GROUND NOISE

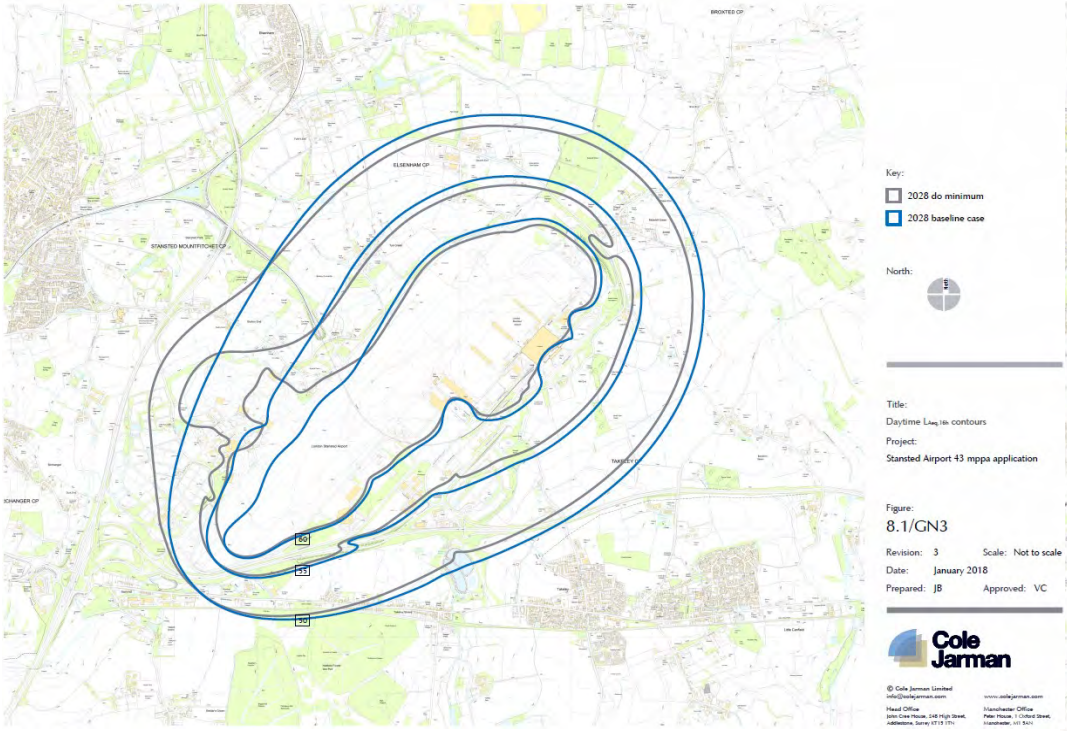

Figure 11: Ground Noise Contours for Day 2028 Do Mnimum vs 2028 Development Case

Figure 12: Ground Noise Contours for Night 2028 Do Minimum vs 2028 Development Case

SURFACE ACCESS NOISE

Assessment Methodology

This chapter sets out the assessment of surface access noise (i.e. noise from traffic on public roads).Traffic levels in the 2016 Baseline, 2028 Development Case and 2028 Do Minimum scenario were established using the TEMPro forecasting model and these have been used to assess how the changes in traffic levels would impact on noise.

Road traffic noise has been assessed by reference to the overall change in noise levels expected along each section of road considered, accounting for the predicted percentage of HGVs, vehicle speeds and speed limits.

Rail noise was been scoped out of the assessment because forecast growth will not lead to any direct change to the activity on the railway and there will be no changes to the number of trains per day.

Operational Phase Effects

An assessment of the 2028 Development Case against the Do Minimum scenario has concluded that the difference in road noise would either be zero or less than 1 dBA. As these changes would not be perceptible, all impacts are assessed as **negligible.**

When comparing the 2028 Development Case against the existing (2016) Baseline conditions, the great majority of changes in noise levels are predicted to be less than 3 dBA and the corresponding impacts are therefore **negligible.** The gradual changes in noise over this time period would also be imperceptible.

The only exception is Round Coppice Road, with an increase of 3.8 dBA. This corresponds to a minor impact. However, the only existing noise receptor on this road is a hotel which is more than 150m from the road, and when all existing noise sources are taken into account, the actual change in road noise at this property is well below 3 dBA. This amounts to a **negligible** impact.

Mitigation and Residual Effects

As the predicted changes in road traffic noise levels are small, with impacts of negligible significance, there is no need for any mitigation. In all scenarios the residual surface access noise effects resulting from the proposed development are assessed as **negligible.**

Table 8: Surface Access Noise Assessment Criteria

Change in Noise Level (dB)	Impact Magnitude
0.0	No Change
0.1 to 2.9	Negligible
3.0 to 4.9	Minor
5.0 to 9.9	Moderate
10+	Major

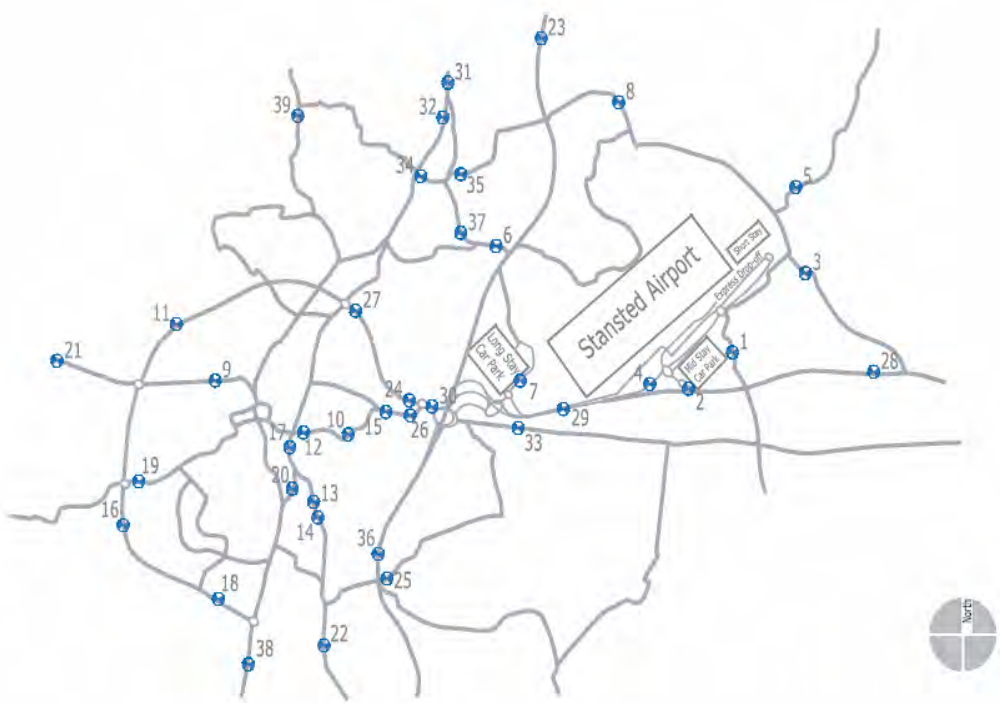

Figure 13: Locations of Road Links

AIR QUALITY

Assessment Methodology

Local air quality is influenced mainly by vehicle emissions, with the M11 motorway and the A120 being the principal sources of pollution. Emissions from aircraft and airport facilities have a localised impact, being largely confined to within the airport boundary.

The main pollutants are oxides of nitrogen (NOx), including nitrogen dioxide (NO_2), and particulate matter (PM_{10} and $PM_{2.5}$). As agreed with UDC through its Scoping Opinion, other pollutants were screened out of the air quality assessment, since they are not likely to exceed their respective standards.

Air quality impacts from the proposed development could result from increased volumes of road traffic and increased aircraft movements compared to the Do Minimum (DM) scenario. The assessments use the ADMS-Airport (version 4.1) atmospheric dispersion model which is widely used for air quality assessments of airports in the UK. An inventory of emissions was compiled for the following pollution sources:

- Aircraft main engines in the landing and take-off (LTO) cycle;
- Aircraft auxiliary power units (APUs) while in use on the ground;
- Ground support equipment (GSE), e.g. airside vehicles which handle aircraft turn-arounds, loading and unloading baggage and cargo, and maintenance activities;
- Other airport sources, including car parks, airport heating plant and the fire training ground; and
- Road vehicles using the local and strategic highway network.

Monitoring of NO_2 and PM_{10} concentrations is currently carried out by UDC, East Herts District Council (EHDC) and STAL. There are four continuous monitoring sites and 21 diffusion tube sites within proximity of the airport, as shown on Figure 14.

Monitoring data for the past five years reveals that pollutant concentrations are generally well below the relevant air quality standards. Exceedances of annual mean NO2 concentrations in 2016 were recorded near the M11 to the northwest of the airport and at three sites within the centre of Bishop's Stortford, which is designated as an Air Quality Management Area (AQMA). These locations are largely influenced by emissions from road vehicles, rather than aircraft or airport operations.

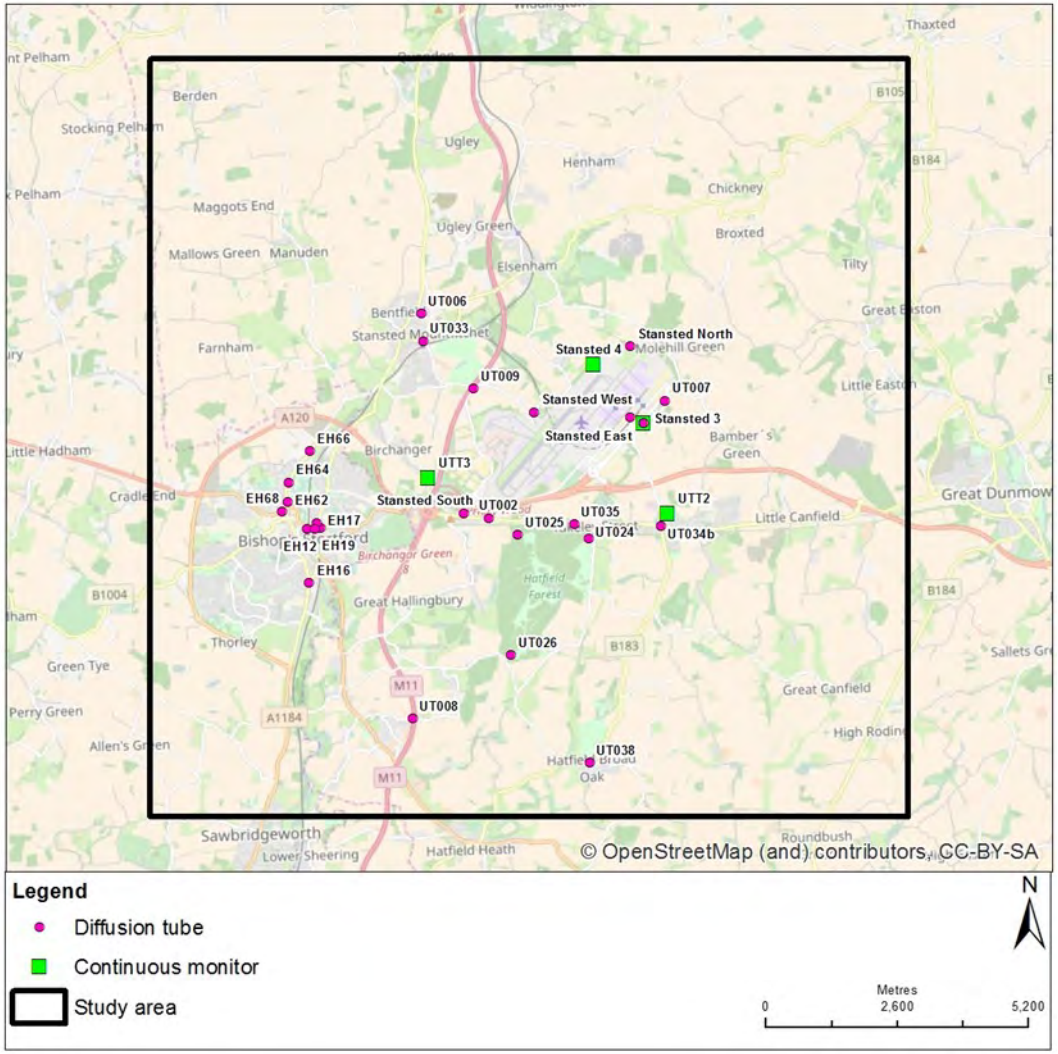

Figure 14: Air Quality Monitoring Sites

AIR QUALITY

Over the next decade, it is predicted that background air quality (especially NOx) will improve due to advances in vehicle engine technology and, to a lesser extent, an increase of alternative and lower emissions vehicles. These improvements will more than offset the increases in surface access traffic in both the 2028 Development Case and Do Minimum scenarios. During this time, it is also expected that emissions from aircraft will reduce due to fleet replacement, with a higher percentage of new generation aircraft (such as the Boeing B737MAX and the Airbus A320neo aircraft) which have 'cleaner' engines than existing models.

Operational Phase Effects

In 2023 a **negligible** impact is predicted at all receptors. Predicted concentrations are above the air quality standard for NO_2 (40µg/m^3) at only one receptor in Bishop's Stortford (London Road), which is mainly influenced by emissions from road vehicles. However, air quality conditions at this receptor site are predicted to improve between the 2016 Baseline Year (57µg/m^3) and 2023 (45.1µg/m^3), in both the DC and DM scenario. Furthermore, the change in concentrations between the two assessment cases for 2023 is only 0.1µg/m^3 and therefore there is a **negligible** impact due to the proposed development.

By 2028, no exceedances of the air quality standards for NO_2, PM_{10} or $PM_{2.5}$ are predicted at any receptor in the study area, including within Bishop's Stortford. The contribution of emissions from the proposed development remains very small – being a maximum of 1.0µg/m^3 for NO2 and 0.1µg/m^3 for particulate matter. Accordingly, negligible impacts are predicted at all receptors in 2028 due to the proposed development, and therefore **no significant effects** are anticipated for air quality.

The potential impacts from changes to nitrogen deposition rates on designated ecological sites in proximity to the airport, including Hatfield Forest (a National Nature Reserve and Site of Special Scientific Interest, SSSI), Elsenham Woods SSSI and other woodland sites, have also been assessed. This was because of the potential for nitrogen to cause changes in vegetation and other detrimental effects to these habitats.

The assessment highlights marked improvements in the concentrations of NOx between the 2016 Baseline Year and 2023, such that concentrations are predicted to remain below the air quality threshold for ecological effects (30µg/m^3) at all sites. The nitrogen deposition at Hatfield Forest in 2023 and 2028 is predicted to be below the upper critical load for the most sensitive habitat. Moreover, the change in nitrogen deposition due to the proposed development is predicted to be less than 1% of the lower critical load at all sites, and therefore **no significant effects** would be anticipated at any of these designated sites.

Mitigation

The 2015 SDP includes practical steps that the airport takes to reduce air pollution, including reducing emissions generated by vehicles and aircraft, promoting the use of public transport, and working with airline and air cargo operators to minimise the impact of aircraft operations. STAL will also continue to undertake regular air quality monitoring at and around the airport and is currently arranging for the installation of monitoring equipment within the Hatfield Forest SSSI and NNR, as part of a previous planning agreement.

However, as no significant effects have been predicted for air quality in this assessment no further mitigation is considered necessary.

SOCIO-ECONOMIC EFFECTS

Introduction

The socio-economic assessment presented in the ES considers the effects of the proposed development in respect of user benefits, wider economic and employment impacts.

The additional 8 million passengers per annum (mppa) will result in increased employment at the airport as well as additional employment and socio-economic benefits at the regional level. The development will enable growth in air services in terms of destinations served and frequency of flights. This will create benefits for local people and businesses and generate beneficial economic effects in the region and beyond, through the airport's role as a catalyst and facilitator of economic activity. The development will help deliver new services to destinations regarded as important for local people and business and high value in-bound tourism, especially from new long haul routes.

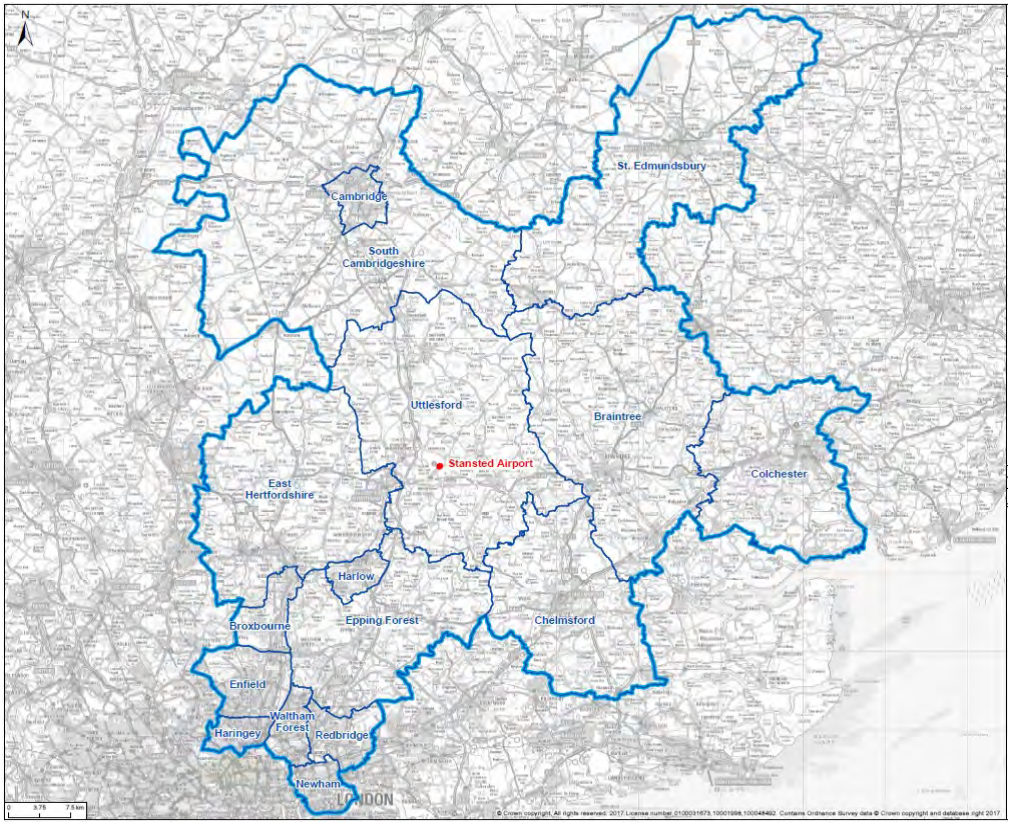

Figure 15: Wider Economic Study Area

The employment impacts are considered in relation to both the construction and operational phases. Stansted provides employment across a wide range of job types including those which are particularly attractive to young people and residents of North London. Businesses based at the airport also source many goods and services from suppliers in the local area.

Operational Phase Effects

User Benefits

Airport users will benefit from more destinations from a local airport, saving longer surface journeys to Heathrow or Gatwick. Increased capacity will encourage competition and choice in airlines at Stansted, improving routes, frequency of flights and potentially reducing fares. New passengers, who would otherwise be unable to fly due to the cap on capacity will benefit. Existing passengers will benefit from greater choice as a result of the additional flight frequencies, expanded route network and the opportunity to use a more convenient airport. There will also be benefits to freight users (with an additional 800 tonnes of cargo throughput), the Government (from increased tax revenue) and STAL.

Wider Socio-Economic Effects

The proposed development will generate economic and social benefits for the wider economic study area (comprising the East of England and London), including:

- Opportunities for local businesses to access a wider range of passenger and freight air services from a local airport;
- Increasing attractiveness and competitiveness of the study area for businesses in terms of its improved air connectivity;
- Opportunities for increased flights to serve higher numbers of both inbound and outbound leisure visitors; and
- Strengthening the airport's important role in the freight market which helps UK businesses compete in the global economy.

SOCIO-ECONOMIC EFFECTS

Employment Effects

Employment at the airport in the 2028 Do Minimum scenario has been compared to that in the 2028 Development Case. This comprises direct, indirect and induced employment and is assessed for the employment study area shown in Figure 15. The Development Case shows additional employment of 5,400 people, of which approximately 3,000 will be direct on and off-airport jobs and 2,400 will be indirect and induced jobs. The proposed development will generate a gross value added (GVA) benefit of £357 million to the local and wider economy compared to the Do Minimum scenario.

As there are predicted to be approximately 270,000 more people available to work than there will be jobs in the study area by 2028, the proposed development will contribute to reducing this 'shortfall', reducing the need for out-commuting and helping to achieve the jobs target in the Economic Plan for Essex. In the light of the very small labour market impact of the development relative to wider forces, it has been concluded that the scale of any consequential effects on the net demand for housing in the study area can only be minor. Table 9 summarises the predicted socio-economic effects of the proposed development and the significance of such effects.

Mitigation and Residual Effects

No significant adverse effects have been identified. However, to maximise the benefits of the proposed development, the airport will continue to develop and enhance its existing initiatives including those set out in the 2015 SDP. Key initiatives include:

- **The Stansted Airport Employment and Skills Academy** which will particularly focus on attracting employees from disadvantaged areas including Harlow, Braintree, other parts of Essex and North-East London. By 2028 STAL's aim is to increase employment of local people in line with airport employment growth by 700 a year;
- **The new Stansted Airport College** will provide a purpose-built training facility for up to 500 young people a year to gain industry recognised qualifications and work experience at the airport. This will ensure the students have the correct skills to take advantage of the employment opportunities at the airport and will secure a pipeline of future employees; and
- Maintain and enhance the **Airport Surface Access Strategy (ASA)** which will focus on connections to areas targeted for workforce recruitment including North London Boroughs. STAL will continue to promote the Airport Travelcard, which offers significant savings over standard fares to encourage travel by public transport.

Table 9: Summary of Socio-Economic Impacts

Impact	Description of Impact of Proposed Development	Assessment of Impact
User Benefits	Benefits to new and existing passengers from increased range of flights and improved flight frequencies. Enabling an additional 8 million passengers to travel at a time where there is excess ("unmet") demand for travel through the London airports.	Moderate Beneficial
Wider Benefits: Inward Investment & Productivity	Enabling an additional 1.2 million business passengers to travel through the Airport and contributing to the "attractiveness" of the area to inward investors.	Major Beneficial
Wider Benefits: Tourism	Enabling 2.2 million foreign leisure passengers to arrive in the UK through Stansted and 4.6 million UK passengers to make a leisure trip abroad. In-bound leisure passengers are estimated to support 13,900 jobs and GVA of £336 million in 2028.	Major Beneficial
Wider Benefits: International Trade	Enabling an additional 800 tonnes of cargo to be carried.	Minor Beneficial
Construction Employment	Employment constructing the physical works of 300 and GVA of £23.4 million over a twelve month period	Negligible
Operational Employment	Additional employment of 5,400 and GVA of £357.3 million compared to the Do Minimum scenario.	Moderate Beneficial

CARBON

Introduction

The assessment quantifies and assesses the carbon emissions associated with both the construction and operation of the proposed development. Emissions of different 'greenhouse gases' (GHGs) have been calculated for different emission categories and the terms 'GHGs' and 'carbon' have been used interchangeably, albeit they have somewhat different meanings. For emissions from aircraft, only carbon dioxide (CO_2) emissions are reported, in line with the UK target for aviation. For non-flight carbon, CO_{2e} has been reported, which includes CO_2, methane (CH_4) and nitrous oxide (N_2O), in line with the UK carbon budgets. Emissions of the other direct GHG from the sources considered are to be zero or negligible.

Assessment Methodology

A lifecycle approach (i.e. from cradle to grave) has been adopted, capturing direct and indirect carbon emissions from the construction and operation of the proposed development. Direct sources of emissions include facilities owned and controlled by STAL (e.g. heating plant) whereas indirect emissions are those released as a consequence of airport activities, but from sources owned or controlled by another entity (e.g. airlines).

The assessment has accounted for the following sources:

- Aircraft in the air and on the ground; including aircraft in the landing and take-off cycle - LTO (below 3,000ft) and aircraft in the climb, cruise and descent cycle - CCD (above 3,000ft);
- Embedded carbon from construction materials;
- Energy consumption during construction;
- Power and heat generation on-site;
- Consumption of energy generated off-site; and
- Transport associated with staff commuting and passenger travel.

Unlike other EIA topics, carbon emissions have be projected to 2050 (as well as 2028) in order to compare them to DfT UK aviation forecasts and the Climate Change Committee estimates of total emissions from UK aviation. The Climate Change Committee estimates emissions will be 37.5 million tonnes of CO_2 ($MtCO_2$) by 2050, within a range of $35MtCO_2$ to $42MtCO_2$.The carbon emissions from the proposed development are predicted to be comparatively small and there are no appropriate significance criteria or thresholds for assessing the 'environmental effects' of carbon emissions at this localised scale of development.

Operational Phase Effects

Figure 16 shows the interpolated time series of annual carbon emissions and carbon intensity between the 2016 Baseline Year and the 2028 future assessment year. It shows a small increase in carbon emissions in 2022, reflecting construction activities. The carbon footprint under both scenarios would increase between 2016 and 2023. The Development Case would see a steeper increase without the restriction of the 35mppa operating limit. Thereafter, the Do Minimum scenario will see a slight decrease in overall annual carbon emissions to 2028, whereas the Development Case would see an increase. Conversely, the carbon intensity at Stansted , expressed as $kgCO_{2e}$ per passenger, would see an improvement after 2023 due to the increased passenger capacity.

In the 2028 Do Minimum scenario, the calculated cumulative emissions are $29.6MtCO_{2e}$ and for the 2028 Development Case they would be $30.7MtCO_{2e}$, a difference of 1.1MtCO2e.

By 2050, the annual flight emissions from Stansted are projected to reduce from $1.7MtCO_2$ in 2016 to between $1.5MtCO_2$ (best practice scenario) and $2.0MtCO_2$ (pessimistic scenario). The rate of decrease depends on the speed of improvement in aircraft and engine efficiency, air traffic management and use of sustainable fuels. This represents between 4.0% and 5.3% of the $37.5MtCO_2$ target for UK aviation by 2050. Although not within STAL's direct control, carbon emissions from flights will be managed, reduced and offset by the aviation sector through international agreements, standards and policy.

Emissions due to construction would account for approximately 0.001% of the total allocated budget for the UK's 3rd carbon budget (2018 to 2022), and for approximately 0.09% of all UK construction in 2022.

It can therefore be concluded that construction and operational emissions are compatible with the UK meeting its targets for GHG emissions and CO_2 from aviation in 2050.

CARBON

Mitigation and Residual Effects

Post 2021, airlines flying from Stansted will be required to offset all growth in international flight carbon emissions by funding carbon-reducing activities and renewable energy projects in order to reduce indirect carbon emissions. STAL is committed to working with stakeholders to develop and improve systems to help reduce emissions. Stansted, as part of Manchester Airports Group (MAG), and in accordance with the Airport Carbon Accreditation (ACA) scheme, has achieved carbon neutrality for direct and indirect carbon emissions through a combination of on-site energy management and offsetting strategies.

As there are no quantified significance criteria for carbon, professional judgement has been used to assess a negligible residual effect from the proposed development. The trends show that although Stansted Airport cannot directly influence aviation carbon emissions, the Development Case is unlikely to materially impact the UK's ability to meet its 2050 national aviation target of 37.5MtCO_2. Construction carbon emissions from the proposed development represent a fraction of UK's 3rd carbon budget, and are unlikely to materially impact the UK's ability to meet its national UK carbon reduction targets.

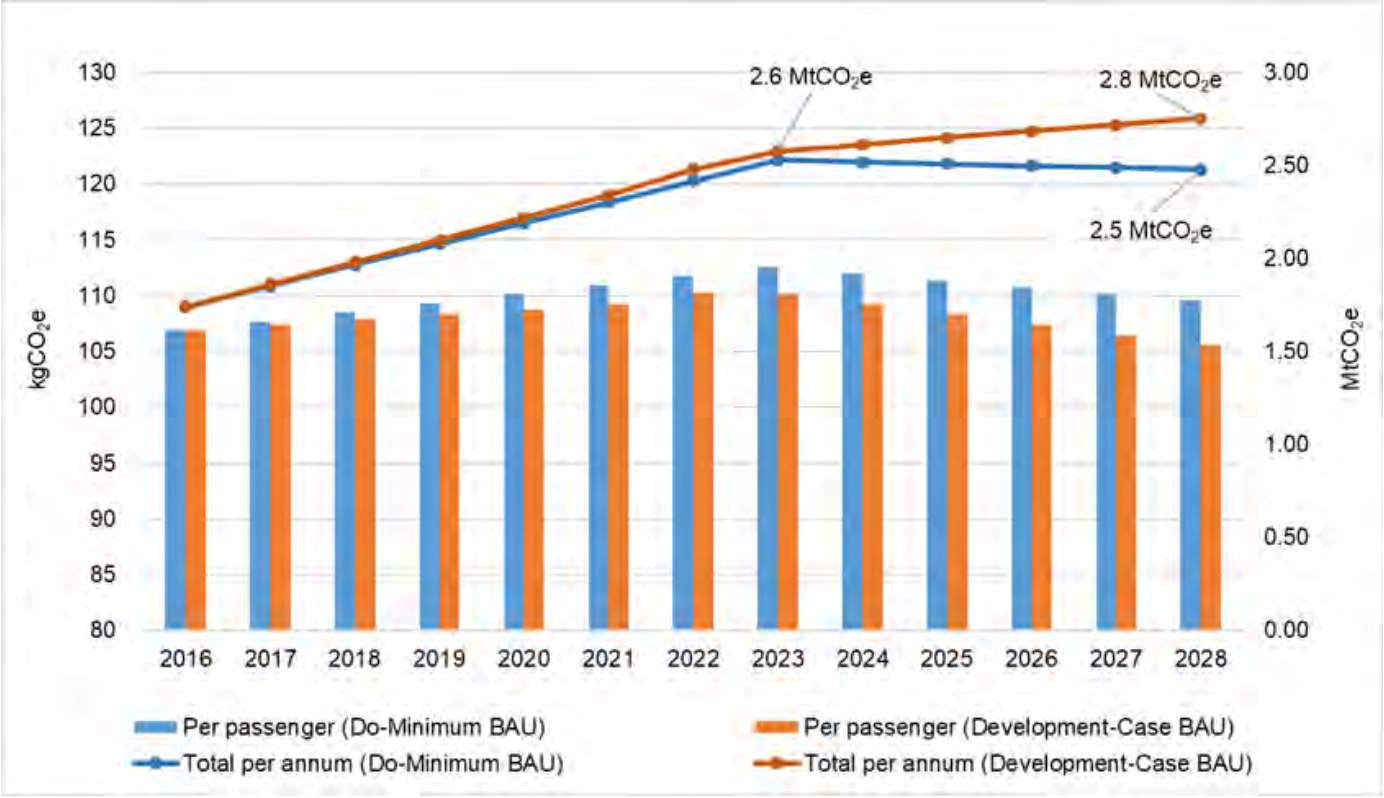

Figure 16: Interpolated time series for overall annual carbon emissions and carbon intensity 2016-2028

CLIMATE CHANGE

Introduction

The ES includes two separate, but related, climate change assessments which are:

- **The in-combination climate change impact assessment:** An assessment of the combined effects of the proposed development and potential climate change impacts on the receiving environment and community; and.
- **The climate change resilience assessment:** An assessment of the resilience of the design, construction and operation of the proposed development to potential climate change impacts.

An illustration of the two assessments and their relation to each other and the receiving environment is provided in Figure 17.

Operational Phase Effects – In Combination Assessment

The assessment has identified several potential adverse effects including:

- increased stress on existing road and rail networks, in-combination with increased frequency of extreme weather events negatively impacting surface access and transport;
- increased prevalence of hotter and drier weather, in-combination with increases in vehicle and aircraft emissions potentially leading to changes in concentrations of air pollutants; and,
- increase in frequency of extreme weather events, in-combination with direct and indirect job creation during operation leading to increased stress on local infrastructure.

No in-combination climate change effects have been identified for noise, or public health and wellbeing.

Operational Phase Effects— Resilience Assessment

The assessment of operational stage resilience has been informed by the airport's Climate Change Adaption Progress Report (CCAPR) which includes contingency plans to deal with extreme weather events. The assessment concludes that mitigation and monitoring measures are currently in place for several climate hazards (low precipitation, low temperature) and for several potential climate change impacts and risks identified.

Mitigation and Residual Effects

No adverse residual effects have been identified within either the in-combination or climate change resilience assessments. Existing mitigation measures for climate change resilience are detailed in Stansted's 2015 SDP and the CCAPR.

A full review of the climate change adaptation risk register will be undertaken in 2021, in light of the upcoming UKCP 18 climate projections. This review will consider the increase in passenger capacity up to 43mppa in 2028 and adjust mitigation measures accordingly. Based on the updated climate change adaptation risk register, an action plan will be produced in order to address the findings of the risk assessment.

In line with mitigation measures outlined in the CCAPR, STAL will continue to commit to careful monitoring of trends in weather events and the level of risk these events may pose to airport property, built assets (infrastructure and buildings) and operations. In particular, intense rainfall events and high temperatures will be monitored, in line with mitigation measures outlined in the CCAPR. Collaboration and communication with local government bodies and owners and operators of surface transport networks will also be encouraged, to ensure co-ordination of climate change resilience plans and information before, during and after extreme weather events occur.

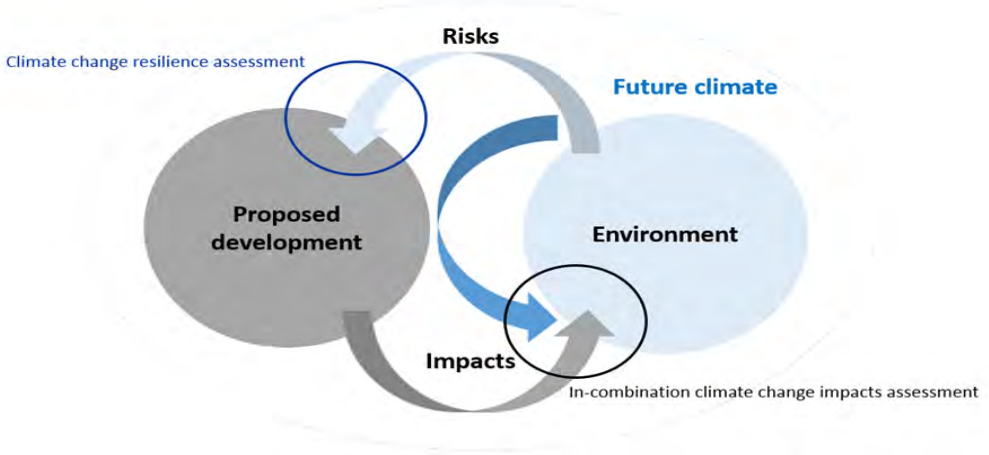

Figure 17: Illustration of the in-combination climate change impacts and climate change resilience

PUBLIC HEALTH AND WELLBEING

Assessment Methodology

This chapter of the ES presents the findings of a Health Impact Assessment (HIA) which considers whether the proposed development could have beneficial or adverse effects on public health and wellbeing. The assessment is based on both 'social' and 'ecological' (environmental) determinants of health, as shown in Figure 19, which are affected through relevant health pathways defined.

Assessing 'Population and Human Health' impacts is a requirement of the EIA Regulations. Although other assessment chapters of the ES (e.g. air noise, air quality and socio-economic impacts) do address aspects of this topic, this chapter and the HIA report have been produced to assess all relevant aspects of human health and wellbeing in an integrated way.

'Health' is defined by the World Health Organisation (WHO) as *"a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"*. Therefore, the assessment applies a broad socio-economic model of health that encompasses conventional health impacts (e.g. disease, accidents and risk), along with wider health determinants vital to achieving good health and wellbeing (e.g. employment and local amenity). It considers both physical and mental health, and also equality and social impacts where relevant.

The assessment follows a source-pathway-receptor approach to identify and assess health impacts. Receptors and their sensitivity have been identified through the HIA 'community profile' (baseline population and health statistics) and from the receptors detailed in the other topic chapters of the ES. Significant effects have been characterised through professional judgement, taking into account the magnitude of potential impacts, sensitivity of the communities affected (based on the community profile), and the context of local health priorities and objectives defined by Essex and Hertfordshire Health and Wellbeing Boards.

Operational Phase Effects

Socio-economics

The employment, leisure travel and other socio-economic benefits arising from the proposed development means that, overall, the magnitude of impact on health and wellbeing is predicted to be a major beneficial effect. Being in stable, good-quality employment is strongly associated with good health and wellbeing, and the proposed development has the potential to offer important long-term health and wellbeing benefits affecting up to 5,400 people (the total predicted direct, indirect and induced jobs). STAL's existing and proposed measures to target recruitment at socio-economically deprived areas and provide skills training and support to those in long-term unemployment will be important to maximising the beneficial effects of employment opportunities available.

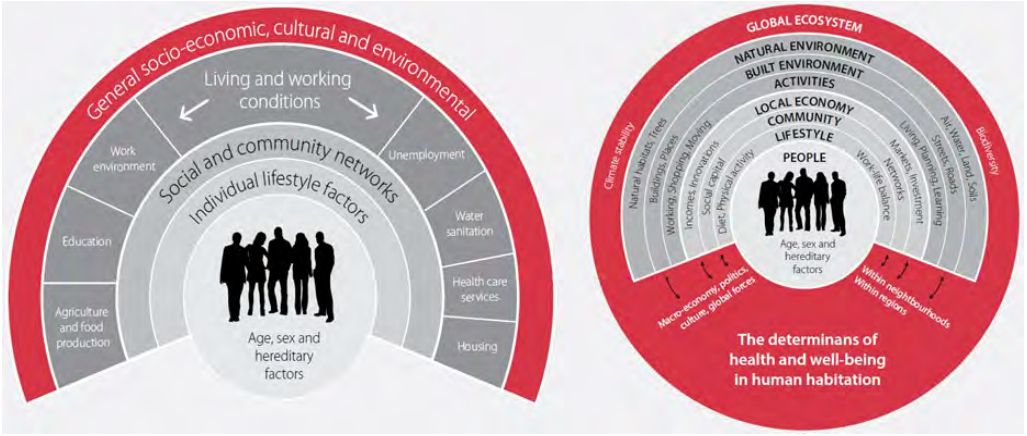

Figure 18: Social (left) and ecological (right) determinants of health

The 2.3 million more oversees leisure trips available (which would facilitate maintaining social and family connections outside of the UK) also have the potential to provide important health and wellbeing benefits. These effects would be at a regional level, and would support actions to address several health policy objectives in Essex and Hertfordshire, and are considered to be significant.

Surface Access

The Surface Access and Transport assessment predicts no adverse impacts on pedestrians, cyclists or community severance and a negligible impact on road safety. In consequence, no direct adverse impact from the proposed development on health and wellbeing due to road traffic growth would be expected. There will also be a negligible impact on driver delay on local minor and trunk roads, and a minor impact on the M11 Junction 8. Therefore, no significant adverse impact on health and wellbeing due to increased congestion and reduced access to services is likely,

A minor adverse impact on some rail, bus and coach travel services is predicted as a result of the proposed development, which has the potential to adversely affect wellbeing for residents using local public transport

networks. However, as noted previously, local bus and coach service operators can respond quickly to new demand the proposed development will provide a catalyst for public transport improvements. In this context, any adverse wellbeing impact is likely to be very minor, if present.

Adverse impacts on airport employees are unlikely due to the existing initiatives including travel subsidies and services geared to employee travel. Therefore, overall, the magnitude of impact on health and wellbeing from surface access and transport is considered to be **negligible** and would not result in a significant effect.

Air Quality

With regard to air pollution, the results indicate that the negligible changes in air quality predicted would have no measurable adverse health outcomes. In addition, the assessment shows that there would be no significant adverse impacts on sensitive ecological habitats as a result of the proposed development, and thus no impact on health and wellbeing through affecting green space and recreation. In conclusion, the magnitude of air quality impacts on public health is considered to be **negligible** and would not result in a significant effect.

Noise

The predicted change in noise exposure would have no measurable adverse health outcomes for ischemic heart disease, stroke or dementia, with an increase of fewer than one additional annual incident case predicted.

Approximately four to six additional cases of hypertension, prevalent within the population, are predicted and additional cases of depression or anxiety associated with annoyance from overflying aircraft are also possible (though the evidence for this is less clear). These diseases are common in the baseline population, and while the magnitude of change predicted is a measurable adverse health outcome, the change as a proportion of the baseline rate is very small – less than 0.5%.

An increase of around 339 people who feel highly annoyed by aircraft noise is predicted, which is around a 28% increase compared to the Do Minimum situation. However, a small reduction in the number of people with high sleep disturbance is predicted, due to the very limited change in night-time noise contours in the Development Case.

Amenity, Green Space and Physical Activity

The air noise assessment shows that limited areas of countryside (with rights of way), including parts of Hatfield Forest, would be affected by additional overflights generating noise at a level considered likely to affect people's behaviour. As a conservative prediction, therefore, it is considered that the magnitude of impact would result in at most a **minor adverse** effect on quality of life and wellbeing due to a reduction in amenity of green space.

Flood Risk and Water Contamination

No impact on health and wellbeing due to either water contamination or off-site flood risk is predicted (see next section).

Governance

The EIA process is designed to clearly communicate any significant impacts of the development to members of the public and to their elected representatives. STAL engages actively with local stakeholders through the quarterly Stansted Airport Consultative Committee, Parish and District Council liaison meetings, annual community impact surveys, outreach events, complaints monitoring and a noise track keeping system, and reporting of air quality and noise impacts..

Overall therefore, the governance for decision-making on the planning application for the proposed development is considered to have a high degree of transparency and public participation. This matches STAL's ongoing approach to engagement regarding impacts of its current operations and future changes, and hence any adverse wellbeing and quality of life impacts due to poor governance are minimised. A **negligible** impact is predicted overall.

Mitigation and Enhancement

Taking into account the existing embedded mitigation as part of the 2015 SDP and associated initiatives, and the proposed mitigation measures recommended in the Surface Access, Air Noise and Socio-economic chapters of the ES, no further health-specific mitigation is required.

Nevertheless, further measures have been recommended to develop and enhance these initiatives, maximising the effectiveness for health and wellbeing. These measures have been recommended with reference to Hertfordshire and Essex's reported health needs and objectives. In summary they comprise suggested means by which the Community Fund can be used to benefit community health, on-airport measures to encourage healthy food options, and continued engagement with local health stakeholders.

WATER RESOURCES AND FLOOD RISK

Assessment Methodology

This chapter of the ES considers the impacts on flood risk, hydrology, foul drainage, surface and ground water quality, and potable water supply (collectively referred to as 'water resources'). The assessment is supplemented and informed by a separate Flood Risk Assessment (FRA) and Drainage Strategy which are appended to the ES.

The potential impacts on water resources and flood risk are not considered to be significant, particularly given the commitments in the 2015 SDP and airport-wide improvements which will be implemented over the next few years (i.e. prior to the construction of the new airfield infrastructure in 2021-2022). However, this chapter has been prepared in response to the comments of the Environment Agency (EA) and other consultees at the EIA scoping stage that were reflected in the UDC Scoping Opinion.

Construction Phase Effects

The assessment has considered the potential for construction phase effects on the following aspects: the potential contamination of water resources; alteration to drainage regime; increased risk to fluvial flooding; increase in water demand; and, the increase in demand on foul water infrastructure.

Negligible effects were determined on most of these aspects. The exception is the risk of contamination of water resources and the temporary alteration to drainage regime, which have been predicted (prior to mitigation) to have the potential for negligible to minor adverse effects and minor to moderate adverse effects, respectively. These potential adverse effects are a consequence of the high sensitivity of the local water courses to change, meaning that small changes resulting from the proposed development could in theory have a large impact. However, after mitigation is employed, the risk of the construction works impacting on the local watercourses is low and therefore the residual effect is predicted to be **negligible** overall.

Operational Phase Effects

The ES considered the potential for operational phase effects on the following aspects of water resources and flood risk: the potential contamination of water resources; increased risk to fluvial flooding; increase in potable water consumption; impact on potable supply network; and, the increase in demand on foul water infrastructure.

Negligible effects have largely been determined for these factors. There is potential for a minor adverse effect to potable water consumption due to the potential for increased water usage at the airport, resulting from increased passenger numbers. However, allowing for a predicted 20% + improvement to efficiency and changes to draw down from the mains (to be agreed with Affinity Water), this effect would be **negligible.**

Thames Water Utilities (TWUL) has expressed some concerns over the capacity of their local foul water treatment infrastructure to deal with any increased discharges from the airport in the future (both with and without the proposed development). This could constitute a minor adverse effect prior to the implementation of any mitigation measures. However, with necessary and planned upgrades, the effects from additional passengers and employees by 2028 are expected to be **negligible**.

Mitigation and Residual Effects

Construction Stage

The use of a CEMP in the construction phase will ensure compliance with environmental legislation and best practice standards. This will include procedures to avoid or reduce, as far as reasonably practicable, any risk to water resources (e.g. by the use of bunds around earth stockpiles, fuel and chemical stores). The Principal Contractor will have the primary responsibility to ensure that these measures are adhered to. In addition, a localised surface water run-off management system will be used and, where necessary, any polluted or silt-laded water will be diverted and treated before discharge to the airport's drainage system. Only surface water which is of a suitable bio-chemical standard will be permitted to be discharged from the site.

Through the incorporation of the above mitigation measures, residual effects from the construction stage are determined as **negligible**.

Operational Stage

Further upgrade works to the existing airport's drainage system (Pond C) are proposed to ensure that it has capacity to store and treat the drainage from the new stands and taxiways. Outline modelling for mitigation options has indicated that this may be achieved through one or more of the following options:

- Merge the two eastern basins into a single basin;
- Increase the size of one or both of the eastern basins; and
- Construct a new attenuation basin next to the existing basins.

WATER RESOURCES AND FLOOD RISK

STAL will continue to liaise with Affinity Water to determine the requirement for, and timing of, any changes to the manner in which the airport currently draws from the mains and/or offsite reinforcement works to their mains supply.

Building on the water efficiency and conservation measures already committed to in the 2015 SDP, additional measures and revised targets will be explored and reported on in the next revision to the SDP, which is scheduled to occur before 2020 (i.e. in advance of the implementation of the proposed development).

Possible additional water conservation measures that could be introduced include water recycling (rainwater and treated effluent/ de-icer) for toilet flushing and irrigation, and the use of low flow/ dual flush WCs and aerated spray taps throughout the airport campus.

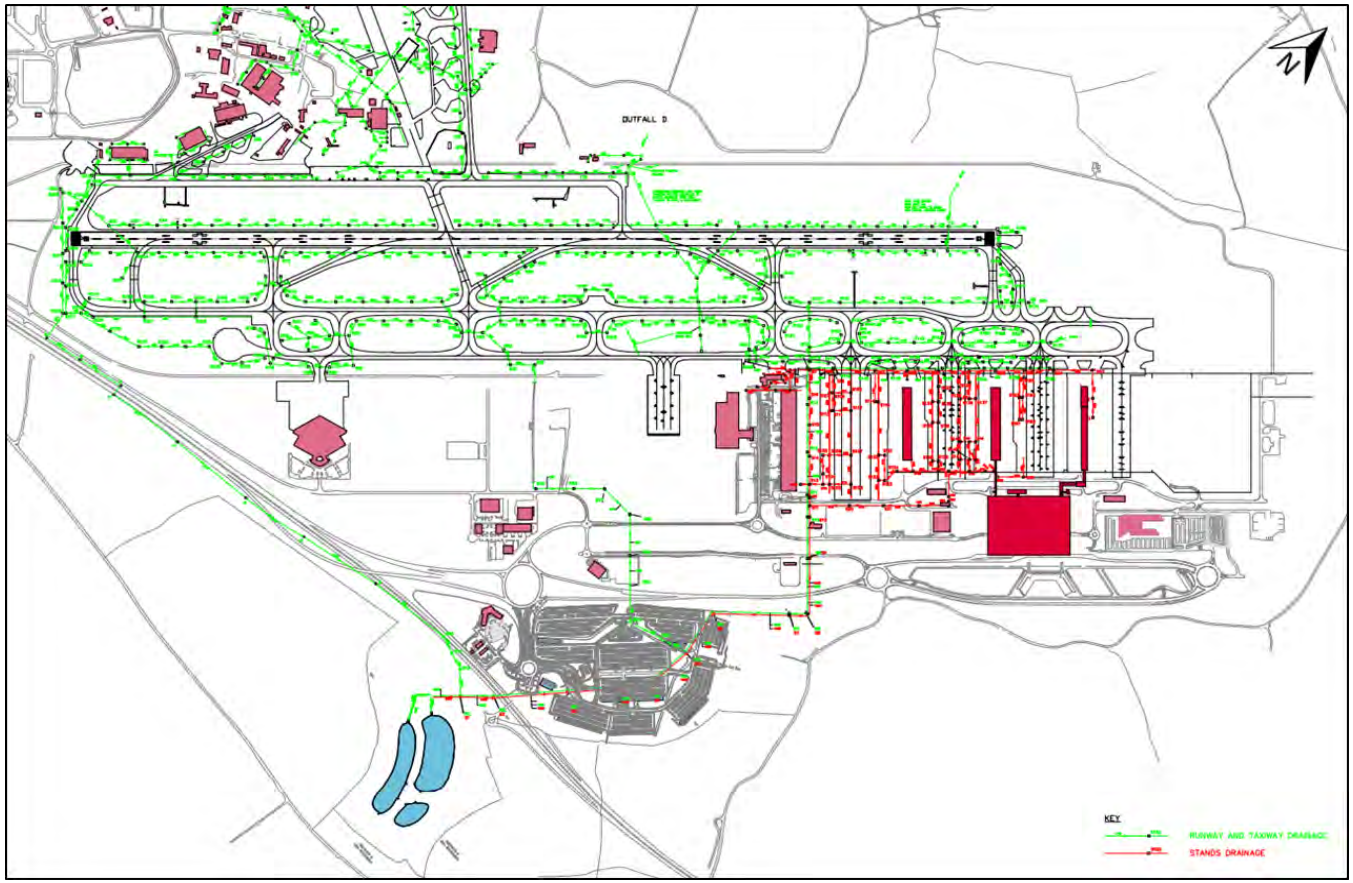

Figure 19: Stansted surface water drainage system

NON-SIGNIFICANT TOPICS

Ecology and Biodiversity

Negligible impacts have been identified in respect to on and off-airport ecology and biodiversity during the construction works. However, field surveys found a 'low' population of common lizard and two Great Crested Newts (GCNs) at one location in the northern perimeter of the airfield where the additional Echo stands are proposed (see Figure 20). As these species are protected by law, the construction works would not be allowed to harm them. Therefore, an Ecological Mitigation Strategy has been developed to safely remove and relocate any specimens that are detected on the site prior to the commencement of the works. Their translocation would be governed by a licence from Natural England. They will be moved to an off-site receptor site – Monks' Farm, which is within STAL's ownership. This receptor site is currently under construction (to be completed late spring 2018) and will provide suitable habitat for a range of species including reptiles and amphibians.

A desk-based air quality assessment was undertaken to determine the potential for impacts on air quality at the Epping Forest Special Area of Conservation (SAC); details of which are reported within the ES and an accompanying Preliminary Ecological Appraisal (found at ES Appendix 16.1).

The screening stage of a Habitats Regulations Assessment (HRA) has been completed for the SAC at Epping Forest. This assesses the potential effects of the proposed development on nitrogen deposition levels to the Forest. This concludes **no likely significant effects**, and so a further 'Appropriate Assessment' is not considered to be necessary, subject to confirmation from Natural England.

No specific mitigation is required in respect of the negligible operational impacts of the proposed development on ecology and biodiversity. STAL's existing approach is to protect all local wildlife and habitats in proximity to the airport and to manage these areas (in conjunction with the Essex Wildlife Trust and/or the landowners) with the aim to maintain or enhance their value as far as possible.

The Stansted Biodiversity Action Plan was produced in December 2017 and sits alongside site specific Habitat Management Plans referred to in the 2015 SDP. These reinforce STAL's commitment to maximise the biodiversity value of the airport, provided that this does not compromise operational requirements and aircraft safety.

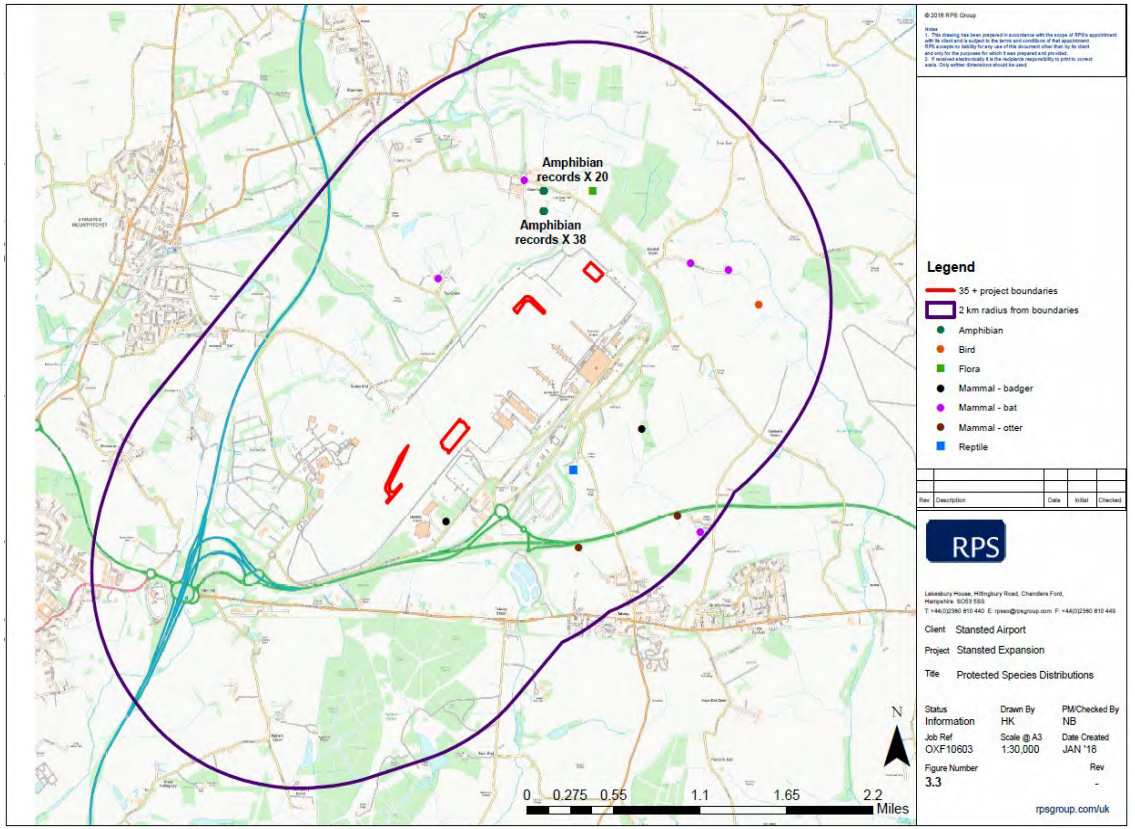

Figure 20: Protected Species Distributions

NON-SIGNIFICANT TOPICS

Land and Soil (including Ground Conditions and Contamination)

The areas of the proposed works have no evidence of previous contamination. Moreover, as the extent and depth of excavation works will be limited, the likelihood of encountering historical contaminated ground or creating new pollution pathways is remote. As a result, it is considered that no significant effects on 'Land and Soil' (including ground conditions and contamination) will arise from the proposed development during both the construction and operational phases.

Archaeology and Built Heritage

There are no known archaeological or heritage assets within the construction areas. Moreover, only shallow excavations are required and these will take place largely within previously disturbed and engineered soils. There would be a **negligible** (or nil) impact on archaeological assets as a result of the construction activity.

The proposed development is relatively small in scale in the wider airport context, is entirely within the existing airport boundary and does not involve any tall or otherwise visually prominent structures. As such, it will not have any effect on the integrity or setting listed buildings, the closest of which lies over 1km west and does not have direct views onto the site of the works. As a result, it has also been determined that there would be a **negligible** impact to built heritage.

Landscape and Visual Impacts

Construction activities will entail minimal disruption and will generally not be noticeable/ visible from outside the airport boundary. The proposed development will not require high-rise structures or plant (e.g. tower cranes).

In light of the above, no significant landscape and visual impacts are predicted. The increased number of flights is not expected to have an impact visually, as the increase will occur gradually on an annual basis.

Waste

The reduction of construction waste is targeted within the airport's Waste Strategy 2014-2019. Materials which cannot be re-used on site will be recycled and processed off-site using a suitably licensed facility. It is anticipated that between 85% and 90% of all construction waste taken off site will ultimately be recycled. With these methods and objectives in place, waste from construction of the proposed development is considered to have a **negligible** environmental impact.

The airport has a long term waste strategy in order to encourage a reduction in waste throughout the airport, including through investing in waste and recycling technology, monitoring and targeting of waste, and compliance with the waste hierarchy (reduce; reuse; recycle; recover). In addition, STAL continues to work with business partners across the airport campus to increase the segregation of wastes for recycling and proactively manages waste contractors to ensure legal compliance and high quality of service to all airport parties. With these initiatives and objectives to reduce waste in place, it is concluded that a **negligible** impact would result from the proposed development.

Major Accidents and/or Disasters

Some construction work will take place while the runway is in use. However, strict operational controls will be imposed to ensure safe working practices and to avoid incursion of construction plant, vehicles and personnel into live aircraft manoeuvring areas. These will follow well established and robust control and management protocols. The airfield is governed by a comprehensive and strict safety regime, licenced by the CAA. Therefore, the risk of a major accident or disaster occurring as a result of the proposed development has been determined to be negligible.

CUMULATIVE EFFECTS

Type 1 Cumulative Effects

Type 1 cumulative effects are generally considered to arise from the combination of effects from the proposed development and other, unrelated consented schemes (not yet constructed or currently under construction) in the vicinity, acting together to generate elevated levels of impact. A number of committed schemes have been identified as relevant for inclusion within the ES and agreed with UDC. The locations of these schemes are shown in Figure 6.

As many of these developments are likely to be built and fully operational before 2028, they have been included in the projected baseline, against which the environmental effects of the proposed development have been assessed. Further developments in the wider area of influence around the airport are already factored into the approved transport model (TEMPro), so the associated effects of traffic noise and exhaust emissions are accounted for in these assessments. Other potential cumulative effects are considered within the individual topic assessments.

No significant negative Type 1 cumulative environmental effects have been identified and therefore no specific mitigation measures are recommended.

'On Airport' Projects – Intra and Inter Cumulative Effects

In addition to off-airport developments, there is the potential for inter and intra project effects within the airport boundary due to the overlap of different planned capital investment projects by STAL as part of the Stansted Transformation Project (STP). These include the new Arrivals Terminal and proposed additional car parking spaces.

As it is anticipated that these planned developments will be operational by 2020 - 2022 and therefore they have also been included in the projected EIA baseline. It is therefore concluded that there will be no construction or other 'in combination' effects arising from them.

Interactive Effects – Type 2 Cumulative Effects

Type 2 (interactive) cumulative effects constitute the net effect of two or more separate environmental impacts (e.g. traffic, noise and dust) from the proposed development occurring at a single receptor where, in combination, they might create a significant (i.e. moderate or major) adverse effect on that particular receptor.

These interactive effects have been considered in the respective topic chapters of the ES and within the Health Impact Assessment. No significant adverse effects have been identified.