



England's Economic Heartland

INTEGRATED SUSTAINABILITY APPRAISAL

Scoping Report





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WSP

The Forum
Barnfield Road
Exeter, Devon
EX1 1QR

Phone: +44 1392 229 700

Fax: +44 1392 229 701

WSP.com



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Signature				
Checked by	Sally Newbold			
Signature				
Authorised by	Ursula Stevenson	Sally Newbold	Ursula Stevenson	
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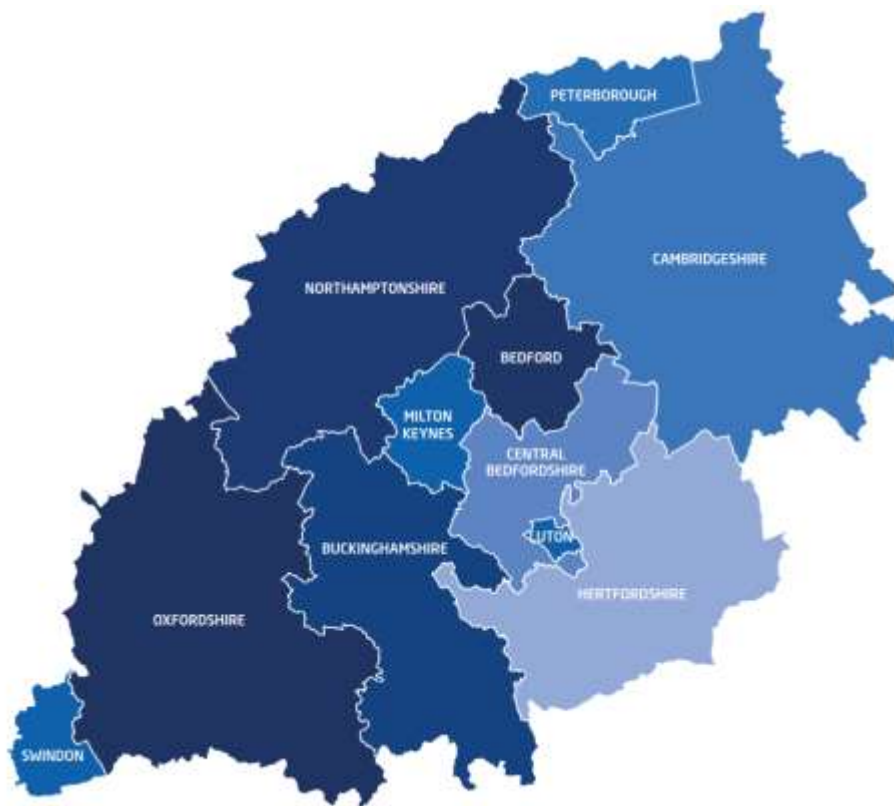
REVIEW OF PLANS, POLICIES AND PROGRAMMES

1 INTRODUCTION

1.1 BACKGROUND

1.1.1. England's Economic Heartland (EEH) is the Sub-National Transport Body (STB) representing 11 Local Authorities (LAs) and six Local Enterprise Partnerships (LEPs) (referred to hereafter as EEH Partners) across the Oxford-Cambridge Arc and surrounding areas. Stretching from Swindon across to Cambridgeshire and from Northamptonshire down to Hertfordshire, the EEH region has a population of more than 5.1 million people, with its 280,000 businesses employing 2.7 million people. The EEH region is shown in Figure 1.1 below.

Figure 1.1 - EEH Region



1.1.2. EEH is responsible for developing a transport strategy to 2050. The EEH Transport Strategy is being developed to set out how transport interventions can help realise the economic potential of the region, whilst ensuring the principles of sustainable development are followed to maximise social and environmental benefits. It is EEH's ambition to support growth whilst achieving environmental net gain. A key example of transformational investment in strategic infrastructure is the delivery of East West Rail.

1.1.3. An Integrated Sustainability Appraisal (ISA) is being undertaken alongside the Transport Strategy to ensure that sustainability aspects are incorporated into the Strategy.

- 1.1.4. In parallel to developing the Transport Strategy, EEH will be preparing a proposal to establish themselves as a statutory STB. The powers and responsibilities sought through that proposal will be those required to enable efficient and cost-effective implementation of the Transport Strategy.
- 1.1.5. The region is economically important, as recognised by the National Infrastructure Commission, and its particular position at the heart of the UK's knowledge economy is a reflection of its concentration of world leading research facilities, internationally significant business clusters, track record in innovation and entrepreneurship, and the skills of its workforce. The region's economy is valued at more than £155 billion annually and has significant links with other high performing regions of England, as well as internationally through the airport gateway at London Luton Airport. The region also has London Heathrow, London Stansted and Birmingham International airports directly on its borders. Achieving the region's full potential is dependent on the delivery of major transport infrastructure, transformational growth and connecting existing communities through well designed placemaking.
- 1.1.6. The region is also home to over five million people and is recognised for its historic environment, landscape and nature conservation designations. Maintaining and enhancing the region's natural capital, particularly in light of climate change, is fundamental to both quality of life for its residents and the economy.

1.2 PURPOSE OF REPORT

1.2.1. This report sets out the first stage of the ISA process, known as scoping. The purpose of this stage is to set out proposals for conducting the ISA, through:

- Identifying likely options for delivery of the Transport Strategy (**Section 2**);
- Presenting the methodology and framework for undertaking the ISA (**Section 3**);
- Reviewing relevant policies, baseline information and future trends (**Section 4**);
- Identifying key issues and opportunities for the Transport Strategy, reflecting for example the increased pressure of development on the natural environment or the beneficial health effects of active travel (**Section 5**);
- Identifying Sustainability Objectives to feed into an overall framework for appraisal of options (**Section 6**); and
- Setting out next steps (**Section 7**).

This report also provides baseline information on the environmental, social and economic characteristics of the area, including the likely evolution of the baseline position which would occur without the Strategy.

2 TRANSPORT STRATEGY

2.1.1. EEH is a partnership of local authorities and LEPs, including:

2.1.2. LA Partners

- Bedford Borough Council
- Buckinghamshire County Council
- Cambridgeshire County Council
- Central Bedfordshire Council
- Hertfordshire County Council
- Luton Borough Council
- Milton Keynes Council
- Northamptonshire County Council
- Oxfordshire County Council
- Peterborough City Council
- Swindon Borough Council

■ LEP Partners

- Buckinghamshire
- Swindon and Wiltshire
- Oxfordshire
- South East Midlands

■ Mayoral Combined Authorities

- Greater Cambridge and Peterborough Combined Authority (Observer)

2.1.3. The development of the Transport Strategy will provide the key mechanism for expressing how EEH will realise its vision and strategic priorities. In July 2019, EEH launched the Outline Transport Strategy Framework for Engagement to engage with stakeholders across the region in shaping the development of the Transport Strategy. This period of engagement concluded in October 2019 and responses fed into the development of the vision and principles underpinning the Strategy.

2.1.4. The structure of the Strategy, and policies within it, will reflect four draft principles, subject to further iterative development:

- achieving net-zero carbon emissions from transport no later than 2050;
- realising economic opportunities through improved intra-regional connectivity;
- improving quality of life and wellbeing through enhanced local connectivity; and
- improving access to markets through strategic connectivity.

2.1.5. The following series of technical studies will support the development of the Strategy, including more detailed policies and proposals therein:

- Decarbonisation;
- First Mile Last Mile;
- Connectivity studies;
- Passenger Rail Study; and
- Freight study.

- 2.1.6. A key priority for the Strategy is to understand the best approach EEH can take towards **decarbonisation** of the pan-regional transport network. Work is underway to prepare a number of model scenarios that will show the various impacts of pathways to decarbonisation with a focus on behavioural economics and transport behaviour change to inform policy decisions towards decarbonisation. Additionally, EEH is working to investigate the development of a calculator which will capture an emissions baseline for carbon within the region and demonstrate the possible impacts of different interventions.
- 2.1.7. The Strategy is also an opportunity to embed the **first mile last mile** connectivity principle into transport decision making in the region. By taking a people, place and connectivity approach to local connectivity, the Strategy will be better placed to respond to local needs.
- 2.1.8. The translation of the Transport Strategy into action will be supported by a series of interventions, including **connectivity studies**. These studies will identify and prioritise corridors or areas where there are connectivity challenges or opportunities to improve sub-regional connectivity. Potential study corridors are being identified through: the EEH Regional Evidence Base (Appendix A maps the existing and planned economic assets and growth opportunities across the region); the Outline Transport Strategy engagement phase; and ongoing Partner feedback. Corridor studies will be expected to devise connectivity solutions that deliver against all four principles of the Transport Strategy.
- 2.1.9. The Strategy will also be informed by: a passenger **rail study** to identify the future role for rail in the region; and a major study into **freight** and logistics around the Oxford to Cambridge Arc, which identifies a number of priorities for the region in terms of freight needs and the implications of future demands and trends to 2050.
- 2.1.10. In addition, EEH is contributing to the Oxfordshire Rail Corridor Study being led by Oxfordshire County Council. The first phase of the study is nearing completion and quantifies rail travel demand arising from planned housing and economic growth up to 2031. The study considers the impacts of planned growth, additional growth and Oxfordshire's freight requirements, identifying aspirational levels of capacity and connectivity.
- 2.1.11. There are also a number of other Strategic studies taking place in the region, which are not managed by EEH. These studies are in response to transport needs in the following locations/corridors: Oxfordshire Rail Study; Cambridgeshire Rail Study; the A1(M) East of England Study; the (Milton Keynes) - Northampton to Market Harborough – (East Midlands) rail corridor; the West Midlands to Thames Valley rail study; and the M25 south-west quadrant.
- 2.1.12. In 2017, the Department for Transport commissioned Highways England, to explore options for the Oxford – Milton Keynes section of the Oxford-Cambridge Expressway. Following completion of the study by Highways England, DfT Ministers confirmed in the House of Commons that a review of the Oxford-Milton Keynes section of the Expressway would take place and that the terms of that review would be announced in due course.
- 2.1.13. In April 2019, EEH held a workshop with environmental stakeholders. The aim of the workshop was to define a series of indicators that would inform how EEH, as the STB, could deliver its environmental ambitions. The Strategy will make use of the resulting sustainability performance indicators to enable progress to be quantifiably assessed. A long list of indicators has been prepared, across the three themes of economy, accessibility and inclusion, and quality of life and

environment. A core list will be developed and incorporated into the Strategy to drive environmental performance and progress.

- 2.1.14. In developing detailed proposals, EEH's approach to connectivity will also consider:
- Improved connectivity for local journeys
 - Freight and logistics
 - National/international connectivity
- 2.1.15. Individual scheme proposals will not be produced as part of the Transport Strategy. Rather, it is the intention that the policies, tools and evidence base underpinning the Strategy, in addition to the vision and priorities will be used to determine the options, case for transport interventions and their assessment.

3 APPROACH TO THE ISA

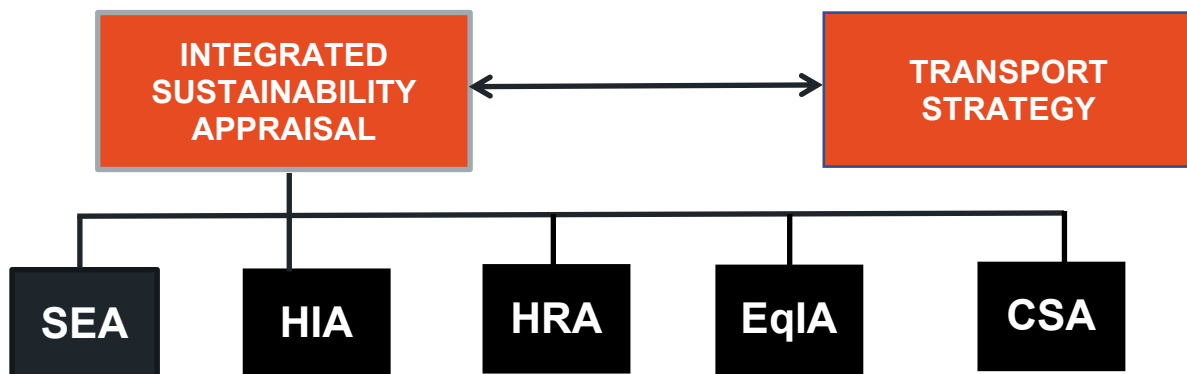
3.1 INTRODUCTION

3.1.1. Sustainability Appraisal is a systematic process that is undertaken during the preparation of a plan. Its role is to promote sustainable development by assessing environmental, social and economic impacts, as well as mitigating any potential adverse effects that the plan might otherwise have.

3.1.2. The Integrated Sustainability Appraisal (as set out in Figure 3.1) comprises:

- Strategic Environmental Assessment (SEA);
- Health Impact Assessment (HIA);
- Habitats Regulations Assessment (HRA);
- Equality Impact Assessment (EqIA); and
- Community Safety Assessment (CSA).

Figure 3.1 - ISA and component processes



3.2 STRATEGIC ENVIRONMENTAL ASSESSMENT

3.2.1. SEA is used to describe the application of environmental assessment to plans and programmes in accordance with European Council Directive 2001/42/EC¹. The SEA Directive is enacted in England through the “Environmental Assessment of Plans and Programmes Regulations” (SI 2004/1633, known as the SEA Regulations)².

3.2.2. The purpose of the SEA Directive is to ensure a high level of environmental protection, and to integrate the consideration of the environment into the preparation and adoption of plans, with a

¹ Directive 2001/42/EC, [online] Available from: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32001L0042> (Accessed on: 10/02/2020)

² SI 2004 No. 1633, The Environmental Assessment of Plans and Programmes Regulations 2004. [online] Available at: http://www.legislation.gov.uk/ukxi/2004/1633/pdfs/ukxi_20041633_en.pdf

view to promoting sustainable development. SEAs aim to make a plan more sustainable and more responsive to its environmental effects, by identifying a plan's significant impacts and ways of minimising its negative effects.

3.3 HEALTH IMPACT ASSESSMENT

- 3.3.1. HIA is a process to identify the likely health effects of plans, policies or developments and to implement measures to avoid negative impacts and promote opportunities to maximise the benefits. There is no formally adopted methodology for HIA although there is a body of practice and guidance at a policy level. Assessment of health can be undertaken as a discrete process within an HIA and can also be embedded within environmental assessments.
- 3.3.2. HIA is not a statutory requirement of the Local Plan preparation process. However, Planning Practice Guidance³ states that '*Local planning authorities should ensure that health and wellbeing and health infrastructure are considered in local and neighbourhood plans and in planning decision making*'.
- 3.3.3. HIAs can be done at any stage in the development process but are best done at the earliest stage possible.

3.4 HABITATS REGULATIONS ASSESSMENT

- 3.4.1. Under Article 6(3) of the EU Habitats Directive as transposed into the UK law by the Habitats Regulations⁴, an assessment (referred to as an HRA) needs to be undertaken in respect of any plan or project which:
- Either alone or in combination with other plans or projects would be likely to have a significant effect on a site designated within the Natura 2000 network – these are Special Areas of Conservation (SACs), candidate SACs (cSACs), and Special Protection Areas (SPAs). In addition, Ramsar sites (wetlands of international importance), potential SPAs (pSPA) and in England possible SACs (pSACs), are considered in this process as a matter of law or Government policy. [These sites are collectively termed 'European sites' in Habitats Regulations Assessment (HRA)]; and
 - Is not directly connected with, or necessary to, the management of the site.
- 3.4.2. Guidance on the Habitats Directive sets out four distinct stages for assessment under the Directive:
- Stage 1: Screening: the process which initially identifies the likely impacts upon a Natura 2000 site of a plan or project, either alone or in combination with other plans or projects, and considers whether these impacts are likely to be significant;
 - Stage 2: Appropriate Assessment: the detailed consideration of the impact on the integrity of the Natura 2000 sites of the plan or project, either alone or in combination with other plans or

³ Ministry of Housing, Communities & Local Government. 2017. Health and Wellbeing. [online] Available from: <https://www.gov.uk/guidance/health-and-wellbeing>

⁴ The Conservation of Habitats and Species Regulations 2017. Available from: <http://www.legislation.gov.uk/uksi/2017/1012/contents/made>

projects, with respect to the site's conservation objectives and its structure and function. This is to determine whether there will be adverse effects on the integrity of the site;

- Stage 3: Assessment of alternative solutions: the process which examines alternative ways of achieving the objectives of the plans or projects that avoid adverse impacts on the integrity of the Natura 2000 site; and
- Stage 4: Assessment where no alternative solutions exist and where adverse impacts remain: an assessment of whether the development is necessary for imperative reasons of overriding public interest (IROPI) and, if so, of the compensatory measures needed to maintain the overall coherence of the Natura 2000 network.

3.4.3. The first stage of the Habitats Regulations Assessment (screening) will be undertaken as the Transport Strategy develops. Stages 2 to 4 will be excluded due to the strategic nature of the Strategy. The HRA screening will enable consideration of the Transport Strategy regarding likely significant effects on European sites, as required by the legislation.

3.5 EQUALITY IMPACT ASSESSMENT

3.5.1. The Equality Act 2010 includes a public-sector equality duty which requires public organisations and those delivering public functions to: show due regard to the need to eliminate unlawful discrimination, harassment and victimisation; advance equality of opportunity; and foster good relations between communities.

3.5.2. The EqIA process focuses on assessing and recording the likely equalities effects as a result of a policy, project or plan. It seeks to ensure that the policy, project or plan does not discriminate or disadvantage people, and enables consideration of how equality can be improved or promoted. The equality duty came into force in April 2011 and covers the following nine Personal Protected Characteristics:

- Age;
- Disability;
- Gender;
- Gender reassignment;
- Marriage and civil partnership;
- Pregnancy and maternity;
- Race;
- Religion or belief; and
- Sexual orientation.

3.6 COMMUNITY SAFETY ASSESSMENT

3.6.1. CSA is used to identify where potential community safety issues could arise, for example through level of use, accessibility or speed or proximity to sensitive receptors. Recommendations can also be made regarding future option development such as lighting or visibility in design.

3.7 NATURAL CAPITAL

3.7.1. Natural capital is used to describe the natural environment in terms of the benefits it provides to people (also known as ecosystem services), including food, recreation, and clean air and water. These ecosystem services fall across many sustainability topics. A natural capital approach is

therefore useful for understanding the inter-dependencies between nature, people, the economy and society, and ensuring that natural capital is considered as an integrated system.

- 3.7.2. There is no adopted formal methodology for assessing natural capital, although the UK Government has recently produced guidance on Enabling a Natural Capital Approach (ENCA)⁵. Assessment of natural capital can therefore be embedded within environmental assessments, and in this case natural capital will be addressed as an additional SEA topic. Factoring in natural capital into an SEA can broaden the view of nature beyond a constraint on development to an opportunity to deliver social and economic outcomes.
- 3.7.3. In line with ENCA guidance, a broad, qualitative assessment will be undertaken regarding possible natural capital impacts of the Transport Strategy, making use of available baseline data (spatial or qualitative) on natural capital and ecosystem services emerging through the Environment Agency (EA)'s Oxford to Cambridge Local Natural Capital Plan. This will help to ensure that the Transport Strategy will maintain rather than degrade the provision of ecosystem services from the region's natural capital, and ideally contribute towards delivering environmental net gain.

⁵ Defra (2020) Enabling a Natural Capital Approach (ENCA). Available from: <https://www.gov.uk/guidance/enabling-a-natural-capital-approach-enca>

4 POLICY CONTEXT

- 4.1.1. In order to establish a clear scope for the ISA, it is necessary to review and develop an understanding of the environmental, social and economic objectives contained within international, national and regional legislation, policies and plans that are of relevance to the Transport Strategy.
- 4.1.2. The SEA Regulations require information on:
- *“An outline of the contents and main objectives of the plan or programme, and of its relationship with other relevant plans and programmes.”* (Schedule 2, Paragraph 1); and
 - *“The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation.”* (Schedule 2, Paragraph 5).
- 4.1.3. The review process ensures that the ISA complies with existing international, national and regional governance. The process entails identifying and reviewing those environmental protection objectives that are directly relevant to both the Transport Strategy and the ISA, which will also include equality, health, habitats and community safety objectives of relevance to the EqIA, HIA, HRA and CSA.
- 4.1.4. The scoping task of identifying related legislation, policies and plans cannot yield an exhaustive or definitive list, therefore, the review has been focussed to ensure that only policies that are current and of direct relevance to the Transport Strategy and sustainability are included.
- 4.1.5. A detailed outline of the policy documents, objectives and targets reviewed is set out in Tables C.1 and C. 2 in Appendix C. Table 4.1 below outlines the key messages of the review. The review provides the context for the ISA and helps to inform an SA Framework of objectives which will guide the subsequent appraisal process.
- 4.1.6. Due to the overlapping content of policies and plans, some of the ISA topics in the table below have been combined, therefore, the ISA topics in Chapter 5 are not exactly the same as those listed in Table 4.1 below.

Table 4.1 – Key Messages from the Policy Review

ISA Topic	Key Messages from Review
Population and Equalities	<ul style="list-style-type: none"> ■ Transport is a key factor shaping experiences of poverty. The ability of households in poverty to find paid work often depends on access to affordable, regular and reliable transport. ■ The delivery of new developments should not be of detriment to the interests of existing communities. ■ There is a need to: <ul style="list-style-type: none"> – reduce inequalities in care (both physical and mental) across and within communities; – 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

ISA Topic	Key Messages from Review
	<ul style="list-style-type: none"> – ensure that there are appropriate facilities for people with disabilities and the elderly.
Economy	<ul style="list-style-type: none"> ■ 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. ■ Working with businesses and infrastructure owners is necessary to develop proposals that meet the needs of the freight and logistics sector. ■ Additional investment is required in strategic transport infrastructure. ■ There is a need to: <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	<ul style="list-style-type: none"> ■ Good placemaking is linked to a wider set of positive social, economic and environmental outcomes. ■ There is a need to: <ul style="list-style-type: none"> – promote healthy standards of living; – prioritise walking, cycling and use of public transport; and – enhance accessibility to key community facilities, services and jobs for all.
Community Safety	<ul style="list-style-type: none"> ■ Safety is an important consideration for road users owing to the significant impact of serious and fatal accidents. ■ There is a need to: <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; and – reduce crime and the fear of crime, as well as encourage reporting.
Biodiversity, Natural Capital and Ecosystem Services	<ul style="list-style-type: none"> ■ There is a need to: <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 wherever possible; – maintain and enhance ecosystems and their services; and – improve the long-term sustainability of ecological and physical processes that underpin the functioning of ecosystems.
Landscape and Townscape	<ul style="list-style-type: none"> ■ The delivery of new developments should not have adverse impacts on the quality of the natural and built environment. ■ There is a need to:

ISA Topic	Key Messages from Review
	<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	<ul style="list-style-type: none"> ■ There is a need to: <ul style="list-style-type: none"> – conserve and enhance nationally and locally designated cultural and historical assets 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; and – 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.
Water Environment	<ul style="list-style-type: none"> ■ Water Resources in the region are under increasing pressure from a rapidly growing population, climate change and environmental needs. ■ Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest flood risk. ■ 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. ■ There is a need to: <ul style="list-style-type: none"> – protect and enhance surface and groundwater quality and ensure that water quality is improved or maintained where possible; and – avoid development in areas prone to flooding.
Air Quality, Climate Change and Greenhouse Gases	<ul style="list-style-type: none"> ■ Take all possible action to mitigate climate change, while adapting to reduce its impact. ■ Avoid increased vulnerability to the range of impacts arising from climate change. ■ There is a need to: <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	<ul style="list-style-type: none"> ■ There is a need to: <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	<ul style="list-style-type: none"> ■ Development must be undertaken in accordance with statutory requirements for noise.

ISA Topic	Key Messages from Review
	<ul style="list-style-type: none"><li data-bbox="491 291 1505 416">▪ 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.

5 BASELINE, SUSTAINABILITY ISSUES AND OPPORTUNITIES

5.1 INTRODUCTION

- 5.1.1. This section sets out the key baseline information for each of the ISA topics, as well as any future trends regardless of the implementation of the Transport Strategy. It also identifies key issues for sustainability in relation to the Transport Strategy, which has then been used to develop an appraisal framework in Section 6.
- 5.1.2. The Study Area referred to as the EEH region is shown in Figure 1.1. Where possible this report assesses the whole study area on a regional scale and will not compare sub-regions.
- 5.1.3. EEH is a strategic collaborative partnership of local authorities and Local Enterprise Partnerships. Given its geography spans across three historic 'English regions', where data isn't available at a regional level, a combination of data from clinical commissioning groups (CCG) and EEH Partners have been used instead (e.g. population and equalities and health and wellbeing).

5.2 POPULATION AND EQUALITIES

Summary of Current Baseline

- 5.2.1. The EEH region has a total population of 5,107,900 people, with the LA of Hertfordshire having the highest total population with 1,184,400⁶. Figure 5.1 in Appendix B 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 average.
- 5.2.2. Within the EHH 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).
- 5.2.3. Overall the ethnic make-up of the region closely resembles the national average⁷. 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.
- 5.2.4. 25.7% of the population in the EEH region live in rural areas, which is considerably higher than the national average of 18.5%⁷. Cambridgeshire is the most rural of the region's local authorities (upper tier authority level), with 47.1% of the population living in rural area⁷. There is a considerable

⁶ Office for National Statistics, 2016- based subnational population projections for local authorities and high administrative areas in England

⁷ Office for National Statistics, Census 2011

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.

- 5.2.5. The percentage of qualifications held by the population of EEH region is very similar to the national levels. The EEH region has a higher percentage of National Vocational Qualification (NVQ) Level 4 (22.7%) and NVQ Level 3 (12.7%) compared to the national figures; however, it has a lower percentage of NVQ Level 2, NVQ Level 1 and those with no qualifications⁸.
- 5.2.6. 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 nationally⁹. 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%)⁹.
- 5.2.7. 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. Buckinghamshire is ranked 145th out of 151 upper-tier authorities (where 1 is the most deprived and 151 is the least deprived); this is reflected in the Buckinghamshire Health Profiles¹⁰ 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 Profiles¹¹ which show the health of the population is significantly worse than the national average. Figure 5.2 in Appendix B shows the spread of deprivation across the region.
- 5.2.8. 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 each¹².
- 5.2.9. 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%⁷.

⁸ Nomis, Local Labour Statistics, 2019

⁹ England's Economic Heartland Stage 1 Databank, Resident Working Age Population (16-64) by EEH Region Local Authority District, 2012-2018

¹⁰ 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> Accessed on: 14/02/2020

¹¹ 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> Accessed on: 14/02/2020

¹² NOMIS, Local Area Report, 2011.

Future Trends

- 5.2.10. Over the next 20 years, the total population across the region is anticipated to rise by 10.6%, with the LA of Central Bedfordshire predicted to see the greatest population increase of 21.7%⁶. The lowest population change is anticipated in Cambridgeshire with a rise of 8.5%⁶.
- 5.2.11. 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 olds⁶. 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.
- 5.2.12. 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.

Issues and Opportunities

- 5.2.13. WSP has identified the following issues as part of this scoping exercise:
- Transport issues affect different groups to varying extents, and there is evidence to show that the barriers to accessing and using transport can be exacerbated by age, ethnicity and, in particular, gender¹⁵.
 - The rural nature of some parts of the region could pose significant challenges in providing good services for all residents. There will, therefore, be a need for increased access to transport services within the rural areas of the region.
 - The population of the EEH region is increasing both in number and age profile.
 - Changing work habits such as remote, internet-based jobs and working from home are likely to reduce transport demand, but may also increase social isolation, which could increase reliance on alternative social interaction.
 - With an increasing ageing population in the region, there is likely to be additional strain on the region's services and infrastructure; this is likely to be exacerbated with a higher than average number of people living in rural areas.
- 5.2.14. WSP has identified the following opportunities as part of this scoping exercise:
- There are opportunities to improve access to rural areas through transport services, digital services and bring services to people.
 - There will be a need for adequate support and greater access to services and facilities for the elderly population, families with young children and single parent families.

¹³ The King's Fund. 2012. Demography: Future Trends. [online] Available at: <https://www.kingsfund.org.uk/projects/time-think-differently/trends-demography> Accessed on:14/02/2020

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

¹⁵ Sheffield Hallam University. 2017. Centre for Regional Economic & Social Research, Addressing Transport Barriers to Work in Low Income Neighbourhoods Accessed on:14/02/2020

- There were 3.5 million disabled people in work in 2017, with the Government aiming to increase this to 4.5 million by 2027. By helping more disabled people into work, this will enable people to reach their potential and to achieve economic independence. Employers will also enjoy the advantages of a diverse workplace including the talents of disabled people and the potential for greater productivity¹⁶.

5.3 ECONOMY

Summary of Current Baseline

- 5.3.1. Oxford, 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, Luton and Aylesbury. These areas help to drive higher levels of productivity and higher wages. Figure 5.3 in Appendix B shows the key areas of economic activity across the region.
- 5.3.2. Productivity as a whole is around 2.5% higher than the UK average¹⁷. Levels of employment are also high across the region, with an average of 81% of the population being economically active, exceeding the national average. In terms of gross value added (GVA) per head, Milton Keynes has the highest value at £ 46,780 in 2016, which was significantly higher than both the EEH (£27,963) and national averages (£21,486)¹⁸.
- 5.3.3. Watford Borough in Hertfordshire has seen the greatest increase in GVA per head between 2011 and 2016, with a total increase of 40.2%, which again is significantly higher than the EEH (18.4%) and national (13.5%) average¹⁸. Northamptonshire has the lowest GVA values across the Heartland, with an average of £22,439, of the lower tier local authorities within Northamptonshire, East Northamptonshire has the lowest GVA values per head at £16,226¹⁸.
- 5.3.4. 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 and Milton Keynes, although the science and technology sectors are still very productive, the largest employment sector is wholesale and retail trade.
- 5.3.5. 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

¹⁶ Department of Work & Pensions and the Department of Health, 2017. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/663399/improving-lives-the-future-of-work-health-and-disability.PDF Accessed on:14/02/2020

¹⁷ 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 Accessed on:13/02/2020

¹⁸ ONS, Gross Value Added (Income Approach), 2017

pharmaceutical, cybersecurity software, automotive and biotechnology sectors attract the largest amounts of capital.

- 5.3.6. 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 region¹⁹.
- 5.3.7. Access to skills is a key barrier to growth in the region. Despite having world class higher education facilities, there are some schools and colleges that are of a low quality, resulting in a skills mismatch. Educational attainment is influenced by both the quality of education received and the socio-economic circumstances of families.
- 5.3.8. 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%²⁰. 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 8²⁰. The LAs of Bedford (45.5%), Luton (43.7%), Swindon (45%) and Northamptonshire (45.4%) are all also underperforming the national average for Attainment 8²⁰.
- 5.3.9. 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 Buckinghamshire²¹. 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 nationally²².

Future Trends

- 5.3.10. 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.
- 5.3.11. 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. See Appendix A for more details.

¹⁹ 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> (Accessed on: 17/02/2020)

²⁰ Public Health England, Local Authority Health Profiles, All Indicators

²¹ ONS, Median house prices for administrative geographies: HPSSA dataset 9, [online] (Accessed on 18 available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/housing/datasets/medianhousepriceformationalandsubnationalgeographiesquarterlyrollingyearhpssadataset09>)

²² Ministry of Communities, Housing and Local Government, Indices of Deprivation 2019, Barriers to Housing

5.3.12. 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.

Issues and Opportunities

5.3.13. WSP has identified the following issues as part of this scoping exercise:

- Housing affordability pressures are contributing to net out-migration from (less affordable) urban areas to (more affordable) rural areas. If employment remains more concentrated in urban centres, this could put increased pressure on transport systems as commuting distances increase.
- Many LAs are underperforming the national average with regards to Attainment 8.
- Some locations are reaching near full employment, which could make it difficult for some local businesses to attract a skilled labour force.

5.3.14. WSP has identified the following opportunities as part of this scoping exercise:

- The development of East West Rail will be transformative across the Heartland, providing opportunities for increased economic growth, prosperity and employment.
- The impact of factors such as Brexit, new vehicle and energy technologies, disruptive digital technologies, changing working patterns and preferences and extreme climactic events will play a part in determining the types of transport investment which will most benefit the economy.
- Improved connectivity between business clusters and housing markets (both planned and existing) in the region will improve access to the skills pool as well supporting improvements in productivity.

5.4 HEALTH

Summary of Current Baseline

5.4.1. 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 females²³.

5.4.2. The percentage of physically active adults varies across the Heartland region. High levels are recorded in Buckinghamshire (70.5%), Cambridgeshire (68.6%), Oxfordshire (72.5%) and Swindon (71.1%), where the national average of 66.3% is far exceeded. Conversely, physical activity in Luton (58.7%), Northamptonshire (64%) and Peterborough (61.7%) are significantly worse than the national average²⁴.

²³ ONS, Life expectancy (LE) at birth and age 65 by sex, UK, 2001 to 2003 to 2016 to 2018

²⁴ Public Health England, Local Authority Health Profiles [online] available at: <https://fingertips.phe.org.uk/profile/health-profiles> (Accessed on: 11/02/2020)

- 5.4.3. 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 Buckinghamshire, Cambridgeshire and Hertfordshire, which are all significantly better than the national average. Conversely, levels in Northamptonshire and Peterborough are significantly worse than the national averages.
- 5.4.4. 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 average²⁴.
- 5.4.5. This trend is reflected within the IMD 2019 health and disability deprivation figures²⁵. 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 nationally²⁵.
- 5.4.6. 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 pollutants²⁴.
- 5.4.7. Of the eleven clinical commissioning groups (CCGs)²⁶ 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 year²⁷. 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.

Future Trends

- 5.4.8. The Heartland region exhibits higher levels of life expectancy and overall general health when compared with national averages. However, as noted in Paragraph 5.2.11 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.

²⁵ Ministry of Communities, Housing and Local Government, Indices of Deprivation 2019, Health and Disability

²⁶ The CCG boundaries are contained within the EEH region; however, the boundaries do not follow the same administrative boundaries of the LAs.

²⁷ Public Health England, Inhale - Interactive Health Atlas of Lung conditions in England, [online] available at: <https://fingertips.phe.org.uk/profile/inhale> (Accessed on: 17/02/2020)

- 5.4.9. 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.
- 5.4.10. The anticipated population growth and the increasing affordability and convenience of car travel 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.
- 5.4.11. Reduced levels of physical activity is a growing issue nationally, with fewer people reporting that they are achieving the level of activity recommended by the NHS. Effective transport planning can play a role in encouraging active transport choices (e.g. walking and cycling) as well as improve accessibility to sports and recreation facilities. Continued traffic growth without adequate provision for pedestrian and cyclists facilities is unsustainable.

Issues and Opportunities

- 5.4.12. WSP has identified the following issues as part of this scoping exercise:
- The population of the Heartland region is ageing; older people may not have access to appropriate forms of private transport to access healthcare, community, and social care facilities.
 - There are some large disparities between levels of physical activity across the Heartland region.
 - Physical inactivity and obesity are worsening issues nationally as well as in the region
 - There are disparities between the prevalence of COPD and emergency admissions across the Heartland region.
- 5.4.13. WSP has identified the following opportunities as part of this scoping exercise:
- The transport strategy could present opportunities to enhance walking and cycling routes and encourage the use of non-motorised forms of transport.
 - There will, therefore, be an ongoing need to provide inclusive services in order to meet the needs of older residents.

5.5 COMMUNITY SAFETY

Summary of Current Baseline

- 5.5.1. 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.

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>
Accessed on: 07/02/2020

5.5.2. There were 4792 accidents in the EEH region in 2018, of which 665 were serious and 84 were fatal²⁹. The highest number of fatal accidents in 2018 occurred on the A5, which had 7 fatalities. Table 5.1 below shows the highest risk roads across the region; these are roads that exceed the national average for fatal and serious accidents. These figures are representative of the number of accidents per billion vehicle miles.

Table 5.1 – 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
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		

5.5.3. 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.

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

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

5.5.4. In 2017/2018, the number of reported sexual offences committed on public transport in the UK, increased by 7.6% (over 60% of these assaults were against females). The number of violent offences increased by 16% to 13,591 in 2018/19³¹.

Future Trends

- 5.5.5. 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 accidents.
- 5.5.6. 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 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 accidents in the region.

Issues and Opportunities

- 5.5.7. WSP has identified the following issues as part of this scoping exercise:
- Crime on public transport in the UK is on the rise, particularly with regards to sexual assault, violent crimes and disruption.
 - Children in the 10% most deprived wards in England are four times more likely to be hit by a car than children in the 10% least deprived wards³³.
 - Vulnerable road uses such as cyclist and pedestrians are more likely to be casualties.
- 5.5.8. WSP has identified the following opportunities as part of this scoping exercise:
- There is a need to engage with communities and encourage the reporting of crimes as well as ensuring safety for all transport users.
 - There opportunities to introduce softer measures such as increase training and awareness and incorporation of safety by design measures

5.6 BIODIVERSITY

Summary of Current Baseline

- 5.6.1. There are a large range of nationally and locally designated sites within the EEH region including:
- Sites of Special Scientific Interest (SSSI);
 - Local Nature Reserves (LNR); and

³¹ British Transport Police. 2019. Annual Report 2018 -2019 [online] available at: https://www.btp.police.uk/PDF/BTP_Statistical_Bulletin_2018_2019.pdf Accessed on: 07/02/2020

³² British EuroRap Results 2017, Cutting the Cost of Dangerous Roads, 207 [online] available at: <https://roadsafetyfoundation.org/cutting-cost-dangerous-roads/> Accessed on: 07/02/2020

³³ Department for Transport. 2009. A safer way - Consultation on Making Britain's Roads the Safest in the World [online] Available at: <https://webarchive.nationalarchives.gov.uk/+http://www.dft.gov.uk/consultations/closed/roadsafetyconsultation/roadsafetyconsultation.pdf> (Accessed on: 12/02/2020)

- National Nature Reserves (NNR).

5.6.2. In addition to these, there are numerous internationally designated sites within the EEH region, outlined below in Table 5.2.

Table 5.2 – Internationally designated sites within the EEH region

Ramsar	Special Area for Conservation (SAC)	Special Protection Areas (SPA)
<ul style="list-style-type: none"> ▪ Lee Valley ▪ Chippenham Fen ▪ Wicken Fen ▪ Ouse Washes ▪ Nene Washes ▪ Woodwalton Fen ▪ Upper Nene Valley Gravel Pits 	<ul style="list-style-type: none"> ▪ Hackpen Hill ▪ Cothill Fen ▪ Little Wittenham ▪ Hartlock Wood ▪ Oxford Meadows ▪ Aston Rowant ▪ Chilterns Beechwoods ▪ Burnham Beeches ▪ Chilterns Beechwoods ▪ Wormley-Hoddesdonpark Woods ▪ Eversden and Wimpole Woods ▪ Portholme ▪ Fenland ▪ Ouse Washes ▪ Nene Washes ▪ Orton Pit ▪ Barnach Hills and Holes ▪ Devils Dyke 	<ul style="list-style-type: none"> ▪ Lee Valley ▪ Ouse Washes ▪ Nene Washes ▪ Upper Nene Valley Gravel Pits

5.6.3. All designated sites are shown on Figure B.5 in Appendix B.

5.6.4. 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. Across the region are areas of ancient and semi-natural woodland, 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

- 5.6.5. 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.
- 5.6.6. Development of greenbelt land in particular is 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.
- 5.6.7. 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.

Issues and Opportunities

- 5.6.8. WSP has identified the following issues as part of this scoping exercise:
- There are a wide range of statutory local, national and international sites designated for nature conservation in the EEH region, which may be affected by increased transport infrastructure development. Habitats and wildlife corridors outside of these protected areas are especially at risk of being lost, damaged or fragmented by transport development.
- 5.6.9. WSP has identified the following opportunities as part of this scoping exercise:
- The Transport Strategy presents opportunities to be strategic in the enhancement of biodiversity at the landscape scale.
 - Several local authority areas within the EEH region are designated enhancement areas, which aim to restore biodiversity at a landscape scale through maintenance, restoration and creation of priority habitats. These can be combined with priorities for wider ecosystems services benefits to deliver landscape wide environment gain for biodiversity and people.

³⁴ State of Nature. 2016.[online] Available from: <https://www.rspb.org.uk/our-work/conservation/projects/state-of-nature-reporting> (Accessed on: 11/02/2020)

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 (accessed on: 19/02/2020)

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/> (Accessed on: 19/02/2020)

- Biodiversity Net Gain (BNG) is the end result of a process applied to development so that, overall, there is a positive outcome for biodiversity. Although not currently a legal obligation for UK development, on 14th March 2019, Her Majesty's Treasury confirmed that following consultation the government will use the forthcoming Environment Bill to mandate BNG for development in England, ensuring that the delivery of much-needed infrastructure and housing is not at the expense of vital biodiversity.

5.7 NATURAL CAPITAL AND ECOSYSTEM SERVICES

Summary of Current Baseline

- 5.7.1. 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.
- 5.7.2. The UK's natural capital accounts³⁸ show that approximately 20-25 million tonnes of carbon has 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.
- 5.7.3. 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 (especially walking and cycling routes) can enhance people's physical and mental health and wellbeing, for example by reducing stress levels.
- 5.7.4. 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 accounts⁴⁰. 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).
- 5.7.5. As part of the EA's Oxford to Cambridge Local Natural Capital Plan, a baseline assessment of natural capital is being completed across the arc at the local planning authority level. The outputs of this assessment will include a fine scale map of the dominant habitats and land cover across the

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)

⁴⁰ ONS, UK Natural Capital Accounts, 2019, [online] available at: <https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/uknaturalcapitalaccounts/2019> (Accessed on: 19/02/2020)

majority of the EEH region. As this assessment is still in progress, the spatial data is not available for the present scoping report. However, the data is expected to be available for the natural capital assessment as part of the forthcoming ISA. The EA additionally intends to produce mapping of baseline ecosystem services provision across the majority of the EEH region, however this will not be available until the second half of 2020.

- 5.7.6. Some pre-existing baseline data is available for areas of the EEH region, namely Oxfordshire⁴¹ and the Nene Valley⁴². 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 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.
- 5.7.7. 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.
- 5.7.8. A detailed natural capital assessment placed a monetary value on the provision of the following ecosystem services: food production, carbon sequestration, pollination and recreation⁴³. A total value of £300 million was placed on the annual flow of these ecosystem services within the Nene Valley⁴⁴. 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.

⁴¹ Smith, A. (2019) Natural capital in Oxfordshire – Short Report. Available at: <https://www.eci.ox.ac.uk/index.html>.

⁴² Rouquette, J. R. (2016) Mapping Natural Capital and Ecosystem Services in the Nene Valley. Report for the Nene Valley NIA Project. Available at: <http://www.naturalcapitalsolutions.co.uk/>.

⁴³ Rouquette, J. R. (2016) Mapping Natural Capital and Ecosystem Services in the Nene Valley. Report for the Nene Valley NIA Project. Available at: <http://www.naturalcapitalsolutions.co.uk/>.

⁴⁴ 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> (Accessed on: 19/02/2020)

Future Trends

- 5.7.9. 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’ report⁴⁵.
- 5.7.10. 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 EA⁴⁶.
- 5.7.11. 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 vehicles, particulate emissions are predicted to be problematic into the future due to the impacts of non-exhaust emissions.
- 5.7.12. 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 infrastructure⁴⁷.

Issues and Opportunities

- 5.7.13. WSP has identified the following issues as part of this scoping exercise:
- Though not the key cause, transport networks have contributed to the decline in natural capital; however, they also have the potential to improve ecosystem service delivery.
 - New transport routes will need to be carefully planned so that they do not cause adverse effects on ecosystems with high (potential) ecosystem services provision.
 - Given that ecosystem services are the benefits that nature provides to people, areas of high (potential) provision are often the green and blue spaces close to centres of population, as well as connecting habitats that link these with more remote designated habitats and landscapes.
- 5.7.14. WSP has identified the following opportunities as part of this scoping exercise:

⁴⁵ State of Nature. 2019. Available from: <https://www.bto.org/our-science/publications/state-nature-report/state-nature-report-2019>

⁴⁶ State of Nature. 2019. [online] Available at: <https://www.bto.org/our-science/publications/state-nature-report/state-nature-report-2019>

⁴⁷ 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>

- As transport corridors are typically linear, ensuring the connectivity of ecosystems is both an issue and an opportunity for the Transport Strategy. There is scope to encourage the redevelopment of existing assets as well as build new, to focus development away from areas of high biodiversity and ecosystem service provision, and to enhance the quality of the transport 'soft estate' alongside existing and new transport corridors in order to improve habitat connectivity.
- Enhancing the quality of transport 'soft estate' can also help improve the resilience of the transport network to future climate change, for example by reducing flood risk and providing shading and cooling benefits.
- Based on the spatial data available, much of the region's natural capital with the capacity to mitigate some of the negative impacts of transport is ill placed to do so.
- Investing in natural capital within transport 'soft estate' presents an opportunity to deliver the noise and air quality regulation where it is most in demand.
- Human health and quality of life can be improved by taking a natural capital approach to the Transport Strategy. For example, improving the quality of habitats (including tree planting) alongside walking and cycling routes can help encourage more active lifestyles with benefits for people's physical and mental health and wellbeing.
- Views of vegetation from other modes of transport (e.g. along roads and railways) can also enhance mental wellbeing, for example by reducing stress levels.

5.8 LANDSCAPE, TOWNSCAPE AND VISUAL AMENITY

Summary of Current Baseline

- 5.8.1. There are three Areas of Outstanding National Beauty (AONB), detailed on Figure B.6 in Appendix B, within the EEH region, including the:
- Chilterns AONB, South Buckinghamshire, Bedfordshire and Hertfordshire;
 - North Wessex Downs, south of Swindon; and
 - Cotswolds, west of Oxford.
- 5.8.2. 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 Report⁴⁸, commissioned by DEFRA, made a strong recommendation that Chilterns should become England's next National Park.
- 5.8.3. The EEH region falls within a number of Natural England's National Character Areas (NCA), as shown on Figure B.7 in Appendix B and in
- 5.8.4. **Table 5.3** below.

⁴⁸ 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 Accessed on:26/02/2020

Table 5.3 – 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

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

- 5.8.5. Key settlements in the Heartland include Cambridge; Luton; Peterborough; Corby; Kettering; Northampton; Bedford; Hemel Hempstead; St Albans; Hatfield; Welwyn Garden City; Stevenage; Hitchin; Aylesbury; Milton Keynes; Bletchley; Oxford; and Swindon.
- 5.8.6. Between the main towns and cities, dispersed villages and farmsteads are spread across the countryside.
- 5.8.7. Major transport routes include:
- Sections of the M40, M1, and A1(M)
 - Luton Luton Airport, Oxford Airport and Cambridge Airport
 - Sections of the West Coast and East Coast and Midland mainline railway lines
- 5.8.8. 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
 - Cambridge University
 - Cambridge University Botanic Garden
 - Fitzwilliam Museum
 - Anglesey Abbey
 - National nature reserves (21 in total)
 - Three AONBs

Future Trends

- 5.8.9. 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.
- 5.8.10. 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.
- 5.8.11. Similarly, pressures from expanding populations put more strain on existing systems, and more pressure on recreational landscapes and tourist attractions.
- 5.8.12. If the Chilterns was to be granted National Park status, it would be given greater recognition and would create the potential for a more strategic view to be taken on appropriate conservation and development across the whole AONB.

Issues and Opportunities

- 5.8.13. WSP has identified the following issues as part of this scoping exercise:
- Transport infrastructure has the potential to cause direct and indirect impacts on designated landscapes, eroding the character and quality of the landscapes, increasing pollution and eroding the visual amenity for residents and visitors alike.
 - Future growth in some locations could risk compromising landscape and townscape character and features, however a landscape-led design with green infrastructure principles in place, could play a key role in the enhancement of the natural environment, visual amenity and physical and mental health of its people;
- 5.8.14. WSP has identified the following opportunities as part of this scoping exercise:
- The design of transport infrastructure requires a landscape-led approach to design, to ensure the best placement and integration of the proposed development into the existing landscape, especially in sensitive locations. Landscape-led designs can help contribute to the climate change agenda, health and wellbeing, and tackling pollution in all its forms (such as air, light and noise);
 - There is potential for transport to improve access to the countryside, to promote sustainable tourism and to provide greater awareness for the UK's AONBs and other designated areas.
 - Increasing access to the countryside, whilst increasing pressure on those resources, can greatly improve health and wellbeing, help combat air pollution, provide storm water management and reduce flooding (contributing to climate change adaptation) and provide connectivity through urban built form to the countryside for wildlife. It can also bring new audiences to tourist attractions and enable better appreciation of historic assets through creating new views and vistas, providing information and enhancing access; and
 - The incorporation of 'Future Ready' Landscape principles into landscape-led designs would help ensure transport infrastructure is designed for longevity in the 21st century, for both its people and its natural environment.

5.9 HISTORIC ENVIRONMENT

Summary of Current Baseline

- 5.9.1. 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 a Grade II Listed Building.
- 5.9.2. 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.
- 5.9.3. There are a number of designated assets throughout the EEH region including:
- 1392 Scheduled Monuments;
 - 378,853 Listed Buildings;
 - 6 register battlegrounds; and
 - 239 Registered Parks and Gardens⁴⁹.
- 5.9.4. 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 areas⁵⁰ 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 5.4 below.

Table 5.4 - Conservation Areas

LA	Conservation Areas
Bedford	28
Buckinghamshire	183
Cambridgeshire	223
Central Bedfordshire	59
Hertfordshire	157
Luton	5
Milton Keynes	27

⁴⁹ Historic England, Listing Data

⁵⁰ Compiled from Local authority level data

LA	Conservation Areas
Northamptonshire	200
Oxfordshire	252
Peterborough	29
Swindon	28
Total	1191

Future Trends

- 5.9.5. 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.
- 5.9.6. 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.
- 5.9.7. 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

Issues and Opportunities

- 5.9.8. WSP has identified the following issues as part of this scoping exercise:
- Any proposed development (including transport infrastructure) that has the potential to adversely impact on the significance of assets of the highest importance is likely to be refused and strongly resisted in planning.
 - The NPPF does address non-designated assets, and direct physical impacts occur on them. For archaeological resource, the impacts are permanent as they are destroyed.
 - New and/or upgraded transport infrastructure across the EEH region has the potential to affect the survival, fabric, condition and setting of cultural heritage assets (both above and below ground) in addition to increased pressure from population growth.
 - There is potential for development to encroach on locally designated sites or areas of high archaeological value, that do not have the same statutory protection as nationally listed sites.
 - Ancillary features of transport infrastructure can adversely impact upon the setting of historic assets, especially those in urban areas. The Strategy should therefore respect the historic context of the region to sustain the significance of its assets.
 - Highly significant archaeological remains, whether designated or not, normally require preservation in situ. This clearly has implications and can represent a significant constraint to future scheme design, which should respect, retain and protect the remains (e.g. through avoidance and redesign).
 - Vehicle damage and pollution can adversely affect both listed buildings and scheduled monuments, so reducing vehicle movements within historic urban areas is also an important area to address.

5.9.9. WSP has identified the following opportunities as part of this scoping exercise:

- The principle opportunities for the Transport Strategy are for enhancing the understanding and appreciation of the significance of above ground heritage assets. This might be achieved for example, by reducing traffic volume, visibility and noise in the vicinity of a designated heritage asset and reducing existing detrimental effects on setting.
- Asset enhancement has the potential to lead to an increase in tourism and associated revenue, and education opportunities associated with the region's cultural heritage.

5.10 WATER ENVIRONMENT

Summary of Current Baseline

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

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

5.10.2. 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 5.3 below shows water quality data of the 779 waterbodies across the EEH region for 2015⁵¹.

⁵¹ Environment Agency, River Basin Districts, Anglian and Thames [online] Available from: <https://environment.data.gov.uk/catchment-planning/> Accessed on: 17/02/2020

Table 5.5 – Water Quality

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

- 5.10.3. 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.
- 5.10.4. The Anglian River Basin Management Plan, published in 2009 and updated in 2015⁵² states that 13% of the Anglian river basin rivers, canals and surface water transfers should be at good or better overall status by 2021.
- 5.10.5. The Thames River Basin Management Plan, published in 2009 and updated in 2015⁵³ states that 80% of the Thames river basin rivers, canals and surface water transfers should be at good or better status by 2021.
- 5.10.6. 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 planning⁵⁴ shows that the

⁵² 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 Accessed on: 14/02/2020

⁵³ 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 Accessed on: 14/02/2020

⁵⁴Environment Agency, Flood Map for Planning [online] Available at: <https://flood-map-for-planning.service.gov.uk/confirm-location?easting=546289.62&northing=257472.944&placeOrPostcode=cambridge> Accessed on: 14/02/2020

north of Cambridge and most of the east of Peterborough are within a flood zone 3 area; areas of Oxford and Northampton are within flood zone 2 areas.

- 5.10.7. The EA have identified locations where there is believed to be significant flood risk for communities. Within the Heartland, there are four areas that are considered to have significant flood risks for the communities that reside within them. These are located in Northampton, Cambridge, Luton and High Wycombe.
- 5.10.8. The EA 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)⁵⁵.

Future Trends

- 5.10.9. 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.
- 5.10.10. 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.
- 5.10.11. At a regional level, the future implications of climate change projections include: increased coastal and 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).

Issues and Opportunities

- 5.10.12. WSP has identified the following issues as part of this scoping exercise:
- The physical and chemical quality of water resources is an important aspect of the natural environment and can be adversely affected by pollution associated with surface water runoff from new or existing transport infrastructure, as well as by changes to waterbodies which can affect their quality as a habitat;
 - Of the 779 water bodies, just 2% are achieving 'good' status, falling far short of the WFD target;
 - Upgrading existing infrastructure provides the opportunity to improve pollution control on older drainage systems;

⁵⁵ Environment Agency, Groundwater source protection zones, [online] available at: <http://apps.environment-agency.gov.uk/wiyby/37833.aspx> (Accessed on: 19/02/2020)

- Increased development (including transport infrastructure) can increase flood risk on a local and catchment scale; and
- Climate change is likely to increase the occurrence of flooding from all sources and hence raise the flood risk in the EEH region.

5.10.13. WSP has identified the following opportunities as part of this scoping exercise:

- Upgrading existing infrastructure also provides the opportunity to improve pollution control on older drainage systems.
- New transport infrastructure could result in improved drainage, reducing surface water flooding.

5.11 AIR QUALITY

Summary of Current Baseline

- 5.11.1. The latest national emissions statistics, which are for 2016, are quoted in the Clean Air Strategy 2019⁵⁶. Road transport and other transport modes (including rail and shipping) for 2016 contributed 34% and 17% respectively to total national nitrogen oxide (NO_x) emissions, and 12% to particulate matter (PM_{2.5}) 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 NO_x and SO₂ national emissions).⁵⁷ Currently, the most challenging pollutant in terms of limit value compliance is nitrogen dioxide (NO₂).
- 5.11.2. 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 NO_x, 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.
- 5.11.3. Using data records from 156 monitoring sites across various monitoring networks nationwide during 2005-2016, Air Quality Consultants (AQC) reported in January 2018⁵⁸ 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.

⁵⁶ 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 (Accessed on: 19/02/2020)

⁵⁷ 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 (Accessed on: 14/02/2020)

⁵⁸ Air Quality Consultants. 2018. Nitrogen Dioxide and Nitrogen Oxides Trends in the UK 2005 to 2016

- 5.11.4. A Defra statistical release in April 2019⁵⁹ 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.
- 5.11.5. 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)⁶⁰. Defra has reported non-compliance with the long-term objective (relating to human health) for ground level ozone across the EEH area⁶¹. Whilst ozone is not directly emitted by transport sources, transport emissions of volatile organic compounds and NO_x will influence regional ozone levels.
- 5.11.6. 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/will only receive 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

- 5.11.7. 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.
- 5.11.8. 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. Both developments in isolation could have substantial effects on air quality in the EEH region.
- 5.11.9. 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 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 issues⁶².
- 5.11.10. 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

⁵⁹ Defra. 2019. Defra National Statistics Release: Air Quality statistics in the UK 1987 to 2018

⁶⁰ European Environment Agency, Tropospheric Ozone in EU - The consolidated report, [online] available at: <https://www.eea.europa.eu/publications/TOP08-98>

⁶¹ Defra. 2019. Air Pollution in the UK 2018. Available from: <https://uk-air.defra.gov.uk/library/annualreport/index>

⁶² 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

the UK of: NO_x reduced by 72%; PM₁₀ reduced by 73%; SO₂ reduced by 97% and non-methane volatile organic compounds (NMVOCs) reduced by 66%⁶³.

5.11.11. Improved engines and emission standards have helped bring about the reductions in NO_x emissions seen in recent decades. The use of catalytic convertors 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 improvements⁶⁴.

5.11.12. 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. 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 vehicles⁶⁵, 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.

Issues and Opportunities

5.11.13. WSP has identified the following issues as part of this scoping exercise:

- 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 as a result of climate change can contribute to the worsening of air quality.
- Whilst electric cars should have positive effects for air quality in terms of NO₂ reductions, there is concern that electric vehicles, which are currently heavier than ‘conventional’ vehicles, may generate more particulate (PM₁₀) pollution from brake and tyre wear.

5.11.14. WSP has identified the following opportunities as part of this scoping exercise:

- There is the potential that improved transport links will facilitate traffic flows, reduce idling times and thus improving air quality locally. However, an improved highway network could also result in increased usage, thus increasing emissions.
- The UK Government’s plan to end the sale of all new conventional petrol and diesel cars and vans by 2035 and support for work and home-based electric charging facilities, will promote use of hybrid and electric vehicles, with positive effects for air quality.
- The UK Government’s commitment to end diesel haulage on the rail network by 2040.

⁶³ 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

⁶⁴ 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

⁶⁵ Surrey Live. 2018 [online] Available from: <https://www.getsurrey.co.uk/news/surrey-news/guildford-set-first-fleet-electric-15612957>

- Uptake of technological advances such as autonomous vehicles have the potential to further reduce emissions through reduction in the stop start nature of traffic, opening up the possibility of vehicle platooning.
- Air quality issues across the EEH region can be addressed via a modal shift towards less polluting methods of transport (low carbon transport initiatives) and inclusive of active transport (e.g. cycling, walking etc.) thereby leading to a higher standard of air quality.
- Improved traffic management can decrease congestion having a beneficial effect on air quality. This is because “accelerating or decelerating too rapidly leads to inefficient driving and fuel consumption with harmful emissions being released into the environment unnecessarily”⁶⁶.

5.12 CLIMATE CHANGE AND GREENHOUSE GASES

Summary of Current Baseline

- 5.12.1. In 2018, an estimated 33 per cent of carbon dioxide (CO₂) emissions were from the transport sector, 27 per cent from energy supply, 18 per cent from business and 18 per cent from the residential sector⁶⁷. In 2018, transport accounted for 124.4 MtCO₂, equivalent to 28% of total greenhouse gas emissions in the UK, which represents a reduction of 1% compared with 2017 figures⁶⁸.
- 5.12.2. In 2017, a total of 28,833 kt CO₂ emissions were generated in the region⁶⁸. 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 in the region make up 10% of the total emissions in England⁶⁹.
- 5.12.3. During the same period, the average per capita emissions 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 person⁶⁹. 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 tonnes⁶⁸.
- 5.12.4. 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

⁶⁶ NICE. 2016. Available from: <https://www.nice.org.uk/news/article/drive-smoothly-to-reduce-harmful-effects-of-air-pollution-says-nice>

⁶⁷ 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

⁶⁸ 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 Accessed on: 10/02/2020

⁶⁹ 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 (Accessed on: 11/02/2020)

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 1981–2010⁷⁰.

Future Trends

- 5.12.5. The UK is committed to legally binding greenhouse gas emissions reduction targets of 34% by 2020 and 80% by 2050, compared to 1990 levels, as set out in the Climate Change Act 2008. However, more ambitious targets were set in line with the Paris Agreement 2014, 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 2050⁷¹. This means changes to technology as well as ways in which people travel.
- 5.12.6. 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 2019⁷². 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 2020⁷². Other examples include changing travel modes and increasing planning for efficient and reliable public transport infrastructure.
- 5.12.7. 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 extremes⁷³. Both temperature and rainfall the changes will be much larger if greenhouse gas emissions continue to increase.
- 5.12.8. Despite this, the current estimates for temperature increases and changes to rainfall patterns are unlikely to alter significantly in the near future, given the 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.

⁷⁰ 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> (Accessed on: 10/02/2020)

⁷¹ https://ec.europa.eu/clima/policies/strategies/2050_en

⁷² Electric car market statistics, 2020. [online] Available from: <https://nextgreencar.com/electric-cars/statistics/> Accessed on: 10/02/2020

⁷³ 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> (Accessed on: 10/02/2020)

Issues and Opportunities

5.12.9. WSP has identified the following issues as part of this scoping exercise:

- Transport is the largest contributor to greenhouse gas emissions in the UK
- In rural areas particularly, with limited local facilities and fewer public transport services, many people are reliant on private transport which contributes to greenhouse gas emissions.
- There is a need to reduce the environmental impact of prosperity and the provision of infrastructure and housing to accommodate it, and the need to address the vulnerability of the region to ensure resilience.
- The extent of future climate change will be strongly affected by the amount of greenhouse gases that the population chooses to emit.
- There is a lack of baseline for the carbon emissions at a regional level, which may make decarbonisation difficult to measure.

5.12.10. WSP has identified the following opportunities as part of this scoping exercise:

- There is a need to plan for and implement/facilitate climate change adaptation, in respect of rising temperatures, water scarcity and extreme weather events, particularly heavy rainfall/flooding.
- There is a need to support the continued increase in infrastructure to support the demand in electric cars.

5.13 SOIL, LAND USE, RESOURCE AND WASTE

Summary of Current Baseline

- 5.13.1. 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).
- 5.13.2. Sandstone, Limestone, Argillaceous Rocks, Mudstone, Siltstone and Chalk are the common bedrock geology in the EEH region⁷⁴.
- 5.13.3. 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 uses⁷⁵. This exceeds the EU target of 70%, which the UK must meet by 2020.⁷⁶

⁷⁴British Geological Society Maps. [online] Available at: <http://mapapps2.bgs.ac.uk/geoindex/home.html?topic=Minerals>

⁷⁵MRW. 2019. CDE recycling levels. [online] Available from: <https://www.mrw.co.uk/knowledge-centre/do-the-numbers-reflect-true-cde-recycling-levels/10040434.article>

⁷⁶Defra. 2018. UK Statistics on Waste. [online] Available from: <https://www.gov.uk/government/statistical-data-sets/env23-uk-waste-data-and-management>

5.13.4. Defra's landfill capacity figures⁷⁷ show that landfill capacity for the EEH region has been declining and will do so in the absence of future provision.

Future Trends

- 5.13.5. 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.
- 5.13.6. 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.
- 5.13.7. 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.

Issues and Opportunities

- 5.13.8. WSP has identified the following issues as part of this scoping exercise:
- It is important that any future development of the transport network across the EEH region does not have adverse impacts or lead to the degradation or sterilisation of the best and most versatile land, as this is important for the UK's self-sufficiency in food production.
 - Minerals are a finite resource and materials will be required for any new transport infrastructure, with subsequent waste produced.
 - There is currently a large reliance on road transport for importing and exporting minerals across the UK, which is unlikely to change.
- 5.13.9. WSP has identified the following opportunities as part of this scoping exercise:
- Resource efficiency is important in the reduction of waste and conservation of resources.

5.14 NOISE AND VIBRATION

Summary of Current Baseline

- 5.14.1. 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 Viewer⁷⁸ 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 (L_{den} , 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.

⁷⁷ Defra. 2018. [online] Available at: <https://data.gov.uk/dataset/237825cb-dc10-4c53-8446-1bcd35614c12/remaining-landfill-capacity>

⁷⁸ Extrium, 2012. England Noise Map Viewer. [online] Available from: <http://www.extrium.co.uk/noiseviewer.html> Accessed 12 February 2020

5.14.2. 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

5.14.3. 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.

5.14.4. 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 period⁷⁹, this suggests that larger planes are in use or upgauging⁸⁰ 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 2035⁸¹, which will inevitably increase flight numbers resulting in the potential for increase noise levels.

5.14.5. 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.

Issues and Opportunities

5.14.6. WSP has identified the following issues as part of this scoping exercise:

- Increased transport development and infrastructure may adversely impact sensitive receptors and increase current noise levels in areas adjacent to roads, rail lines and airports across the EEH region.
- Excessive noise exposure from transport can cause stress and sleep disturbance and is often perceived as a nuisance. This can result in adverse effects on human health.

⁷⁹ 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> Accessed 13/02/2020

⁸⁰ The process of replacing aircrafts with a different aircraft of the same type, but with a higher seat density

⁸¹ 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> Accessed 13 February 2020

- Transport noise can adversely affect biodiversity including nesting and feeding habits of many species.
- Increased noise exposure can also have negative impacts on designated sites including AONBs, and other designated sites with road, rail or air traffic noise reducing amenity within these areas.

5.14.7. WSP has identified the following opportunities as part of this scoping exercise:

- There exists an opportunity to reforecast the understanding of transport noise profiles and exposure, accounting for the benefits from low-noise electrified road vehicles, quieter aircraft and reactions to climate change, to develop a plan that accounts for the future and realises benefits for the EEH region.

6 SUSTAINABILITY FRAMEWORK

6.1 INTRODUCTION

- 6.1.1. This section sets out the Sustainability Appraisal Framework which will be used in the ISA assessment process. The ISA assessment will involve the appraisal of the transport aspirations and priorities (once finalised), identifying their environmental and social sensitivities and the potential for significant effects from a regional perspective.

6.2 SUSTAINABILITY APPRAISAL FRAMEWORK

- 6.2.1. While not specifically required by the SEA Regulations, sustainability objectives are a recognised way of considering the environmental, social and economic effects of a plan or programme and comparing the effects of alternatives. The objectives are developed using the sustainability issues identified in Section 5. The objectives will be used to assess the options in the Transport Strategy and identify likely sustainability effects.

- 6.2.2. Sustainability objectives were developed using:

- The review of key policy documents;
- The baseline data collation;
- An assessment of future trends; and
- The identification of sustainability issues and opportunities.

- 6.2.3. Table 6.1 below sets out the sustainability objectives that have been created from this Scoping Report.

Table 6.1 – Sustainability Appraisal Framework

Topic	Key Sustainability Issues Identified	Sustainability Objective
Population and Equalities	<ul style="list-style-type: none"> ■ The rural nature of some parts of the region could pose significant challenges in providing good services for all residents. ■ The population of the EEH region is increasing in number, age profile, and ethnic diversity and there will be additional transport movement associated with this growth. ■ The ageing population in the region, is likely to place additional strain on the Region’s services and infrastructure ■ Transport issues affect groups with protected characteristics to varying extents, which can exacerbate the barriers to accessing and using transport 	<p>To increase the capacity, connectivity and efficiency of the transportation network to support demographic changes, including improving access for all groups inclusively, including deprived communities and those in rural isolation</p>
Economy	<ul style="list-style-type: none"> ■ There is a need to improve connectivity of key employment clusters within EEH. ■ Housing affordability pressures are contributing to net out-migration from urban areas to affordable rural areas. 	<p>To provide greater connectivity across the region in order to raise national and international competitiveness and support economic success.</p>
Health	<ul style="list-style-type: none"> ■ The population of the Heartland region is ageing; older people may not have access to appropriate forms of private transport to access healthcare and social care facilities ■ There are some large disparities between levels of physical activity and obesity across the Heartland region ■ There are a high number of emergency admissions for COPD across the Heartland 	<p>To protect and enhance both physical and mental health through better access to public transport, supporting active travel and improving air quality.</p>
Community Safety	<ul style="list-style-type: none"> ■ There are increasing levels of crime on public transport. ■ A number of roads exceed the national average for both serious and fatal casualties 	<p>To promote safe transport through reducing accidents and improving security.</p>

Topic	Key Sustainability Issues Identified	Sustainability Objective
Biodiversity	<ul style="list-style-type: none"> ■ There are a wide range of statutory local, national and international sites designated for nature conservation in the EEH region. ■ Several counties within the EEH region are designated enhancement areas, which aim to restore biodiversity at a landscape scale through maintenance, restoration and creation of priority habitats. ■ There is potential for transport developments to impact protected species and wider biodiversity. 	To protect and enhance protected habitats, species, valuable ecological networks and ecosystem functionality in the region, contributing to biodiversity net gain.
Natural Capital and Ecosystem Services	<ul style="list-style-type: none"> ■ Deterioration in quality, and severance and/or loss of connectivity of ecosystems. ■ Effects on ecosystems with high (potential) ecosystem services provision and/or those close to centres of population. 	To maintain and enhance the provision of ecosystem services from the region's natural capital and contribute to environmental net gain.
Landscape and Townscape	<ul style="list-style-type: none"> ■ Transport infrastructure has the potential to cause direct and indirect impacts on designated landscapes, whilst eroding the character and quality of the landscapes and their characteristic landscapes ■ Significant future growth in some locations could risk compromising landscape and townscape quality, character and visual amenity 	To conserve and enhance the quality of the region's landscapes and townscape character
Historic Environment	<ul style="list-style-type: none"> ■ New and/or upgraded transport infrastructure across the EEH region has the potential to affect the survival, fabric, condition and setting of cultural heritage assets both above and below the ground. ■ There is potential for development to encroach on non-designated sites or areas of high archaeological value. ■ Vehicle damage and pollution can adversely affect both listed buildings and scheduled monuments. 	To protect and enhance the character of the Heartland's built and historic environment.
Water Environment	<ul style="list-style-type: none"> ■ The physical and chemical quality of water resources can be adversely affected by pollution associated with surface water runoff from new or existing transport infrastructure. ■ Just 2% of the region's waterbodies are achieving 'good' status. 	To protect water quality and manage and reduce the risk of flooding from all sources.

Topic	Key Sustainability Issues Identified	Sustainability Objective
	<ul style="list-style-type: none"> ▪ Increased development (including transport infrastructure) can also increase flood risk on a local and catchment scale. ▪ Climate change is likely to increase the occurrence of flooding from all sources and hence raise the flood risk in the EEH region. 	
Air Quality	<ul style="list-style-type: none"> ▪ An improved highway network could result in higher usage increasing emissions. ▪ There are a number of AQMAs across the regions that are failing to comply with the limit value for annual mean NO₂. 	To protect and enhance air quality by reducing transport related emissions.
Climate Change and Greenhouse Gases	<ul style="list-style-type: none"> ▪ Transport is the largest contributor to greenhouse gas emissions in the UK. ▪ In rural areas many people are reliant on private transport. ▪ There is a need to support the continued increase in infrastructure to support the demand in electric cars. ▪ Climate change (extreme heat, flooding and storms) can impact on the quality and safety of transport infrastructure. 	To reduce greenhouse gas emissions, support 2050 decarbonisation initiatives and incorporate climate change adaptation to help maximise resilience.
Soil, Land Use, Resource and Waste	<ul style="list-style-type: none"> ▪ Minerals are a finite resource and materials will be required for any new transport infrastructure, with subsequent waste produced. ▪ Resource efficiency is important in the reduction of waste and conservation of resources. ▪ There is currently a large reliance on road transport for importing and exporting minerals across the UK, which is unlikely to change. 	To ensure the efficient use of land by supporting the use of existing infrastructure, whilst protecting geologically/agriculturally important land and seeking opportunities to deliver a circular economy.
Noise and Vibration	<ul style="list-style-type: none"> ▪ Increased transport development and infrastructure may adversely impact sensitive receptors and increase current noise levels. ▪ Excessive noise exposure from transport can cause stress and sleep disturbance and is often perceived as a nuisance. ▪ Transport noise can adversely affect biodiversity including nesting and feeding habits of many species. 	To reduce exposure to transport related noise and vibration, including noise pollution and annoyance.



Topic	Key Sustainability Issues Identified	Sustainability Objective
	<ul style="list-style-type: none"><li data-bbox="517 264 1386 357">■ Increased noise exposure can also have negative impacts on designated sites including AONBs, and other designated sites with road, rail or air traffic noise reducing amenity within these areas.	

7 NEXT STEPS

- 7.1.1. EEH is seeking the views of statutory bodies and other stakeholders on the scope of the ISA. Consultation at this stage helps to ensure that the ISA will provide a robust assessment of the Transport Strategy.
- 7.1.2. Following consultation on this report, any necessary amendments will be made in responses to consultation comments and a finalised version of the report will be issued.
- 7.1.3. The next step in the ISA is the assessment stage (Stage B) during which emerging options will be assessed.
- 7.1.4. The Transport Strategy timetable is set out in Table 7.1 below. The ISA reports will be available for consultation alongside the draft Transport Strategy as it is prepared.

Table 7.1 – ISA and Transport Strategy Timetable

Transport Strategy Activity	Timeframe
Scoping Consultation	March 2020
Officer Working Group	March and May 2020
Transport Strategy Options produced	March-April 2020
ISA Assessment	March-May 2020
Transport Strategy produced	April-May 2020
Strategic Transport Forum	May and June 2020
ISA Consultation	July-August 2020
Final ISA produced	October 2020
Post Adoption Statement	November 2020



The Forum
Barnfield Road
Exeter, Devon
EX1 1QR

wsp.com

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