



England's Economic Heartland

POLICY REVIEW AND SUSTAINABILITY BASELINE

Appendix I to the ISA





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1 POLICY CONTEXT

- 1.1.1. The sustainability legislation and overarching policy documents of relevance to the EEH region, and therefore the context of ISA of the Transport Strategy, were set out in the ISA Scoping Report. An updated collection is presented in Appendix A, with an updated summary of the key messages set out in Table 1.1 below. The review provides the context for the ISA and helps to inform the framework of Sustainability Objectives, which have guided the subsequent appraisal process.
- 1.1.2. Due to the overlapping content of policies and plans, some of the sustainability topics in the table below have been combined; therefore, the sustainability topics in Chapter 5 of the ISA report are not exactly the same as those listed in Table 1.1 below.
- 1.1.3. Transport policy and context has also been reviewed for the Transport Strategy.

Table 1.1: Key messages from the policy review

ISA Topic	Key Messages from Review
Population and Equalities	<p>Transport is a key factor shaping experiences of poverty¹. The ability of households in poverty to find paid work often depends on access to affordable, regular and reliable transport.</p> <p>The delivery of new developments should not be of detriment to the interests of existing communities.</p> <p>There is a need to:</p> <ul style="list-style-type: none"> ▪ ensure fair and equal access to services and support irrespective of race, religion, sex, age, sexual orientation, disability, gender reassignment, marriage and civil partnership or pregnancy/maternity; ▪ plan for an aging population with complex needs, which will require inputs from all parts of the health and social care system; and ▪ ensure that there are appropriate facilities for people with disabilities and the elderly (e.g. ensuring streets have adequate resting places, which will benefit all).
Economy	<p>The NPPF states that planning policies should recognise and address the specific locational requirements of different sectors, which includes making provision for clusters or networks of knowledge and data-driven, high technology industries in suitably accessible locations.</p> <p>Working with businesses and infrastructure owners is necessary to develop proposals that meet the needs of the freight and logistics sector.</p> <p>Additional investment is required in strategic transport infrastructure.</p> <p>There is a need to:</p>

¹Crips, R et al, Sheffield Hallam University, Addressing Transport Barriers to Work in Low Income Neighbourhoods, June 2017, [online] available at: <https://www4.shu.ac.uk/research/cresr/sites/shu.ac.uk/files/jrf-addressing-transport-barriers.pdf>

ISA Topic	Key Messages from Review
	<ul style="list-style-type: none"> ▪ promote a low carbon economy; ▪ support the sustainable growth and expansion of businesses particularly within the science, research and innovation sectors; ▪ ensure that housing growth requirements are accommodated in the most sustainable way, whilst also delivering a mix of high-quality housing of varying size and tenure to meet local needs; and ▪ deliver increased economic growth and decreased emissions.
Health and Wellbeing	<p>Good placemaking is linked to a wider set of positive social, economic and environmental outcomes.</p> <p>There is a need to:</p> <ul style="list-style-type: none"> ▪ promote healthy standards of living; ▪ prioritise walking, cycling and use of public transport; ▪ enhance accessibility to key community facilities, services and jobs for all; ▪ improve air quality; ▪ reduce noise impacts of motor traffic, which will improve the ambience of street environments; and ▪ ensure people feel relaxed by ensuring public rights of way are not overcrowded, dirty or in disrepair.
Community Safety	<p>Safety is an important consideration for road users owing to the significant impact of serious and fatal accidents.</p> <p>There is a need to:</p> <ul style="list-style-type: none"> ▪ continue to improve safety by investing in the road network, both to prevent incidents from occurring and to reduce the severity of those that do; ▪ reduce crime and the fear of crime, as well as encourage reporting; and ▪ ensure people feel safe on the streets by ensuring busy streets, with lots of traffic, have adequate crossing facilities.
Biodiversity, Natural Capital and Ecosystem Services	<p>There is a need to:</p> <ul style="list-style-type: none"> ▪ identify opportunities for green infrastructure provision, recognising the multiple functions that green infrastructure provides to the area and linking into regional and national green infrastructure networks; ▪ protect and enhance biodiversity, including designated sites, priority species, habitats and ecological networks; ▪ minimise the impact on biodiversity and ensure net gain. Regional stakeholders should work together to develop clear and measurable net gain targets for natural capital and for biodiversity across the region; ▪ maintain and enhance ecosystems and their services; ▪ improve the long-term sustainability of ecological and physical processes that underpin the functioning of ecosystems; ▪ integrate the environment, natural capital and biodiversity with other strategies as well as health and wellbeing plans; ▪ provide a plan that builds on the ambitions within the Governments 25- year plan for the environment; and ▪ ensure that local authorities cooperate to enhance natural capital and biodiversity at a catchment or landscape scale across local authorities' boundaries.

ISA Topic	Key Messages from Review
Landscape and Townscape	<p>The delivery of new developments should not have adverse impacts on the quality of the natural and built environment.</p> <p>There is a need to:</p> <ul style="list-style-type: none"> protect and enhance the quality and distinctiveness of natural landscapes in ways that allow them to continue to evolve; and provide greater access to greenspace, to help reconnect people to nature.
Historic Environment	<p>There is a need to:</p> <ul style="list-style-type: none"> ■ conserve and enhance designated cultural and historical assets, both known and unknown, as well as those which are undesignated; ■ enhance the beauty of the natural scenery and improving its environmental value while being sensitive to considerations of its heritage encourage engagement with the natural environment; ■ Ensure that transport development adjacent, or in close proximity to the local conservation areas, designated assets, archaeological remains or listed buildings, respects their character and context, and does not detract from the quality of the built environment; and ■ Ensure that planning authorities maintain, or have access to a historic environmental record, which should be used to assess the significance of heritage assets.
Water Environment	<p>Water Resources in the region are under increasing pressure from a rapidly growing population, climate change and environmental needs.</p> <p>Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest flood risk.</p> <p>Any 'essential infrastructure' proposed to be located in Flood Zone 3a or 3b should be designed and constructed to remain operational and safe for users in times of flood, as well as demonstrating it can pass the Exception Test².</p> <p>There is a need to:</p> <ul style="list-style-type: none"> ■ protect and enhance surface and groundwater quality and ensure that water quality is improved or maintained where possible; ■ change the way the water resource is used to ensure sustainable abstraction; ■ increase resilience to drought in light of a changing climate; and ■ avoid development in areas prone to flooding- risk should be managed in a co-ordinated way within catchments yet balance the needs of communities, the economy and the environment.
Air Quality, Climate Change and Greenhouse Gases	<p>Take all possible action to mitigate climate change, while adapting to reduce its impact.</p> <p>Avoid increased vulnerability to the range of impacts arising from climate change.</p> <p>There is a need to:</p>

² <https://www.gov.uk/guidance/flood-risk-and-coastal-change#The-Exception-Test-section>

ISA Topic	Key Messages from Review
	<ul style="list-style-type: none"> ▪ ensure that air quality is maintained or enhanced and that emissions of air pollutants are kept to a minimum; ▪ reduce emissions of greenhouse gases that may cause climate change; and ▪ increase energy efficiency and move towards a low carbon economy.
Soil, Land Use Resource and Waste	<p>There is a need to:</p> <ul style="list-style-type: none"> ▪ facilitate the sustainable use of minerals and minimise impacts on soil quality, considering any mitigation measures proposed; ▪ maintain and enhance geodiversity through the management of sites, areas and wider landscapes; ▪ consider land stability in respect of new development; and ▪ encourage a circular economy.
Noise and Vibration	<p>Development must be undertaken in accordance with statutory requirements for noise.</p> <p>There is a need to promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.</p>

2 OVERVIEW OF BASELINE

2.1 INTRODUCTION

- 2.1.1. The following section provides an overview of the baseline, updated from the ISA Scoping Report. Note that transport trends and future scenarios have also been considered as part of the Transport Strategy.
- 2.1.2. It should be noted that many of the topics below are interrelated and that identified baseline information, trends, issues and opportunities may therefore have a bearing on more than one topic.

2.2 POPULATION AND EQUALITIES

Summary of Current Baseline

- 2.2.1. The EEH region has a total population of 5,485,676 people, with the LA of Hertfordshire having the highest total population with 1,210,073³. Figure 5.1 in Appendix B of the ISA Scoping Report shows the population density of the region. The highest proportion of people within the region are aged between 50-54, who make up 7% of the total population. The percentage of those aged between 5-14 years and 40-49, far exceed the national average⁴.
- 2.2.2. Within the EEH region approximately 48.7% of population are male and 51.3% female, which is comparable with the national male and female percentage of 49.2% and 50.8% respectively. 49.8% of residents in the EEH region are married or in same-sex civil partnerships, with Buckinghamshire having the highest percentage of marriage at 52.6%. As with gender, the percentage of marriage is similar to the national percentage (46.8%).
- 2.2.3. Overall the ethnic make-up of the region closely resembles the national average⁵. The population of the EEH region is 84.3% white, 2.8% mixed ethnicity, 12% black, Asian and minority ethnic (BAME) and 1.4% other. Luton is the most ethnically diverse of the LAs, where 38.9% of the population identify as BAME, 7.1% as mixed ethnicity and 1.5% as other. Conversely, Central Bedfordshire is the least diverse, with 3.9% identifying as BAME, 1.9% as mixed ethnicity and 0.3% as other.
- 2.2.4. Approximately a quarter of the population in the EEH region live in rural areas, which is considerably higher than the national average of 18.5%⁵. Cambridgeshire is the most rural of the region's local authorities (upper tier authority level), with 47.1% of the population living in rural area⁵. There is a considerable disparity between rural and urban areas in the region, with urban areas generally having higher levels of deprivation in relation to employment, income, education and skills, crime and health. The exception to this is Fenland, which is the most deprived local authority in the

³ EEH ProjectView, EEH Population change, given by expected changes in household growth

⁴ Office for National Statistics, 2016- based subnational population projections for local authorities and high administrative areas in England

⁵ Office for National Statistics, Census 2011

region (ranked 51st out of 317 local authorities nationally – where 1 is the least deprived) and is also one of the most rural local authorities⁶.

- 2.2.5. The percentage of qualifications held by the population of EEH region is very similar to the national levels. The EEH region has a slightly higher percentage of National Vocational Qualification (NVQ) Level 4 (45%) compared to the national figures; however, it has a slightly lower percentage of NVQ Level 3 (16%) and NVQ Level 1⁷.
- 2.2.6. The percentage of working age population (16-64) is slightly lower than the national average at 62.3%. Like the national trend, the working age population has continued to decrease year on year since 2012, but at a slightly greater rate; 3% decrease compared to a 2.3% decrease nationally⁸. 73.4% of the population across the EEH region are in employment, with 3.8% unemployed which is better than the national average employment (69.9%) and unemployment levels (4.4%)⁸.
- 2.2.7. The EEH region contains neighbourhoods covering the entire deprivation spectrum, ranging from 10% most deprived to 10% least deprived. The most deprived neighbourhoods are generally found in and around the city and town centres. The local authorities of Fenland, Luton and Peterborough are amongst the top 20% of deprived local authorities nationally, whilst the local authorities of Three Rivers, South Bucks, South Cambridgeshire, West Oxfordshire, South Oxfordshire, Vale of White Horse, St Albans, East Hertfordshire, South Northamptonshire and Chiltern are amongst the top 10% of least deprived local authorities nationally.
- 2.2.8. This is reflected in the Buckinghamshire Health Profiles⁹ which show the health of the population is significantly better than the national average. In contrast, Luton is ranked 41st out of 151 upper-tier authorities, which is reflected in the Luton Health Profiles¹⁰ which show the health of the population is significantly worse than the national average. Figure 5.2 in Appendix B of the ISA Scoping Report shows the spread of deprivation across the region.
- 2.2.9. 66.8% of the population in the EEH region are religious, of which 57.6% state their religion as Christianity. The second largest religious group are Muslims, who make up 5.4% of the religious population, followed by Hindus (1.5%) and Sikhs and others (both 0.6%). The least represented religious group are Jewish and Buddhists, making up just 0.4% of the religious population each¹¹.

⁶ Ministry of Housing, Communities and Local Government, The English Indices of Deprivation, 2019

⁷ England's Economic Heartland Stage 1 Databank, Education (Tab 11) 2019

⁸ England's Economic Heartland Stage 1 Databank, Resident Working Age Population (16-64) by EEH Region Local Authority District, 2012-2018

⁹ Public Health England, 2019. Buckinghamshire Local Authority Health Profiles. Available at: <https://fingertips.phe.org.uk/static-reports/health-profiles/2019/e10000002.html?area-name=buckinghamshire>

¹⁰ Public Health England, 2019. Luton Local Authority Health Profiles. Available at: <https://fingertips.phe.org.uk/static-reports/health-profiles/2019/e10000002.html?area-name=buckinghamshire>

¹¹ NOMIS, Local Area Report, 2011.

- 2.2.10. The EEH region has a lower proportion of the population classed as disabled compared to the national average. 15% of the EEH region are disabled, with Peterborough having the highest proportion (16.7%), compared to the national average of 17.6%⁵.

Future Trends

- 2.2.11. Over the next 30 years, the total population across the region is anticipated to rise by 26%. The LA of Daventry (Northamptonshire) is predicted to see the greatest population increase of 68%. Luton is expected to see the greatest decrease in population with a decrease of 7%¹².
- 2.2.12. In terms of age groups, the greatest increases are expected amongst those aged between 75-90 years, and the greatest decreases are anticipated amongst the 35-39-year olds³. By 2032, it is anticipated that more people will be living on their own, making up 40% of all households nationally. The number of over 85s living alone is expected to more than double to 1.4 million nationally¹³ in which social isolation could become a more prevalent issue.
- 2.2.13. In 2016, 14% of the working age population in the UK were from a BAME background. This is increasing, with the proportion expected to rise to 21% by 2051¹⁴. The working population in the region is likely to become increasingly diverse, as indicated by this national trend.

2.3 ECONOMY

Summary of Current Baseline

- 2.3.1. Oxford, Swindon, Cambridge, Milton Keynes and Northampton are the region's major economic centres. They have large populations and are major regional hubs for employment, drawing commuters from across the region. The region also comprises of a wider set of overlapping travel to work areas including those centred on Bedford Borough, Luton and Aylesbury. These areas help to drive higher levels of productivity and higher wages.
- 2.3.2. Productivity (as measured per head) across the region as a whole is around 2.5% higher than the UK average¹⁵. Levels of employment are also high across the region, with an average of 81% of the population being economically active, exceeding the national average.
- 2.3.3. In terms of gross value added (GVA) across all industries, Milton Keynes has the highest value at £13.5 billion, which is significantly higher than the EEH average of £4.2 billion¹⁶.
- 2.3.4. Three Rivers district in Hertfordshire has seen the greatest increase in GVA across all industries over the last 5 years (between 2013 and 2018), with a total increase of 56%, which again is

¹² EEH ProjectView, EEH Population change, given by expected changes in household growth

¹³ The King's Fund. 2012. Demography: Future Trends. [online] Available at: <https://www.kingsfund.org.uk/projects/time-think-differently/trends-demography>

¹⁴ Race in the Workplace, The McGregor-Smith Review, 2017

¹⁵ Ministry of Housing, Communities & Local Government, The Oxford-Cambridge Arc, 2019, [online] available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/799993/OxCam_Arc_Ambition.pdf

¹⁶ ONS, Regional gross value added (balanced) by industry: local authorities, 2019

significantly higher than the EEH average of 14%¹⁶. East Northamptonshire has the lowest GVA values across the Heartland, with a value of £1.3 billion across all industries.

- 2.3.5. In Oxford and Cambridge, education is the largest employment sector, but in the neighbouring local authorities of South Oxfordshire, South Cambridgeshire and Vale of White Horse, the professional, science and tech sector dominates. In Bedford Borough and Milton Keynes, although the science and technology sectors are still very productive, the largest employment sector is wholesale and retail trade.
- 2.3.6. The key clusters in the region include aerospace; life sciences; health; defence; research; data and computing; engineering; and motorsport, particularly Formula 1. The last five years has seen the pharmaceutical, cybersecurity software, automotive and biotechnology sectors attract the largest amounts of capital.
- 2.3.7. Knowledge intensive industries form a key part of the economy. However, there are significant variations across the region, with some clusters having stronger links with Birmingham and London rather than with other locations in the region¹⁷.
- 2.3.8. Educational attainment is influenced by both the quality of education received and the socio-economic circumstances of families. Attainment 8 measures the achievement of a pupil across 8 qualifications at Key Stage 4 (pupils aged 15-16 in year 11), of which the national average is 46.7%¹⁸. Within the region, Buckinghamshire, Hertfordshire and Cambridgeshire all exceed the national average at 53.2%, 46.9% and 48.1% respectively. Peterborough is the worst performing of the LAs with 43.7% achieving attainment 8¹⁸. The LAs of Bedford Borough (45.5%), Luton (43.7%), Swindon (45%) and Northamptonshire (45.4%) are all also underperforming the national average for Attainment 8¹⁸.
- 2.3.9. Housing availability and affordability varies significantly across the EEH area. The median residential transaction value across the region in 2019 was £290,816. However, this ranged from £190,000 in Peterborough to £389,000 in Buckinghamshire¹⁹. With regards to the IMD 2019 barriers to housing deprivation domain, five of the eleven LAs are amongst the top 20% to 30% of deprived upper-tier authorities nationally²⁰.

Future Trends

- 2.3.10. Between 2016 and 2051 the region's population is forecast to increase, accelerating the need for the delivery of additional housing, services and infrastructure. Growth in jobs is also anticipated in order to close the gap between increases in population and the need for employment.

¹⁷ Savills, The Oxford-Cambridge Innovation Arc, 2019, [online] Available at: <https://pdf.euro.savills.co.uk/residential---other/report---the-oxford-cambridge-innovation-arc.pdf>

¹⁸ Public Health England, Local Authority Health Profiles, All Indicators

¹⁹ ONS, Median house prices for administrative geographies: HPSSA dataset 9, [online] Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/housing/datasets/medianhousepriceformationalandsubnationalgeographiesquarterlyrollingyearhpssadataset09>

²⁰ Ministry of Communities, Housing and Local Government, Indices of Deprivation 2019, Barriers to Housing

- 2.3.11. The EEH region contains neighbourhoods covering the entire deprivation spectrum, ranging from 10% most deprived to 10% least deprived. The most deprived neighbourhoods are generally found in and around the city and town centres. The local authorities of Fenland, Luton and Peterborough are amongst the top 20% of deprived local authorities nationally, whilst the local authorities of Three Rivers, South Bucks, South Cambridgeshire, West Oxfordshire, South Oxfordshire, Vale of White Horse, St Albans, East Hertfordshire, South Northamptonshire and Chiltern are amongst the top 10% of least deprived local authorities nationally.
- 2.3.12. The pattern of future growth is also not anticipated to be uniform across the region. Cambridge and Oxford are projected to see the most growth in the scientific and research sectors, while in both Milton Keynes and Northampton, high performance technology and motorsport are projected to see strong growth.
- 2.3.13. East West Rail will provide a new rail link between Oxford and Cambridge and join up key towns and cities across the region. The scheme will be transformative for East-West connectivity in the region, creating opportunity across the region, stimulating economic growth, housing and employment.

2.4 HEALTH

Summary of Current Baseline

- 2.4.1. The average life expectancy (at birth) across the Heartland region is higher than the national average (79.3 years for males and 83.2 years for females) for both males and females at 80.1 years and 83.6 years respectively. When looking at the individual LAs, the life expectancy for both males and females in Luton, Milton Keynes and Peterborough are lower than the national average. Buckinghamshire has the highest life expectancy at 81.7 years for males and 85.1 years for females²¹.
- 2.4.2. The percentage of physically active adults varies across the Heartland region. High levels are recorded in Buckinghamshire (71%), Hertfordshire (69.1%) and Oxfordshire (73.6%), where the national average of 67.2% is far exceeded. Conversely, physical activity levels in Luton (56.6%), Northamptonshire (65.5%) and Swindon (61.7%) are significantly lower than the national average²².
- 2.4.3. The percentage of adults who are overweight or obese in the Heartland region is slightly lower than the national average at 61.7%, compared to 62% nationally. Lower levels of obesity are seen in Oxfordshire and Hertfordshire, which are all significantly lower than the national average. Conversely, levels in Peterborough are significantly higher than the national averages.
- 2.4.4. The health of people across the region is varied. Buckinghamshire, Central Bedfordshire, Herefordshire and Oxfordshire are all described as having levels of health that are generally better than the national average. Health in Peterborough is described as being generally worse than the national average²².

²¹ ONS, Life expectancy (LE) at birth and age 65 by sex, UK, 2001 to 2003 to 2016 to 2018

²² Public Health England, Local Authority Health Profiles [online] available at: <https://fingertips.phe.org.uk/profile/health-profiles>

- 2.4.5. This trend is reflected within the IMD 2019 health and disability deprivation figures²³. This domain measures the risk of premature death and the impairment of quality of life through poor physical or mental health. Of the eleven LAs, Peterborough is the most deprived and is placed amongst the top 30% of deprived upper-tier authorities nationally. Conversely, the LAs of Buckinghamshire and Oxfordshire are amongst the bottom 10% of the least deprived upper-tier authorities nationally²³.
- 2.4.6. Poor air quality is a significant public health issue and there is clear evidence that particulate matter has a significant contributory role in human all-cause mortality, and in particular in cardiopulmonary mortality. All eleven LAs exceed the national average for fine particulate matter. Sufferers of chronic respiratory diseases such as chronic obstructive pulmonary disease (COPD) and asthma are especially vulnerable to the effects of air pollutants²².
- 2.4.7. Of the eleven clinical commissioning groups (CCGs)²⁴ located in the Heartland region, Corby NHS CCG has the highest prevalence of COPD at 2.9%, 1% higher than the national average. This is the only CCG to exceed the national average. Corby NHS CCG also has the highest emergency admissions for COPD of the eleven CCGs, with 625 admissions a year, which exceeds the national average of 247.6 admissions per year²⁵. The Luton, Milton Keynes, Nene and Swindon CCGs also exceed the national average for emergency admissions for COPD with 303.1, 311.4, 327.5, and 259.4 admissions a year respectively.
- 2.4.8. There is an extensive network of Public Rights of Way (PRoW) across the EEH region. These PRoWs are mostly prominent in urban areas of the region, with decreased connectivity with the rural areas²⁶.

Future Trends

- 2.4.9. The Heartland region exhibits higher levels of life expectancy and overall general health when compared with national averages. However, as noted in Paragraph 4.3.13 it is predicted that the region will have an expanding ageing population in the future. This can create challenges itself, such as rising inequalities in access to healthcare, community facilities and other services. In particular, older people will need to have adequate access to public transport facilities.
- 2.4.10. A population with a larger proportion of older people will likely result in an increase in the number of people in the region with physical and sensory impairments which could result in a greater demand for access to health and social care services.

²³ Ministry of Communities, Housing and Local Government, Indices of Deprivation 2019, Health and Disability

²⁴ The CCG boundaries are contained within the EEH region; however, the boundaries do not follow the same administrative boundaries of the LAs.

²⁵ Public Health England, Inhale - Interactive Health Atlas of Lung conditions in England, [online] available at: <https://fingertips.phe.org.uk/profile/inhale>

²⁶ FootPath Map UK [online] available at: <https://footpathmap.co.uk/>

- 2.4.11. The anticipated population growth and the increasing affordability and convenience of car travel²⁷ is likely to result in an increase in the number of private vehicles on the roads. This could have subsequent cumulative effects on air quality, noise pollution and public health if current trends continue.
- 2.4.12. Reduced levels of physical activity are a growing issue nationally, with fewer people reporting that they are achieving the level of activity recommended by the NHS. As noted in Paragraph 4.3.6 urban areas generally having higher levels of deprivation in relation to health. Effective transport planning can play a role in encouraging active transport choices (e.g. walking and cycling) and improve accessibility to sports and recreation facilities which can lead to increasing healthy life expectancy, workforce productivity and decreasing health inequalities. Continued traffic growth without adequate provision for pedestrian and cyclist facilities is unsustainable.

2.5 COMMUNITY SAFETY

Summary of Current Baseline

- 2.5.1. Taking an average across the EEH's LAs, on average 41.7 people (per 100,000 resident population) are killed or seriously injured on the region's roads²⁸. Of the LAs, Swindon has the lowest number of people killed or seriously injured on the roads at 31.6 per 100,000 population, whilst Cambridge has the highest with 57.5 per 100,000 population, far exceeding the national average of 41.2.
- 2.5.2. There were 4792 road traffic collisions in the EEH region in 2018, of which 665 were serious and 84 were fatal²⁹. The highest number of fatal road traffic collisions in 2018 occurred on the A5, which had 7 fatalities. Table 4.2 below shows the highest risk roads across the region; these are roads that exceed the national average for fatal and serious road traffic collisions. These figures are representative of the number of road traffic collisions per billion vehicle miles.

Table 2.1: Fatal and Serious casualties per billion road miles

Road Name	Fatal Severity	Road Name	Serious Severity
A141	25.8	A120	132.2
A142	10.2	A1303	83.9
A361	18.4	A4183	272.5
A4095	7.7	A4500	106.6

²⁷ Public Health England, Working Together to Promote Active Travel, 2016 [online] available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/523460/Working_Together_to_Promote_Active_Travel_A_briefing_for_local_authorities.pdf

²⁸ Public Health England, Killed and seriously injured (KSI) casualties on England's roads, 2020 [online] available at: <https://fingertips.phe.org.uk/search/road#page/6/gid/1/pat/6/par/E12000004/ati/102/are/E06000015/iid/11001/age/1/sex/4>

²⁹ Department for Transport, Road Traffic Count and Safety Data, 2018

Road Name	Fatal Severity	Road Name	Serious Severity
A427	44.3	A5028	125.5
A428	7.8	National Average	77
A4500	40.5		
A5	13.7		
A507	6.8		
A5076	13.2		
A508	9.6		
National Average	5.4		

- 2.5.3. In 2018, car occupants accounted for 44% of road deaths in the UK, pedestrians 26%, motorcyclists 20% and pedal cyclists 6%³⁰. However, in terms of casualty rates, vulnerable road users (usually defined as pedestrians, pedal cyclists and motorcyclists), have much higher casualty rates per mile travelled in comparison with the other road user groups³⁰.
- 2.5.4. In 2017/2018, the number of reported sexual offences committed on public transport (railways) in the UK, increased by 7.6% (over 60% of these assaults were against women). The number of violent offences increased by 16% to 13,591 in 2018/19³¹. Whilst, the railway remains a very safe environment – the number of crimes per million journeys made has fallen from 25.6 in 2009/10, to 20.8 in 2018/19 – the perception of safety may be an issue.

Future Trends

- 2.5.5. The number of people seriously hurt or killed on the roads is significantly higher than the national average in parts of the region. As the population increases, there are expected to be a greater number of vehicles on the roads, which could result in an increase in the number of road traffic collisions.
- 2.5.6. Highways England has set a clear long-term goal to bring the number of people killed or injured on the network as close as possible to zero by 2040. It has committed that, by the end of 2020, 90% of

³⁰ Department for Transport, Reported road casualties in Great Britain: 2018 annual report, [online], available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/834585/reported-road-casualties-annual-report-2018.pdf

³¹ British Transport Police. 2019. Annual Report 2018 -2019 [online] available at: https://www.btp.police.uk/PDF/BTP_Statistical_Bulletin_2018_2019.pdf

travel on the roads for which it has responsibility will be on roads with a 3-star safety rating or better³². This could help contribute to a reduction in serious road traffic collisions in the region.

2.5.7. Similarly, Network Rail have committed to reducing the risk of a train accident by a further 10%, building on the 38% reduction in the five years prior to 2019. Network Rail are endeavouring to incorporate better techniques and digital technologies to improve the maintenance and management of infrastructure and take steps to further reduce risk to the public at level crossings by 13%³³.

2.6 BIODIVERSITY

Summary of Current Baseline

2.6.1. There are a large range of nationally and locally designated sites within the EEH region including, but not limited to:

- Sites of Special Scientific Interest (SSSI);
- Local Nature Reserves (LNR); and
- National Nature Reserves (NNR).

2.6.2. In addition to these, there are numerous internationally designated sites within the EEH region, outlined below in Table 2.2. All designated sites are shown on Figure B.5 in Appendix B of the ISA Scoping Report.

Table 2.2: Internationally designated sites within the EEH region

Ramsar	Special Area for Conservation (SAC)	Special Protection Areas (SPA)
Lee Valley	Hackpen Hill	Lee Valley
Chippenham Fen	Cothill Fen	Ouse Washes
Wicken Fen	Little Wittenham	Nene Washes
Ouse Washes	Hartlock Wood	Upper Nene Valley Gravel Pits
Nene Washes	Oxford Meadows	
Woodwalton Fen	Aston Rowant	
Upper Nene Valley Gravel Pits	Chilterns Beechwoods	
	Burnham Beeches	
	Chilterns Beechwoods	
	Wormley-Hoddesdonpark Woods	

³² British EuroRap Results 2017, Cutting the Cost of Dangerous Roads, 207 [online] available at: <https://roadsafetyfoundation.org/cutting-cost-dangerous-roads/>

³³ Network Rail, Delivery Plan (2019-2024), High Level Summary Plan, 2019 [online] available at: <https://www.networkrail.co.uk/who-we-are/publications-and-resources/our-delivery-plan-for-2019-2024/#downloadall>

Ramsar	Special Area for Conservation (SAC)	Special Protection Areas (SPA)
	Eversden and Wimpole Woods Portholme Fenland Ouse Washes Nene Washes Orton Pit Barnach Hills and Holes Devils Dyke	

2.6.3. There are 56 habitats recognised as being of ‘principal importance’ for the conservation of biological diversity in England under section 41 of the Natural Environment and Rural Community (NERC) Act 2006. Priority habitats are a focus for conservation action in England. Across the EEH region, there are a large range of priority habitats, including (but not limited to) coastal and floodplain grazing marsh, lowland meadows, good quality semi-improved grassland, lowland calcareous grassland, deciduous woodland and purple moorgrass and rush pasture.

2.6.4. Across the region are areas of ancient and semi-natural woodland and areas of woodlands within the Chilterns AONB, which are a valuable resource. As well as providing ecologically rich habitats for wildlife, woodlands play an important role in flood amelioration, soil conservation, carbon storage, recreation and tourism.

Future Trends

2.6.5. Studies such as the ‘State of Nature 2016’ report³⁴ and Defra’s 25 Year Environment Plan³⁵ have shown that national biodiversity has been declining despite the prevalence of conservation efforts, and approximately 13% of all species across the UK are under threat of extinction. The most important habitats (those for which the UK has a European level responsibility) also remain in relatively poor condition (71% unfavourable for the UK versus an EU average of 30%). A rising population and associated need for development may cause further loss, fragmentation and degradation of habitats, causing a further decline in biodiversity.

2.6.6. The recent budget announcement for a Nature Recovery Network Fund to deliver the Nature Recovery Networks, which will be introduced via the Environment Bill Nature Recovery Network Fund, aims to deliver habitat and species restoration and recovery, alongside wider natural capital

³⁴ State of Nature. 2016.[online] Available from: <https://www.rspb.org.uk/our-work/conservation/projects/state-of-nature-reporting>

³⁵ HM Government. 2018. A Green Future: Our 25 Year Plan to Improve the Environment Annex 1: Supplementary evidence report [online] available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/673492/25-year-environment-plan-annex1.pdf

benefits. Local Nature Partnerships will be responsible for leading the delivery of biodiversity net gain.

- 2.6.7. Development of greenbelt land is generally likely to encourage less sustainable travel methods (i.e. use of the private car), given these areas are likely to have limited existing transport infrastructure available. This may have knock-on effects on habitats sensitive to air quality and disturbance. However, for selected greenbelt sites close to existing or improving transport networks, take up of active travel or public transport modes could be higher, particularly if they are also in proximity to employment sites, community resources or other facilities.
- 2.6.8. Biodiversity is also under threat from climate change, with changing temperatures and extreme weather events resulting in the loss, degradation and movement of species and habitats. Increased frequency and severity of summer drought will be a particular threat to woodlands, with sensitive tree species on shallow freely draining soils in southern and eastern England being most at risk³⁶.

2.7 NATURAL CAPITAL AND ECOSYSTEM SERVICES

Summary of Current Baseline

- 2.7.1. The UK National Ecosystem Assessment (UK NEA)³⁷ revealed that the loss, fragmentation and deterioration of natural habitats in the UK since the 1940s has caused a decline in the provision of many ecosystem services.
- 2.7.2. The UK's natural capital accounts³⁸ show that approximately 20-25 million tonnes of carbon have been sequestered by vegetation in the UK each year between 2007 and 2015, whilst around 1.5 million tonnes of air pollutants have been removed each year. This equates to a monetary value of approximately £1.5 billion for carbon sequestration and £1 billion for pollution removal in 2015. Natural capital therefore has a mitigating effect on the emissions of carbon and air pollutants associated with transport. Within the EEH region, the total carbon stored by natural capital stocks is approximately 73 million tonnes. Of this total, 7 million tonnes are stored within vegetation and 66 million tonnes within topsoil. Across the region, this relates to an average carbon stock of 59 tonnes per ha (5 in vegetation and 54 within topsoil).
- 2.7.3. Within the Nene Valley NIA, the annual value of carbon sequestration was estimated to contribute £7.2 million⁴⁶. In Oxfordshire, carbon storage is generally low across the county, except for pockets of woodland such as the Chilterns⁴⁵. Natural capital within or adjacent to transport corridors (the 'soft estate')³⁹ can be used to enhance delivery of other ecosystem services, such as water purification, flood reduction, and provision of habitat for wildlife. In addition, the greening of transport routes

³⁶ The Woodland Trust. 2011. The State of the UK's Forests, Woods and Trees [online] available at: <https://www.woodlandtrust.org.uk/publications/2011/11/state-of-uk-forests/>

³⁷ UK National Ecosystem Assessment (2011) The UK National Ecosystem Assessment Technical Report. UNEP-WCMC, Cambridge

³⁸ Office for National Statistics (2019) UK natural capital accounts: Estimates of the financial and societal value of natural resources to people in the UK

³⁹ Natural England (2014) NEWP32 Transport green corridors: options appraisal and opportunity mapping (NECR168)

(especially walking and cycling routes) can enhance people's physical and mental health and wellbeing, for example by reducing stress levels⁴⁰.

- 2.7.4. The value of recreation (based on the number of hours people spend outside in the natural environment) has also been estimated through the UK's natural capital accounts⁴¹. From a peak of £8.5 billion in 2010, this fell gradually to just under £6 billion in 2015. This is due to a decline in expenditure associated with visiting these sites (including fuel and public transport costs, and admission fees). Based on the estimated number of annual visits, the annual recreational value of the Nene Valley NIA was placed at £230 million⁴⁶.
- 2.7.5. A Local Natural Capital Plan (LNCP) is being completed for the OxCam Arc. Detailed natural capital and ecosystem services evidence is being produced for the area which covers Bedfordshire, Buckinghamshire, Cambridgeshire, Northamptonshire and Oxfordshire. At this stage, only indicative natural capital information is available which is mapped at a 1 km grid scale⁴². More detailed information should become available shortly.
- 2.7.6. The Environment Agency additionally intends to produce mapping of baseline ecosystem services provision across the majority of the EEH region as part of the Local Natural Capital Programme; however, this will not be available until the second half of 2020. The Environment Bill 2020 will bring into UK law environmental protections and recovery⁴³. The bill will introduce the Nature Recovery Network which will support an expanding and increasingly connected area of wildlife-rich habitats, which will aid the recovery of wildlife, help wildlife adapt to climate change and provide wider environmental benefits, such as carbon capture, water quality and recreation⁴⁴.
- 2.7.7. Some pre-existing baseline data is available for areas of the EEH region, namely Oxfordshire⁴⁵ and the Nene Valley⁴⁶. Oxfordshire is dominated by intensive farmland, which makes up roughly 70% of its landcover and is split two thirds arable land to one third improved grassland. Just over 10% of the county is comprised of semi-natural habitat. Due to the high cover of agricultural land, food provision is an important ecosystem service within Oxfordshire, especially to the north. Carbon storage is generally low across the county, except for pockets of woodland such as the Chilterns. These woodland areas are generally located away from areas of high PM2.5 pollution, limiting their ability

⁴⁰ Defra (2017) Evidence Statement on the links between natural environments and human health. Department for Environment, Food and Rural Affairs, London.

⁴¹ ONS, UK Natural Capital Accounts, 2019, [online] available at: <https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/uknaturalcapitalaccounts/2019>

⁴² OxCam Local Natural Capital Plan (2019) Oxford to Cambridge Arc Natural Capital Indicator Maps. Available at: <https://www.oxcamlncp.org/building-our-evidence-base>.

⁴³ Environment Bill 2020 Policy Paper, [online] available at: <https://www.gov.uk/government/publications/environment-bill-2020>

⁴⁴ Defra (2020) Policy Paper: 10 March 2020: Nature and conservation covenants (parts 6 and 7), [online] available at: <https://www.gov.uk/government/publications/environment-bill-2020/10-march-2020-nature-and-conservation-covenants-parts-6-and-7>

⁴⁵ Smith, A. (2019) Natural capital in Oxfordshire – Short Report. Available at: <https://www.eci.ox.ac.uk/index.html>.

to regulate air quality. The general lack of pollinator supporting semi-natural habitats across the county negatively impacts on pollination and therefore the resilience of agricultural systems.

- 2.7.8. The Nene Valley occupies much of Northamptonshire and Peterborough. The change in habitat cover and ecosystem service provision within the Nene Valley since the 1930s echoes the national change outlined in the UK NEA. The state of natural capital within the Nene Valley is similar to that of Oxfordshire, with much of the ecosystem services (aside from food production) being provided by pockets of semi-natural habitat, in particular woodland. With more data available, urban areas have been shown to support pollination and air quality regulation through dense gardens and urban tree cover. For the Nene Valley NIA alone, a total annual value of £5.5 million was placed on pollination for food production.
- 2.7.9. A detailed natural capital assessment placed a monetary value on the provision of the following ecosystem services: food production, carbon sequestration, pollination and recreation. A total value of £300 million was placed on the annual flow of these ecosystem services within the Nene Valley⁴⁶. The recreational value of accessible land was the biggest contributor, with recreational expenditure totalling approximately £230 million. Carbon sequestration within the valley was valued at £7.1 million, approximately £42 per hectare.
- 2.7.10. Public Rights of Way (PRoW) serve as connections to areas of accessible greenspace but are also important recreational assets themselves. Coverage of PRoW is highest within the central and southern areas of the region, in particular the local authorities of Bedford Borough, Central Bedfordshire, Milton Keynes and Buckinghamshire⁴².

Future Trends

- 2.7.11. The declining trend in the provision of many ecosystem services reported in the UK NEA is expected to continue – in part due to the continuing deterioration, loss and fragmentation of habitats, as reported in the national ‘State of Nature 2019’ report⁴⁷.
- 2.7.12. Further development to address the needs of the EEH region’s growing population – in combination with a changing climate – has the potential to further fragment and deteriorate the region’s ecosystems, impacting on natural capital and its ability to provide ecosystem services. Freshwater provision is perhaps the ecosystem service most at risk in the South East and Eastern regions, where 22% of the UK’s water is currently abstracted. The rapid population growth is set to place more pressure on the regions, which are already considered overexploited by the EA⁴⁷.
- 2.7.13. An increase in the number of private vehicles on the roads and associated increases in noise pollution, air pollution, and contaminated surface water run-off, could restrict the ability of existing roadside habitats (including trees) to reduce these impacts. Even with the transition towards electric

⁴⁶ Nene Valley NIA Project , Mapping Natural Capital and Ecosystem Services in the Nene Valley, 2016 [online] available at: <http://www.naturalcapitalsolutions.co.uk/wp-content/uploads/2017/01/Mapping-natural-capital-ecosystem-services-in-the-Nene-Valley.pdf>

⁴⁷ State of Nature. 2019. Available from: <https://www.bto.org/our-science/publications/state-nature-report/state-nature-report-2019>

vehicles, particulate emissions are predicted to be problematic into the future due to the impacts of non-exhaust emissions.

- 2.7.14. However, there is also an increasing trend amongst governments and businesses to be “Future Ready”, which includes addressing issues surrounding biodiversity, resource use, and climate change. Investing in natural capital and delivering resilient nature-based solutions is an effective way of addressing these issues simultaneously. As such, the multiple benefits that arise from taking a natural capital approach significantly contribute to sustainable development, often at lower cost than more conventional infrastructure⁴⁸.
- 2.7.15. The new Environment Bill will mandate biodiversity net gain for many new developments under the Town and Country Planning Act⁴⁹ except in the case of irreplaceable habitats, urgent Crown developments, where planning permission is secured by a development order, or other developments as specified by the Secretary of State (SoS)⁴⁴. A net gain in biodiversity also has the potential to enhance ecosystem services within development projects as biodiversity underpins natural capital assets and the ecosystem services they provide. This could potentially help to mitigate the overall negative trend of continued ecosystem services decline in the UK.

2.8 LANDSCAPE AND TOWNSCAPE

Summary of Current Baseline

- 2.8.1. There are three Areas of Outstanding National Beauty (AONB), detailed on Figure B.6 in Appendix B of the ISA Scoping Report, within the EEH region, including the:
- Chilterns AONB, South Buckinghamshire, Bedfordshire and Hertfordshire;
 - North Wessex Downs, south of Swindon; and
 - Cotswolds, west of Oxford.
- 2.8.2. In July 2018, the Chilterns Conservation Board submitted a request to Natural England for a review of the designation and requested that National Park status be considered. More recently, in 2019 the Glover Report⁵⁰, commissioned by DEFRA, made a strong recommendation that the Chilterns should become England's next National Park, with the Cotswolds noted as also having a strong case.
- 2.8.3. The EEH region falls within a number of Natural England's National Character Areas (NCA), as shown on Figure B.7 in Appendix B of the ISA Scoping Report and in
- 2.8.4. Table 2.3 below.

⁴⁸ IPBES. 2019. Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Available at: <https://ipbes.net/global-assessment>

⁴⁹ Town and Country Planning Act (1990). Available at: <http://www.legislation.gov.uk/ukpga/1990/8/contents>.

⁵⁰ DEFRA, Landscape Review 'The Glover Review', 2019 [online] available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/833726/landscapes-review-final-report.pdf

Table 2.3: National Character Areas within the EEH region

NCA	Description
46: The Fens	A distinctive, historic and human influenced wetland landscape notable for its large-scale, flat, open landscape with extensive vista to level horizons
86: South Suffolk and North Essex Claylands	Ancient landscape of woodland arable countryside with a distinct sense of enclosure, chalky boulder clay plateau and gentle undulations caused by numerous small-scale river valleys
87: East Anglian Chalk	Uninterrupted landscape of smooth, rolling chalked hills with large regular fields enclosed by low hawthorn hedges with few trees and straight roads
88: Bedfordshire and Cambridgeshire Claylands	A broad, gently undulating, lowland plateau dissected by shallow river valleys that gradually widen in the east
89: Northamptonshire Vales	Consisting of a series of low-lying clay vales and river valleys, the area is 10% urban, with settlement and major roads often visually dominant
90: Bedfordshire Greensand Ridge	A distinctive ridge with a north-west facing scarp slope, with historic landscapes including farmland, parklands and historic architecture, with small settlements, greenbelt and ancient and modern woodlands
91: Yardley Whittlewood Ridge	A low and gently undulating plateau, containing a variety of semi-natural habitats, including ancient woodland, wood pasture and parkland, hedgerows, lowland meadow and flood plan grazing marsh
92: Rockingham Forest	A patchwork of woodland and large to medium sized fields of mixed arable with some pastoral use surrounding small nucleated villages
95: Northamptonshire Uplands	A landscape with extensive areas of open field systems with ridge and furrow and the earthworks of deserted and shrunken settlements throughout
107: Cotswolds	The dominant pattern of the landscape is of a steep scarp crowned by a high, open wold; the beginning of a long and rolling dip slope cut by a series of increasingly wooded valleys
108: Upper Thames Clay Vales	A broad belt of open, gently undulating lowland farmland, the North Wessex Downs, Chilterns and Cotswolds AONB fall within this NCA
109: Midvale Ridge	Low-lying hills with extensive views across the surrounding countryside, predominantly agricultural area with mixed arable/pastoral uses
110: Chilterns	A patchwork of mixed agriculture with woodland set within hedged boundaries, contains part of the Chilterns and North Wessex Downs AONB
111: North Thames Basin	Diverse landscapes ranging from wooded Hertfordshire plateaux and river valleys top open landscape and predominantly arable areas of the Essex Heathlands with areas of urbanisation throughout
115: Thames Valley	A diverse landscape of urban and suburban settlements, infrastructure networks, fragmented agricultural land, historic parks, commons, woodland, reservoirs and extensive mineral works

NCA	Description
116: Berkshire and Marlborough Downs	Extensive views from the escarpment, punctuated by landmarks including chalk-cut horse figures, beech clumps and ancient monuments

- 2.8.5. Key settlements in the Heartland include Cambridge, Luton, Peterborough, Corby, Kettering, Wellingborough, Northampton, Bedford, Hemel Hempstead, St Albans, Hatfield, Welwyn Garden City, Stevenage, Hitchin, Aylesbury, High Wycombe, Hemel Hempstead, Hitchin, St Albans, Dunstable, Watford, Milton Keynes, Bletchley, Oxford and Swindon.
- 2.8.6. Between the main towns and cities, dispersed villages and farmsteads are spread across the countryside.
- 2.8.7. Major transport routes include:
- Sections of the M40, M1, and A1(M);
 - London Luton Airport, Oxford Airport and Cambridge Airport;
 - Railway lines including sections of the West Coast, East Coast, Great Western and Midland main lines and the Chiltern Line; and
 - Major trunk roads such as the A14, A34, A43.
- 2.8.8. Major tourist attractions in the region include:
- Blenheim Palace, Woodstock, Oxfordshire - a designated UNESCO World Heritage Site and a designated Grade I registered Park and Garden
 - Oxford University
 - Oxford University Museum of Natural History
 - Oxford Botanic Garden
 - Bicester Village
 - Cambridge University
 - Cambridge University Botanic Garden
 - Fitzwilliam Museum
 - Anglesey Abbey
 - National nature reserves (21 in total)
 - Three AONBs
 - Several stately homes and National Trust sites and properties

Future Trends

- 2.8.9. Designated landscapes, such as AONBs, are given the highest status of protection against development within their boundaries to conserve their landscape and scenic beauty. However, they may still be impacted indirectly through changes to their setting.
- 2.8.10. Landscape and townscape character and quality is under particular threat from future development (including the construction and operation of transport infrastructure) through, for example, loss of tranquillity, increased lighting (particularly into dark night skies), visual intrusion, and the incremental loss of landscape features and characteristic elements.
- 2.8.11. Similarly, pressures from expanding populations put more strain on existing systems, and more pressure on recreational landscapes and tourist attractions.

2.8.12. If the Chilterns was to be granted National Park status, it would be given greater recognition with regards to funding, which would create the potential for a more strategic view to be taken on appropriate conservation and development across the whole AONB. It should be noted that, whether AONB or National Park, the Chilterns have the same statutory status and protection.

2.9 HISTORIC ENVIRONMENT

Summary of Current Baseline

- 2.9.1. Blenheim Palace, located in Woodstock, Oxfordshire, is a designated UNESCO World Heritage Site and is home to one of Europe’s historically significant collections of portraits, furniture, sculptures and tapestries. The property as a whole is designated as a Grade I registered Park and Garden. There are five scheduled monuments within the park and 45 on site Grade I and Grade II* Listed Buildings, with the park wall also designated a Grade II Listed Building.
- 2.9.2. World Heritage Sites are considered to be of ‘Outstanding Universal Value’, which have been inscribed on the World Heritage List by the World Heritage Committee. World Heritage status is a high accolade that brings international scrutiny.
- 2.9.3. There are a number of designated assets throughout the EEH region including:
- 1392 Scheduled Monuments;
 - 378,853 Listed Buildings;
 - 6 registered battlegrounds; and
 - 239 Registered Parks and Gardens⁵¹.
- 2.9.4. Local planning authorities are obliged to designate conservation for areas in their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. There are 1191 conservation areas⁵² located within the EEH region, with Oxfordshire having the greatest number with 252 designations. The breakdown for each of the LAs which is displayed in Table 4.5 below.

Table 2.4: Conservation Areas

LA	Conservation Areas
Bedford Borough	28
Buckinghamshire	183
Cambridgeshire	223
Central Bedfordshire	59

⁵¹ Historic England, Listing Data

⁵² Compiled from Local authority level data.

LA	Conservation Areas
Hertfordshire	157
Luton	5
Milton Keynes	27
Northamptonshire	200
Oxfordshire	252
Peterborough	29
Swindon	28
Total	1191

2.9.5. In addition, local authorities may identify non-designated heritage assets, which are not formally designated but have a degree of significance meriting consideration in planning decisions. In some areas, local authorities identify some non-designated heritage assets as ‘locally-listed’ assets, which make a positive contribution to the local character and sense of place because of their heritage value⁵³.

Future Trends

- 2.9.6. Protection of the historic environment is firmly embedded in national and local planning policy, and this has been the case since 1990. This policy has developed independently of the European Union and is unlikely to change in the near future.
- 2.9.7. However, whilst direct (physical) impacts on designated historical sites are strongly restricted, adverse effects on the setting of designated heritage assets does still occur, for example relating to visual intrusion, or aspects such as traffic, lighting and noise. This can be a sensitive planning issue.
- 2.9.8. One trend over the last few years which may well continue is the reduction in funding for Historic England and county and local authorities, with increased pressure on the case workload of Archaeological Officers, Conservation Officers and Historic England advisors. This can have an impact on the response times for the provision of planning advice.

2.10 WATER ENVIRONMENT

Summary of Current Baseline

- 2.10.1. There are two river basin districts that fall within the EEH region; the Anglian and Thames. These river basins cover nine management catchments and 779 waterbodies that fall within the Heartland:

⁵³ Historic England, Locally Listed Heritage Assets. Available (online) at: <https://historicengland.org.uk/advice/hpg/has/locallylistedhas/>

- Anglian management catchments:
 - Ouse and Upper Bedford;
 - Nene;
 - Cam and Ely Ouse; and
 - Old Bedford and Middle Level.
- Thames management catchments:
 - Cotswolds;
 - Lea Upper;
 - Cherwell and Ray;
 - Gloucestershire and the Vale; and
 - Thames and Chilterns.

2.10.2. The Water Framework Directive (WFD) sets an objective of aiming to achieve at least 'good' status for all waterbodies by a set deadline specific for each waterbody. The majority of the monitored waterbodies are 'main rivers' that are under the jurisdiction of the Environment Agency. Table 4.6 below shows water quality data of the 779 waterbodies across the EEH region for 2015⁵⁴.

Table 2.5: Water Quality

River Basin Management Catchment		Classification						
		Total Water Bodies	Good	Moderate	Poor	Bad	Fail	Does not support Good
Anglian	Ouse and Upper Bedford	36	1	17	13	5	0	0
	Nene	167	0	87	73	7	0	0
	Cam and Ely Ouse	86	0	43	20	9	2	10
	Old Bedford and Middle Level	8	0	3	3	1	0	1
Thames	Cotswolds	97	3	50	35	6	0	3
	Lea Upper	36	1	16	14	3	0	2
	Cherwell and Ray	121	3	68	58	26	0	2
	Gloucestershire and the Vale	139	4	67	55	11	1	1

⁵⁴ Environment Agency, River Basin Districts, Anglian and Thames [online] Available from: <https://environment.data.gov.uk/catchment-planning/> Accessed on: 17/02/2020

River Basin Management Catchment	Classification						
	Total Water Bodies	Good	Moderate	Poor	Bad	Fail	Does not support Good
Thames and Chilterns	89	0	43	38	5	0	3
Total	779	12	394	309	73	3	22

- 2.10.3. Of the 779 water bodies, just 12 are achieving ‘good’ status, falling far short of the WFD target. 50% of the waterbodies are achieving ‘moderate’ status, whilst 49.1% are either achieving ‘poor’ or ‘bad’ status.
- 2.10.4. The Anglian River Basin Management Plan, published in 2009 and updated in 2015⁵⁵ states that 13% of the Anglian river basin rivers, canals and surface water transfers should be at good or better overall status by 2021. The Thames River Basin Management Plan, published in 2009 and updated in 2015⁵⁶ states that 80% of the Thames river basin rivers, canals and surface water transfers should be at good or better status by 2021.
- 2.10.5. The area’s water bodies also include a number of spring-fed chalk streams, which are an internationally rare habitat, and at risk from pollution and groundwater extraction.
- 2.10.6. National flood zone data correlates with the location of main rivers and ordinary watercourses as areas with the greatest risk of flooding. The government’s flood map for planning⁵⁷ shows that, amongst others and at a strategic scale, the area north of Cambridge and most of the east of Peterborough are within flood zone 3; areas of Oxford and Northampton are within flood zone 2 and 3. Flood risk from surface water, groundwater and reservoirs is also present in the area.
- 2.10.7. The Environment Agency have defined Source Protection Zones (SPZs) for groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution. The EEH region has 317 ground source protection zones, of which 168 are classed as zone 1, which have the lowest resilience to pollution (50-day travel time of pollutant to source with a 50 metres default minimum radius)⁵⁸. Additional sensitive groundwater aquifers are found outside these areas, particularly on areas

⁵⁵ Anglian River Basin Management Plan [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718327/Anglian_RBD_Part_1_river_basin_management_plan.pdf

⁵⁶ Thames River Basin Management Plan [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718342/Thames_RBD_Part_1_river_basin_management_plan.pdf

⁵⁷ Environment Agency, Flood Map for Planning [online] Available at: <https://flood-map-for-planning.service.gov.uk/confirm-location?eastings=546289.62&northing=257472.944&placeOrPostcode=cambridge>

⁵⁸ Environment Agency, Groundwater source protection zones, [online] available at: <http://apps.environment-agency.gov.uk/wiyby/37833.aspx>

underlain by chalk. Though not used for water supply, they provide baseflows to local springs, which in turn support the area's chalk streams, and as such should be protected from pollution.

Future Trends

- 2.10.8. In terms of water quality, the requirements of the WFD should lead to continued improvements to water quality in watercourses. However, water quality is also likely to continue to be affected by: pollution incidents in the area; runoff from urban, transport and agricultural areas; the presence of non-native species; and physical modifications to water bodies.
- 2.10.9. Maintaining water supplies in the 2050s will be particularly challenging in the EEH region. Deficits may develop across England by the 2050s due to climate change alone; these would be exacerbated by population growth. The largest water supply/demand deficits are projected to occur in the Thames river basin region. New infrastructure in the form of supply pipes and reservoirs could have implications on transport networks, whether existing or proposed.
- 2.10.10. At a regional level, the future implications of climate change projections include: increased flood-plain flood events leading to damage to property and disruption to economic activity; water shortages; and higher incidence of damage to transportation, utilities and communications infrastructure caused by an increase in the number of extreme weather events (e.g. heat, high winds and flooding caused by increased rainfall).

2.11 AIR QUALITY

Summary of Current Baseline

- 2.11.1. The latest national emissions statistics, which are for 2016, are quoted in the Clean Air Strategy 2019⁵⁹. Road transport and other transport modes (including rail and shipping) for 2016 contributed 34% and 17% respectively to total national nitrogen oxide (NOx) emissions, and 12% to particulate matter (PM2.5) emissions. The adverse impact of airports on air quality is principally from surface access via road transport and the biggest domestic impact of an aircraft is during take-off and landing (1% of total NOx and SO2 national emissions)⁶⁰. Currently, the most challenging pollutant in terms of limit value compliance is nitrogen dioxide (NO2).
- 2.11.2. Where air quality objectives are not likely to be achieved, an Air Quality Management Area (AQMA) must be declared. These are predominantly associated with vehicle emissions, principally NOx, although a few have been declared for PM10. As such, AQMAs are mostly located within urban areas and sections of the road network which are heavily trafficked and frequently congested. In the EEH region, there are currently 79 AQMAs, of which 68 are declared for NO2, four are declared for both NO2 and PM10, two are declared for PM10 alone and four are declared for SO2.

⁵⁹ Defra, Clean Air Strategy, 2019 [online] available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf

⁶⁰ Defra, 'UK Emissions inventory submission under NECD and CLRTAP' (2018), [online] Available at: http://cdr.eionet.europa.eu/gb/eu/nec_revised/inventories/envwnwqzg/Annex_I_Emissions_reporting_template2018_GB_v1.0.xls

- 2.11.3. Using data records from 156 monitoring sites across various monitoring networks nationwide during 2005-2016, Air Quality Consultants (AQC) reported in January 2018⁶¹ significant downward trends in both NO₂ and NO_x concentrations. The magnitude of the reduction was 1.50% per year for NO₂ and 1.48% per year for NO_x.
- 2.11.4. A Defra statistical release in April 2019⁶² focussed on trends in NO₂, particulate matter and ozone between 1987 and 2018. It revealed that roadside NO₂ pollution has reduced in the long-term and in recent years, having been stable for most of the 2000s.
- 2.11.5. Ground level ozone concentrations and related respiratory illnesses occur with greater frequency in the EEH region due to the high population density in this region compared to the rest of the country (except for London)⁶³. Defra has reported non-compliance with the long-term objective (relating to human health) for ground level ozone across the EEH area⁶⁴. Whilst ozone is not directly emitted by transport sources, transport emissions of volatile organic compounds and NO_x will influence regional ozone levels.
- 2.11.6. Airports can have an adverse effect on air quality principally from surface access via road transport. The impact on air quality from proposed increased capacity at both London Heathrow, London Luton and London Gatwick, in addition to other airports in the EEH region, has received conditional support on delivery of a comprehensive programme of measures that result in a step change in connectivity to/from the airport by non-car modes.

Future Trends

- 2.11.7. The number of vehicles on the roads is likely to increase as the population rises, putting air quality at further risk of degradation. More severe and frequent heat episodes (associated with the changing climate) can also worsen air quality, and therefore asthma, respiratory diseases and allergic reactions, without further intervention.
- 2.11.8. There are currently plans for a second terminal at London Luton Airport which could increase the airport's capacity significantly. The plans for a third runway at Heathrow Airport now face an uncertain future after the Court of Appeal declared the government's decision to allow unlawful. However, there is still potential for future developments at Heathrow to go ahead, as the Airport plans for a Supreme Court appeal. Regardless, both developments in isolation could have substantial effects on air quality in the EEH region.
- 2.11.9. The creation of Clean Air Zones in major UK cities and possibly beyond is part of the government's broader Air Quality Plan, which aims to improve air quality and address sources of pollution. The UK

⁶¹ Air Quality Consultants. 2018. Nitrogen Dioxide and Nitrogen Oxides Trends in the UK 2005 to 2016

⁶² Defra. 2019. Defra National Statistics Release: Air Quality statistics in the UK 1987 to 2018

⁶³ European Environment Agency, Tropospheric Ozone in EU - The consolidated report, [online] available at: <https://www.eea.europa.eu/publications/TOP08-98>

⁶⁴ Defra. 2019. Air Pollution in the UK 2018. Available from: <https://uk-air.defra.gov.uk/library/annualreport/index>

Government's 25 Year Environment Plan reports that the transport sector is responsible for around 40% of the UK's final energy use and contributes to local air quality issues⁶⁵.

- 2.11.10. Reductions have been made in emissions through tighter regulation of industry, and with the introduction of cleaner, more efficient car engines and fuels. Between 1970 and 2016, emissions in the UK of: NOX reduced by 72%; PM10 reduced by 73%; SO2 reduced by 97% and non-methane volatile organic compounds (NMVOCs) reduced by 66%⁶⁶.
- 2.11.11. Improved engines and emission standards have helped bring about the reductions in NOX emissions seen in recent decades. The use of catalytic converters aided the decline in emissions of NMVOCs and the reduction of sulphur in fuels has contributed to a decline in SO2 emissions from the transport sector. However, despite tighter emissions standards a rise in diesel vehicle numbers has held back further improvements⁶⁷.
- 2.11.12. Overall, emissions have the potential to reduce in future, largely due to progressively tighter vehicle emission and fuel standards agreed at European level and set in UK regulations, such as the UK Government's plan to end the sale of all new conventional petrol and diesel cars and vans by 2035. This is also resulting in advances in vehicle technology (such as electric and plug-in hybrids) – for example, bus fleets are commonly being upgraded to either electric or hybrid vehicles⁶⁸ – and this trend is expected to continue. Predictions for future vehicle NO2 reductions are more reliant on the Real Driving Emissions (RDE) testing than a switch to electric vehicles in the short to medium term and as such, are reliant on enforcement and compliance with approval standards.

2.12 CLIMATE CHANGE AND GREENHOUSE GASES

Summary of Current Baseline

- 2.12.1. In 2018, the largest emitting sector of UK greenhouse gas emissions was the transport sector, followed by energy supply, business and the residential sector⁶⁹. In 2018, transport accounted for

⁶⁵ HM Government (2018). A Green Future: Our 25 Year Plan to Improve the Environment. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

⁶⁶ DEFRA. (2018). Emissions of air pollutants in the UK, 1970 to 2016. London: Department for Environment, Food and Rural Affairs [online] available at: www.gov.uk/government/statistics/emissions-of-air-pollutants

⁶⁷ Defra (2018). The state of the environment: air quality. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/729820/State_of_the_environment_air_quality_report.pdf

⁶⁸ Surrey Live. 2018 [online] Available from: <https://www.getsurrey.co.uk/news/surrey-news/guildford-set-first-fleet-electric-15612957>

⁶⁹ Department for Business, Energy and Industrial Strategy, 2018 UK Greenhouse Gas Emissions, Provisional Figures, Statistical Release: National Statistics, 2019, [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/790626/2018-provisional-emissions-statistics-report.pdf

124.4 MtCO₂, equivalent to 28% of total greenhouse gas emissions in the UK, which represents a reduction of 1% compared with 2017 figures⁷⁰.

- 2.12.2. In 2017, a total of 28,833 kt CO₂ emissions were generated in the region⁷⁸. Like the national trend, the greatest number of CO₂ emissions in the EEH region came from the transport sector, making up 47% of the total emissions. The total CO₂ emissions from the region contribute 10% of the total emissions in England, and the overall emissions from transport is 10% higher than the national average⁷¹.
- 2.12.3. During the same period, the average per capita emissions⁷² across the region at 5.3 tonnes of CO₂ emissions per person, which is slightly higher than the national average of 5.1 tonnes per person⁷⁹. Looking at the LAs individually, the county of Cambridgeshire has the highest level of emissions per capita at 7.1 tonnes, whilst Luton has the lowest at 3.2 tonnes⁷³.
- 2.12.4. During the most recent decade (2008-2017) the UK has been on average 0.3°C warmer than the 1981-2010 average and 0.8°C warmer than 1961-1990. All of the top ten warmest years have occurred since 1990. In the past few decades there has been an increase in annual average rainfall over the UK, particularly over Scotland for which the most recent decade (2008–2017) has been on average 11% wetter than 1961-1990 and 4% wetter than 1981-2010⁷⁴.
- 2.12.5. A climate emergency declaration is when the government and local authorities acknowledge that global warming exists and that they should take action and implement measures to reduce this. In the EEH region besides Central Bedfordshire Council and Swindon Borough Council, all other local authorities have declared a climate emergency⁷⁵.

Future Trends

- 2.12.6. The UK is committed to legally binding greenhouse gas emissions reduction targets of 34% by 2020 and 100% by 2050, compared to 1990 levels, as set out in the Climate Change Act 2008 (2050 Target Amendment) Order 2019. However, more ambitious targets were set in line with the Paris

⁷⁰ Department for Business, Energy and Industrial Strategy, 2018 UK Greenhouse Gas Emissions, 2020, [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/863325/2018-final-emissions-statistics-summary.pdf

⁷¹ Department for Business, Energy & Industrial Strategy, 2018, UK Greenhouse Gas Emissions, [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/776083/2017_Final_emissions_statistics_one_page_summary.pdf

⁷² The average per capita emissions include emissions from: Industry, commercial & public sector (including electricity-related emissions); Domestic (including electricity-related emissions); Transport (estimates do not include emissions from international aviation and shipping. Domestic aviation and shipping, however, are included); Land use, land use change and forestry (including removals of carbon dioxide from the atmosphere).

⁷³ Department for Business, Energy & Industrial Strategy, 2019, UK Local Authority and regional carbon dioxide emissions national statistics: 2005 to 2017, [online] Available at: <https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2017>

⁷⁴ Met Office, UKCP18 Science Overview Report, 2018, [online] Available at: <https://www.metoffice.gov.uk/pub/data/weather/uk/ukcp18/science-reports/UKCP18-Overview-report.pdf>)

⁷⁵ Declare a Climate Emergency (2020). List of councils who have declared a climate emergency. Available at: <https://www.climateemergency.uk/blog/list-of-councils/>

Agreement 2015 for EU countries (including the UK) reducing greenhouse gas emissions by at least 40% by 2030, compared to 1990 with a long-term strategy for net zero emissions by 2050⁷⁶. The Judgement from the Court of Appeal on the Airports National Policy Statement highlights the importance of taking the Paris Agreement into account in decision-making.

- 2.12.7. Reducing carbon emissions will mean changes to technology as well as the ways in which people travel. For example, ahead of 26th Conference of the Parties (COP26) Summit, the UK has brought forward its ban on the selling of new petrol, diesel or hybrid cars from 2040 to 2035. The last six years have seen a remarkable surge in demand for electric vehicles in the UK – new registrations of plug-in cars increased from 3,500 in 2013 to more than 265,000 by the end of December 2019⁷⁷.
- 2.12.8. The infrastructure to support the demand in electric cars has also continued to increase, and as a result of sustained government and private investment, the UK network of charging points has increased from a few hundred in 2011 to more than 10,500 charging locations, 16,900 charging devices and 29,500 connectors by January 2020⁸⁰. The network needs to expand further to meet demand and maximise carbon emission reductions⁷⁸.
- 2.12.9. Other examples include changing travel modes and increasing planning for efficient and reliable public transport infrastructure. By the end of the 21st century, all areas of the UK are projected to be warmer, more so in summer than in winter. This projected temperature rise in the UK is consistent with future warming globally. Rainfall patterns across the UK are not uniform and vary on seasonal and regional scales and will continue to vary in the future, with significant increases in hourly precipitation extremes⁷⁹. For both temperature and rainfall, the changes will be much larger if greenhouse gas emissions do not reduce.
- 2.12.10. The current estimates for temperature increase and changes to rainfall patterns are unlikely to alter significantly in the short term, given the longer term timescales associated with climate change. This being the case, there will be an increasing need to implement climate change mitigation and adaptation measures in light of changing environmental conditions already being observed.

2.13 SOIL, LAND USE, RESOURCE AND WASTE

Summary of Current Baseline

- 2.13.1. According to Natural England's Agricultural Land Classification, much of the agricultural land in the Heartland is rated as of good to moderate quality (grades 3a-3b). Land to the north east of the EEH region between Peterborough and Cambridge, is of the best and most versatile in the region, rated very good to excellent (grades 1-2).

⁷⁶ https://ec.europa.eu/clima/policies/strategies/2050_en

⁷⁷ Electric car market statistics, 2020. [online] Available from: <https://www.nextgreencar.com/electric-cars/statistics/>

⁷⁸ Committee on Climate Change, Plugging the gap: An assessment of future demand for Britain's electric vehicle public charging network, 2018 [online] available at: <https://www.theccc.org.uk/publication/plugging-gap-assessment-future-demand-britains-electric-vehicle-public-charging-network/>

⁷⁹ Met Office, UK Climate Projections: Headline Findings, 2019 [online] available at: <https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp-headline-findings-v2.pdf>

- 2.13.2. Sandstone, Limestone, Argillaceous Rocks, Mudstone, Siltstone and Chalk are the common bedrock geology in the EEH region⁸⁰.
- 2.13.3. The UK generated 222.9 million tonnes of total waste in 2016, with England responsible for 85% of the UK total. Construction, demolition and excavation (CDE) waste makes up around 60% of the entire amount of waste produced by the UK each year, making this the country's largest waste stream. However, once hazardous waste and navigational dredging spoil is excluded, 76% of CDE waste is currently being recovered and recycled for alternative uses⁸¹. This exceeds the EU target of 70%, which the UK must meet by 2020⁸².
- 2.13.4. Defra's landfill capacity figures⁸³ show that landfill capacity for the EEH region has been declining and will do so in the absence of future provision.

Future Trends

- 2.13.5. Due to projected population trends, there will be a need for development (including transport infrastructure) to support this growth. This development is likely to increase pressure upon agricultural land, which could potentially result in the loss of some of the region's best and most versatile land.
- 2.13.6. Agricultural areas are also at risk from climate change. Projections of increased flooding (including that caused by sea-level rise) and drought may lead to the loss of important agricultural areas, through compaction, waterlogging and erosion of soil.
- 2.13.7. The growing population and associated need for development are also likely to increase use of mineral resources and waste generation. As such, it will be necessary to apply resource efficiency and waste management measures, including the re-use and recycling of materials.

2.14 NOISE AND VIBRATION

Summary of Current Baseline

- 2.14.1. There are several Noise Important Areas (NIAs) throughout the EEH region, concentrated in and around the town and city centres and along major roads. Data from the England Noise Viewer⁸⁴ shows that motorways, namely the M1, M40 and the M4 create significant noise with noise levels exceeding 55dB in areas within 1km of the source (Lden, 24-hour annual average noise levels with weightings applied for the evening and night periods). Areas affected are exacerbated along where major roads merge and in locations where airport noise is also recorded.

⁸⁰British Geological Society Maps. [online] Available at: <http://mapapps2.bgs.ac.uk/geoindex/home.html?topic=Minerals>

⁸¹ MRW. 2019. CDE recycling levels. [online] Available from: <https://www.mrw.co.uk/knowledge-centre/do-the-numbers-reflect-true-cde-recycling-levels/10040434.article>

⁸² Defra. 2018. UK Statistics on Waste. [online] Available from: <https://www.gov.uk/government/statistical-data-sets/env23-uk-waste-data-and-management>

⁸³ Defra. 2018. [online] Available at: <https://data.gov.uk/dataset/237825cb-dc10-4c53-8446-1bcd35614c12/remaining-landfill-capacity>

⁸⁴ Extrium, 2012. England Noise Map Viewer. [online] Available from: <http://www.extrium.co.uk/noiseviewer.html> 0

2.14.2. The EEH region comprises the London Luton Airport and some other smaller commercial, public, private and military airfields and airstrips. London Luton Airport is the fifth busiest airport by total passenger traffic in the UK. The activities at airports, including take-off and landing, generate high noise levels and further noise contributions from road transport. The EEH region boundary is close to London Stanstead and Heathrow Airports and noise associated with the flight paths to and from this airport will affect receptors within the EEH region.

Future Trends

- 2.14.3. Given the projections for an increasing population, and the current preference for cars as the main mode of transport, there is potential that noise levels will increase along major roads. However, more congestion may lead to slower moving traffic which may reduce noise levels. Furthermore, recent vehicle innovations such as hybrid and electric cars have led to quieter vehicles and this trend is expected to continue with greater uptake.
- 2.14.4. According to the Department for Transport and the Civil Aviation Authority, the number of passengers using airports in the UK was 292 million in 2018, an increase of 2.7% from 2017. However, the number of flights decreased by 15,000 over the same period⁸⁵, this suggests that larger planes are in use or upgauging⁸⁶ is occurring. The International Air Transport Association expects that global passenger numbers will increase to 7.2 billion by 2035, with the UK predicted to hit 300 million passengers by 2035⁸⁷, which will inevitably increase flight numbers resulting in the potential for increase noise levels.
- 2.14.5. Future trends in noise targets are expected to focus on more stringent criteria, where the link between health effects and noise begins to be better understood. Additionally, future climate change effects will likely result in an increase in ambient temperatures and for longer periods, creating a need to seek thermal relief, which generally with existing housing stock tends to be satisfied by opening of windows, thus increasing exposure to noise.

⁸⁵ Department for transport and Civil Aviation Authority, 2019. Aviation statistics: data tables (AVI) – AVI0101: Ait traffic UK airports. [online] Available from: <https://www.gov.uk/government/statistical-data-sets/aviation-statistics-data-tables-avi>

⁸⁶ The process of replacing aircrafts with a different aircraft of the same type, but with a higher seat density.

⁸⁷ International Air Transport Association, 2016. IATA Forecasts Passenger Demand to Double Over 20 Years. [online] Available at: <https://www.iata.org/en/pressroom/pr/2016-10-18-02>



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