover from events like illnesses or injury. Evidence indicates that the proportion of people living with frailty rises with increasing age, approximately 10% in people aged 65 and over to between 25% and 50% for those aged over 85. Just under 43K who have visited a GP since 2017 have been assigned a frailty score[37], 15% of which were classed as severely frail.

Sensory Loss

Hearing loss is a major public issue in the UK, it is estimated that one in six people is deaf or has some level of hearing loss and by 2035, there will be around 14.2 million people with hearing loss (currently 12 million people). In 2020, it is estimated that 382,750 people aged 18 and over within Greater Essex have a hearing impairment, nearly 10% of which have severe hearing loss[38]. In line with national predictions, all districts/unitary authorities are expected to see a rise over the next 15 years.

In the UK there are almost 2 million people living with sight loss, of which 360,000 are registered as blind or partially sighted. Like hearing, sight loss is closely linked to ageing and as the number of older people is set to increase, so will the number of blind and partially sighted people. In 2020, 45,155 people in Greater Essex are predicted to have a visual impairment, 98.4% predicted to people aged 65 and over[39]. Tendering, Southend-On-Sea and Chelmsford areas have the higher amounts within Essex.

Mental Health Problems

In Greater Essex, it is estimated that there are the following numbers of people aged 18 – 64[40] with the following disorders:

- 26,143 predicted to have a borderline personality disorder,
- 205,890 predicted to have a common mental disorder (anxiety/depression),
- 36,200 predicted to have an antisocial personality disorder,
- 7607 predicted to have psychotic disorder,
- 78,267 predicted to have two or more psychiatric disorders.

It is predicted that the number of people with mental health problems will increase until 2035 in most districts and the unitary authorities.

---

[36] Based on data sourced from Institute of Public Care (IPC) via Projecting Older People Population Information - Projecting Older People Population Information System (poppi.org.uk), accessed circa October 2020.

[37] Exeter data set sourced by Essex Fire in July 2019.

[38] Data sourced from the Institute of Public Care via PANSI/POPPI, accessed circa October 2020.

[39] Data sourced from the Institute of Public Care via PANSI/POPPI, accessed circa October 2020.

[40] Based on data sourced from Institute of Public Care (IPC) via Projecting Adult Needs and Service Information (PANSI) - Projecting Adult Needs and Service Information System (pansi.org.uk), accessed circa October 2020.

Dementia

Less than 500 people in Essex aged between 30 – 64 are predicted to have early onset dementia in Greater Essex. The number of people aged over 65 predicted to have dementia in Greater Essex is significantly higher, over 26k, almost two thirds of which are females. Projections indicate that there will be a significant increase, nearly 50%, of people with dementia by 2035[41].

Substance Abuse

It is predicted that nearly 48k of people aged between 18 - 64 that reside within Greater Essex in 2020 are predicted to be at higher risk of alcohol-related health problems, and this number is projected to increase by over 2K by 2035[42]. Larger numbers are in the 45 - 64 age group. Colchester has a particularly high number of people aged between 18 – 34 that are predicted to be at risk of alcohol-related problems.

It is predicted that over 36K of people aged between 18 - 64 that reside within Greater Essex in 2020 are predicted to be dependent on drugs[43]. This number is projected to increase by over 2K by 2035. Higher number are in the 18-34 age range, with Colchester being particularly high in the 18 – 24 age group.

Safeguarding

The Care Act 2014 for the first-time established legislation setting out specific safeguarding duties for local authorities and their partner agencies. The safeguarding duties apply to an adult who:

- Needs extra care and support (whether or not the local authority is meeting those needs).
- Is experiencing, or is at risk of, abuse or neglect.
- Because of those care and support needs, is unable to protect themselves from either the risk of, or the experience of, abuse or neglect.

A vulnerable adult[44] is any person aged 18 or over who, '*Is or may be in need of a community care services by reason of mental, physical or learning disability, age or illness.'*, and who, *'is or may be unable to take care of him or herself or unable to protect him or herself against significant harm or sexual exploitation'.* There are an estimated 57,000[45] declared vulnerable adults in Essex. The Children Act 1989 and the Adoption and Children Act 2002 govern local authorities' activities when engaging with children.

There are currently six safeguarding boards across Essex for vulnerable persons, a Children's and Adults Board for Southend, Essex and Thurrock (SET), these boards set out how agencies and individuals should work together to safeguard and promote the welfare of adults, children and young people through the 'SET' Procedures. The target audience is professionals (including

---

[41] Data sourced from the Institute of Public Care via PANSI/POPPI, accessed circa October 2020.

[42] Based on data sourced from Institute of Public Care (IPC) via Projecting Adult Needs and Service Information (PANSI) - Projecting Adult Needs and Service Information System (pansi.org.uk) accessed circa October 2020.

[43] Based on data sourced from Institute of Public Care (IPC) via Projecting Adult Needs and Service Information (PANSI) - Projecting Adult Needs and Service Information System (pansi.org.uk), accessed circa October 2020.

[44] Southend, Essex and Thurrock Safeguarding Adults Handbook

[45] Data via direct contact with the Safeguarding Adults Boards

unqualified staff and volunteers) and front-line managers who have particular responsibilities for safeguarding and promoting the welfare of adults, children, and young people.

Human Trafficking and Modern-Day Slavery

Human Trafficking is "the movement of people by means such as force, fraud, coercion or deception, with the aim of exploiting them. It is modern day slavery." It is a crime against the person due to a violation of their human rights. In 2015, 3,266 people were identified in the UK as potential victims of trafficking, a 40% increase from 2014. Modern-Day slavery is closely linked to human trafficking, as the people being trafficked will normally be forced to work, form labour on farms to being forced to work in the sex industry.

Gangs and Youth Violence in Essex

In November 2011, the Government published 'Ending Gang and Youth Violence', from which the message was that gang and youth violence can only be addressed by a coordinated approach, based on early intervention as well as enforcement, and the active involvement of every local agency to share information, resources and accountability. Knowledge and expertise within the Essex Youth Offending Service describes the development of 'satellite gangs' as an important and current challenge for Essex.

Criminal Activity

A declining economy can have several effects. There is a widely held perception and some objective correlation from studies across wide areas that fire activity has identifiable links with reported crime, unemployment, low income, ill health and other educational and social deprivations. Anecdotal evidence suggests that arson may increase during periods of financial difficulty as well. Fire Stations have experienced theft of high-value equipment in the past. In times of economic difficulties, attempts to steal equipment like RTC (Road Traffic Collisions) cutting gear, may increase. This requires careful management of Fire Station security.

Human and Animal Health

Infectious Diseases

The risk posed by infectious diseases on the human population and the associated impacts on the Service is rated high, as such the Service maintains an Infectious Diseases Plan to ensure appropriate preparation and mitigation measures are considered in relation to emerging information. These diseases such a high impact on staffing, as well as the need to limit or enhance control measures with Service public interactions. The Service's planning for infectious diseases have triggers of the loss of 20% and 50% of the Service's staff. The impact of the countermeasures in any given pandemic is difficult to predict as it will depend on the nature of the virus.

Included within this category are -

- COVID-19 - the emergence of the coronavirus COVID-19 happened in late 2019. Following the initial response phase, the Infectious Diseases Plan was updated in relation to new ways of working. Our response remains under review and ongoing in line with any new developments.
- Other Influenza Type Disease - Planning assumptions for this suggest up to 50% of the population may experience symptoms, which could lead up to 750,000 fatalities in total in the UK.

- Emerging Infectious Diseases - Over the past 30 years, more than 30 new or newly recognised diseases have been identified. Most of these have been zoonoses, i.e., diseases that are naturally transmissible directly or indirectly from animals to humans. An emerging or re-emerging infection would not necessarily be spread by the respiratory route (as are influenza and SARS/MERS), but could instead be transmitted directly between people through the gastro-intestinal (e.g., E. coli) or blood routes (e.g., Ebola), or indirectly via vectors such as insects (Zika virus).
- Based upon the experience of the outbreak of SARS and more recently, MERS and Ebola, the worst-case impact of such an outbreak originating outside the UK would be cases occurring amongst returning travelers and their families and close contacts, with spread to health care workers within a hospital setting. However, it is unlikely to present a wider threat to the UK through sustained spread.
- Non-Zoonotic Notifiable Animal Diseases - Disease introduced by infected animals. Assessment based on the need to cull and dispose up to 4 million animals with up to 900 infected premises across UK. Will lead to strong controls on the movement of stock and impacts upon food chain industry. Loss of disease-free status resulting in EU and third country import bans on livestock and livestock products from susceptible animals.

Zoonotic Notifiable Animal Diseases

The most significant disease in this category is Highly Pathogenic Avian Influenza. The major outbreak scenario is of much greater scale than that experienced in any of the recent outbreaks of avian influenza in the UK, where the disease has been contained and has been limited to one or two infected premises plus associated contact premises.

Need to cull and dispose of up to 30 million poultry across UK. Loss of disease-free status resulting in EU and third country import bans on poultry, captive birds and poultry products. Disruption to communities, local economies, tourism and the environment. Economic impacts for a major outbreak assess at £60 million.

Health Risk Summary

- Tendring and Southend-On-Sea will have the largest number of people aged 65 and over who will need help with ADLs and IDALs by 2025, they are also the highest for mobility issues, with Uttlesford due to have the biggest increase in the coming years.
- When considering long term conditions or chronic diseases, Tendring has the highest estimated number of people in Essex over 65 and 'limited a lot' (projections 15.5K by 2035), over 4K more than any other district.
- Proportion of people living with frailty rises with increasing age considered in the context of an aging population.
- Hearing loss, visual impairment, dementia suffers, mental health conditions and substance misuse are all expected to increase in the coming years.
- The long-term impact from COVID-19 is still unknow, with a third phase expected in Autumn 2021.
- Aside from COVID-19, having to manage an influenza type disease (pandemic) is rated as a very high risk by the ERF CRR[46]

---

[46] [3.6_.1_Community_Risk_Register_Hazards_Only_(ERF_website_version_Feb_2017)__5a8d4b21a1723.pdf (essexprepared.co.uk)](#)

- Impacts from a pandemic planning escalation points are loss of up to 20% of and worse case assume the loss of up to 50% of staff, this includes illness, the need to self-isolate and caring responsibilities.
- Learning from COVID-19 suggest other partners (Health in particular) will be put under extreme pressure, with requests for support forthcoming. Resourcing of the ERF and one of key partners at a time when the Service itself could be challenged with staff absences.
- The ERF[47] highlights the risk from Animal disease as damage to the agricultural economy, mass cull/disposal of animal carcasses, loss of livelihood for farm owners/workers and health risk to farm workers. It could also lead to the Service needing extra controls in place to protect staff and stop the spread of any disease when attending incidents.

Health Current Risk Mitigation
- ECFRS involvement in the ERF
- Infectious Disease Plan Business Continuity Plan reviewed and exercise once a year.
- Department Business Continuity Planning
- Prevention Strategy – Live safe
- Attendance as Community Safety Partnerships
- Attendance at Local Strategic Partnerships
- Prevention Strategy – Safeguarding
- Attendance at SETDAB
- Attendance at Safeguarding Boards
- Partnership health meetings. E.g., CareNav Plus.
- Systemic volunteer work with partners.
- Attendance at Safer Essex meetings

Additional Control Measures for consideration
- Additional work to be carried out on the impact on COVID-19 on the Service.

TRANSPORT
Infrastructure Planning
Some regional planning projects which will impact upon Greater Essex in the future are; -

- 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
- Cross Rail 2 developments
- Potential nuclear power plant at Sizewell (Suffolk), in addition to the potential new nuclear power plant at Bradwell (Essex)

---

[47] Animal Disease - Essex Resilience Forum (essexprepared.co.uk)

Commuting Behavior

Essex is an advantageous location for commuters working in London. Removing the London commuters, (GIF; p44) 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.

The map below (GIF; p49) shows Greater Essex's main travel network, including the volumes of traffic/availability of seating on trains etc.
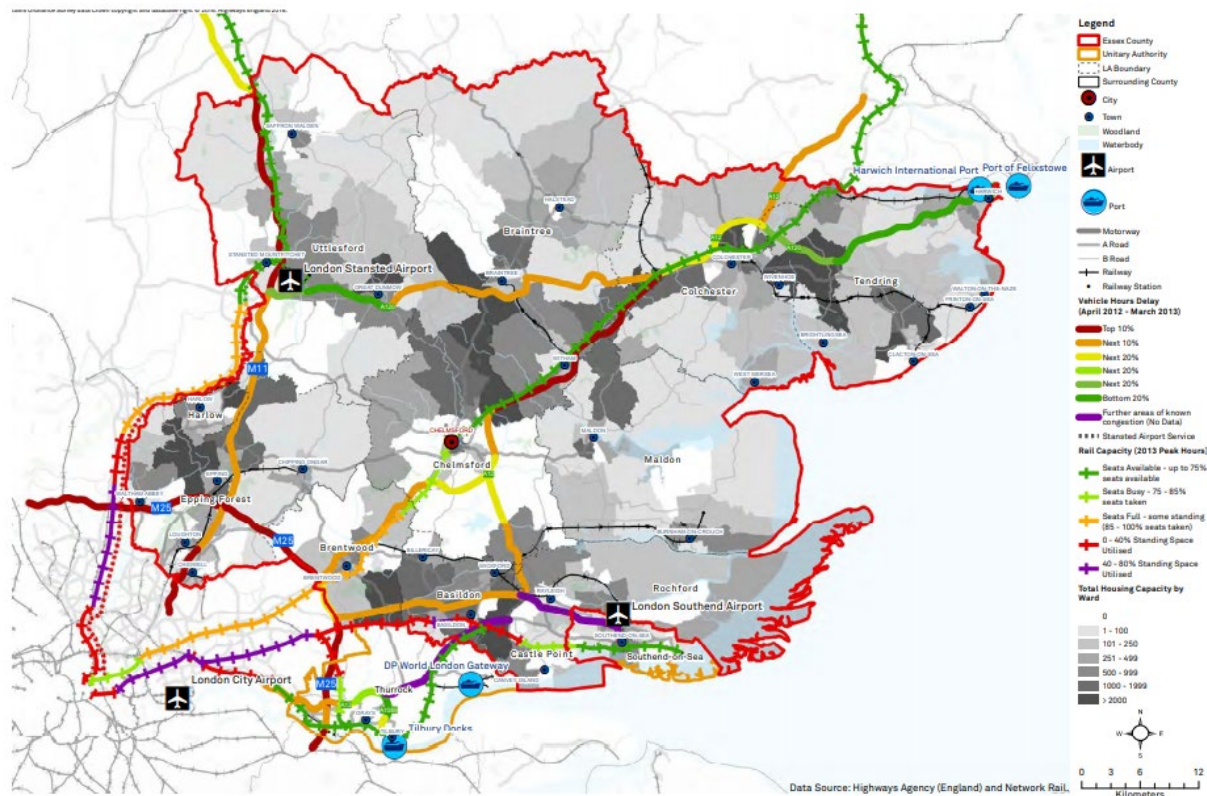
FIGURE 5- NETWORK PERFORMANCE 2012/2013

Significant Roads

The Department for Transport (DfT) regards the M25, M11, A12 and A13 (as far as Tilbury) to be transport routes of national significance. The A120 provides an important link between the M11, the A12 and the East Coast Port of Harwich and is part of the Trans-European Network (TEN) connecting east coast ports with the rest of the UK, as far as Holyhead and the Republic of Ireland.

The A13 and the A127 provide the two primary routes between London and the south of Essex.

The A130 provides a cross county link off the A13 at Benfleet to the A12 with a link to the Fair glen Interchange near Rayleigh, through Chelmsford to link with the A120 near Braintree.

The A12 provides the main London to East Coast ports route. There are schemes in place to widen the A12 and A120. In essence, all major routes in Essex are working at, or near to, their capacity. Journeys can be unreliable, especially at peak times. With the increase in traffic through urban areas, necessitated by diversions, there is also an enhanced risk of accidents involving vehicles carrying hazardous cargos. There are 37 listed operators of buses with commercial routes throughout Essex. New road scheme within Essex can be found at; -

- Essex County Council Highways schemes can be found at

http://www.essexhighways.org/Transport-and-Roads/Highway-Schemes-and-Developments/Major-Schemes.aspx

- Southend Borough Council road schemes can be found at
  http://www.southend.gov.uk/roadworks

- Thurrock Council road schemes can be found at
  https://www.thurrock.gov.uk/roads-and-pavements

Lower Thames Crossing[48]

Highways England are planning an additional consultation in April 2021, planning re-submit an application in July/August 2021 with a revised road opening date for 2029. Nine Tunnel Design Safety Coordination Groups have been held since 2018, covering: -

– Planning, safety, general design considerations, tunnel maintenance and tunnel operations
– Hazard identification
– Fire safety engineering

Areas of consideration for the Service fall into two categories, the construction phase and when the crossing becomes operational. Identified risks to date include -

- Increased traffic in the Thurrock area
- Incidents and accident within the tunnel complex
- All lanes running design (70mph) through the tunnels.
- Cross passage spacing still under consultation.
- Currently no Fire suppression system planned.
- Closest station Orsett does not have a direct link onto the LTC route.
- Some areas where we may be unlikely to reach our attendance times.
- Construction phase will involve a number of sites each estimating up to 4500 LGV movements per week (two of these are Kent side).
- Construction workers village earmarked for Tilbury for up to 900 workers.
- Movement of utilities which include electricity pylons.
- Impacts on current road infrastructure considering the slide below.
- 15.7m internal diameter, world's third largest bored tunnel
- 14-mile route
- New junctions with the A13, M25

Tunnels

The main transport tunnels in Essex are:

- Dartford River Crossing: Two, two-lane road tunnels flowing Kent to Essex under the River Thames. Usually both tunnels operate northbound, but one in each direction if the QE2 Bridge (Essex to Kent) is unavailable. Usually, the control to tunnel access is on the Kent side; however, if one tunnel is for Essex-Kent traffic, there is no ability to control traffic into the tunnel in the event of an incident. The tunnels are 1.4km long.
- High Speed 1 Thames Tunnel: 2.9km long, carrying separated twin bores "to" and "from" London.
- Stansted rail tunnel: Carries the Stansted Express rail line on a short branch line from the West Anglia Main Line. The tunnel is a bi-directional rail tunnel, approx. 1.7km in length. Also known as Cooper's Lane Tunnel.

---

[48] Lower Thames Crossing - Highways England

- Stansted transit tunnel: This tunnel is 3km long and completely within the boundary of Stansted Airport. It runs between the main terminal and the satellite terminals. It is only accessible after passing through security in the airport.
- Bell Common Tunnel: Carries the M25 between Epping (Junction 27) and Waltham Abbey (Junction 26). It is 505m long, is four lanes and is fitted with a forced ventilation system.

ECFRS is likely to mobilise to an incident at the Holmesdale Tunnel, also situated on the M25, and a very short distance across the County border into Hertfordshire. The western end of the tunnel is part of Junction 25. The tunnel is 684m long. A revised emergency plan was issued in August 2019.

Operational hazards of tunnels, include:

- Construction features.
- Inherent fire loading of the structure and facilities.
- Fire loading of the transport system and vehicles using it.
- Access to large numbers of the public (who may be unfamiliar with the tunnel).
- Effect of ventilation to the access structures.
- Communications.

Road Traffic Collisions (RTC)

Since 2013 there has been an upward trend with the number of people killed and seriously (KSI) injured on our roads remaining high; -

- RTCs (Road Traffic Collisions) involving powered two wheelers accounted for just under 200 in 2018 and is the highest KSI group in Essex despite only accounting for just 0.8% of traffic on Essex roads.
- In 2018 young car drivers between the ages of 17 and 25 years of age were deemed to be at fault in 7% of all KSI RTCs. Young drivers are at five times greater risk of being the primary contributor to a road traffic collision than drivers of other ages.
- The year 2018 saw 102 pedal cyclists involved in RTC KSIs.
- Pedestrian KSI casualties increased from 116 in 2012 to 145 in 2018 with distractions such as the use of smartphones and listening to music on headphones considered to be notable contributors.

Rail

Rail Transport Infrastructure

There are 343kms of railway line in Essex and 79 railway stations, including seven on the London Underground network. There are plans for a new station as part of the North Chelmsford development. Network Rail is responsible for the overground track network, with Train Operating Companies (TOCs) operating passenger services on the network: Network Rail routes carry a heavy volume of passenger traffic, especially commuters to and from London.

- Cross-Country Trains – operating into the County from Birmingham New Street, via Cambridge, to Stansted Airport (Uttlesford District).
- Abellio Greater Anglia – operate all rail routes out of London Liverpool Street to Cambridge, Norwich, Southend, Harwich, Clacton and Walton (Pan-Essex).
- C2C – operates the route between London Fenchurch Street and Tilbury, Southend and Shoeburyness (Thurrock/Castle Point/Basildon Districts/Southend/Brentwood Boroughs).
- Transport for London – responsible for London Underground including the route operating into Essex: Central Line between Buckhurst Hill and Epping (Epping Forest District). They also run Rail services between Shenfield and Liverpool Street. Eventually, a full through service from Shenfield to Reading should operate. The ambition is for up to 12 services an hour to

allow passengers to travel through central London without changing trains. Cross Rail Ltd has identified a six-month delivery window between October 2020 and March 2021 for the start of Elizabeth line services through central London.

The routes between London and Manningtree/Harwich carry a high volume of freight traffic to and from the ports at Harwich and Felixstowe. Much of this traffic is containerised, and includes a wide variety of cargos, including hazardous substances.

High-Speed 1 (HS1), operates from London St. Pancras through Stratford to Ebbsfleet (Kent), and into Europe (Eurostar) at speeds of up to 300kph, (186mph). A large proportion of the route is underground, including the 2.9km long tunnel under the River Thames at Thurrock, with access point to this tunnel in Purfleet. Additionally, a short section runs above ground in Purfleet.

Air

The holding areas for Heathrow, Gatwick and London City Airports are in Essex air space. In addition, there are two major civil airports in Essex, namely London Stansted and London Southend. there are a number of locations around in Essex from which Flying Clubs and/or private pilots fly, including a site used by Essex Police and Essex Air Ambulance.

London Stansted

Stansted is the fourth largest in the UK. The airport serves more European destinations than any other airport worldwide and is owned by the Manchester Airports Group. The airport operates 24/7/365, with a single runway. Some 20 airlines fly to over 190 destinations in 31 countries. A number of enhancements works on the are planned to accommodate more traffic.

Stansted is one of the UK airports that accommodate hijacked aircraft or aircraft that otherwise have a need for an emergency services/security response on landing.

London Southend

London Southend Airport is base to a wide range of aviation support companies, airlines and operators. In particular, EasyJet is a primary user of London Southend with expectations to expand its service. Ryanair opened a new base in April 2019, with an expectation of increasing passenger numbers by circa 1.2m. Consequences will be an increase in road and rail passenger movements in order to get to the Airport. Flybe and Air Lingus also fly out of London Southend. It is noteworthy that this has been impacted by COVID-19, with some airlines choosing not to fly out from Southend currently. The Airport has a 129-room onsite hotel and its own rail station for passenger convenience.

In addition to the two airports, there are a number of locations around in Essex from which Flying Clubs and/or private pilots fly, including a site used by Essex Police and Essex Air Ambulance.

Air Activity

The Clacton Air show, (Tendring District Council), is an annual event (currently suspended due to COVID-19), that usually takes place around the August Bank Holiday weekend. Reported attendance figures over the two days are in the region of 200,000.

North Weald Airfield is an operational general aviation aerodrome, in North Epping Forest District Council. The airfield is home to several flying organisations offering flight training, flight experiences and regular trips. Fixed and rotary wing aircraft operate from this location. The airfield also hosts a large Saturday Market, vehicle shows and Track days for cars and bikes. The site is now used as an

inland border facility post EU exit. No added congestion at the moment because of this, however this has only currently been open since COVID-19 restrictions have been in place.

Stapleford Aerodrome is an operational general aviation aerodrome near Abridge, (Epping Forest District Council). It is about 3.4 nautical miles south of North Weald Airfield and 4.5 nautical miles north of Romford. This location offers flying training, business charter and London sightseeing flights, and aircraft engineering services

Essex has no military air assets based in it. However, Wattisham Airfield is just outside Essex and rotary wing aircraft frequently fly in the north Essex area, with exercises involving 16 Air Assault Brigade based at Colchester.

Air Related Incidents

There is evidence of 58 light aircraft incidents in Essex since 1960, resulting in 19 fatalities to the pilot and/or passengers, with three seriously injured reported. No great property damage occurred, with airframes largely going down onto open country. None appeared to require a major involvement of ECFRS.

There was one major air incident, (December 1999), which involved a Korean Airline Boeing 747 cargo aircraft that crashed shortly after take-off from Stansted Airport. In that instance, the aircraft fell onto farmland.

The likelihood of an air related incident is remote, however the potential of impact of such an incident could be high, as other incidents have demonstrated.

Sea (Maritime and Ports)

Maritime Related Incidents

The responsibility for fighting fires on ships at sea rests with the ship operating company. Neither the Maritime and Coastguard Agency (MCA) nor any shore-based Fire and Rescue Service are under a statutory duty to tackle such fires.

Each ship operating company is obliged to have a safety management system, commensurate with the Articles of the International Convention for the Safety of Life at Sea (SOLAS) and as accepted by the vessel's Flag State. Once the fire is contained, the ship operating company could make an application to coastal states for a Port or Place of Refuge, allowing the vessel to enter port so that shore FRS could tackle the fire.

In addition to Port facilities, the River Thames has a number of locations on the Essex side that provide berths for petrochemical tankers. The Port of London Authority is a Trust port and the Custodian of the tidal Thames covering 95 miles of the river Thames. In 2018, the PLA (Port of London Authority) saw 54m tonnes of goods handled, 9.9m passenger journeys, with 4.79m tonnes of inland waterways freight moved. Thames Oil Spill Clearance Association (TOSCA)[49] provides a 24-hour response to oil spills between Tower Bridge and Canvey Island. Funded in part by the terminals that handle oil and oil products, the service has two purpose-built craft, each designed to collect and/or contain oil in the first critical hours after a spillage.

---

[49] TOSCA (pla.co.uk)

Major Ports

Essex has three major ports within the County, with a fourth, Felixstowe, opposite Harwich and across the River Stour, the northern County boundary with Suffolk. Tilbury, the London Container Port and DP World (see below) are part of the Port of London.

Tilbury and Tilbury 2[50]

Both Tilbury and Tilbury 2 are independent Port authorities managed by the Port of Tilbury, the ports have a wide range of berths and the ability to handle almost all cargo types. The Port of Tilbury is a significant distribution centre, with access to the M25 orbital motorway and therefore the UK motorway network. In addition, there are direct rail connections within the Port, for access to the UK at large. The Port includes 130 companies employing 4000 people, handling 16M tonnes of cargo, including containers, paper, cruise, wood and cars.

Tilbury 2 has been developed to the east of the existing Port and Tilbury Fort.   The Lower Thames Crossing will have a link to Tilbury 2. Tilbury 2 comprises of:

- A roll on/roll off ferry terminal for importing and exporting containers and trailers to northern Europe, in partnership with P&O Ferries
- A facility for importing, processing, manufacturing and distributing construction materials.
- A strategic rail terminal which can accommodate the longest freight trains of 775m.
- Storage areas for a variety of goods, including exported and imported cars.

Tilbury has doubled the size of its business in the past 10 years and is projected to double the volume of cargo across the quay (from 16 million to 32 million tonnes) and increase direct employment (from 3,500 to 12,000 jobs) over the next 10-15 years.

The port includes -

- London Container Terminal – this is Europe largest terminal for refrigerated containers and operates 24/7.
- Tilbury is the UK's leading port for handling paper products with volumes of over 3 million tonnes per annum. The Port also handles significant quantities of forest products and there is an on-site Wood Treatment Plant for sheet materials and timber.
- General Cargo and Ro-Ro
- Grain and animal feed - The grain terminal at the Port is the largest in the UK, with 120,000 tonnes in capacity with over 200 separate silos for product segregation. Expansion is planned to increase this to 136,000 tonnes.
- Purpose built 'bulks' warehouse.
- London cruise terminal
- Dubai Port London Gateway[51] – parts are still under construction; this has the capacity to handle ultra large container ships. It is largely automated. Once completed the Port Will have the largest logistics park.
- The port owns the Enterprise Distribution Centre, a fully automated terminal that handles 700,000 tonnes per year.
- The port has capacity to handle non-hazardous liquid bulks for customers through bespoke silo but also has licensing to handle all classes of dangerous goods in container form.

---

[50] http://www.forthports.co.uk/tilbury-london/

[51] https://londongateway.blob.core.windows.net/n2cms/upload/PDF/Port%20specs.pdf

- The port handles 2 million tonnes of recycled products each year and this makes up approximately 15% of its throughput.

Harwich International Port[52]

Harwich International Port is a multi-purpose freight and passenger port with road & rail links to the Midlands, London, and the South East. Approximately 1 million passengers pass through Harwich International Port every year, travelling on ferry services to the Netherlands and Denmark and also caters for cruises to Scandinavia and the Baltic, as well as Round-Britain and other European destinations. The Port receives regular shipments from northern Europe, Cyprus, Libya, Algeria, Tunisia and Malta.

Speciality hydrocarbons are imported and exported via Harwich to Haltermann Carless Ltd site next to the Port, this site is the only fuel refining facility within Essex. Every year, Petrochem Carless distils up to 500,000 tonnes of condensates, mainly naphtha, kerosene, and gas oils. Other similar products are imported for processing alongside these products to create a range of speciality products for industry. Storage capacity totals 150,000 tonnes, in 175 storage tanks ranging from 5 tonnes to 1,300 tonnes. A direct pipeline links the berth to the site.

A long-term project is the proposed Bathside Bay development of Harwich International Container Terminal, a £300 million deep-water container terminal, currently at the planning stage. There is no indication when this project will begin.

Crouch Harbour Authority

The Crouch Harbour Authority is the statutory harbour and navigation authority for the Rivers Crouch and Roach, controlling both pleasure and commercial use of the rivers. The Harbour Authority passes by-laws to regulate use and employs staff to enforce the by-laws. The Authority provides weather forecasts, tide tables and other important sailing information.

Freeports

In 2021 the chancellor announced a number of freeports to simplify export and import taxes and tariffs. In these ports, goods can be imported, manufactured and re-exported without being subject to customs checks, paperwork, or import taxes, known as tariffs. Freeport East is planned to be situated at Felixstowe and Harwich. Plans could create up to 13,500 new jobs. There is also a consortium promoting one in the Thames area, they claim it will create 25,00 jobs and £400 million port investment.

Other Ports

There are a number of smaller ports around the Essex coastline. These handle a variety of traffic including coal, grain, timber, chemicals, oil, fertilisers and general products. In addition, a large number of pleasure craft and yachts use the many marinas on the Essex coastline. (Fingringhoe, Rowhedge, and Wivenhoe on the River Colne, where there is a flood barrage, Maldon, at the confluence of the Rivers Chelmer and Blackwater, Mistley Quay on the River Stour, and Wallasea on the River Crouch.)

Several dedicated jetties exist at industrial sites on the Thames, which handle a range of materials, including petroleum-based products.

Thames Estuary & the SS Richard Montgomery

In 1944, the SS Richard Montgomery went aground in the Thames Estuary. The wreck contains 1,400 tonnes of explosives, and lies in approximately 15m of water, some 2km off Sheerness. The MCA

---

[52] http://www.harwich.co.uk/

(Maritime and Coastguard Agency) monitors the wreck, registered as dangerous under the Protection of Wrecks Act 1973.

The MCA believes that the cargo is stable. Nonetheless, there are concerns that if an explosion took place, parts of the Isle of Sheppey, the Isle of Grain and more pertinent to Essex, Canvey Island and Southend could be impacted by a tidal wave causing flood.

Transport Risk Summary

- The ERF[53] has outlined the impacts and consequences of a transport incident, aside from the incident itself the impact to travel, people stranded in vehicles, impacts on the environment, significant damage to buildings/infrastructure and impact on the economy if long term damage is sustained.
- RTCs in Essex remain high and account for a significant number of incidents in each year. With reference to 'Road' it is the highest transportation risk for the Service, with powered 2 wheelers remaining the highest risk KSI group in Essex. Young car drivers between 17 and 25 years continue to be a high-risk group in Essex. There are also considerable freight movements along Essex major link roads due to its ports and airports.
- Despite having 2 major airports, thankfully the likelihood of an aircraft incident remains low, with most involving smaller aircraft. Should a larger aircraft incident be realised the impact is likely to be high, with high numbers of death/casualties. Stansted Airport accounts for a number of mobilisations each year.
- There have been no significant Rail incidents within Essex recently[54]. However, there is significant rail travel through Essex each year and historically, particularly involving derailments have led to high causalities.
- In Essex there has been only one recent incident of note has taken place at Sea, in January 2018, whereby a fire start in a refrigerator lorry and spread to other vehicles, there were 400 people on board. The ship's crew extinguished the fire. The risk to the Service from ships exists around fighting an along-side fire.
- In general, maritime incidents impact depends upon the cargo/number of passengers, not just from the potential of loss to life, but also for the impact on the environment from pollution from any incident.
- In summary, the main risk to the Service from transport is RTC's involving a small number of vehicles, however Greater Essex has significant transport infrastructure which offers a foreseeable risk to the Service and therefore requires appropriate planning and preparation.
- Essex's transport infrastructure is already at capacity in some areas, with the potential of an increase in population increasing this still further.

Transport Risk Mitigation

- Participant of the Safer Essex Road Partnership (SERP)
- Prevention Strategy – Life Safe
- Prevention Strategy – Be Road Safe
- Prevention Strategy – Delivery – intelligence and data led approach

---

[53] Transport Incidents - Essex Resilience Forum (essexprepared.co.uk)
[54] http://www.raib.gov.uk/publications/investigation_reports.cfm

- Targeting P2W RTC KSI incidents through the Fire Bike
- Prevention Strategy – Be water safe
- Community speed watch
- Response Strategy – PORIS
- Response Strategy – Training and Exercising
- Heavy duty Rescue Pumps
- Urban Search and Rescue
- External expertise in LGV vehicles and access to additional heavy-duty equipment
- Protection Strategy – Risk Based Inspection Programme
- People Strategy – Training
- Operational Training Strategy

INDUSTRIAL, UTILITIES AND OTHER INFRASTRUCTURE

The National Infrastructure[55]

The national infrastructure is comprised of the facilities, systems, sites and networks necessary for the delivery of the essential services upon which daily life in the UK depends. There are nine national infrastructure sectors providing these essential services:

- Communications
- Emergency Services
- Energy
- Finance
- Food

- Government
- Health
- Transport
- Water

Figure 2.1 Essential Services

In the sectors, there are certain 'critical' elements of infrastructure, the loss or compromise of which would have a major, detrimental impact on the availability or integrity of essential services, leading to severe economic or social consequences or to loss of life. These 'critical' assets make up the nation's critical national infrastructure (CNI) referred to individually as 'infrastructure assets. Infrastructure assets may be physical (e.g., sites, installations, pieces of equipment) or logical (e.g., information networks, systems). Relevant Statute & Regulations to protecting national infrastructure are -

- **Pipelines Safety Regulations 1996**: which relate to hazardous oil and gas pipelines and pipelines installations.
- **Radiation (Emergency Preparation and Public Information) Regulations 2001 (REPPIR):** which relate to radiation hazards at locations including nuclear power. Bradwell Power Station is the only site that falls under these regulations in Essex.
- **Control of Major Accident Hazard Regulations (COMAH) 2015[56]:** The purpose of the COMAH Regulations is to prevent major accidents involving dangerous substances and limit the consequences to people and the environment of any accidents that do occur. A 'competent authority' enforces the Regulations. In England, the competent authority is one of the HSE, the Office for Nuclear Regulation (ONR) for nuclear establishments, and the Environment Agency (EA).
- **Civil Contingencies Act (2004)** - establishes a clear set of roles and responsibilities for those involved in emergency preparation and response at the local level. Identifying levels of responders. ECFRS is a category One responder. Category 1 responders[57] have specific responsibilities.

Essex Sites

A number of locations in Essex require site-specific plans under the COMAH, REPPIR and Pipeline Regulations. Others form part of important infrastructure, both locally and nationally. Whilst

---

[55] http://www.cpni.gov.uk/about/cni/
[56] A guide to the Control of Major Accident Hazards Regulations (COMAH) 2015 - L111 (hse.gov.uk)
[57] Category 1 responders are Police, including the British Transport Police, Fire and Ambulance Services, HM Coastguard, Local authorities, Port health authorities, NHS primary care trusts, NHS hospital trusts, NHS foundation trusts, and the Environment Agency.

responses to these sites are "business as usual", the size of an incident might cause a responding Authority to use nationally agreed arrangements.

COMAH requires on-site and off-site emergency plans to deal with potential major accidents for those sites with the greatest hazards. The on-site emergency plan details the roles that those who work at the establishment will have to play in the event of a major accident. It should include the arrangements established for assisting with emergency response offsite. This plan is the responsibility of the site operator and must be in writing. The local authority for the area where an upper-tier establishment is located deals with off-site emergency plans. The plan must be suitable for dealing with the consequences of major accidents beyond the establishment. As with the on-site plan, it should be in writing. The off-site emergency plan details the roles carried out by emergency services, local authorities and other external organisations in the event of a major accident. This includes the arrangements established to help with the emergency response on site. The degree of planning should be proportionate to the probability and consequences of the accident occurring. On-and off-site plans must be tested at least once every three years.

The Regulations operate at two levels Upper-tier and Lower-tier, depending on the quantities of dangerous substances at an establishment. A full list of COMAH sites can be found via this link - COMAH sites

Utilities

The provision of water, gas and electricity is very important to any community. The loss of any utility infrastructure will have a negative effect, and generally, highly localised losses.

Water companies

Around 1.8 Million consumers are provided with water services in Essex, the main suppliers are -
- Essex and Suffolk which is a 'water only' supplier.
- Anglian Water and Thames Water provide sewerage within its areas of supply.

Storage and Distribution of Water

The prediction is that water demand in Essex will rise by 6% by around 2035, almost entirely due to an increase in population, assuming that growth in housing development occurs as planned. Essex is the driest county in the UK receiving on average less than 600 mm of rain a year, two thirds of the average for England and Wales. Only half the water supplied comes from Essex.

In a dry year up to one third of the required water transfers from Norfolk, through pipelines and pumping stations to the River Stour and River Blackwater to fill the reservoirs at Abberton and Hanningfield during dry periods.

Hanningfield and Abberton Reservoirs, owned by Northumbrian Water Limited trading as Essex & Suffolk Water, are direct supply reservoirs. Both contain about 25,000 megalitres. They are pumped storage reservoirs, involving pumped water from the rivers Chelmer, Blackwater and Stour to fill them, rather than simply relying on rainfall from their limited catchment area.

Abberton Reservoir is about 6.5 km south of Colchester, and less than 8 km from the coast, and is the fourth largest in England, at 4.9 sq. km. It is a Ramsar Site (Wetland of International Importance for Birds), a Special Protection Area (SPA) designated under the EU Birds Directive, and a Site of Special Scientific Interest (SSSI) due to wildfowl. It is the largest freshwater body in Essex, with 485 hectares covered by water.

Hanningfield Reservoir is the second largest reservoir in Essex, situated about 4.8 km south of Chelmsford. Its main scientific interest lies in its breeding and wintering wildfowl.

In drought conditions could lead to excessively low reservoir levels, leading to the imposition of water restrictions. The National Drought Risk R84, involves three consecutive dry winters in the south and southeast. This is in line with those encountered in 1976, which appear to provide the background to unprecedented drought risk. Both reservoirs must have a flood plan.

During dry or drought conditions, reduction in pressure is likely to be a consequence of increased usage rather than a strategy employed by the Water Supply companies to reduce consumption, as most of the distribution network in Essex is gravity fed from elevated storage (water towers).

Hydrants

There are 34,830 fire hydrants and associated bypass valves in Essex, (July 2018), some capped, (a common situation in London.) Increasingly, the Water industry is finding it difficult to maintain these.

Electricity

Generated electricity usually goes into the National Grid transmission system for transmission around the UK. Transmission substations take the electricity off the transmission system and inject into the distribution network. The distribution network then carries the electricity from the transmission substation to the customer. The distribution system in Essex operates at voltages from 132,000 Volts (Extra High Voltage) through 33,000 Volt and 11,000 Volt networks down to the low voltage distribution network which supplies the majority of customers at either 230 Volts (single phase) or 400 Volts (three phase).

Substations transform voltage from one level to another. The design of the electricity network makes it robust with varying levels of resilience built into the various parts of the system to limit the impact of faults on the customer in accordance with national standards of security of supply. For example, on some parts of the network, usually the higher voltage networks, this means that in the event of a fault, protective equipment isolates the faulty piece of network and redirects the electricity along a different path to the customer to avoid interruption to the customer's supply.

The safe interruption of power takes place on other parts of the network, usually the lower voltages, to minimise the damage to the network and because there are no alternative routes to the customer, until a repair team can be dispatched to carry out repairs and restore supplies. The following can affect electricity supplies:

- Third party damage such as from roadwork teams damaging cables, metal theft etc.
- Severe weather, e.g., strong winds causing trees and branches to fall into overhead lines down overhead cables etc.

There is a link between thefts of copper wiring and the value of scrap metal, with recent prices being very high. The loss of electricity, recognised as a national risk (R76 NSRA 2019), will have a severe impact on society and the economy if the loss is over a prolonged period[58].

---

[58] https://www.raeng.org.uk/publications/reports/living-without-electricity provides further detail

Power Stations

Tilbury Power Station

The Tilbury Greenpower project comprises two separate phases of development: Phase 1 is a waste wood power plant; and Phase 2 is a Solid Recovered Fuel power plant. There is not decision to on whether to proceed with phase 2. Phase 1 utilises around 270,000 tonnes of waste wood sourced from the region. Electricity generated by the Plant will be transferred by underground cable to the Plant's 132 kV Electricity Substation, and subsequently along a 4.5 km underground cable to the existing 132 kV substation at Tilbury.

Bradwell B Power Station

The Power Station Permanent Development - the proposed new nuclear power station on land within the main development site (adjacent to the existing Bradwell station) which will be developed with two UK HPR1000 nuclear reactors, together with associated plant and ancillary structures and features of the power station.

Temporary Construction Facilities - these are temporary facilities required for construction on the main development site and for the duration of the construction period.

Off-site Power Station Facilities - these are permanent facilities away from the main development site, which are essential for the safe operation of the power station.

Associated Development - development on and off-site to support the construction and/or operation of the power station, for example park and ride facilities for construction workers, freight management facilities, temporary worker accommodation and road and junction improvements.

The Bradwell B project is still in the early stages, with consultation phase one having been completed in 2020.

Key features of note in the proposals are:

- Concern has been raised around the potential disruption to the road network during the construction phase including along the A12.
- The proposals include changes to the road layout in the Dengie Peninsular.
- Proposals for park and ride and freight storage facilities near to villages in the area.
- The site itself is likely to include extensive workers accommodation.
- Proposals outline use of Rail and Marine transport

Oil and Gas Pipelines

There are two Calor Gas facilities at Canvey Island and Coryton. In addition, there are in excess of 750 km of high-pressure gas pipelines in Essex. They are:

- National and Transmission Systems (NTS) operated by Transco used to distribute natural gas to users throughout Essex.
- Horndon to Barking (power station) operated by Thames Power Services Ltd (18 km).
- Epping Green to Enfield pipeline operated by Enfield Energy Centre Ltd (12.8 km).

Oil Pipelines

Pipelines transport petroleum and its derivatives to and from refineries, shipping terminals and storage terminals. Typically, these products are:

- Petrol
- Diesel Fuel
- Dyed Diesel Fuel (red. Diesel)
- Aviation Fuel
- Crude oil of varying viscosity.

Increasingly, Biofuels, (e.g. ethanol), are being transported by pipelines, as well as slurries suspended in water and other liquids. Multi-product pipelines transport two or more different products in sequence in the same pipeline. Usually there is no physical separation between the different products. Steel or plastic pipelines are buried at 1-2 m deep. There are two oil pipelines flowing out of Essex and one that flows into Essex. Three companies, the British Pipeline Agency, SERCO Gulf Engineering and Unipen, operate them.

British Pipeline Agency (BPA)

The British Pipeline Agency (BPA) is responsible for approximately 700 km of pipeline on behalf of oil, gas and chemical companies. This includes the United Kingdom Oil Pipeline (UKOP), part of which is in Essex. The UKOP has been constructed and laid at a nominal depth of 1m underground for most of its length and has a diameter of 356mm. The system is operated and maintained by the BPA and is routed from Canvey Island to the River Mersey, with a spur to Heathrow/Gatwick Airports. It passes through Essex from Canvey Island to Fishers Green, near Waltham Abbey, by way of Corringham, Great Warley and Stapleford Abbots.

The Thames Estuary Pumping Station is near the former Shell Haven site. At any time, the pipeline can be transporting several petroleum products, including motor spirit, at pressures up to 80 bars, with a flow rate of approximately 300 tonnes per hour. Whilst the pipeline is operating, there will always be a controller in attendance at the Control Centre. Pipelines from Canvey Island and oil installations at Coryton of 265mm and 305mm diameter supply the pumping station, known as the Thames Gathering System.

SERCO Gulf Engineering and Unipen

SERCO maintains a system on behalf of the Department of Energy. The route of this system is from Thames Haven to Saffron Walden then to Sandy (Bedfordshire) with branches elsewhere, including Stansted Airport. (Unipen operates this section). The pipeline has a diameter of 254mm. Pumps with a capacity of 340tonnes per hour at up to 80 bar pressure are used and are remotely controlled from a Central Control whilst pumping is in progress. Pumps are fitted with an automatic cut-out that would come into operation immediately a rise in pressure occurred.

Telephone and Wi-Fi

Telephone and broadband coverage are Essex is good. There was a programme to ensure 95% of Essex would have superfast broadband by 2019. Particularly with the influence of COVID-19 and

working from home increasing, as well as the foreseen increase in populations, and more reliance of 'smart' technology, reliance on mobile signal and broadband will only increase.

Cyberattacks

Cyberattacks have become a common hazard for individuals and businesses and can take a multitude of forms—from data theft and ransomware to the overtaking of systems with potentially large-scale harmful consequences.

It should be noted that cyber-attack features high on the National Reasonable Worst-Case scenarios (RWCS) and that the public sector has already experienced several attacks.

The requirement for the protection of personal data is clearly set out in the Data Protection Act (2018). Local Authorities and the public sector have been targeted by criminal often demanding ransoms in order to not share data they have accessed.

The UK has one of the world's most open and most digital economies, making it vulnerable to attack from hostile countries, criminal gangs and individuals, attempts to steal information, damage or disrupt continue to grow and evolve.

The National Cyber Security Centre (NCSC) provides information and advice in general, and more specifically to the public sector[59].

The pandemic has led to a huge increase in employees working from home, with many making rapid adjustments to their new "office". With more people using personal devices for work purposes came an increased vulnerability to cyber fraud, as criminals sought to exploit the changing circumstances.

The NCSC has created a number of toolkits to assist organisations and individuals combat the threat posed by online technologies, including the Cyber Essentials Programme. In addition, the NCSC recommends investing in the development of Cyber Professionals alongside the greater involvement of boards in tackling the potential threats.

Other Infrastructure

Low, Medium and High-Rise Dwellings

All major urban conurbations in Essex have clusters of low, medium or high-rise dwellings. Medium rise new builds appear to be a popular choice by developers over most recent years. Medium rise can also include Sheltered Housing schemes, of which there have been a number in existence for many years. New "Retirement Living" such as the McCarthy & Stone Miami House in Chelmsford may typically be of three or four stories over a wide campus. All the main urban areas have high rise blocks in varying numbers.

Grenfell Fire

The events at the Grenfell Tower fire in 2017 graphically and tragically illustrated the issues of poor construction coupled with difficult access to both the hi-rise block and to the flats within. There are 197 dwellings which meet the definition of high-rise accommodation. Further learning is expected from the current enquiry, and the Service has an action plan to ensure that the Service responds appropriately to any requirements going forward.

---

[59] Public sector - NCSC.GOV.UK

Properties requiring Tactical Fire Plans

Currently, there are 56 industrial or business premises that are the subject of Tactical Fire Plans, (TFPs). Plans can be viewed via the operations SharePoint site for Operational Risk Information

Commercial Properties in Essex

There are many commercial properties throughout Essex, and a number of business estates. The Service monitors these via their Risk Based inspection Programme (RBIP) which it uses for premises that are regulated under the Regulated Reform (Fire Safety) Order.

Hospitals

Essex has five NHS acute hospitals, situated in major population centres. All have Accident and Emergency facilities. These are:

- Basildon & Thurrock University Hospitals NHS Foundation Trust General Hospital. (608 beds).
- Southend University Hospital NHS Foundation Trust General Hospital. (320 beds).
- Mid Essex Hospital Services NHS Trust, Broomfield, Chelmsford General Hospital and provides the Regional Burns & Plastic Centre. (396 beds).
- Princess Alexandra Hospital NHS Trust General Hospital, Harlow. (364 beds)
- Colchester University Hospital NHS Foundation Trust General Hospital. (560 beds)

In addition to those beds stated above, there is provision for additional commissioned escalation beds during periods of significant surges, including crisis, there are also 5 other NHS sites, at Maldon, 2 at Braintree, Epping and Clacton used for day or otherwise limited admissions. There are also 9 private hospitals, 2 at Brentwood, Buckhurst Hill, 2 at Chelmsford, Colchester, Leigh and 2 at Southend.

Schools

There are 525 primary schools in Greater Essex[60], and 100 Secondary Schools. In 2016 there was a surplus of places at both primary and secondary schools, however the surplus tends to be in more rural areas, not close to planned developments, in urban areas, particularly Braintree, Chelmsford and Colchester schools are under pressure due to overcapacity.

Universities

Universities present a challenge in that they tend to house large numbers of students leaving home for the first time with no local support. It can often be the case that those attending university particularly new admissions are taking on responsibilities such as cooking for the first time. There are three universities based in Essex in addition to the school and college offer. The University of Essex supports more than 12,000 students across three locations in Essex, with all offering accommodation to students. The campuses are in Colchester, Loughton and Southend. Anglia Ruskin University has one campus located in Chelmsford which supports around 6,000 students, the university offers accommodation. The third university being Writtle University College. University of Essex Student numbers are forecast to grow from 15,000 at present to 20,000 by 2025 (principally on the Colchester campus).[61]

Heritage and similar Properties

Essex has several Grade I and Grade II* Listed Buildings and Historic Houses and Thatched properties. Policies, procedures and processes inform the Operational Risk Information System, (PORIS). Whilst the Service does not respond to any automatic fire detector actuation other than for

---

[60] GIF page 60
[61] GIF page 65

schools or sleeping risks without confirmation from an occupant or call centre that there is an incident, the Service does respond immediately to heritage sites.

Sites and Events attracting High Density Crowds

Major Retail Sites

All the major towns in Essex have a large retail footprint. In addition, there is a rising number of retail parks located throughout Essex including Chelmsford, Braintree, Basildon, Thurrock, Maldon

Lakeside in Thurrock is a major retail outlet, which attracts visitors throughout the East and Southern parts of the UK. The site accommodates parking for 12k cars, has 3 floors with 250 retailers and services.

Large Events of Note in Essex

Colchester United Football Club is situated at the Weston Homes Community Stadium. The ground has a crowd capacity of just over 10,000. The Stadium is accessible from the A12 (J28 Colchester bypass) via a purpose built on and off slip road system. The venue is also used to host pop concerts as well as other events. Southend United Football Clubs current ground is at Roots Hall, just outside Southend town centre. The ground has a crowd capacity of just over 12,000.

Essex County Cricket Club, County Ground, Chelmsford (capacity approx. 6,000) is just located outside of the town centre. Essex County Cricket Club also play a limited number of matches at Colchester and Southend.

Chelmsford City Racecourse at Great Leighs, approximately five miles north of Chelmsford, provides day and night all-weather horseracing. The attendance license is for up to 30,000, (non-racing event). However, the Thursday night race meetings attract between 800-1200 racegoers. The highest attendance to date was for a concert after horse racing that attracted 12,000 people.

There are a number of other Essex towns which have local football clubs with small and enclosed grounds. An Example is Chelmsford City Football Club, Melbourne Stadium, Chelmsford (capacity approx. 3,000).

Penal Establishments

Chelmsford Prison is situated in Springfield Road, Chelmsford. It is a Category B Prison for males, including young offenders, convicted or on remand direct from courts within its local catchment area. The Prison currently has an operational capacity of 700 as at October 2018.

Future Sites of Note

Proposed just across the Thames on the Swanscombe peninsula, the first phase could open in 2024. Impact of Development:

- Increased road, rail and river traffic through Thurrock to the parking area and Tilbury Passenger Landing Stage.
- Subsequentially an increase in road risk.
- Extension to the landing stage supporting point 1 above.
- The building phase of the Essex logistics facility.
- All of the above factors in addition to the Lower Thames Crossing project which will potentially impact upon response times across the area.
- Redevelopment of the area to the east on the site of the decommissioned Tilbury Power Station which already houses:
    - The Tilbury 2 port development with the new two berth jetty (in operation).
    - Stobart's renewable timber storage facility (in operation)

Industrial, Utilities and Other Infrastructure Risk Summary

- Total failure of GB's National Electricity Transmission Network is rated as very high by the ERF's CRR[62]. Generally, the most likely risk leading to a loss of electricity will be via damage to cables either through another accident or severe weather. If over a prolonged period it can have a severe impact on society and the economy[63].

- Actual or threatened significant disruption to fuel supplies including because of industrial action by tanker drivers or refinery staff, or effective blockades at key refineries/terminals by protestors and large toxic chemical release are rated as high by the ERF in its CRR.

- The ERF[64] outlines the risks from a loss of utilities as being ddisruption to essential services and activities, people exposed to poor sanitation or limited drinking water, homes without heating, the ability to cook and/or keep food cold and limited telecommunications.

- The ERF[65] outlines that impacts could be filling stations being exhausted within 48 hours, and it is taking up to 10 days to return to normal supplies.

- The consequences of long-term power outages over a significant area and for a prolonged period could affect mobilisation and response at an incident site. In addition, it may not be possible to refuel appliances, as pumps will not work, either at a Fire Station, or at a Fuel Station on the appliance's ground. Fire Stations could experience a range of issues, e.g., working in the dark, lack of heating, ICT failure, no Mobile Data Terminal updates, etc. and water shortages as the pumps require electricity. This is a National Risk, (R76) that is receiving greater attention following a review.

- The Service business continuity arrangements have an increasing reliance on network access, aside from the need for power, cyber-attacks are on the increase, to either hold local authorities to ransom or as an act of terrorism.

- The ERF[66] highlights the impact that an industrial accident could have on the local residents.

- The risk spectrum can range from minor fire or chemical spill to larger incident involving explosion and chemical discharge effect off site locations and wider areas. Historically those sites requiring extra regulation are relatively low risk, with incidents largely remaining on-site.

- High-rise incidents are reasonably frequent and represent a risk to the Service from the difficulties in access and egress and to firefighters having to work in a challenging and arduous environment.

- A major fire at any location such as school, or hospital has long-term consequences on surrounding communities due to closure and the need to relocate vital services.

- Fortunately, incidents at events involving large numbers of people have a low likelihood, though the Service does do significant planning for any potential terrorist incident in such areas.

- The fall-out from incidents have a negative impact on the environment either through water run off or discharge of chemicals.

---

[62] 3.6 .1 Community Risk Register Hazards Only (ERF website version Feb 2017) 5a8d4b21a1723.pdf (essexprepared.co.uk)
[63] National Risk R76 (NSRA 2019)
[64] Loss of Utilities - Essex Resilience Forum (essexprepared.co.uk)
[65] Fuel Shortage - Essex Resilience Forum (essexprepared.co.uk)
[66] Industrial Accidents - Essex Resilience Forum (essexprepared.co.uk)

Industrial, Utilities and Other Infrastructure Risk Mitigation

- The Response Strategy – Training and Exercising
- Response strategy – engagement with all COMAH sites and Local Authorities, involvement with on-and off-site plans exercises
- Protection Strategy – Risk Based Inspection Programme
- Protection Strategy – Business Engagement
- Protection Strategy – Enforcement
- Protection Strategy – Consultation and licensing arrangements
- The Service's Hazardous Materials and Environmental Protection Officers, (HMEPO)
- The Services Petrochemical Officers,
- The Service's National Interagency Officer (NILO) level,
- Participants of the Essex Resilience Forum, and each of the Emergency Planners situated within each Local Authority.
- Fuel Business Continuity Plan

THE NATURAL ENVIRONMENT

Essex has an area of approximately 3,670 sq. km, with large areas of flat, low-lying land, about half of which are in agricultural use. Also within this are multiple internationally protected habitats and landscapes, including the Dedham Vale Area of Outstanding Natural Beauty, these include -

- 10 Ramsar sites, three of which extend into other administrative areas.
- Seven Nature Reserves.
- 24 nationally important sites of geological conservation
- 86 Sites of Special Scientific Interest
- 49 Local Nature Reserves.
- 236 designated Conservation Areas.

The Essex Coastline and River System

Essex has 515 km of coastline, one of the longest coastlines of any English county; the coastline includes many estuaries and islands. The coast is low-lying and has sizeable flood defence structures, particularly the extensive lengths of sea wall. The eastern side of the coastline is characterised by saltmarshes, muddy estuaries, and isolated islands, most notably Mersea Island, accessed by a causeway often submerged at high tide.

Rivers

The River Stour to the North, the North Sea to the East and the Thames Estuary to the South provide Essex with three of its boundaries. The County is highest to the North and West with the major river systems draining eastwards into the North Sea (e.g., Rivers Stour, Colne, Blackwater, Chelmer, Crouch and Roach) or the Thames Estuary (Rivers Mardyke, Beam, Roding, and Lee) although the area around Saffron Walden flows northwards via the River Cam to eventually reach the sea at Kings Lynn.

Estuaries

The Essex Estuaries European Marine Site, (EMS), is the second largest estuarine site on the east coast of England. It contributes to the range and variation of estuaries in the UK as the best example of a coastal plain estuary system on the British North Sea coast. Covering an area of 472 square kilometres, this estuary complex contains the major estuaries of the Rivers Colne, Blackwater, Crouch and Roach, as well as extensive open coast tidal flats at Foulness, Maplin and the Dengie. The intertidal mudflats and sandflats within the European marine site support a wide range of typical estuarine and marine communities. The Essex Estuaries are a Special Area of Conservation[67], and Essex has several Special Protection Areas[68] and Sites of Special Scientific Interest[69].

Flood Risk

The risk of coastal flooding is one of the most significant risks on the National Risk Assessment[70]. Essex is vulnerable to flooding from the sea, rivers, surface water or a combination of these. Coastal inundation becomes a concern when Low Pressure and a north-westerly wind combine to lift the prevailing sea height. This worsens when Spring Tides are due, particularly in the spring and autumn months, when significantly high Spring Tides are experienced.

The creation of flood barriers and the increase in height of some sea defences around Essex has improved the resilience of areas vulnerable to tidal flooding. Even so, in recent years there have been a series of river and coastal flooding events within Essex, which resulted in several residential

---

[67] Essex Estuaries - Special Areas of Conservation (jncc.gov.uk)
[68] List of UK SPAs (jncc.gov.uk)
[69] Sites of Special Scientific Interest (England) | Natural England Open Data Geoportal (arcgis.com)
[70] Coastal Flooding - Essex Resilience Forum (essexprepared.co.uk)

and commercial properties being flooded. Additionally, there has also been a rise in the number of flash flooding events. The map below shows the coastal and inland areas at risk from tidal flooding.

Figure 6 Essex Flood Risk. Copyright Environment Agency

Water Management

Outcomes from the Pitt Review of the floods in 2007 brought about The Flood & Water Management Act 2010. In addition, the following Acts of Parliament apply:

- The Water Resources Act 1991.
- The Land Drainage Act 1991.
- The Environment Act 1995 (that created the Environment Agency).

The Environment Agency (EA) is responsible for carrying out flood risk management activities in England and Wales as established by the afore mentioned Acts, this means the EA is responsible for dealing with coastal (Tidal) flooding and flooding from main rivers (Fluvial). Local Authorities are accountable for ensuring effective management of the groundwater flooding, surface water flooding (Pluvial) and ordinary watercourses (streams and ditches not designated by the EA as a main river). The ERF provides an overview of the risk from Inland flooding[71] (Pluvial and Fluvial) and Coastal[72] (Tidal) on their webpage. Assessment of flooding risk should include:

- Local flood maps including flash flood areas and specific risks such as fords and flooded roads, and specific hydrology.
- Geographic and demographic areas of highest need involving vulnerable members of the community and critical national infrastructure.
- Previous incident data.
- Links to weather patterns and historical flood data.
- Response capability in line with the Flood Rescue Emergency Plan

---

[71] Inland Flooding - Essex Resilience Forum (essexprepared.co.uk)
[72] Coastal Flooding - Essex Resilience Forum (essexprepared.co.uk)

Waste Management

There are several landfill sites within Essex, 15 licenced. Over the past few years that have been increase amounts of fires which has occurred at non-licenced waste site. Traditionally these are difficult to extinguish and often lead to Service resources needing to be on site for many weeks.

Protecting the Environment

Pollution

The Service has to deal, from time to time, with pollution arising from accidents involving hazardous materials. ECFRS is also required to consider and mitigate pollution arising from an incident either because of the accident or because of ECFRS actions to deal with it. The scale of operation can vary enormously.

The Service has a duty to reduce pollution wherever it can. In addition to the impact of a pollutant on the environment, the additional risk is one of reputation if the Service fails to manage its business appropriately. In operational terms, there are three significant drivers for operational commanders, all of which must be in place to be effective:

- There is a life risk.
- The Service took all reasonable preventative measures.
- The Service informed the EA at the earliest possible opportunity.

Climate Change

Global Environmental Risks

The last five years globally are the warmest on record, with climate related natural disasters such as hurricanes, droughts and wildfires are becoming more intense and more frequent. Polar ice is melting more quickly than anticipated, with drastic implications for sea levels and coastal populations, and increasing instances where severe and more extreme weather occur. The Met Office provide a National Severe Weather Warning service[73].

Biodiversity is declining faster than it has at any other time in human history. How we grow food, produce energy, dispose of waste, and consume resources is destroying nature's delicate balance that all living creatures depend on for survival.

The destruction of nature will inevitably disrupt supply chains and cause economic losses from disasters such as flooding, and the loss of potential new sources of medicine.

UK Environmental Risks

The UK Government is required, under the 2008 Climate Change Act, to publish a Climate Change Risk Assessment (CCRA) every five years which is published on the Government website. The headlines are[74]; -

- The average annual UK temperature is around 1.2°C warmer than the pre-industrial period.
- The chances of experiencing hot summers like in 2018 have doubled in recent decades and are now about 10-25% per year. This will rise to 50% by 2050, i.e., on average, every other

---

[73] Weather warnings guide - Met Office
[74] UK Climate Risk

summer will be as hot or hotter than 2018. The ERF has further detail on the risk from heatwave.

- UK average sea level has risen by 16cm since 1900 and will continue to rise for centuries due to time lags in the climate system.

In July 2018, the Government published the latest National Adaptation Programme to address the risks identified in 2017. Six priority areas of climate change risks for the UK were identified, three of which are particularly important to ECFRS.

- Flooding and coastal change risks to communities, businesses and infrastructure is a high risk now and is expected to remain a high risk in the future.
- Risks to health, wellbeing, and productivity from elevated temperatures.
- Risks of shortages in the public water supply for agriculture, energy generation and industry

Further projects can be found in the UKCP18[75] factsheet on the Met Office's web page.

Accurate predictions around climate change and its impact/likelihood are difficult to provide, as they are dependent on variable factors. Nonetheless, there is an increased likelihood of severe, localised flooding in urban areas, (where storm drain capacity and capability to deal with heavy and sustained rainfall will be challenged – as experienced in Essex in August 2013), and rural areas surrounding waterways and coastal areas.

Drought
The Environment Agency has four stages of drought incident management, normal, prolonged dry weather, drought, and severe drought. Prolonged Dry Weather (PDW) is referred to when there has not been sufficient rainfall to recharge the groundwater and rivers with sufficient winter reserves to allow such activities as abstraction for agriculture and business.

Coastal Erosion and Rising Sea Levels
Sea level rise will increase coastal flooding and erosion. Current projections indicate an increase in flooding. Higher tides and storm related flooding may affect coastal areas more frequently. Standing water depths may prevent standard Fire Service response vehicles from entering, leaving, and moving around flooded areas. If sea levels rise in line with expert predictions, the Essex coastline will face serious threat. Average sea levels off the Essex coast could rise by 26-86cm by 2080, with sea levels in extreme conditions potentially rising by 80-140cm, meaning flood management schemes may become compromised and less likely to mitigate or control the impact of flooding.

The Natural Environment Risk Summary
- Tidal Flooding is identified as a very high risk by the ERF in its CRR[76]
- The impacts of substantial increases in rainfall are wide-ranging, particularly if rain does not fall evenly (i.e. very heavy rain over a 24-hour period). The frequency of fluvial and pluvial flooding is expected to increase.
- Increased flooding incidents and levels could lead to damage to infrastructure (i.e. bridges and roads) in addition to shorter term impacts such disruption to travel and schools/business closures.

---

[75] https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-fact-sheet-derived-projections.pdf

[76] 3.6 .1 Community Risk Register Hazards Only (ERF website version Feb 2017) 5a8d4b21a1723.pdf (essexprepared.co.uk)

- (Floods 2007 – Pitt Report – The possible impact is that of a major and prolonged incident that requires the deployment of other Fire Services into Essex, or Essex deploying out of County to support a major and prolonged incident.)
- Heatwave, low temperatures and heavy snow, poor air quality and Severe space weather are all assessed as high by the ERF CRR.
- The climate for Essex is getting wetter and warmer, and this is likely to continue to increase. Expectations are that winters will become wetter and summers warmer.
- With hotter winters, insufficient water availability could seriously hamper fire-fighting operations. If longer, hotter, and drier summers are expected, this will lead to reduced water availability from open water supplies such as watercourses, lakes, and ponds. As most of the distribution network in Essex is gravity fed from elevated storage (water towers), reduction in pressure is likely to be a consequence of increased usage rather than a strategy employed by the Water Supply Companies to reduce consumption. In areas where pressure is already managed as a means of both leakage and consumption control, it is at a point where further reduction would result in an inability to meet the existing statutory minimum.
- Grassland secondary fires may increase in number with the potential for more large-scale incidents. In the event of more frequent and larger fires, proportionate attendances would be required or dramatic changes to firefighting response and attitudes. In rural areas, this will place greater demand on On-Call fire fighters.
- Wind speeds associated with extremes of weather are predicted to rise almost certainly increase the incidence and experience of severe wind related incidents. Attendance times to incidents might increase and prioritising of emergency calls in spate conditions become more common.
- Firefighting operations may require more resources to attend the same incident over a longer period. Increased incidents of flooding may require more operational attendances, including On-Call crews. Specialist equipment and training will be necessary to execute rescues and to mitigate the impact of flooding.
- Firefighting is an arduous activity, particularly during hot weather. Attending fires for long periods may have health and welfare implications for crews.
- The ERF sets out the impact from Coastal pollution as damage to Sites of Special Scientific Interest, wildlife and the environments as well as posing a health risk.
- Fire at large waste sites have increased over the past few years, leading to Service resources being at locations for days, and sometimes weeks.
- Further details of the risk from pollution and working with the environment agency is available by via the NOG – Environmental Protection[77].

The Natural Environment Risk Mitigation
- Engagement with the ERF
- The Service's Hazardous Material and Environmental Protection Officers
- The Service's Environmental Unit
- The Service's Water the Service's hose laying lorry
- The Service's High Volume Pumps the Prevention Strategy – Be water Safe.
- The Service's water rescue teams and equipment
- The Service's Water Incident Manager officers
- Response Strategy – PORIS - determined dedicated water plans with extra resources added to any incident at that location.
- The Service's Environmental Strategy 2021-31
- ECFRS Flood plan

---

[77] Environmental protection | NFCC CPO (ukfrs.com)

- Attendance at Executive Flood Officers Meeting

<u>Additional Control Measures for consideration</u>

- Review of water rescue to ensure that it is fit for purpose with the potential for increase of flooding and review the Services response arrangements to Tidal flooding.

ECONOMIC ESSEX

Essex Economic Commission

The GIF (p36) identified that *'Greater Essex is a significant driver of the UK economy – generating £36bn Gross Value Added and supporting over 816,000 jobs.'* Via its location and transport links into London, Essex also provides significant labour resource into the capital, particularly in the west, central and southern districts of Essex. The net outflow from Essex to London is 110k.

As well as London another key factor to Essex's economy is its location to Europe and its international travel link, both existing through its ports and airports, but also those being planned (Thames Crossing). The GIF also identifies; -

- Its Gross Value Added per head recent growth lags behind 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., employment base) and in the labour market (e.g., qualification rates, employment rates and resident earnings).
- Employment is strongly concentrated in districts of Chelmsford, Basildon, and Colchester, with the forecast being that this will increase in those districts in addition to Thurrock.

Growth Corridors

Essex has four well-established growth corridors:

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

Outside London, Greater Essex is the eighth largest economy in the UK, with greater Essex growth rate of 0.6% a year between 2004 and 2014 was slower than UK average of 1.3% and the slowest amongst counties in South East and East Anglia. The Essex coastline offers a wide variety of water-based recreation activities including nature and landscape appreciation as well as sports and leisure activities.

South East Local Enterprise Partnership

The South East Local Enterprise Partnership, (SELEP), is the largest partnership between private and public sector bodies outside London working to develop and deliver sustainable economic growth across all parts of the SELEP area.

The SELEP brings together business, local government and education partners from the counties of Kent, Essex and East Sussex and the unitary authorities of Medway, Thurrock and Southend-on-Sea. The South East Growth Deal aims to contribute to the Local Enterprise Partnership's Strategic Economic Plan.

The Growth Deal will focus on four key priority areas as identified in the Local Enterprise Partnership's Strategic Economic Plan:

- Enhancing Transport Connectivity
- Increasing Business Support and Productivity
- Raising Local Skill Levels
- Supporting Housing and Development

Thames Estuary Growth Commission

In 2016, The Thames Estuary Growth Commission was formed, its task to develop an ambitious vision and delivery plan for north Kent, south Essex and east London. The Commission published their 2050 Vision report in June 2018. The report focuses on the diversity of places across the Thames Estuary area, recognising that it will be most successful when viewed as a series of functional economic areas, places (for both people and wildlife), and communities. It stresses that those places need to take concerted and coordinated action together to create positive change in the Thames Estuary. Further detail can be found at; -

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/789048/Thames_Estuary_Commission_Response.pdf

Economic Risk Summary

- It is currently unknown the long-term impacts of COVID-19 and the EU exit on the Essex economy, however it is envisaged that much of the longer-term planning and forecasts for both the Essex and UK economy will need to be revised.
- Increases in the populations and the consequences of that require significant investment in the Essex infrastructure, this is essential in Essex's economic growth.
- With jobs concentrated in London and major cities, and links to London and Europe, transport is important.
- Certainly, in the short term, post COVID, it is likely that more people will work from home more regularly – this is different than allot of planning assumptions used in future projections.
- Challenges to the local and UK economy will have funding implications for the Service.

Economic Risk Mitigation

- Protection Strategy – engagement with business
- Prevention Strategy – evaluation process (to form the business case for funding)
- The Service's medium and long-term financial plans
- Representation on the NFCC Economic and Social Value Fire Projects

Terrorism

CONTEST – Counter Terrorism Strategy

The government publishes a national treat level[78] and provides a counter terrorism strategy, CONTEST[79]. The latest version, published in 2018, is based on four main work streams, each with a clear objective to reduce the risk to the UK from international terrorism:

- Pursue: stopping terrorist attacks
- Prevent: stopping people becoming terrorists or supporting violent extremism
- Protect: strengthening our protection against terrorist attack
- Prepare: where an attack cannot be stopped, mitigating its impact

The National Risk Register 2020 (NRR) includes the threat of terrorist attacks, and the current risk register identifies the following risk areas:

- Attacks on crowded places
- Attacks on infrastructure
- Attacks on Transport Systems
- Small scale (Chemical, Biological, Radiological) attacks,
- Cyber security (infrastructure and data confidentiality)
- Catastrophic attacks

More recently attacks have tended to be through means which are more readily available (i.e. knifes) and therefore the threat can be extend beyond what may have been considered in the past to be more obvious targets. The Government published a new and on-line Security Policy Framework in May 2018.[80] The current government threat level is SUBSTANCIAL.

New Dimensions

The New Dimension programme provided the Fire and Rescue Service with the specialist equipment and training needed to respond to terrorist and other large-scale major and catastrophic incidents. The programme provided several specialist transport vehicles, Prime Movers, equipment to deal with mass decontamination, modules for Urban Search & Rescue, high volume pumps and larger diameter hoses together with hose boxes for extra length hose laying.

CBRNe Resilience

The resilience planning assumptions estimate that the expected consequences from a CBRNe event will be beyond those that any single FRS can manage. Work has been done on the Initial Operational Response, whereby crews can provide initial actions to mitigate the initial effects of an incident. The Service has Gold and Silver CBRNe officers trained. The Service has officers trained as CBRNe Subject Matter Advisors. These resources can be deployed outside Essex to assist other FRSs (Fire and

---

[78] https://www.mi5.gov.uk/threat-levels

[79] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/716907/140618_CCS207_CCS0218929798-1_CONTEST_3.0_WEB.pdf

[80] https://www.gov.uk/government/publications/security-policy-framework/hmg-security-policy-framework

Rescue Service) with tactical and operational incident management. Subject Matter Advisors (SMAs) from another Fire Services could support ECFRS if a CBRNe incident occurred in Essex.

National Inter-Agency Liaison Officers & Marauding Terrorist Incidents

All managers at Group Manager level are trained as National Inter-Agency Liaison Officers (NILOs) who have been qualified to a National standard to advise Incident and Strategic Commanders at multi-agency terrorist incidents. There are two declarations that can and will be made in the event of certain types of incident. Operation RED DISCUS identifies the move to CRITICAL.

Operation PLATO will occur when a Police Force identifies a major incident involving an actual or suspected terrorist incident, often referred to a Marauding Terrorist Attack (MTA). For both RED DISCUS and PLATO the Service NILOs will become involved at some level of incident management, and the Service also has specifically trained personnel provided with additional PPE (Personal Protective Equipment) and trained to attend an PLATO incident. Whilst this is most likely in Essex, cross-border support may be called for, e.g. an incident in London.

Detection, Identification and Monitoring Officers

Part of the New Dimension programme is the provision of an advanced Detection, Identification and Monitoring (DIM) capability. A team of 12 DIM Advisors, utilising a bespoke vehicle equipped with a range of advanced scientific equipment, deliver the capability. The DIM vehicle is part of a national capability, covering the Eastern Region with support of four DIM Advisors from Cambridgeshire FRS, available for accidental hazardous materials incidents in Essex and neighbouring counties.

Terrorist Incident - Impact

The impacts on ECFRS of a worst-case terrorist event may require:

- Supporting London Fire Brigade (LFB) (London target) with resources.
- Responding to an Essex based event on land.
- Responding to a marine based incident.
- Supporting regional partners (event outside Essex).
- Responding to an Essex based event on land following an air incident, (e.g. Lockerbie).

The people impact is initially on the victims directly involved, and subsequently their families, and incident responders. The secondary impact involves the multi-agency recovery process in the immediate aftermath and over the days and weeks that follow.

Whilst this will be similar to a large-scale natural hazard event, by its nature, a terrorist incident is likely to invoke different feelings and potential divides in the community.

Terrorism Risk Summary

- Crowded places with Essex, such as major shopping facilities and travel hubs offer attractive targets for acts of terrorism.
- More recent attacks have been a move away from explosives to the use of knife and vehicles attacks as these are more readily available.
- Key areas of the Critical National Infrastructure are within Essex and may be targets.
- The Service hold National resources and may need to support other FRS.
- Station/appliance security is important as potential 'trojan horse' attack.

Terrorism Risk Mitigation

- Engagement with ERF
- Working with Essex Police and Regional Counter terrorism Unit, and establishment of agreed working practices in advance
- The Service's cadre of NILOs
- Engagement with other Fire and Rescue Service through the NILO network
- National Operating Procedure for Marauding Terrorist Attack
- The Service engagement national and local training and exercising of the MTA response
- The Service's Airbox software, mad available to all NILOs and compatible with Essex Police and East of England Ambulance Service.