Department for Transport

AECOM

Appraisal of Sustainability (AoS) for the Draft Heathrow Expansion National Policy Statement

AoS Report

Department for Transport

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Abbreviations

AoS	Appraisal of Sustainability
ALC	Agricultural Land Classification
ANPS	Airports National Policy Statement
AoS	Appraisal of Sustainability
APA	Archaeological Priority Area
AQMA	Air Quality Management Area
BAP	Biodiversity Action Plan
BMV	Best and Most Versatile
BNG	Biodiversity Net Gain
CNGI	Critical National Growth Infrastructure
DCO	Development Consent Order
DfT	Department for Transport
DWSZ	Drinking Water Safeguard Zone
EIA	Environmental Impact Assessment
EqIA	Equality Impact Assessment
GHG	Greenhouse Gas
GLA	Greater London Authority
HAL	Heathrow Airport Limited
HENPS	Heathrow Expansion National Policy Statement
HIAn	Health Impact Analysis
HRA	Habitats Regulations Assessment
HS2	High Speed Two
HWL	Heathrow West Limited
ICAO	International Civil Aviation Organization
ISEP	Institute of Sustainability and Environmental Professionals
LNR	Local Nature Reserve
MSA	Minerals Safeguarding Area
NO2	Nitrogen Dioxide
NOx	Nitrogen Oxides
RA	Reasonable Alternative
SAC	Special Area of Conservation

SEA	Strategic Environmental Assessment
SINC	Site of Importance for Nature Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
UFP	Ultrafine particles
ULEZ	Ultra Low Emission Zone

1. Introduction

1.1. Aims of the report

1.1.1 The Department for Transport (DfT) has commissioned AECOM to prepare an Appraisal of Sustainability (AoS) to support the preparation and publication of the draft Heathrow Expansion National Policy Statement (HENPS).

1.1.2 The AoS is a systematic process for identifying, describing and evaluating the likely significant social, environmental and economic effects of the draft HENPS, together with the reasonable alternatives considered. It is intended to inform policy preparation by ensuring that sustainability considerations are considered and clearly presented to decision-makers and consultees.

1.1.3 The final HENPS will replace the ANPS designated in 2018. The renaming of the policy statement reflects that the document does not reconsider the appropriate location for additional runway capacity in the South East of England decided in the 2018 Airports NPS. Instead, the Government has considered whether there remains a strong case for expanding hub capacity at Heathrow, via the Heathrow Northwest Runway scheme, that it can meet its four tests and that the requirements it places on an applicant are robust and up to date.

1.1.4 Since the designation of the ANPS in 2018, there have been significant changes in the context relevant to aviation and sustainable development, including strengthened statutory climate change commitments, updates to environmental and public health policy, evolving patterns of aviation demand and advances in evidence. In this context, the preparation of the draft HENPS provides an opportunity to reassess the sustainability implications of the policy framework.

1.1.5 The AoS forms part of a wider suite of technical assessments undertaken to inform the draft HENPS, alongside a Habitats Regulations Assessment (HRA), a Health Impact Analysis (HIAn), an Equalities Impact Assessment (EqIA), and an Environmental Principles Policy Statement (EPPS). Each of these assessments constitutes a distinct process with its own legislative basis, but have drawn on shared baseline information where appropriate to ensure consistency.

1.1.6 A scoping report for the AoS was prepared and consulted upon with the Environment Agency, Historic England and Natural England in February 2026. The scoping report set out the proposed scope and level of detail for the AoS, including the key sustainability considerations, the evidence base, study areas and proposed appraisal framework. Responses received from the consultation have informed the approach taken in this AoS Report.

1.1.7 This presents the appraisal at this stage of the AoS, including an appraisal of the likely significant effects of the draft HENPS and the reasonable alternatives considered during its development. The appraisal is undertaken at a strategic, policy level and does not prejudice subsequent project-level assessments or decision-making. Due to the extent of changes in the revised NPS, the AoS considers the impact of the draft HENPS as a whole document, rather than the impact of individual changes.

1.2. AoS explained

Requirements for AoS

1.2.1 Section 5(3) of the Planning Act 2008 requires that an "*appraisal of the sustainability of the policy set out in the statement*" must be carried out before a National Policy Statement can be designated. The same requirement applies where an NPS is amended (section 6(6)).

1.2.2 The AoS also fulfils the requirements of the Environmental Assessment of Plans and Programmes Regulations 2004 (as amended) (the SEA Regulations), which implement the SEA Directive as assimilated into UK law. In accordance with Government guidance, an integrated appraisal process has been undertaken to meet both the procedural requirements of SEA and the wider objectives typically addressed through an AoS.

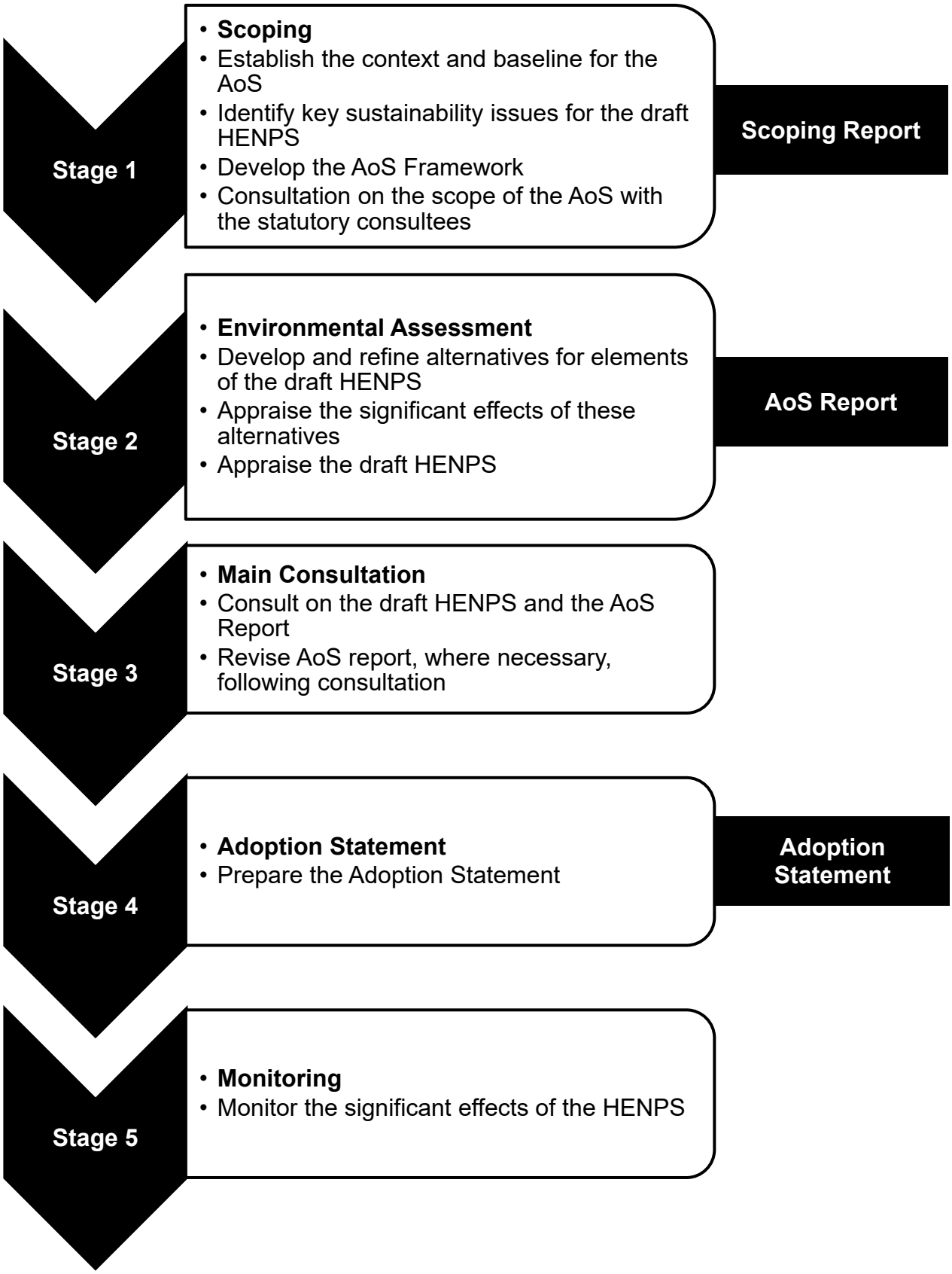
1.2.3 The main purpose of the AoS is to examine the likely significant social, environmental and economic effects of the proposed policy, together with reasonable alternatives. Where potential significant adverse effects are identified, the AoS considers opportunities for avoiding, reducing or mitigating such effects, and highlights options for enhancing beneficial effects. In doing so, the AoS helps to inform the preparation of the HENPS in a manner consistent with the objectives of sustainable development.

1.2.4 The AoS is therefore both an analytical and communicative tool. It informs policy-making directly through structured, evidence-based appraisal, and indirectly by providing stakeholders with information on potential effects to support effective consultation and engagement.

1.2.5 The approach to the AoS follows relevant Government guidance for SEA and sustainability appraisal. While there is no bespoke national guidance specifically for AoS of NPS, the process adopted reflects established good practice and is undertaken in a series of stages, as illustrated in **Figure 1-1**.

1.2.6 It should be noted that the AoS does not determine whether development consent should be granted for any individual project. Instead, it provides a strategic-level assessment of the sustainability implications of the policy framework set out in the draft HENPS. Any proposal brought forward under the final HENPS would remain subject to detailed project-level assessment, consultation and decision making in accordance with the Planning Act 2008 and other relevant legislation.

Figure 1-1: Stages of the AoS



Relationship with other processes

1.2.7 The AoS will be accompanied by the following separate studies: Equalities Impact Assessment (EqIA); Health Impact Analysis (HIAn); and Habitats Regulations Assessment (HRA).

1.2.8 The development of the draft HENPS has been informed by an iterative appraisal process, through which the findings of the AoS, EqIA, HIAn, and HRA have influenced and helped refine the evolving policy framework. This has supported the strengthening of environmental and social considerations throughout the document.

Habitats Regulations Assessment (HRA)

1.2.9 Under the Conservation of Habitats and Species Regulations 2017 (as amended), as well as the Conservation of Offshore Marine Habitats and Species Regulations 2017 (together known as the 'Habitats Regulations'), consideration must be given to the potential effects of a plan or policy on European sites. HRA determines whether a policy is likely to have a significant effect and, if so, whether an Appropriate Assessment is required. Initial screening and subsequent review of screening conclusions have been undertaken alongside the AoS to reflect the evolving policy position. While HRA is a legally separate process from the AoS, the two assessments have been progressed iteratively, with information shared to ensure consistency.

Equalities Impact Assessment (EqIA)

1.2.10 Public bodies have a duty under the Equality Act 2010 to have due regard to the need to eliminate discrimination, advance equality of opportunity, and foster good relations between different groups. EqIA is a separate process to the AoS, but the AoS can support or complement it by identifying distributional effects across population groups.

Health Impact Analysis (HIAn)

1.2.11 An HIAn provides a systematic analysis of how a plan, policy or proposal may impact health across the population, including vulnerable groups. The findings support decision-makers by providing an evidence-based understanding of potential health impacts.

1.2.12 The AoS can provide information on potential health effects, including impacts on communities and quality of life, which can inform or complement a standalone HIAn.

1.3. Requirements Associated with the Strategic Environmental Assessment (SEA) Regulations

1.3.1 As highlighted above, AoS is undertaken to address the procedures prescribed by the Environmental Assessment of Plans and Programmes Regulations 2004 ('the SEA Regulations') and widens the scope of the assessment from focusing on environmental issues to further consider social and economic issues.

1.3.2 Two key procedural requirements of the SEA Regulations are that:

- when deciding on '*the scope and level of detail of the information*' which must be included in the AoS Report, there is a consultation with nationally designated authorities concerned with environmental issues (stage 1 in **Figure 1-1**); and
- a report (the 'AoS Report') is published for consultation alongside the draft HENPS that presents an appraisal of "*the plan and reasonable alternatives*" with a particular focus on appraising "*significant effects*" (Regulation 12(2)). In the context of an AoS for an NPS, this function is fulfilled by the AoS Report (stage 2 in **Figure 1-1**).

1.3.3 More specifically, the AoS Report must answer the following **three questions**:

- What has policy-making / AoS involved **up to this point**?
  - Including appraisal of reasonable alternatives.
- What are the AoS findings **at this stage**?
  - i.e. in relation to the draft policy.
- What are the **next steps**?

1.3.4 The report must then be taken into account, alongside consultation responses, when finalising the draft HENPS.

1.3.5 For further detail on compliance with the SEA Regulations, see **Tables A-1** and **A-2** in **Appendix A**.

1.4. Structure of this report

1.4.1 This AoS Report aims to present all of the information required of the AoS Report and so is structured in **three parts** in order to answer each of the questions set out above in turn, specifically:

- Part 1 – explains work to date including work to explore reasonable alternatives.
- Part 2 – presents an appraisal of the draft HENPS as currently published for consultation.
- Part 3 – discusses next steps for the draft HENPS and AoS.

1.4.2 Ahead of Part 1, there is a need for two further introductory sections:

- Section 2 – introduces the draft HENPS scope.
- Section 3 – introduces the AoS scope.

2. The HENPS

2.1. Introduction

2.1.1 This chapter provides an overview of the scope and context of the draft Heathrow Expansion National Policy Statement (HENPS). It describes the role of the draft HENPS within the planning and consent regime, outlines the policy background to its preparation, and explains the geographic, sectoral and temporal scope of the policy.

2.1.2 The purpose of this chapter is not to assess the effects of the draft HENPS, which are considered in later parts of this AoS Report, but to provide the necessary contextual understanding to inform the appraisal that follows.

2.2. Context to policy preparation

2.2.1 National Policy Statements are designated under the Planning Act 2008 to provide the primary basis for decision making on applications for development consent for nationally significant infrastructure projects. In the aviation sector, the ANPS (2018), established the Government's strategic policy framework for addressing future airport capacity and associated infrastructure where proposals fall within its scope.

2.2.2 The ANPS was designated in June 2018 following extensive analysis by the Airports Commission and subsequent Government consideration. The Airports Commission, established in 2012, undertook a comprehensive assessment of the UK's future aviation capacity needs and concluded that additional runway capacity was required in the South East of England to maintain the UK's connectivity and international competitiveness, identifying expansion through an additional Northwest runway at Heathrow Airport as the preferred strategic option.

2.2.3 Since the designation of the ANPS, significant global, policy and legislative changes have taken place. New environmental and climate obligations have been introduced, patterns of travel have changed, and other airports have received planning approval to expand. Changes to the NPS process have also been introduced, including a requirement to review and update NPSs at regular intervals. The Government has therefore decided to review the Airports NPS to reflect these changes and ensure it aligns with the Government's tests for Heathrow expansion in relation to climate change, noise, air quality and economic growth across the country.

2.2.4 In this context, the Government decided to update and strengthen the policy framework set out in the ANPS and to clarify its scope. This process has resulted in the preparation of the draft HENPS, which will replace the 2018 ANPS. In doing so, the Government has reviewed the continued need for new airport capacity at Heathrow, taking into account updated passenger demand forecasts, an updated appraisal of expansion through a Northwest Runway, and modelling of wider economic impacts.

2.2.5 This review confirms that there remains a clear need for new airport capacity, driven by capacity constraints across the London and South East airport system and Heathrow's position as the busiest two-runway airport in the world, which has been operating at or near full capacity for over 20 years.

2.2.6 The Government has also confirmed that Heathrow continues to play a critical role as the UK's principal hub airport, supporting international connectivity and economic growth.

2.2.7 The preparation of the draft HENPS does not, therefore, revisit the strategic decision taken in 2018 regarding the location for additional hub capacity in the South East of England, but reflects the Government's conclusion that there is still a clear need for new airport capacity at Heathrow through a Northwest Runway. The review instead considers whether and how the updated policy framework for expansion at Heathrow Airport remains consistent with current policy objectives and legal requirements.

2.2.8 This defined policy scope has important implications for the appraisal of reasonable alternatives within the AoS (see **section 6**). In light of the Government's conclusion that there remains a clear need for expansion at Heathrow, the AoS does not re-examine alternative locations for new hub capacity, but instead focuses on alternative policy approaches, growth assumptions and mitigation measures capable of influencing the nature, scale and effects of expansion at Heathrow Airport.

2.3. Purpose and role of the HENPS

2.3.1 The draft HENPS sets out the Government's policy in relation to the provision of additional airport capacity within its defined scope. It establishes the policy framework against which applications for development consent for infrastructure covered by the final HENPS in the future will be examined and determined under the Planning Act 2008.

2.3.2 The draft HENPS does not in itself grant development consent. Rather, it provides guidance to applicants, examining authorities and the Secretary of State on the matters that are considered important and relevant when assessing applications, including the types of impacts that should be addressed and the principles that should inform mitigation and decision making. Any application brought forward under the final HENPS in the future would remain subject to a separate statutory process, including consultation, examination and project-level assessment.

2.3.3 In accordance with the Planning Act 2008, where an NPS has effect and is relevant to an application, the Secretary of State is required to decide the application in accordance with the NPS unless specific statutory exceptions apply.

2.4. Geographical scope

2.4.1 The draft HENPS applies to development located in England and is concerned with infrastructure at Heathrow Airport and its immediate and wider areas of influence. However, given the strategic role of Heathrow Airport within the UK aviation network, the potential effects of the policy may extend beyond the immediate area.

2.4.2 In preparing the AoS, consideration has therefore been given to the need to assess impacts at appropriate spatial scales, including local, regional and national levels. Where relevant, potential effects on other parts of the UK have been taken into account, recognising that while aviation policy is largely a reserved matter, certain aspects of planning, environmental policy and surface access are devolved.

2.5. Sectoral scope

2.5.1 The draft HENPS focuses on the provision of runway and airport infrastructure necessary to deliver additional aviation capacity at Heathrow Airport. While the policy is concerned primarily with aviation infrastructure, it also has implications for related sectors, including ground transport, construction, employment and environmental management.

2.5.2 The AoS considers these interactions where they give rise to social, economic or environmental effects that are relevant at a strategic level. The appraisal does not extend to detailed consideration of operational or design matters that would be addressed through project-level assessment.

2.6. Policy timeframe and review

2.6.1 The draft HENPS provides a long-term policy framework for infrastructure that is expected to be required over an extended period. The policy, once finalised, will remain in force until it is withdrawn, amended or replaced, and is subject to periodic review in accordance with the Planning Act 2008, as amended by the Planning and Infrastructure Act 2025, and associated legislation.

2.6.2 The long-term nature of the draft HENPS means that there is inherent uncertainty associated with future conditions, including technological change, demand patterns and environmental constraints. The AoS recognises this uncertainty and takes it into account by adopting a proportionate, strategic approach to assessment and by highlighting the importance of monitoring and future review.

2.6.3 The AoS also considers the temporal scope of effects, distinguishing between construction, operational and longer-term effects over the lifetime of development, as well as short-, medium- and long-term timescales where relevant.

2.7. Implications for the AoS

2.7.1 The scope and nature of the draft HENPS shape the approach taken in the AoS. In particular:

- The site-specific focus of the draft HENPS informs the definition of reasonable alternatives considered in the appraisal;
- The strategic role of the draft HENPS determines the level of detail that is appropriate for assessment, with the AoS focusing on strategic level effects rather than detailed project design; and
- The long-term and adaptive nature of the policy framework highlights the importance of considering uncertainty and monitoring as part of the appraisal.
- A precautionary approach has been applied, whereby the assessment takes a cautious view of predicted effects, particularly where there is potential for significant adverse environmental effects.

2.7.2 These considerations are reflected in the AoS methodology and framework, which are introduced in **Chapter 3**.

3. The AoS scope

3.1. Introduction

3.1.1 The scope of the AoS defines the breadth of sustainability issues, objectives and themes that are considered when assessing the likely significant effects of the draft HENPS and the reasonable alternatives examined. The AoS scope provides the framework through which conclusions are reached regarding potential effects, including their nature and significance.

3.1.2 The AoS scope relates specifically to the appraisal process. It should be distinguished from:

- the scope of the draft HENPS itself, which is described in **Chapter 2**; and
- the scope of reasonable alternatives, which is discussed in **Part 1** of this report.

3.1.3 This chapter introduces the scope of the AoS and explains how it has been defined, refined and applied to the appraisal. More detailed information on the initial development of the scope is provided in the AoS Scoping Report, which was consulted upon in February 2026.

3.2. Consultation on the AoS scope

3.2.1 In accordance with the SEA Regulations, when determining the scope and level of detail of the information to be included in the AoS Report, the responsible authority must consult the designated consultation bodies with environmental responsibilities.

3.2.2 A scoping report for the AoS was prepared and issued for consultation to Natural England, the Environment Agency and Historic England in February 2026. The Scoping Report set out:

- the proposed AoS themes and objectives;
- the baseline information to be used in the appraisal;
- the spatial study areas proposed for different AoS themes; and
- the methodology for identifying and evaluating likely significant effects.

3.2.3 Responses received from consultees (see Appendix A in the Scoping Report: Technical Annex) have been reviewed and used to inform updates to the AoS scope and framework (discussed in section 3.3). The revised Scoping Report is published alongside this AoS Report and reflects refinements to the scope, baseline information and appraisal framework arising from the scoping consultation.

3.2.4 In addition, wider engagement has been undertaken with relevant Government departments and arm's length bodies during preparation of the AoS, including through circulation and review of draft material, reflecting the focused scope of the ANPS review.

3.2.5 The AoS scope has remained sufficiently flexible to respond to:

- the emerging content of the draft HENPS;
- the development of reasonable alternatives; and
- updates to the available evidence base.

3.3. Defining the AoS framework

Purpose of the framework

3.3.1 The primary output of the scoping stage was the development of an AoS framework. The framework provides a structured means of appraising the draft HENPS and reasonable alternatives in a consistent, transparent and proportionate manner. The framework was informed by the identification of key sustainability issues through review of plans, programmes and policies, together with analysis of baseline conditions and key environmental and socio-economic constraints.

3.3.2 The AoS framework is designed to:

- ensure that all relevant sustainability issues are considered;
- focus the appraisal on themes where significant effects are likely to arise at a strategic policy level; and
- facilitate comparison between alternatives and the emerging policy.

3.3.3 The framework comprises a set of sustainability objectives, grouped under a defined number of AoS themes. These themes reflect, and build upon, the themes identified in Schedule 2 (6) of the SEA Regulations, while also incorporating wider social and economic considerations typically addressed through sustainability appraisal. The use of objectives and supporting appraisal questions provides a consistent structure for identifying and evaluating effects, and reflects established good practice in SEA and sustainability appraisal.

AoS themes and objectives

3.3.4 Following consultation and refinement, the framework was refined to take account of responses received from statutory consultees. The Scoping Report was subsequently finalised in April 2026.

3.3.5 Since the finalisation of the Scoping Report, the framework has been subject to further minor refinements to improve clarity, consistency and alignment with the draft HENPS and the evolving evidence base.

3.3.6 The AoS framework comprises 11 AoS themes, under which a total of 18 sustainability objectives are defined. The themes and objectives have been tailored to reflect the nature and scope of the draft HENPS, including its site-specific focus and strategic role in infrastructure planning.

3.3.7 The AoS themes are:

- Air Quality
- Biodiversity
- Climate Change
- Communities and Quality of Life
- Economy
- Historic Environment
- Landscape
- Noise
- Resources and Waste
- Soil
- Water

3.3.8 Each theme is supported by one or more sustainability objectives that reflect the desired sustainable outcomes relevant to the draft HENPS. These objectives are accompanied by a series of supporting questions, which guide the appraisal by identifying how the policy or an alternative may influence each objective. The appraisal questions are used to inform a balanced judgement rather than determine outcomes in isolation, and responses are considered collectively across objectives in reaching an overall assessment of likely significant effects.

3.3.9 The full AoS framework is presented in **Table 3-1**.

Table 3-1: The AoS framework

AoS Theme	AoS Objective	Supporting Questions (Will the option/proposal...:)
 Air Quality	• To minimise emissions from airport-related activities within a promoter's control and influence, and to avoid exacerbating existing air quality issues, in order to support compliance with international, national and local air quality objectives.	• …minimise air pollutant emissions arising from activities within the promoter's control or influence, including airport operations, construction activities and associated surface access? • …avoid worsening existing air quality conditions or delaying progress towards compliance with air quality objectives in the Heathrow area? • …reduce exposure to air pollution for local communities and sites designated for nature conservation during construction and operation, (including over the longer term), recognising areas already sensitive to air quality impacts? • …support wider efforts by relevant authorities to improve air quality, without relying on actions outside the airport's control to offset airport-related emissions?
 Biodiversity	• To protect and enhance designated sites for nature conservation. • To conserve and enhance undesignated habitats, species, irreplaceable habitats, valuable ecological networks and ecosystem functionality, and support the delivery of Biodiversity Net Gain.	• …affect the internationally, nationally and locally designated biodiversity sites? • …lead to adverse significant effects on the internationally designated South West London Waterbodies SPA and Ramsar? • …conserve and enhance undesignated habitats, priority habitats and species, internationally and nationally protected species, and the ecological networks that support them? • …have a measurably positive impact on the delivery of the London Local Nature Recovery Strategy? • … increase the exposure of wildlife to transport noise, air pollution, and water pollution during construction and operation (including over the longer term)?

AoS Theme	AoS Objective	Supporting Questions (Will the option/proposal...:)
		• …result in changes to water quantity (including abstraction, flow, drainage and hydrological regimes) that could affect water-dependent habitats and species? • … increase the occurrence of bird strikes in relation to aviation activity surrounding Heathrow?
 Climate Change	• To minimise carbon emissions in airport construction and operation, including flight emissions. • To minimise risks to the whole life cycle of the site from all sources of flooding and ensure resilience to climate change.	• …be consistent with overall carbon budget requirements? • …minimise carbon emissions associated with surface transportation, air travel, construction, and operation? • …reduce fluvial, surface and groundwater flood risk on and off site? • …increase the resilience of Heathrow and the surrounding area to the likely impacts of climate change over the longer term, including through the incorporation of nature-based solutions? • …affect the intensity and occurrence of the Urban Heat Island effect at Heathrow Airport?
 Communities and Quality of Life	• To avoid or minimise negative effects on community viability, including housing, facilities and indirect effects. • To avoid or minimise disproportionate impacts on any social group. • To maintain and where possible improve the quality of life for local residents and the wider population.	• …lead to a loss of housing and community facilities? • …lead to increasing demand for housing and community facilities? • …lead to indirect effects on community viability? • …minimise disproportionate negative effects on particular locations, users or vulnerable groups? • …help to maintain and improve quality of life? • …lead to the loss of publicly accessible greenspace or reduce access to recreational areas? • …result in physical or perceptual severance that affects community connectivity, access to services or ease of movement?

AoS Theme	AoS Objective	Supporting Questions (Will the option/proposal...:)
Economy	• To maximise economic benefits and to support the competitiveness of the UK economy. • To promote employment and economic growth in the local area and surrounding region	• …enhance economic growth across the country? • …contribute to sustainable growth in employment? • …support the productivity of the UK economy? • …deliver inclusive economic benefits for local communities? • …incorporate accessibility improvements, particularly with key local employment centres and areas of high unemployment? • …support growth and diversification of the local economy?
Historic Environment	• To conserve and where possible enhance the historic environment including buildings, structures, townscapes and landscapes and archaeological remains.	• …affect the significance of internationally and nationally designated heritage assets and their settings? • …affect the significance of non-designated heritage assets and their settings? • … conserve and, where possible, enhance the historic environment including landscapes, townscapes, buildings, structures, and archaeological remains by supporting high-quality design and sensitive integration with local character? • …harm the significance of heritage assets (for example from the generation of noise, pollutants and visual intrusion)? • …promote high-quality design that reinforces local character? • …increase the risk to the continued viable use of heritage assets with consequent loss of their significance? • …ensure that, where heritage assets are affected by development, they are effectively investigated, recorded and the resulting information disseminated in a proportionate manner, deposited in the Historic Environment Record, and made publicly available?

AoS Theme	AoS Objective	Supporting Questions (Will the option/proposal...:)
 Landscape	• To promote the protection and improvement of landscapes, townscapes, waterscapes and the visual resource, including areas of tranquillity and dark skies.	• … be sensitively designed to protect and enhance nationally and locally designated landscape, townscape and waterscape character and quality, including National Landscapes, in line with the statutory duty to further their purposes? • …lead to impact on sensitive views? • …lead to a loss of tranquillity and increase in light pollution? • …lead to the loss of parcels of the London Area Green Belt? • …contribute to coalescence between settlements? • …create opportunities to enhance local landscape and townscape quality?
 Noise	• To minimise and where possible reduce noise impacts on human receptors.	• …avoid or reduce the harmful effects including annoyance due to exposure to noise?
 Resources and Waste	• To minimise consumption of natural, particularly virgin non-renewable, resources. • To minimise the generation of waste in accordance with the principles of the resource efficiency hierarchy. • To protect sites designated for geodiversity.	• …minimise the consumption of natural resources? • …promote and enable circular economy principles, including the reuse, recovery and recycling of materials during construction and operation? • …support innovation in sustainable construction, such as the use of low-carbon materials or recycled aggregates? • …minimise waste generated during construction and operation? • …preserve, protect and improve geodiversity? • … avoid or reduce the sterilisation of known mineral resources of local or national importance?

AoS Theme	AoS Objective	Supporting Questions (Will the option/proposal...:)
		• …avoid the loss of existing waste processing capacity, or ensure suitable replacement provision is secured where displacement is unavoidable?
 Soil	• To minimise loss of undeveloped soils and protect soils against erosion, contamination and degradation.	• …maximise construction on previously developed land, minimise use of greenfield land (including higher quality category agricultural land)? • …lead to the disturbing, harm, contamination or loss of soil/land resources? • …support the remediation of contaminated land? • …create opportunities to enhance soil health or restore degraded soils? • …embed nature-based solutions to protect ecosystem services provided by soils? • …avoid disturbing historic landfill sites or, where unavoidable, ensure appropriate mitigation is in place to avoid adverse effects?
 Water	• To protect and enhance the quality of surface and ground waters, and promote the efficient use of water resources.	• …lead to surface and groundwater quality being adversely affected during construction and operation (including over the longer term)? • …result in the modification of watercourses? • …support the identification, monitoring and remediation of contaminated groundwater, including legacy contamination associated with existing or former airport activities (such as per- and polyfluoroalkyl substances), and avoid the mobilisation of contaminants? • …lead to an increase in the consumption of available water resources?

AoS Theme	AoS Objective	Supporting Questions (Will the option/proposal...:)
		• …support opportunities for ecological or chemical water quality enhancement of local waterbodies? • …incorporate appropriate drainage and water management measures, including nature-based solutions where runoff is uncontaminated, and suitable treatment or proprietary systems where contamination risks are present, to protect water quality, enhance ecological status and increase resilience to drought and flooding? • …promote water efficiency and reduced consumption?

3.4. Scope of effects considered in the AoS

Types of effects

3.4.1 The AoS considers the likely significant effects of the draft HENPS and reasonable alternatives, including:

- beneficial and adverse effects;
- direct and indirect effects;
- cumulative effects; and
- short-, medium- and long-term effects.

3.4.2 Given the strategic, policy level nature of the draft HENPS, the AoS does not seek to predict effects with the level of detail that would be expected for a specific development proposal. Instead, the appraisal focuses on identifying the direction, magnitude and potential significance of effects, drawing attention to areas of risk, uncertainty or dependency on future decisions.

3.4.3 The appraisal is informed by the evidence base available at the time of preparation, including technical studies, baseline data and published policy and guidance. Given the strategic, plan-level nature of the draft HENPS, the assessment does not draw on detailed scheme design, and instead relies on indicative information and reasonable assumptions regarding the scale and nature of development likely to be brought forward. As such, the appraisal identifies the likely direction and relative significance of effects, rather than predicting precise outcomes. Uncertainty is inherent at this level, and, where relevant, is highlighted in the appraisal, particularly where effects are dependent on subsequent design, mitigation or operational controls to be developed at later stages.

Spatial Scope

3.4.4 The spatial scope of the AoS varies by theme and reflects the geographic scale at which different effects are likely to occur. For some themes, such as noise and historic environment, effects are likely to be more localised. For others, such as climate change and the economy, effects may occur at regional, national or international scales.

3.4.5 The identification of appropriate spatial study areas has taken account of:

- the site-specific nature of the draft HENPS;
- the strategic role of Heathrow Airport within the UK aviation system; and
- the potential for effects to extend beyond the immediate airport boundary.

Part 1: Appraisal of reasonable alternatives

4. Introduction to Part 1

4.1. Overview: appraising reasonable alternatives

4.1.1 The appraisal of 'reasonable alternatives' is a key element of the AoS process to meet the requirements of the SEA Regulations. The SEA Regulations state that the Environmental Report (which is the main output of the SEA process, and is represented by the AoS Report for the draft HENPS) should "*identify, describe and evaluate the likely significant effects on the environment of – (a) implementing the plan or programme; and (b) reasonable alternatives taking into account the objectives and geographical scope of the plan or programme*."

4.1.2 The SEA Regulations are not prescriptive as to what constitutes a reasonable alternative. However, the appraisal undertaken through the AoS should focus on the key choices to be made through the draft HENPS, whilst also recognising the broad character and scope of the draft HENPS as a strategic-level policy building on the 2018 ANPS.

4.1.3 In accordance with the SEA Regulations the AoS Report must include…

- An outline of the reasons for selecting the alternatives dealt with; and
- The likely significant effects on the environment associated with alternatives / an outline of the reasons for selecting the strategic approach in light of alternatives appraised.

4.1.4 This part of the AoS Report therefore discusses the reasonable alternatives that have been considered through the AoS process, and the findings of the appraisal. In this context:

- **Section 5** explains the reasons for selecting the alternatives dealt with;
- **Section 6** presents an appraisal of the reasonable alternatives; and
- **Section 7** explains DfT's reasons for selecting the strategic approach for the draft HENPS.

4.1.5 Presenting this information aligns with the requirement for the AoS Report to present an appraisal of reasonable alternatives and *"an outline of the reasons for selecting the alternatives dealt with"*.

5. Defining reasonable alternatives

5.1. Context for alternatives assessed

5.1.1 With regards to the overall aims and objectives of the draft HENPS, the scope to consider reasonable alternatives through the AoS is shaped by a number of factors.

5.1.2 The 2018 ANPS established the strategic policy position in support of a third runway at Heathrow Airport. In preparing the draft HENPS, the Government has not revisited that strategic decision. Instead, the policy framework has been updated and strengthened following a review of the continued need for additional airport capacity, taking into account updated passenger demand forecasts, capacity constraints across the London and Southeast airport system, and Heathrow's role as the UK's principal hub airport. This review confirms that there remains a clear need for new airport capacity and that expansion at Heathrow continues to be the most appropriate location for further expansion in the Southeast of England.

5.1.3 As such, the AoS considers reasonable alternatives within the context of this defined policy scope, including ensuring the Government's four tests for expansion in relation to economic growth, climate change, air quality and noise are set and could be met, although responsibility will rest with the promoter to meet these through any DCO.

5.1.4 In January 2025 the Government stated that it would support proposals for a third runway at Heathrow Airport, with a commitment to ensuring that airport expansion is delivered in line with the UK's legal, environmental and climate obligations. In response, in June 2025, DfT invited proposals for a Heathrow third runway. Seven proposals were received, and an assessment process was undertaken in summer 2025.

5.1.5 In October 2025 the Transport Secretary launched the ANPS review and announced that a scheme promoted by the Arora Group / Heathrow West Limited (henceforth known as 'Arora / HWL') and a scheme promoted by Heathrow Airport Limited (HAL) remained under active consideration and that the DfT would be seeking further information on the two proposed schemes. The Transport Secretary then announced in November 2025 that, following receipt of further information and a comparative assessment of the two schemes, the Government's view was that the north-west runway scheme brought forward by HAL offered the most credible and deliverable option and, as such, this scheme would inform the ANPS review.

5.1.6 Although a scheme has been selected to inform the draft HENPS, given the Arora / HWL scheme was considered in the final stages of the selection for the scheme to inform the ANPS review, it is appropriate for the HWL scheme to be considered as a reasonable alternative through the AoS.

5.1.7 The reasonable alternatives are also being considered in the context of Heathrow Airport being the UK's only hub airport, giving it a unique national role as an international competitor. These were conclusions from the Airports Commission work, which analysis has built on, including through an updated assessment of the capacity constraints facing the sector and the potential for Heathrow expansion to help increase capacity.

5.1.8 In addition, the reasonable alternatives are being considered within the framework of the agreed overall programme objective to enable the delivery of a third runway at Heathrow, with an ambition for an operational runway by 2035. This reflects the Government's recognition of the need to increase airport capacity to support economic growth, international connectivity and resilience within the aviation sector. In defining reasonable alternatives, regard has been had to proportionality, feasibility, and relevance to the stated programme objective. Alternatives have been considered where they could credibly deliver additional hub capacity of equivalent strategic function and scale.

5.1.9 Options that were either incapable of meeting the programme objective, or which would result in impacts materially more severe than the proposed approach, have been screened out at an early stage. This approach is consistent with SEA requirements to assess reasonable alternatives rather than all conceivable options.

5.2. Current basis for the alternatives considered

AoS undertaken for the 2018 ANPS

5.2.1 In preparing the AoS to support the draft HENPS, regard has been had to the AoS undertaken to inform the 2018 ANPS. The 2018 AoS provides important context for the evolution of reasonable alternatives within aviation capacity policy.

5.2.2 The basis for the alternatives considered through the 2018 AoS was the shortlisting of proposals for alleviating aviation capacity problems undertaken by the Airports Commission (AC) between 2013 and 2015. The AC initially invited proposals for alleviating future aviation capacity problems in 2013, resulting in a total of 58 long-listed proposals. A six-step process was subsequently undertaken, culminating in a series of recommendations for the long list of schemes considered.

5.2.3 The final sift identified two existing airports as credible locations for an additional runway: Gatwick and Heathrow. At Gatwick, the AC committed to further consideration of a new runway to the south of the existing runway. At Heathrow, two alternative expansion proposals were carried forward: a new runway to the northwest of the existing runways, and the extension of the current northern runway to create a runway of double length.

5.2.4 Reflecting this process and final sift, the previous AoS considered the following three alternatives:

- **Heathrow Northwest Runway scheme:** Would consist of a new, full-length runway of at least 3,500 m, constructed to the north-west of the current northern runway at Heathrow, sitting further to the west than the existing runways. This was with a view to allowing an operating capacity of at least 740,000 flights departing and arriving per year. Other new infrastructure or reconfiguration of existing infrastructure, including new terminals, would also potentially be provided to serve the new runway;
- **Gatwick Second Runway scheme:** Would consist of a new full-length runway to the south of the existing runway at Gatwick Airport (of around 3,400m), with a separation between the runways of 1,045 m. While the exact detail of scheme design would be determined via the planning process, the shortlisted design also proposed a new terminal building to the south of the existing South Terminal, together with a new pier and satellites. The new runway was forecast to enable a proposed operating capacity of 560,000 flights departing and arriving per year; and
- **Heathrow Extended Northern Runway scheme:** Would extend the existing northern runway to the west, creating two separate 3,000 m runways with a 650 m safety zone between the two. The runways would be used for departures and arrivals at the same time, effectively operating as two separate runways. The scheme also proposed a new terminal building to the west of the current terminal area and was forecast to provide an operating capacity of 700,000 flights departing and arriving per year.

5.2.5 The Gatwick Second Runway and Heathrow Extended Northern Runway schemes were both considered to be credible and feasible options by the AC and were subject to detailed comparative assessment. The AC concluded, however, that while Gatwick presented a plausible case for expansion, it was less well suited to delivering the type of additional long-haul and hub capacity most urgently required. In the case of the Heathrow Extended Northern Runway scheme, although it offered certain advantages in relation to cost and land take, the AC identified a number of areas where it performed less strongly than the Northwest Runway option, including overall capacity, operational resilience, noise distribution and air quality.

5.2.6 In addition, the AoS acknowledged proposals for a potential **Thames Estuary Airport**. In considering these proposals, the AC identified a number of potential advantages and disadvantages. Advantages included regenerative benefits for deprived areas of Essex and Kent, enabling the expansion of London eastwards, and a substantial reduction in the number of people affected by noise compared to Heathrow. Disadvantages included economic impacts on west London resulting from the loss of Heathrow, significant habitat loss and impacts on wildlife (including the Thames Estuary and Marshes SPA and Ramsar site), impacts on the setting of cultural heritage and landscape assets, and the loss of existing housing and challenges in delivering replacement communities.

5.2.7 In setting out its recommendations, the AC's Final Report concluded that the Thames Estuary scheme would be "*unfeasibly expensive, highly problematic in environmental terms and would be hugely disruptive for many businesses and communities*". The AC therefore concluded that it did not represent a credible scheme for shortlisting and was not considered a reasonable alternative to assess through the AoS.

5.2.8 Accordingly, this updated AoS does not reconsider these alternatives, as the strategic decision regarding the location and nature of additional hub capacity has been established.

Other alternatives considered for the draft HENPS

5.2.9 As highlighted above, in early 2025 the Chancellor invited proposals for a third runway at Heathrow Airport, which led to seven proposals being received in July 2025. These were assessed against published criteria by DfT, HM Treasury and associated technical and financial advisers. Five proposals were assessed as not suitable to inform the HENPS, leaving the schemes promoted by Arora / HWL and HAL as the only proposals that remained under active consideration. Given that the five proposals assessed as not suitable did not meet the criteria, and therefore could not meet the programme objective, they can therefore be discounted as reasonable alternatives for the purposes of the AoS.

5.2.10 A no expansion scenario is also not considered a reasonable alternative. As set out above, in undertaking the ANPS review, the Government has reviewed the need for new airport capacity at Heathrow and concluded that there is still a clear need due to capacity constraints facing the sector, the need to maintain an international competitive hub airport, wider passenger, economic, and freight benefits and for increased resilience. Given this conclusion, the NPS establishes a strategic need for expansion at Heathrow, and a no expansion scenario does not, therefore, represent a reasonable alternative that would meet the programme objective.

5.2.11 Other alternatives which have been considered, but discounted as not being appropriate to assess through the AoS, include as follows:

Operating Heathrow as a 24-hour airport

5.2.12 Operating Heathrow as a 24-hour airport has been considered and ruled out as reasonable alternative. While such an approach could increase movements it would fundamentally undermine long-established policy commitments to night noise protection and would give rise to severe and unavoidable impacts on health, quality of life and local communities, significantly exceeding the impacts assessed and accepted in the designated ANPS. As such, it cannot be considered a reasonable or sustainable alternative within the scope of this AoS.

Increasing capacity at Heathrow without the delivery of a new runway

5.1.20 Increasing capacity through operational optimisation or incremental infrastructure changes has been considered and ruled out. Assessment demonstrates that such approaches would not deliver additional hub capacity at the scale required to meet the programme objective, nor would they provide the resilience and operational flexibility inherent in a three-runway hub airport. It is considered a maximum total capacity of 540,000 ATMs could be achieved through operational optimisation, for example, through mixed-mode operations, compared to around 755,000-770,000 ATMs with a third runway.

Phasing

5.2.13 Consideration was also given to whether alternative approaches to phasing airport delivery could represent a reasonable alternative. For example, bringing forward the development of the runway in different phases, and phasing the use, length and capacity increases of the runway, with capacity coming online later than planned in the current proposal. However, the consideration of phasing options is deemed too detailed from a reasonable alternatives perspectives, and the draft HENPS will set out detail about what level of phasing is deemed compatible with the NPS.

5.2.14 In this respect, alternative phasing will be more appropriately tested through the options appraisal undertaken as part of the Environmental Impact Assessment accompanying any DCO application.

5.2.15 For the reasons set out above, these options are therefore not considered reasonable alternatives for the purposes of appraisal.

Reasonable alternatives to inform the appraisal

5.2.16 As a result of the above considerations, the AoS has focused on the Arora / HWL scheme as the only reasonable alternative to the Northwest Runway proposal capable of delivering additional hub capacity at Heathrow in a materially different way. The Arora / HWL scheme falls within the same strategic location, responds to the same programme objective, and presents a sufficiently distinct design solution to warrant comparative appraisal.

5.2.17 The reasonable alternatives assessed through this AoS for the draft HENPS are therefore:

- **Scenario 1**: An alternative reflecting the Arora / HWL scheme; and
- **Scenario 2:** An alternative reflecting the Heathrow Airport Limited (HAL) scheme.

5.2.18 Additional detail relating to these two scheme options is presented in **Table 6-1** (see **section 6**).

6. Appraisal of reasonable alternatives

6.1. Introduction

6.1.1 The purpose of this chapter is to appraise the reasonable alternatives identified and introduced under the AoS framework (see **Chapters 4 and 5**). The appraisal is undertaken to identify the relative sustainability performance of each alternative and to inform the development of the draft HENPS.

6.1.2 The appraisal is carried out at a strategic, policy level. It does not seek to determine the acceptability of any individual option in planning terms, nor does it pre-judge the outcome of any future DCO decision.

6.2. Appraisal methodology

6.2.1 Under each sustainability theme, the appraisal seeks to evaluate the likely significance of effects arising from the draft HENPS and the reasonable alternatives, using the significance framework set out in **Table 6-1**.

6.2.2 The determination of significance is based on professional judgement, applied at a strategic level. This approach is consistent with guidance published by the Institute of Sustainability and Environmental Professionals (ISEP) on appraisal methodologies associated with environmental appraisals. In making this judgement, the appraisal considers the nature and characteristics of the effect, and, where appropriate, combines the relative value, importance or sensitivity of the receptor with the likely magnitude of the impact upon that receptor.

6.2.3 The significance matrix (**Table 6-1**) provides a structured framework to support this judgement and to promote consistency across the appraisal.

6.2.4 The appraisal considers effects during both construction and operation, including over the short-, medium- and long-term, and takes into account the potential for cumulative effects and changes in baseline conditions where relevant.

6.2.5 For the purposes of this AoS, effects assessed as **major or moderate** are considered to be **significant (indicated by '--' or '++')**. Effects assessed as **minor (indicated by '-' or '+') or negligible ('0')** are **not considered significant** in the context of the appraisal. **Uncertain** effects are indicated by **'?'**.

Table 6-1: Significance matrix and shading key

Receptor importance or sensitivity	Adverse			Magnitude of impact	Beneficial			Mixed effects
	High	Medium	Low	Negligible	Low	Medium	High	
High	Major (--)	Major (--)	Moderate (--)	Negligible (0)	Moderate (++)	Major (++)	Major (++)	Mixed (++/-)
Medium	Major (--)	Moderate (--)	Minor (-)	Negligible (0)	Minor (+)	Moderate (++)	Major (++)	Mixed (++/--)
Low	Moderate (--)	Minor (-)	Minor (-)	Negligible (0)	Minor (+)	Minor (+)	Moderate (++)	Mixed (+/-)
Negligible	Negligible (0)	Negligible (0)	Negligible (0)	Negligible (0)	Negligible (0)	Negligible (0)	Negligible (0)	Mixed (+/--)

6.3. Assumptions

6.3.1 The appraisal of reasonable alternatives is based on a number of simplifying assumptions that reflect the strategic nature of the AoS and the level of information available at this stage of the process.

6.3.2 No detailed mitigation measures have been applied as part of the reasonable alternatives appraisal. This is intended to allow a clear comparison of the underlying sustainability implications of each alternative. Detailed mitigation measures, including avoidance, reduction and compensation, would be developed, refined and secured at subsequent stages through the DCO process and project-level Environmental Impact Assessment (EIA), where design, operational controls and regulatory requirements would be taken into account.

6.3.3 For the purposes of this appraisal, the number of flights and overall emissions are assumed to be the same under each RA scenario, due to the similarities in capacity that both schemes would allow. The appraisal therefore focuses on differences in scheme configuration, land take and interaction with the receiving environment, rather than differences in aviation demand or traffic growth.

6.3.4 The determination of significance for the reasonable alternatives appraisal is undertaken relative to a 'no-expansion' scenario, in which Heathrow Airport continues to operate with two runways. This provides a consistent reference point for assessing the effects of expansion for both the Arora / HWL scheme and HAL scheme. The baseline incorporates reasonable assumptions about future changes in technology, operations and policy, including improvements in aircraft efficiency and emissions performance over time. As such, differences in effects between scenarios reflect the additional impacts associated with expansion, rather than changes that would occur in the baseline in any case.

6.3.5 The significance of effects for each scheme is therefore determined against the no-expansion scenario. The supporting commentary then compares the performance of the two schemes against each other.

6.3.6 Two scheme scenarios are considered. **Scenario 1** reflects the Arora / HWL scheme, and **Scenario 2** reflects the HAL scheme. These scenarios represent the schemes considered in the final stages of the selection for the scheme to inform the ANPS review.

6.3.7 The schemes informing the appraisal of reasonable alternatives are drawn from the following proposals:

- **HWL / Arora**: 'Expanding Heathrow' (Summer 2025)'; and 'Heathrow West Limited's Response to Department for Transport's Request for Information (2025)'; and
- **HAL scheme**: 'Proposal for the Expansion of Heathrow Airport' (31 July 2025); and 'Heathrow Airport Limited response to Government request for additional information (2025)'.

6.3.8 Potential changes to flight paths are not assessed as part of the reasonable alternatives appraisal. Flight path design would be determined through the airspace modernisation process and is subject to a high degree of uncertainty at this stage. Including flight path differences would therefore introduce speculation that would not be appropriate for a strategic policy level appraisal.

6.4. Introduction to the schemes

6.4.1 **Table 6-2** provides a high-level comparison of the two scheme scenarios appraised as reasonable alternatives in this AoS. The purpose of the table is to summarise the principal characteristics of each scheme in descriptive terms, in order to provide context for the theme-by-theme appraisal that follows.

6.4.2 The comparison highlights key differences in scheme configuration, land take and interaction with the surrounding environment. It does not assess sustainability performance or imply any preference between schemes. Detailed assessment of effects is undertaken in subsequent sections using the AoS framework.

6.4.3 The figures for each of the Arora / HWL and HAL schemes are also provided in **Figure 6-1** and **Figure 6-2**, respectively.

Table 6-2: Comparison of the Arora / HWL and HAL schemes (as provided by promoters)

Theme	Arora / HWL Scheme: 'Expanding Heathrow' (Summer 2025) and 'Heathrow West Limited's Response to Department for Transport's Request for Information (2025)'	HAL Scheme: 'Proposal for the Expansion of Heathrow Airport' (31 July 2025) and 'Heathrow Airport Limited response to Government request for additional information (2025)'
Financing	• 100% privately financed (with surface access improvements potentially requiring public funding contribution)	• 100% privately financed (with surface access improvements potentially requiring public funding contribution)
Runway length	• Approx. 2.8 km	• Up to 3.5 km
Proposed air traffic capacity	• Approx. 769,420 air traffic movements per year	• Approx. 756,000 air traffic movements per year
Proposed passenger capacity	• Over 142 million passengers per year**	• Up to 150 million passengers per year**
Terminal development	• New Terminal 6 (T6) with capacity of approx. 40 million passengers per annum	• New Western Terminal Campus (TX5), composed of a processing terminal and a satellite terminal, with capacity of approx. 40 million passengers per annum • Reconfiguration and expansion of Terminal 2, replacing Terminal 3
Indicative programme	• Third runway operational by 2035 • Terminal and supporting infrastructure delivered in phases beyond initial runway opening	• Third runway operational by 2035 • New terminal campus delivered in the years following runway opening
Impact to road network	• Crossing of the M4 Spur Road • Tunnel of the A4 beneath the M25	• Major realignment of the M25 • Realignment of the A4 and A3044

Theme	Arora / HWL Scheme: 'Expanding Heathrow' (Summer 2025) and 'Heathrow West Limited's Response to Department for Transport's Request for Information (2025)'	HAL Scheme: 'Proposal for the Expansion of Heathrow Airport' (31 July 2025) and 'Heathrow Airport Limited response to Government request for additional information (2025)'
	• Removal of Junction 14a and modification of Junction 14 of the M25 • New bridge over the M25 for the A3044	• Modifications to Junctions 14 / 14a of the M25 and Junction 4 of the M4
Public transport proposals	• New public transport hub serving the western terminal area • Design allows for future rail connections but does not commit to specific new rail schemes	• New public transport interchange • Assumes additional rail connections from the west and/or south to meet mode share targets • Increased bus and coach provision, including a new southern road tunnel with bus priority
Car parking approach	• New northern and southern car parks providing up to approx. 36,000 spaces	• Approx. 30,000 additional car parking spaces proposed
Residential property impact	• Approx. 858 residential properties subject to compulsory purchase (including 29 properties owned by Arora / HWL). An additional 56 residential properties may be required for compulsory purchase to enable construction	• Approx. 756 residential properties subject to compulsory purchase (including 105 properties owned by HAL), with a proposed Home Relocation Support Service
Non-residential property impact	• Approx. 696 non-residential properties impacted (this figure **includes** properties owned by Arora / HWL)	• Approx. 1,219 non-residential properties impacted (this figure **excludes** properties owned by HAL)
Communities identified as affected	• Longford, Harmondsworth, Sipson and Harlington	• Longford, Harmondsworth and Sipson

Theme	Arora / HWL Scheme: 'Expanding Heathrow' (Summer 2025) and 'Heathrow West Limited's Response to Department for Transport's Request for Information (2025)'	HAL Scheme: 'Proposal for the Expansion of Heathrow Airport' (31 July 2025) and 'Heathrow Airport Limited response to Government request for additional information (2025)'
Community, business and facility impact	• Loss of commercial and industrial land including hotels and small businesses • Loss of entire villages • Loss of educational facilities • Loss of an immigration removal centre • Relocation of British Airways Headquarters • Loss of listed buildings	• Loss of commercial and industrial land including hotels and small businesses • Loss of entire villages • Loss of educational facilities • Loss of an immigration removal centre • Relocation of British Airways Headquarters Loss of listed buildings • Relocation of existing waste management facilities
River and flooding measures	• Diversion of rivers and drainage features • Relocation of attenuation ponds and water infrastructure • Proposal states compliance with the ANPS flood risk and water quality requirements	• Diversion of rivers and drainage features • Relocation of attenuation ponds and water infrastructure • Commitment to drainage design informed by Environment Agency standards and flood risk assessment
Decarbonisation approach	• Focus on delivering net-zero carbon terminal buildings; acknowledges continued carbon emissions from aviation	• Refers to a Net Zero Plan, with an ambition to reach net zero by 2050 across aviation, ground operations and buildings
Indicative scheme cost*	• Approx. £23.9 billion (as stated by promoter). The proposal may be reliant on additional capital investment to upgrade existing infrastructure to achieve purported benefits.	• Approx. £49 billion (as stated by promoter), comprised of £21 billion for the third runway and £27 billion for new and upgraded terminals and supporting infrastructure

** Cost figures are as reported in promoter documentation and are subject to refinement through detailed design and consents.*
*** Both promoters assumed different numbers of passengers per ATM.*

Figure 6-1: Arora / HWL scheme (from the Proposal for the Expansion of Heathrow Airport Final Report – 31 July 2025)

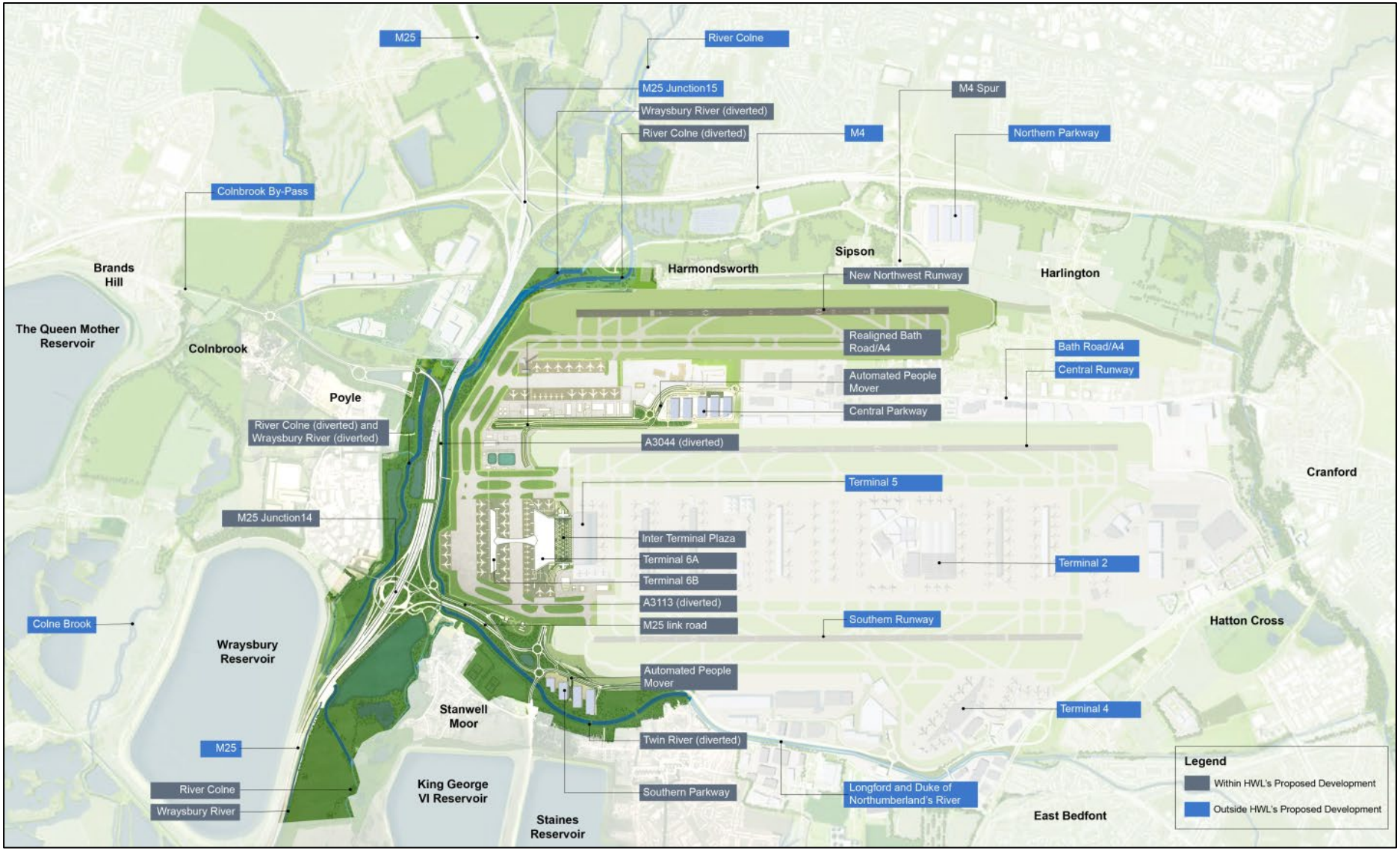
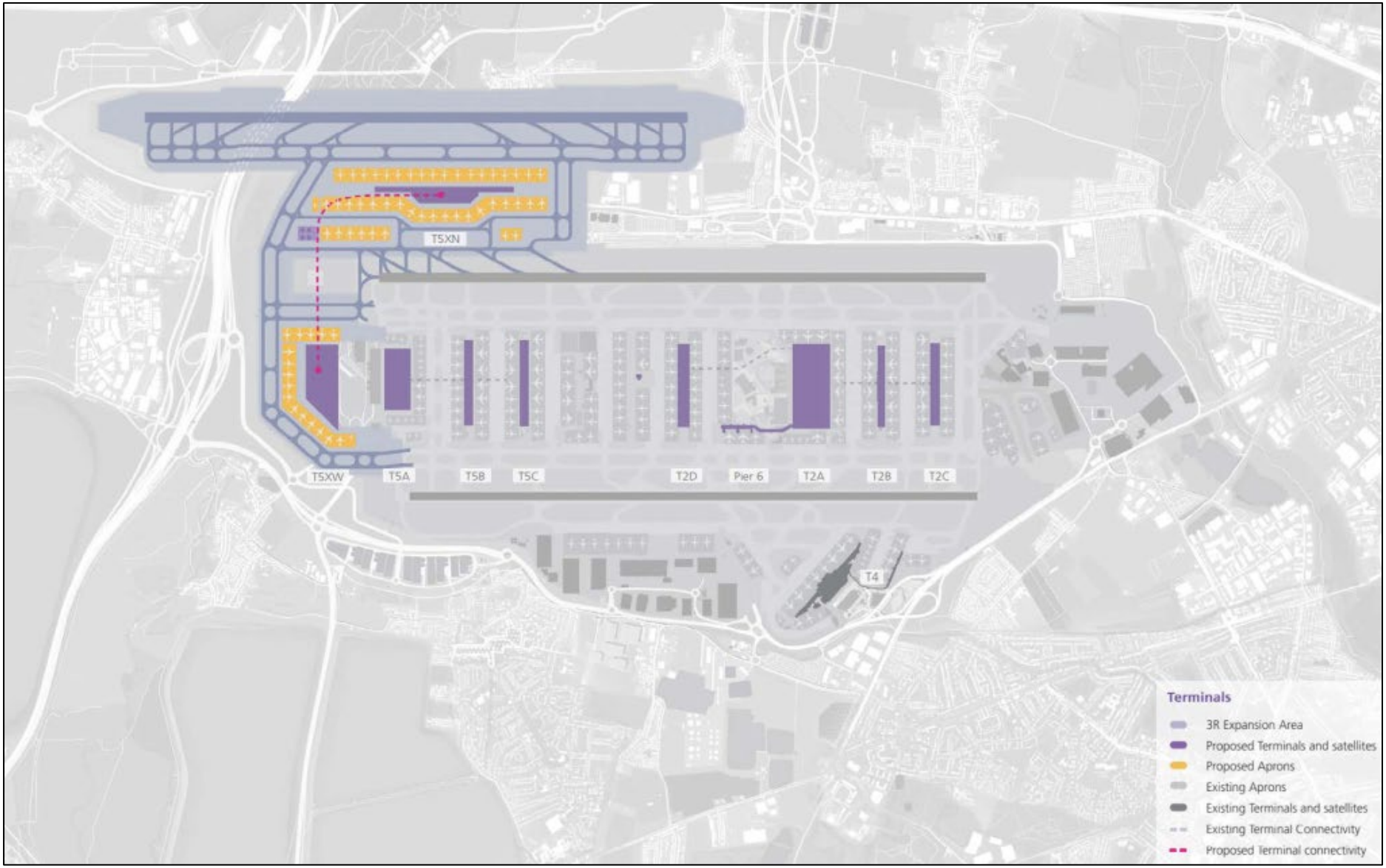


Figure 6-2: HAL scheme (from the 'Expanding Heathrow' proposal report – Summer 2025)



Air quality

	Scenario 1: Arora / HWL	Scenario 2: HAL
Significance	--	--

Context and baseline sensitivity

6.4.4 The area around Heathrow has a history of air quality issues, with large parts declared as Air Quality Management Areas (AQMAs), including the Hillingdon AQMA, Hounslow AQMA, Spelthorne AQMA and South Bucks AQMA No.2, which have all been designated primarily due to historical exceedances of annual mean nitrogen dioxide (NO2) objectives, with particulate matter (PM10 and PM2.5) also representing an important component of local air quality effects. These exceedances arise from a combination of airport-related activity, strategic road network and local road traffic, freight movements and surrounding urban development. Large residential populations (including groups with higher sensitivity to adverse air quality effects, such as children and the elderly), community facilities, and designated biodiversity sites are located within, or in proximity of, these areas already experiencing elevated pollutant concentrations.

6.4.5 Recent improvements in background air quality have been recorded in the area around Heathrow, bringing emissions to within UK Annual Limit guidelines. This progress is largely driven by vehicle fleet renewal, the expansion of the Ultra Low Emission Zone (ULEZ) and wider emissions-reduction policies. However, ongoing compliance remains sensitive to change, and incremental increases in emissions could hinder or delay improvement, particularly along key surface access corridors.

Comparison of effects

Scenario 1: Arora / HWL

6.4.6 The Arora / HWL scheme is characterised by a more consolidated physical footprint and a configuration that limits the geographic spread of development activity. While the overall scale of airport operation and aviation demand is assumed to be similar to the HAL scheme, the Arora / HWL layout may influence where and how air quality effects are experienced.

6.4.7 Compared to a no-expansion scenario, the Arora / HWL scheme would be expected to give rise to additional emissions of nitrogen oxides (NOx) and particulate matter from aircraft operations, airside activities and surface access movements associated with airport expansion. At a strategic level, the scale of these emissions is expected to be broadly comparable to the HAL scheme, reflecting similar levels of aviation activity and surface access demand. Construction activity would also result in temporary increases in dust and particulate emissions. However, these construction effects are of short duration and are not expected to be a primary driver of air quality effects at a strategic level. The more compact configuration and reduced land take relative to the HAL scheme may limit the spatial extent of construction-phase air quality effects, and the number of sensitive receptors exposed to the highest intensity of construction and operational emissions.

6.4.8 The Arora / HWL scheme would require changes to the local road network, with the majority of works located within the Hillingdon AQMA and parts of the Spelthorne AQMA. These works could result in short-term adverse air quality effects during construction and traffic management activities. Over the longer term, the road realignment has the potential to improve traffic flow and limit congestion in certain locations, which may provide minor localised operational air quality benefits. However, these potential benefits would occur alongside increased overall airport-related traffic and there remains the potential for transboundary air quality effects extending into neighbouring AQMAs.

6.4.9 The Arora / HWL scheme proposes a runway alignment that is located further to the east compared with the HAL scheme. This brings the main runway and associated airside activity closer to a greater number of residential areas (including Harlington and Hayes). While the overall scale of aircraft operations is assumed to be similar to the HAL scheme, this eastward shift has implications for air quality, as emissions from aircraft ground movements, taxiing and associated airside activity would occur in closer proximity to sensitive residential receptors.

6.4.10 Taking account of the existing air quality issues and the absence of mitigation at this stage, the Arora / HWL scheme is assessed as resulting in **major (--) adverse effects** on air quality. This reflects the increase in emissions associated with aviation activity and surface access traffic.

6.4.11 The Arora / HWL proposal includes plans intended to promote efficient surface access and lower-emission operation. These measures are not taken into account in the reasonable alternatives appraisal but would be relevant to the assessment of mitigation and residual effects at subsequent stages.

Scenario 2: HAL

6.4.12 The HAL scheme involves a larger physical footprint and more extensive land take, with associated implications for construction activity, road realignments and interaction with the surrounding transport network. As with the Arora / HWL scheme, overall emissions are assumed to be driven primarily by aviation activity and surface access movements, with broadly comparable levels of traffic and aircraft-related emissions across both scenarios. Although total flight numbers and overall emissions are assumed to be similar across the two scenarios, the HAL configuration is more likely to generate wider spatial exposure to construction-phase dust and particulate emissions, reflecting the scale and duration of infrastructure delivery (including the longer runway and more extensive motorway realignment works).

6.4.13 As with the Arora / HWL scheme, road realignment could give rise to temporary adverse air quality effects during construction, with a substantial proportion of works located within existing AQMAs designated for NO2 exceedances. While some longer-term improvements to traffic flow may arise in specific locations, these would occur alongside increased overall traffic demand associated with expansion, and there remains the potential for transboundary impacts on air quality across neighbouring AQMAs.

6.4.14 The more westerly location of the proposed runway under the HAL scheme may influence the spatial distribution of airport-related emissions. When compared to the Arora / HWL scheme, this could reduce exposure in some areas to the east (such as Harlington and Hayes), but would also introduce increased activity closer to receptors to the west.

6.4.15 Overall, the HAL scheme is also assessed as resulting in **major (--) adverse effects** on air quality, primarily reflecting the scale of additional emissions associated with increased aviation activity and surface access movements.

6.4.16 The HAL proposal includes detailed commitments relating to passenger and colleague modal shift, cleaner fleets, cleaner fuel, emissions-based charging, and greater use of zero-emission vehicles. These measures are not considered at this stage but would be addressed through subsequent policy development and project-level assessment.

Summary of effects

6.4.17 At a strategic level, both schemes are expected to give rise to similar increases in emissions associated with aviation activity and surface access traffic, which represent the principal drivers of air quality effects. While the Arora / HWL scheme may offer some advantages in terms of a more compact footprint and reduced spatial extent of construction and operational activity, this is balanced by its runway alignment being located closer to established residential communities to the east, increasing the potential for local exposure to emissions.

6.4.18 Conversely, the HAL scheme may reduce exposure in some of these eastern locations, but would introduce effects over a wider area, including to receptors to the west. As such, differences between the schemes relate primarily to the spatial distribution of effects rather than the overall scale of emissions.

6.4.19 Overall, both schemes are assessed as resulting in **major (--) adverse effects** on air quality, with no clear or material difference in performance between the two at this strategic stage.

Biodiversity

	**Scenario 1: Arora / HWL**	**Scenario 2: HAL**
Significance	**--**	**--**

Context and baseline sensitivity

6.4.20 The local biodiversity context around Heathrow is highly sensitive. The airport lies within an area containing a network of internationally, nationally and locally designated sites, alongside priority habitats, ecological networks and protected species. Internationally designated sites, including Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites, are located within ecological connectivity range of the airport, alongside Sites of Special Scientific Interest (SSSIs), Local Nature Reserves (LNRs) and Sites of Importance for Nature Conservation (SINCs).

6.4.21 Baseline conditions are characterised by cumulative pressures arising from urbanisation, transport infrastructure, aviation activity, air quality, noise, hydrology and recreational disturbance. While designated sites benefit from policy and legislative protection, many habitats and species remain vulnerable to incremental change. In addition, the area supports large populations of bird species, including those associated with internationally designated wetland sites, increasing sensitivity to habitat change, ecological disturbance and changes in hydrological conditions.

Comparison of effects

Scenario 1: Arora / HWL

6.4.22 The Arora / HWL scheme is characterised by a more consolidated layout and reduced land take relative to the HAL scheme. This has implications for the scale and distribution of habitat loss, fragmentation and disturbance affecting biodiversity around the airport.

6.4.23 The scheme would also result in direct habitat loss, including areas of woodland Biodiversity Action Plan (BAP) priority habitat, and would directly affect the Lower Colne SINC at Harmondsworth Moor, although the extent of loss and disturbance is expected to be more limited than under the HAL scheme. This will also result in indirect effects on remaining habitats in the area, including barrier effects and changes to habitat connectivity.

6.4.24 Disturbance from construction activity would also temporarily affect habitats designated sites (including the South West London Waterbodies Ramsar and SPA sites) from noise, lighting and increased human activity. However, the more compact footprint and scale of the scheme, along with its more easterly location, may limit the extent of direct habitat loss and fragmentation affecting ecological corridors and local ecological networks, when compared to the HAL scheme.

6.4.25 The Arora / HWL scheme would also require significant diversions of watercourses (including the River Colne, Wraysbury River, Longford River and Duke of Northumberland's River), which would likely have adverse implications for aquatic and riparian habitats and for ecological connectivity along river corridors.

6.4.26 In addition, the presence of large bird populations in the wider area means that changes in land use or habitat management as a result of the scheme could influence bird behaviour and distribution, with implications for both biodiversity and aviation safety.

6.4.27 Taking account of the sensitivity of the baseline and the strategic nature of the proposals, the Arora / HWL scheme is assessed as resulting in **major (--) adverse effects** on biodiversity. Although the configuration reduces the extent of impact in relative terms, the loss and disturbance of habitats, river diversions and increased pressure on designated sites would still represent a major adverse effect at a strategic level.

6.4.28 The Arora / HWL proposal includes plans intended to support biodiversity enhancement and management. These measures are not taken into account in this appraisal but would be considered as part of mitigation and compensation at later stages.

Scenario 2: HAL

6.4.29 The HAL scheme involves a larger physical footprint and more extensive land take than the Arora / HWL scheme, with direct implications for habitats, ecological networks and species. The scheme's configuration would result in a greater area of land being affected by construction and operation, increasing the scale of both direct and indirect biodiversity impacts.

6.4.30 At a strategic level, the HAL scheme is more likely to lead to:

- greater direct loss of designated habitats and undesignated habitats that contribute to local ecological networks;
- increased fragmentation and severance of ecological corridors; and
- wider disturbance effects affecting species through noise, lighting and human activity during both construction and operation.

6.4.31 The scale of land take for the additional runway would lead to the loss of larger areas of woodland BAP priority habitat, and would result in a substantially greater loss of land within the Lower Colne SINC, when compared with the Arora / HWL scheme.

6.4.32 As with the Arora / HWL scheme, the HAL scheme would also involve extensive diversion of rivers and watercourses (likely including the River Colne, Wraysbury River, Longford River and Duke of Northumberland's River), resulting in potential adverse effects on aquatic and riparian habitats and ecological connectivity.

6.4.33 The proximity of the HAL scheme to internationally and nationally designated sites, including the South West London Waterbodies SPA and Ramsar site and associated SSSIs, increases the risk of adverse effects from disturbance, displacement and changes in habitat function. This risk is heightened by proposed infrastructure works, including diversion of the M25 (which are not included in the Arora / HWL scheme), within and in proximity to these designated areas.

6.4.34 Specifically, the scheme would bring the M25 slightly closer to Westbury Reservoir (which is within the South West London Waterbodies SPA and Ramsar site, and is a standalone SSSI), increasing disturbance effects at this site. The motorway realignment would also move M25 Junction 14 further east, which would result in direct adverse effects on Staines Moor SSSI, resulting in the partial loss of land within the designated site.

6.4.35 While bird strike risk would be managed through operational controls, changes in habitat availability and configuration could also influence bird movements and ecological behaviour at a wider scale.

6.4.36 Given the direct effects to nationally and locally designated sites, extent of land take, river diversion and the sensitivity of surrounding ecological assets the HAL scheme is assessed as resulting in **major (--) adverse effects** on biodiversity. The scale and spatial extent of impacts are greater than for the Arora / HWL scheme, increasing the likelihood of adverse effects on designated sites, ecological networks and species.

6.4.37 The HAL proposal includes plans for habitat creation and enhancement, including the provision of a landscaped green loop. These measures are not applied in the reasonable alternatives appraisal but would be addressed through subsequent policy development and project-level assessment.

Summary of effects

6.4.38 Both of the proposed schemes are expected to result in **major (--) adverse effects** on biodiversity at a strategic level. This reflects the high sensitivity of the baseline, the loss of priority habitats, significant river diversions and the scale of development required to deliver additional runway capacity at Heathrow.

6.4.39 However, differences in layout and land take mean that the HAL scheme presents a greater biodiversity risk. Its direct effects on a SSSI, larger footprint, potential for more extensive river diversions and closer interaction with designated sites increase the likelihood of more extensive habitat loss, fragmentation and disturbance. The Arora / HWL scheme performs more favourably in relative terms but would still result in **major (--) adverse effects** on biodiversity that would need to be addressed through mitigation and compensation at later stages.

Climate change

	**Scenario 1: Arora / HWL**	**Scenario 2: HAL**
Significance	**--**	**--**

Context and baseline sensitivity

6.4.40 The climate change context relevant to the two scheme scenarios is defined by the UK's legally binding commitment to achieve net zero greenhouse gas (GHG) emissions by 2050 and the inclusion of the UK's share of international aviation emissions in the Sixth Carbon Budget, all subsequent carbon budgets, and the net zero target. Aviation is a significant contributor to national emissions, and expansion at Heathrow would occur within a legislative framework requiring that whole-economy emissions (including those from aviation) are managed within increasingly constrained limits.

6.4.41 In parallel, the Heathrow area is already exposed to climate-related risks associated with flooding, extreme weather and rising temperatures, reflecting its low-lying topography, extensive hard surfacing and proximity to multiple watercourses. Climate change is expected to increase the frequency and severity of these risks over the lifetime of any new runway development, increasing the importance of resilience and adaptation in scheme design, location and operation.

Comparison of effects

Scenario 1: Arora / HWL

6.4.42 The Arora / HWL scheme is characterised by a comparatively more compact configuration, which has implications for both greenhouse gas emissions and climate resilience. For climate change mitigation, the scheme would facilitate a substantial increase in aviation activity and associated surface access movements, resulting in increased GHG emissions relative to a no-expansion scenario.

6.4.43 At a strategic level, emissions would arise from several key sources, including:

- aircraft and airport operations (including at the new terminal);
- surface access movements by passengers, staff and freight; and
- construction activities associated with new runway, terminal and supporting infrastructure delivery.

6.4.44 While overall aviation-related emissions are assumed to be the same as under the HAL scheme, the Arora / HWL configuration may influence the scale and duration of construction-related emissions. The more compact footprint and reduced extent of infrastructure may limit emissions associated with temporary works, material movements and land clearance when compared with a more extensive development.

6.4.45 In relation to climate change adaptation, the Arora / HWL scheme would introduce new infrastructure into an area already exposed to flood risk and heat-related pressures. However, much of the proposed runway and associated infrastructure lies outside areas of higher flood risk, with relatively limited interaction with Flood Zones 2 and 3. The consolidated layout may also reduce the extent of new hard-surfaced areas and limit interference with hydrological systems, which may assist, in relative terms, with managing surface water runoff and flood risk. Nonetheless, the scheme would increase exposure to climate-related hazards over the long term.

6.4.46 Taking account of the increase in aviation-related emissions, the construction of new terminal infrastructure, and the exposure of new assets to future climate hazards, and in the absence of mitigation at this stage, the Arora / HWL scheme is assessed as resulting in **major (--) adverse effects** on climate change, in relation to both climate change mitigation and adaptation.

6.4.47 The Arora / HWL proposal includes plans aimed at improving energy efficiency, reducing operational emissions and enhancing climate resilience. These measures are not considered in the reasonable alternatives appraisal but would be addressed through subsequent policy development and project-level assessment.

Scenario 2: HAL

6.4.48 The HAL scheme involves a larger physical footprint and more extensive infrastructure provision when compared to the Arora scheme, which has implications for both greenhouse gas emissions and climate change resilience. Overall aviation demand and flight-related emissions are assumed to be similar to the Arora / HWL scheme; however, differences arise in relation to construction activity, land take and interaction with the surrounding environment.

6.4.49 For climate change mitigation, the HAL scheme is likely to give rise to: higher construction-phase emissions due to the scale, complexity and duration of works (most notably due to the longer runway and the realignment of the M25); and increased embodied carbon associated with more extensive runway, terminal, road and ancillary infrastructure.

6.4.50 In terms of climate change adaptation, the HAL scheme would introduce a larger extent of new hard-surfaced and built development into an area already vulnerable to flooding and heat stress. When compared to the Arora / HWL scheme, a greater proportion of the HAL scheme footprint interacts with areas of higher flood risk, including Flood Zone 3, increasing exposure to fluvial and surface water flooding. The scale of land take and interaction with watercourses increases the complexity of managing flood risk, surface water runoff and overheating, and reduces flexibility in responding to future climate impacts over the operational lifetime of the development.

6.4.51 Taking account of the scale of emissions associated with increased aviation activity, the HAL scheme is assessed as resulting in **major (--) adverse effects** on climate change, consistent with the Arora / HWL scheme. However, the HAL scheme is expected to give rise to slightly higher construction-phase emissions and greater exposure to climate-related hazards, reflecting its larger footprint and increased interaction with flood risk areas. While these differences are secondary to the overall aviation emissions profile (which is assumed to be similar across both schemes), they indicate a marginally higher level of environmental risk associated with the HAL scheme relative to the Arora / HWL scheme.

6.4.52 The HAL proposal includes commitments relating to decarbonisation, surface access strategy and climate resilience. These measures are not taken into account in the reasonable alternatives appraisal and would be considered at later stages.

Summary of effects

6.4.53 Both proposed schemes are expected to result in **major (--) adverse effects** on climate change, reflecting the increase in aviation-related greenhouse gas emissions, construction of new runway and terminal infrastructure, and the introduction of long-lived assets into an environment increasingly affected by climate change impacts.

6.4.54 However, differences in configuration and scale mean that the HAL scheme presents a greater climate change risk overall. Its larger footprint, higher construction-phase and embodied emissions, greater provision for car-based access, requirement for major road realignment and increased interaction with areas of flood risk increase the scale of both climate change mitigation and adaptation challenges. The Arora / HWL scheme performs more favourably in relative terms but would still result in **major (--) adverse effects** that would need to be addressed through mitigation and adaptation measures at later stages.

Communities and quality of life

	Scenario 1: Arora / HWL	Scenario 2: HAL
Significance (locally)	--	--
Significance (nationally)	++	++

Context and baseline sensitivity

6.4.55 The communities and quality of life context relevant to the two scheme scenarios is characterised by a densely populated and socially diverse area, with several established residential communities located in close proximity to Heathrow. These include communities such as Harmondsworth, Longford, Sipson and Harlington, which already experience environmental pressures associated with aircraft and road traffic noise, congestion and localised air quality issues.

6.4.56 Baseline conditions also include areas with high levels of housing need, constrained access to services and existing social vulnerability, meaning that the capacity of communities to absorb further change is limited. This means that some communities are likely to be more affected than others, particularly local communities already experiencing environmental or socio-economic pressures. Community identity, heritage, access to green space and local facilities all make an important contribution to quality of life and are sensitive to physical displacement, severance and environmental change.

Comparison of effects

Scenario 1: Arora / HWL

6.4.57 The Arora / HWL scheme is characterised by a consolidated configuration but would result in a higher level of residential displacement of the two scheme scenarios. While the overall footprint of development is more contained, the scheme is likely to directly affect a number of established communities.

6.4.58 Both the Arora / HWL and HAL schemes would result in similar direct adverse effects on Harmondsworth and Longford. However, due to its more eastern location, the Arora / HWL scheme would result in substantially greater adverse effects on Sipson, including a higher degree of residential displacement, and has a higher potential to adversely affect Harlington, increasing the proximity and intensity of impacts for that community.

6.4.59 At a strategic level, the Arora / HWL scheme would result in:

- the loss of a larger number of residential properties and household displacement, but a smaller number of non-residential properties, compared with the HAL scheme;
- loss of community assets, including schools, nurseries, places of worship, public houses and recreational grounds;
- disruption to established communities during construction, including from traffic, noise, air quality effects and changes to accessibility; and
- indirect effects on community cohesion, access to services and day-to-day living conditions.

6.4.60 The scale of residential displacement under the Arora / HWL scheme has the potential to place significant pressure on neighbouring communities, many of which already experience constraints in housing availability, school capacity and health and social services. The removal of established housing and community facilities would also affect local cultural identity, including impacts on the setting of listed buildings and historic settlement patterns that form part of community character.

6.4.61 Construction-phase effects would be particularly pronounced for nearby communities due to the proximity of works. Temporary road closures, diversions, construction noise, dust, air quality effects and visual intrusion would increase severance and day-to-day disruption. While the duration and spatial extent of construction works may be smaller than under the HAL scheme, the proximity of activity to more residential areas increases impact intensity for affected communities. Overall, these factors are likely to give result in **major (--) adverse effects**.

6.4.62 Alongside these adverse effects, the Arora / HWL scheme also has the potential to deliver **major (++) beneficial effects**, including employment generation during construction and operation, increased economic activity, and improved access to air travel for the wider population. These benefits would be seen at a broader spatial scale and over the longer term.

6.4.63 Overall, the Arora / HWL scheme is assessed as resulting in **mixed effects** on communities and quality of life, comprising **major (--) adverse effects** for directly affected communities and **major (++) beneficial effects** at a wider socio-economic scale.

6.4.64 The Arora / HWL proposal includes plans intended to reduce community impacts and enhance local benefits, including green infrastructure. These measures are not considered at this stage and would be addressed through subsequent policy development and project-level assessment.

Scenario 2: HAL

6.4.65 The HAL scheme involves a larger physical footprint and more extensive land take overall, but would result in the displacement of fewer dwellings than the Arora / HWL scheme. As with the Arora / HWL scheme, HAL would give rise to direct and **major (--) adverse effects** on Harmondsworth and Longford. The HAL scheme would also affect Sipson, although to a more limited degree than under the Arora / HWL scheme, and is unlikely to have direct effects on residential properties in Harlington from land-take.

6.4.66 At a strategic level, the HAL scheme would give rise to:

- residential displacement and permanent loss of housing, albeit affecting fewer dwellings overall than the Arora / HWL scheme;
- greater impact to non-residential properties compared to the Arora / HWL scheme;
- loss of community facilities and assets across a wider area, including schools, nurseries, places of worship, recreational spaces and local businesses; and
- indirect effects on access to services, social networks, community cohesion and overall quality of life.

6.4.67 As with Arora / HWL, the HAL scheme would also give rise to cultural impacts, including adverse effects on the setting of listed buildings, conservation areas and historic landscapes that contribute to sense of place and community identity. In addition, the HAL scheme would result in a relatively greater loss of green infrastructure, an important community asset that contributes to residents' quality of life.

6.4.68 Construction-phase impacts under the HAL scheme would be more extensive and prolonged than under the Arora / HWL scheme, reflecting the larger footprint, longer construction programme and major infrastructure works. These impacts would include sustained disruption from noise, air quality effects, traffic diversion and road closures, and increased severance arising from changes to the transport network. While the geographical spread of these effects would be greater, a proportion of construction activity would occur in areas of comparatively lower population density, which may reduce the intensity of direct effects experienced by some communities when compared with more concentrated construction in higher sensitivity areas. However, the duration and scale of disruption would be greater under the HAL scheme. Overall, these factors are likely to give result in **major (--) adverse effects**.

6.4.69 As with the Arora / HWL scheme, the HAL scheme would also deliver **major (++) beneficial effects** for communities at a wider spatial scale. These include employment creation during construction and operation, increased economic activity, enhanced connectivity and improved access to air travel opportunities. These benefits would accrue over the long term and across the sub-regional and regional population.

6.4.70 Overall, the HAL scheme is assessed as resulting in **mixed effects** on communities and quality of life, comprising **major (--) adverse effects** for communities subject to displacement and prolonged disruption, alongside **major (++) beneficial socio-economic effects** at a wider spatial scale.

6.4.71 The HAL proposal includes commitments relating to community compensation, relocation support (including a home relocation service) and environmental enhancement. These measures are not applied in the reasonable alternatives appraisal and would be considered at later stages.

Summary of effects

6.4.72 Both proposed schemes are assessed as resulting in **mixed effects** on communities and quality of life, comprising **major (--) adverse effects** and **major (++) beneficial effects**.

6.4.73 For both schemes, **major (--) adverse effects** arise from residential displacement, loss of community facilities, cultural and heritage impacts, construction-phase disruption and increased environmental pressures affecting established communities close to the airport. These effects are most pronounced at the local level and would require mitigation, compensation and community-focused measures at later stages.

6.4.74 Both schemes would also deliver **major (++) beneficial effects**, including employment creation, economic activity, improved connectivity and enhanced access to air travel opportunities for the wider population.

6.4.75 Differences between the schemes influence how these effects are distributed. The Arora / HWL scheme results in greater residential displacement, with more intense and direct impacts on specific settlements, notably Sipson and Harlington, but affects fewer non-residential properties. The HAL scheme affects fewer residential properties overall but interacts with a wider area, resulting in more extensive and prolonged disruption for a larger number of receptors. In both cases, the balance of effects is therefore **mixed**, with **major (--) adverse** and **major (++) beneficial** outcomes. These effects are not evenly distributed, with some communities experiencing a greater share of impacts than others.

Economy

€ $ £ ¥	Scenario 1: Arora / HWL	Scenario 2: HAL
Significance (locally)	**++/--**	**++/--**
Significance (nationally)	**?**	**?**

Context and baseline sensitivity

6.4.76 The economic context for the two scheme scenarios is shaped by Heathrow's role as a nationally and regionally significant economic asset, supporting local and regional employment, alongside wider contributions to trade, tourism and economic activity across the UK. Heathrow functions as the UK's principal international hub airport and is closely integrated with local, regional and national labour markets, supply chains and business networks.

6.4.77 At the local level, baseline conditions include areas experiencing economic deprivation, skills shortages and pockets of unemployment. While Heathrow already supports substantial economic activity, the benefits are not uniformly distributed, and expansion has the potential to generate significant economic opportunities alongside short- to medium-term adverse effects associated with land take, construction disruption and the displacement of existing businesses.

Comparison of effects

Scenario 1: Arora / HWL

6.4.78 The Arora / HWL scheme would support a substantial increase in airport capacity, which could facilitate growth in passenger numbers, freight volumes and international connectivity. At a strategic level, this would generate economic effects across construction, airport operations, aviation-related services and the wider supply chain.

6.4.79 During construction, the Arora / HWL scheme would support significant local employment opportunities and economic expenditure, benefiting sectors such as construction, engineering, manufacturing and professional services. At a national level, a proportion of this activity is likely to reflect the displacement of labour and capital from other projects or sectors, although locally it would represent an increase in activity. In operation, additional capacity would strengthen Heathrow's role in supporting tourism, trade and inward investment, with the potential to support economic activity over the longer term.

6.4.80 The more compact configuration of the Arora / HWL scheme may reduce the scale of adverse effects arising from the displacement of existing employment land and businesses when compared with the HAL scheme. This could limit disruption to local economic activity and reduce the extent of permanent business relocation required.

6.4.81 The proposed runway length under the Arora / HWL scheme is sufficient to meet the assumed future aviation demand and international connectivity objectives of the draft HENPS, with the scheme estimated to accommodate approximately 98% of potential demand. This represents a marginal reduction in capacity (around 0.7% of air transport movements), which the promoter indicates could be mitigated through operational adjustments making use of the existing longer runways at Heathrow.

6.4.82 From an operational perspective, longer runways provide greater flexibility for airlines. In this respect, the HAL scheme's longer runway would enable approximately 100% of forecast demand and may provide additional flexibility in accommodating aircraft operations without constraint. However, this advantage is limited in scale and needs to be balanced against the increased cost and footprint associated with a longer runway. The difference between the schemes is therefore marginal and relates primarily to a small variation in capacity and operational flexibility, rather than a fundamental difference in their ability to meet overall demand.

6.4.83 While the Arora / HWL scheme is reported to involve lower overall capital costs and a privately funded delivery model, these factors do not fundamentally alter the scale or direction of the economic effects at a strategic AoS level. The appraisal therefore focuses on the nature and distribution of economic effects, rather than on scheme viability or funding arrangements.

6.4.84 Overall, the Arora / HWL scheme is assessed as resulting in **mixed effects** at the local level during construction, comprising both **major (++) beneficial effects** associated with employment generation and economic activity, and **major (--) adverse effects** associated with disruption to existing economic activity, business displacement and short- to medium-term impacts on local communities. During operation, the scheme would deliver sustained economic activity and employment, resulting in **major (++) beneficial effects** at the local scale, although the scale of national economic effects remains **uncertain**.

6.4.85 The Arora / HWL proposal includes plans intended to maximise local employment, skills development and supply-chain participation. These measures are not considered in the reasonable alternatives appraisal but would influence the distribution and resilience of benefits at later stages.

Scenario 2: HAL

6.4.86 The HAL scheme would also support a significant expansion in airport capacity, delivering economic effects at local, regional, and potentially at a wider spatial scale. As with the Arora / HWL scheme, expansion would generate substantial employment during both construction and operation and reinforce Heathrow's role as a driver of trade, tourism and international connectivity.

6.4.87 Given its larger physical footprint and more extensive infrastructure provision, the HAL scheme is likely to result in higher overall construction expenditure and a longer construction programme, increasing beneficial gross employment effects and supply-chain activity during delivery. As with the Arora / HWL scheme, some of this activity would reflect displacement from elsewhere in the economy, although local economic effects would remain beneficial. The provision of a longer runway may offer some additional benefits with regard to operational flexibility; however, both schemes are capable of accommodating the majority of forecast aircraft movements, with the shorter runway estimated to accommodate approximately 98% of demand. As such, differences in runway length do not materially affect the ability of either scheme to meet overall demand.

6.4.88 The greater land take associated with the HAL scheme increases the likelihood of short- to medium-term **major (--) adverse effects** related to the displacement of existing employment uses and businesses. These effects are expected to be concentrated locally but would be outweighed, at a strategic level, by the scale of new economic activity and long-term economic benefits generated.

6.4.89 Overall, the HAL scheme is also assessed as resulting in **mixed effects** at the local level during construction, comprising both **major (++) beneficial effects** associated with employment generation and economic activity, and **major (--) adverse effects** associated with disruption to existing economic activity, business displacement and short- to medium-term impacts on local communities.

6.4.90 Due to its larger scale and longer construction programme, the HAL scheme is likely to generate a greater magnitude of both **beneficial and adverse effects** during construction when compared with the Arora / HWL scheme. During operation, economic effects are expected to be broadly similar across both schemes, reflecting comparable levels of capacity for passenger and air transport movements, resulting in **major (++) beneficial effects** at the local scale, while the scale of national economic effects remains **uncertain**.

6.4.91 The HAL proposal includes commitments relating to skills, employment and local economic inclusion. These measures are not taken into account in the reasonable alternatives appraisal and would be considered at subsequent stages.

Summary of effects

6.4.92 At the local level, both the Arora / HWL scheme and the HAL scheme are expected to give rise to **major (++) beneficial** and **major (--) adverse effects** during the construction phase. Construction activity would generate substantial employment opportunities and economic activity, resulting in **major (++) beneficial effects**. However, this would be accompanied by **major (--) adverse effects**, including the displacement of existing businesses, disruption to established economic activity and short- to medium-term impacts on local communities. The balance between these effects differs between the schemes, with the Arora / HWL scheme generally limiting the extent of disruption, and the HAL scheme resulting in a broader spatial extent of land take and displacement.

6.4.93 During operation, both schemes are expected to deliver **major (++) beneficial effects** at the local scale, reflecting ongoing employment, business activity and Heathrow's role in supporting local and regional economies. The operational economic function of both schemes is broadly similar, with comparable levels of capacity for passenger and air transport movements, and no material difference in their ability to support long-term economic activity at the local level.

6.4.94 At the national scale, effects during construction are **uncertain**. While both schemes would generate substantial economic activity, a significant proportion of this is likely to reflect the redistribution of labour and capital within the wider economy, and the extent to which this represents additional growth depends on wider economic conditions and competing demands for resources.

6.4.95 During operation, both schemes have the potential to support economic activity through increased capacity and connectivity. However, the extent of these effects is dependent on a range of external factors, including wider economic conditions and aviation demand. As such, national-level operational effects are **uncertain**, and are not considered to materially differ between the schemes.

Historic environment

	Scenario 1: Arora / HWL	Scenario 2: HAL
Significance	--	--

Context and baseline sensitivity

6.4.96 The historic environment context relevant to the two scheme scenarios is characterised by a high concentration of designated and non-designated heritage assets in the area surrounding Heathrow. These include listed buildings, conservation areas, scheduled monuments, registered parks and gardens, archaeological remains and landscapes of historic value. Some nearby assets are of national and international importance, including a World Heritage Site within the wider area.

6.4.97 Large areas of land associated with both runway options lie within the Heathrow Archaeological Priority Area (APA), indicating a high likelihood of surviving archaeological remains. Baseline conditions reflect a historic environment already subject to cumulative pressures arising from urban development, transport infrastructure and aviation activity. Many heritage assets are sensitive to changes in land use, setting, tranquillity and visual intrusion, and extensive ground disturbance has a high potential to affect previously unidentified archaeological resources.

Comparison of effects

Scenario 1: Arora / HWL

6.4.98 The Arora / HWL scheme is characterised by a more compact configuration and reduced land take relative to the HAL scheme. This has implications for the scale and distribution of both direct physical impacts on heritage assets and indirect impacts on their settings.

6.4.99 At a strategic level, the Arora / HWL scheme would result in:

- direct loss or alteration of heritage assets located within the scheme footprint, including archaeological remains within the Heathrow APA and listed buildings;
- indirect effects on the setting of nearby designated and non-designated heritage assets, arising from new infrastructure, construction activity and changes in land use; and
- temporary and permanent changes to historic character during construction and operation.

6.4.100 Both schemes would result in the partial loss of Harmondsworth Conservation Area, together with adverse effects on the setting of the remaining area. The Longford Conservation Area would be entirely lost under both schemes. In addition, the Arora / HWL scheme would give rise to effects on the setting of Harlington Conservation Area, reflecting the proximity of development to that settlement.

6.4.101 The Arora / HWL scheme is likely to result in adverse effects on the setting of Harmondsworth Barn, a Grade I listed building of exceptional significance, due to the introduction of large-scale infrastructure and associated activity into its historic rural context. As the Arora / HWL scheme's runway is further to the east than the HAL scheme's runway, this will also lead to greater adverse effects on the setting of Grade II listed buildings (including Sipson House and Elder Farmhouse) in Sipson and Harlington.

6.4.102 Groundworks associated with the Arora / HWL scheme would pose a risk to buried archaeological remains. While archaeological investigation and recording would be expected to occur, the disturbance or loss of historic assets represents an adverse effect at a strategic level. At the same time, the investigation of archaeological remains has the potential to contribute to a greater understanding of the historic development of the area, representing a limited beneficial effect in terms of heritage knowledge.

6.4.103 Taking account of the sensitivity of heritage assets and potential for direct and indirect effects on them, the Arora / HWL scheme is assessed as resulting in **major (--) adverse effects** on the historic environment.

6.4.104 The Arora / HWL proposal includes plans intended to address heritage impacts through design and management measures. These are not considered in the reasonable alternatives appraisal and would be examined at later stages.

Scenario 2: HAL

6.4.105 The HAL scheme involves a larger physical footprint and more extensive land take, increasing both the scale and reach of effects on heritage assets and their settings. The configuration results in a greater area of heritage-sensitive land being affected by construction and operation, including extensive areas within the Heathrow APA.

6.4.106 At a strategic level, the HAL scheme is likely to result in:

- A similar risk of loss of archaeological remains within Heathrow APA;
- Similar effects on the setting of designated heritage assets; and
- Wider changes to historic character arising from landscape transformation, infrastructure provision and altered land-use patterns.

6.4.107 As with the Arora / HWL scheme, the HAL scheme would result in partial loss of Harmondsworth Conservation Area with adverse effects on the setting of the remaining area, and the entire loss of Longford Conservation Area. Unlike the Arora / HWL scheme, the HAL scheme would have less of an impact on the setting on Harlington Conservation Area, given its relative distance from the designation.

6.4.108 Additionally, like the Arora / HWL scheme, the HAL scheme would adversely affect the setting of Harmondsworth Barn (Grade I listed building). As the HAL scheme's runway is further to the west than the HAL scheme's runway, this will also lead to greater adverse effects on the setting of Grade II (and one Grade II*) listed buildings in Colnbrook.

6.4.109 The greater scale of ground disturbance under the HAL scheme increases the likelihood of affecting significant archaeological remains, with a higher risk of irreversible loss. While archaeological excavation and recording could improve knowledge of the historic environment, this does not offset the loss of physical archaeological assets.

6.4.110 In addition, the scale of development and proximity to multiple heritage assets increase the likelihood of cumulative effects on historic character, including visual intrusion, noise and increased activity across a wider geographical area then the Arora / HWL scheme. However, a greater proportion of these effects would be experienced in areas of lower heritage sensitivity to the west, compared with the more direct effects on the setting of heritage assets associated with the Arora / HWL scheme.

6.4.111 Taking account of the extensive land take and high concentration of heritage assets affected, the HAL scheme is assessed as resulting in **major (--) adverse effects** on the historic environment. Overall, the HAL scheme performs marginally better than the Arora / HWL scheme in terms of reducing effects on particularly sensitive designated assets and residential heritage receptors in Sipson and Harlington, although this relative benefit is offset by its larger footprint and increased potential for archaeological impacts across a wider area.

6.4.112 The HAL proposal includes commitments relating to heritage assessment and conservation. These measures are not considered in the reasonable alternatives appraisal and would be addressed at subsequent stages.

Summary of effects

6.4.113 Both the Arora / HWL scheme and the HAL scheme are expected to result in **major (--) adverse effects** on the historic environment, reflecting the sensitivity of heritage assets, the extensive archaeological interest of the area and the scale of development required to deliver additional airport capacity.

6.4.114 Both schemes would result in the loss of several listed buildings, Longford Conservation Area, partial loss and setting impacts to Harmondsworth Conservation Area, and adverse effects on the setting of Harmondsworth Barn (Grade I). The Arora / HWL scheme has a greater potential to affect the setting of listed buildings in Harlington and the setting of Harlington Conservation Area. In contrast, the HAL scheme would result in more extensive effects overall due to its larger footprint, but with a greater proportion of impacts occurring in areas of lower heritage sensitivity to the west.

6.4.115 While limited beneficial effects may arise from archaeological investigation and recording, these do not outweigh the overall adverse effects for both schemes, which would require mitigation at later stages.

Landscape

	**Scenario 1: Arora / HWL**	**Scenario 2: HAL**
Significance	**--**	**--**

Context and baseline sensitivity

6.4.116 The landscape context relevant to the two scheme scenarios is characterised by a flat, open lowland landscape influenced by extensive transport infrastructure, urban development and areas of remaining open land. While the immediate airport environment is already heavily modified, the surrounding landscape includes locally and nationally valued landscape and townscape character areas, areas of green belt, river corridors, historic parkland, and London's designated Open Space.

6.4.117 Landscape sensitivity varies across the Heathrow area but is heightened where open land, watercourses, historic features and areas of relative tranquillity remain. It is noted that neither scheme would directly impact a National Landscape.

6.4.118 Baseline conditions are influenced by existing aviation activity, lighting and built development; however, residual landscape value persists, particularly in areas that contribute to local identity, visual amenity and perceptions of openness. As a result, further large-scale development has the potential to result in adverse effects on landscape character, visual quality and settlement separation.

Comparison of effects

Scenario 1: Arora / HWL

6.4.119 The Arora / HWL scheme is characterised by a more consolidated layout and reduced land take when compared with the HAL scheme. This influences both the scale of landscape change and the extent of visual intrusion arising from new runway and associated infrastructure.

6.4.120 At a strategic level, the Arora / HWL scheme would result in:

- permanent change to landscape character within the scheme footprint;
- loss of green belt land and London's designated Open Space, with a reduction in perceived openness; and
- introduction of large-scale built elements, movement and lighting affecting views and visual amenity.

6.4.121 The more compact configuration may limit the geographical spread of effects, reducing the number of viewpoints and receptors experiencing the most pronounced change when compared with a more extensive scheme.

6.4.122 Both schemes would result in the full or partial loss of settlements, leading to permanent changes in landscape character and townscape form. In addition, both schemes would require diversion of river corridors (including the River Colne, Wraysbury River, Longford River and Duke of Northumberland's River), resulting in adverse effects on riparian landscapes and local landscape character, with the extent and intensity of effects varying according to the scale and layout of each scheme.

6.4.123 Construction activity associated with the Arora / HWL scheme would give rise to temporary adverse effects on landscape character and views due to earthworks, construction compounds, plant, lighting and temporary infrastructure. Over the longer term, new operational infrastructure would remain a dominant feature, altering visual relationships between the airport, surrounding open land and nearby settlements.

6.4.124 Taking account of the sensitivity of the surrounding landscape and the absence of mitigation at this stage, the Arora / HWL scheme is assessed as resulting in **major (--) adverse effects** on landscape. While the scale and extent of change are reduced when compared to the HAL scheme, the introduction of a new runway and associated infrastructure would fundamentally alter landscape character, openness and visual amenity.

6.4.125 The Arora / HWL proposal includes plans intended to address landscape and visual effects through design and planting. These measures are not considered in the reasonable alternatives appraisal and would be assessed at later stages.

Scenario 2: HAL

6.4.126 The HAL scheme involves a larger physical footprint and more extensive land take, resulting in a greater degree of change to landscape character and visual amenity. The proposed runway location further to the west would extend development into areas of open land beyond the existing airport boundary. While the presence of the M25 corridor already exerts a strong influence on landscape character in this area, the westward expansion would introduce additional large-scale aviation and transport infrastructure, resulting in further intrusion into landscapes that currently retain a stronger sense of openness and relative tranquillity away from the motorway corridor.

6.4.127 When compared to the Arora / HWL scheme, at a strategic level, the HAL scheme is more likely to result in:

- a greater loss of green belt land and land within London's designated Open Space;
- more extensive changes to landscape character across multiple landscape and townscape areas; and
- wider visual intrusion affecting a larger number of viewpoints, settlements and transport corridors.

6.4.128 As with the Arora / HWL scheme, the HAL scheme would involve diversion of river corridors (likely including the River Colne, Wraysbury River, Longford River and Duke of Northumberland's River), resulting in substantial alteration to landscape character and visual patterns. In addition, the HAL scheme would require realignment of the M25, introducing major new transport infrastructure into the landscape and further intensifying landscape and visual effects over a wide area.

6.4.129 The scale of development, including more extensive structures, lighting and increased levels of activity, would increase visual prominence and reduce tranquillity. The cumulative introduction of aviation and transport infrastructure would further support the dominance of airport-related features within the landscape and reduce the distinction between settlements and open land.

6.4.130 Given the extent of land take, intrusion into open countryside and the sensitivity of landscapes affected the HAL scheme is assessed as resulting in **major (--) adverse effects** on landscape, with effects of greater magnitude and wider spatial extent than those associated with the Arora / HWL scheme.

6.4.131 The HAL proposal includes plans for landscape integration and enhancement, including the provision of a landscaped 'green loop'. These measures are not applied in the reasonable alternatives appraisal and would be addressed through subsequent design development and project-level assessment.

Summary of effects

6.4.132 Both the Arora / HWL scheme and the HAL scheme are expected to result in **major (--) adverse effects** on landscape, reflecting the scale of development, the loss of open land and the sensitivity of remaining valued landscape areas around Heathrow.

6.4.133 However, differences in configuration and land take mean that the HAL scheme presents a greater landscape risk overall. Its larger footprint, westward runway location, intrusion into more open land, requirement for M25 realignment and wider spread of infrastructure increase both the magnitude and spatial extent of adverse effects on landscape character, visual amenity and perceived openness. The Arora / HWL scheme performs more favourably in relative terms due to its more compact layout, but would still result in **major (--) adverse landscape effects** requiring mitigation at later stages.

Noise

	**Scenario 1: Arora / HWL**	**Scenario 2: HAL**
Significance	**--**	**--**

Context and baseline sensitivity

6.4.134 The noise environment relevant to the two scheme scenarios is characterised by existing high levels of aviation and transport-related noise, reflecting Heathrow's status as the UK's busiest airport and its location within a densely populated urban area. Large residential communities, schools, healthcare facilities and publicly accessible open spaces are exposed to aircraft noise from arrivals and departures, as well as road and rail noise associated with airport access.

6.4.135 Baseline evidence indicates that significant populations already experience adverse noise effects, including annoyance, sleep disturbance and reduced quality of life. While long-term aircraft fleet modernisation has reduced noise from individual aircraft, population growth and increased activity mean that the overall number of people affected by noise remains high, resulting in a constrained noise baseline with limited capacity to absorb additional impacts.

Comparison of effects

Scenario 1: Arora / HWL

6.4.136 The Arora / HWL scheme would increase airport capacity and activity, resulting in additional noise during both construction and operation. Although the number of flights is assumed to be similar across scenarios, differences in layout and land take influence the scale, proximity and distribution of noise effects for surrounding communities.

6.4.137 At a strategic level, the Arora / HWL scheme would give rise to:

- construction-phase noise from earthworks, plant, vehicle movements and temporary facilities;
- operational noise associated with aircraft movements, airside activity and surface access traffic; and
- indirect effects on community noise exposure due to changes in traffic patterns.

6.4.138 The more compact configuration of the Arora / HWL scheme may limit the overall spatial extent of construction-phase noise. However, the scheme is located further east than the HAL scheme, bringing the new runway closer to areas of dense residential development, including Harlington and communities closer to central London. As a result, construction and operational noise sources would occur in closer proximity to sensitive receptors, increasing the intensity of noise exposure for those most affected.

6.4.139 Operational noise effects would remain a key issue under the Arora / HWL scheme. While the overall footprint is smaller, the reduced separation distances between noise sources and nearby communities mean that high levels of aircraft and ground-based noise would continue to be experienced locally. At a strategic level, these proximity-based effects mean that the Arora / HWL scheme would not necessarily result in lower operational noise exposure, despite its smaller physical size.

6.4.140 Taking account of existing baseline noise levels, the sensitivity of surrounding communities, the proximity of noise sources to residential receptors, the Arora / HWL scheme is assessed as resulting in **major (--) adverse effects** from noise. Although it performs more favourably than the HAL scheme in terms of overall footprint and construction extent, the intensity of impacts for communities close to the scheme remains significant.

6.4.141 The Arora / HWL proposal includes plans intended to manage noise and provide respite and mitigation. These measures are not considered in the reasonable alternatives appraisal and would be addressed at later stages.

Scenario 2: HAL

6.4.142 The HAL scheme involves a larger physical footprint and more extensive infrastructure provision, with implications for both construction-phase and operational noise. The greater scale of development increases the potential for noise effects to affect a wider area and a larger number of receptors.

6.4.143 At a strategic level, the HAL scheme is more likely to result in higher and more prolonged construction-phase noise than the Arora / HWL scheme, reflecting the scale, complexity and duration of works.

6.4.144 The proposed runway under the HAL scheme extends further west, such that some of the additional runway length and associated construction activity would take place in areas that are less densely populated than those affected by the Arora / HWL scheme. This is likely to provide a relative benefit in terms of proximity-based noise exposure for communities to the east, including parts of London, and result in some redistribution of construction and aircraft noise effects.

6.4.145 However, given that overall flight numbers are assumed to be similar across both schemes, and that flight paths are not assessed as part of the appraisal, any redistribution of aircraft noise remains uncertain at a strategic level. In addition, the larger footprint and longer construction programme under the HAL scheme mean that adverse noise effects would be experienced by more receptors and over longer periods during construction.

6.4.146 Taking account of the constrained baseline, the sensitivity of surrounding communities, the duration and extent of construction activity, and prior to mitigation, the HAL scheme is assessed as resulting in **major (--) adverse effects** from noise.

6.4.147 The HAL proposal includes commitments relating to noise management, insulation and community engagement. These measures are not applied in the reasonable alternatives appraisal and would be considered through subsequent policy development and project-level assessment.

Summary of effects

6.4.148 Both the Arora / HWL scheme and the HAL scheme are expected to result in **major (--) adverse effects** from noise, reflecting the already constrained baseline noise environment and the increase in airport-related activity associated with expansion.

6.4.149 However, differences in configuration and footprint influence how noise effects are experienced. Both the Arora / HWL scheme and the HAL scheme are assessed as performing comparably in AoS terms, resulting in **major (--) adverse effects** from noise, albeit through different impact pathways. The HAL scheme would give rise to broader and more prolonged noise effects over a wider area during the construction phase, reflecting its larger footprint and longer construction period, while the Arora / HWL scheme would result in more intense noise effects for communities located close to the eastern edge of the airport, particularly Harlington, during the operation phase.

Resources and waste

	**Scenario 1: Arora / HWL**	**Scenario 2: HAL**
Significance	**--**	**--**

Context and baseline sensitivity

6.4.150 The resources and waste context relevant to the two schemes is shaped by the scale and intensity of existing airport-related activity, which already generates substantial volumes of construction, operational and demolition waste and places significant demand on material resources. The area contains safeguarded mineral resources, including sand and gravel and aggregate, as well as waste management facilities and associated infrastructure that play an important role in managing waste at the London and regional level.

6.4.151 Baseline conditions reflect increasing pressure on waste management capacity and a strong policy emphasis on waste reduction, reuse and recycling, alongside the protection of mineral resources and geodiversity through Minerals Safeguarding Areas (MSAs). Large-scale infrastructure development has the potential to generate significant quantities of waste and to sterilise mineral resources, either directly through land take or indirectly through severance and access constraints. The scale and configuration of runway expansion therefore have clear implications for resource efficiency, mineral safeguarding and waste management capacity.

Comparison of effects

Scenario 1: Arora / HWL

6.4.152 The Arora / HWL scheme would require significant quantities of construction materials and would generate substantial volumes of construction, demolition and excavation waste. Operational waste generation would also increase in line with expanded airport activity.

6.4.153 At a strategic level, the Arora / HWL scheme would result in:

- increased consumption of mineral and construction resources;
- generation of large volumes of construction and operational waste; and
- direct adverse effects on safeguarded mineral resources, particularly MSAs for sand and gravel, and a locally designated geological site (GLA 62 Sipson Lane Complex).

6.4.154 The more compact configuration and reduced land take of the Arora / HWL scheme may limit the overall extent of mineral sterilisation and reduce the need to relocate existing waste management facilities when compared with the HAL scheme. However, direct interaction with safeguarded sand and gravel resources and a locally designated geological site east of the M4 spur represents a notable adverse effect specific to this option.

6.4.155 During construction, concentrated activity would place short-term pressure on waste management capacity, while over the longer-term, increased passenger and operational activity would lead to higher levels of operational waste generation, adding to existing regional demands.

6.4.156 Taking account of the scale of resource use, interaction with safeguarded mineral resources and waste generation, and in the absence of mitigation at this stage, the Arora / HWL scheme is assessed as resulting in **major (--) adverse effects** on resources and waste. Although its configuration performs more favourably in relative terms to the HAL scheme, the Arora / HWL scheme would still place substantial pressure on resource and waste systems.

6.4.157 The Arora / HWL proposal includes plans intended to promote resource efficiency and waste minimisation. These measures are not considered in the reasonable alternatives appraisal and would be addressed through subsequent policy development and project-level assessment.

Scenario 2: HAL

6.4.158 The HAL scheme involves a larger physical footprint and more extensive infrastructure provision than the Arora / HWL scheme, with direct implications for both resource consumption and waste generation. The scale and duration of construction activity would also require higher volumes of primary construction materials and generate larger quantities of waste over a longer period.

6.4.159 When compared to the Arora / HWL scheme, at a strategic level, the HAL scheme is more likely to result in:

- higher demand for primary construction materials;
- greater volumes of construction, demolition and excavation waste; and

- increased risk of sterilisation of safeguarded mineral resources across a wider area.

6.4.160 While the HAL scheme largely avoids direct effects on the GLA 62 Sipson Lane Complex, it would introduce significant additional pressure on mineral resources through other pathways. In particular, the realignment of the M25 required under the HAL scheme is likely to affect MSAs for sand and gravel and aggregate, resulting in sterilisation or displacement of future extraction potential.

6.4.161 The larger footprint and longer construction programme would exacerbate short- to medium-term pressure on waste management capacity, and the increased scale of operational activity would result in higher long-term operational waste arisings. In addition, the HAL scheme is more likely to require the relocation or displacement of existing waste management services and infrastructure, including waste transfer, recycling and treatment facilities serving the Heathrow area (including Grundon Waste Management and Lakeside Energy From Waste).

6.4.162 Given the scale of development, duration of construction, interaction with multiple MSAs, M25 realignment and potential displacement of waste infrastructure, the HAL scheme is assessed as resulting in **major (--) adverse effects** on resources and waste, with effects of greater magnitude and persistence than those associated with the Arora / HWL scheme.

6.4.163 The HAL proposal includes commitments relating to circular economy principles and waste reduction. These measures are not applied in the reasonable alternatives appraisal and would be considered at later stages.

Summary of effects

6.4.164 Both the Arora / HWL scheme and the HAL scheme are expected to result in **major (--) adverse effects** on resources and waste, reflecting the scale of material consumption, waste generation and interaction with safeguarded mineral resources associated with airport expansion.

6.4.165 However, the nature and distribution of effects differ. The Arora / HWL scheme gives rise to direct impacts on the GLA 62 Sipson Lane Complex, alongside effects on sand and gravel MSAs. The HAL scheme avoids these specific mineral assets but presents a greater overall resources and waste risk, driven by its larger footprint, longer construction period, M25 realignment, wider interaction with other MSAs and greater likelihood of displaced waste management infrastructure. In both cases, significant mitigation and strategic level controls would be required at later stages to manage these effects.

Soil

	Scenario 1: Arora / HWL	Scenario 2: HAL
Significance	--	--

Context and baseline sensitivity

6.4.166 The soils context relevant to the two scheme scenarios is characterised by a combination of previously developed land, undeveloped greenfield land and high-quality agricultural soils, alongside areas affected by historic land uses. Parts of the land potentially affected by runway expansion include soils that contribute to agricultural productivity, landscape character and wider ecosystem services, including food production, water regulation and carbon storage.

6.4.167 Baseline conditions also reflect the presence of historic landfill sites, areas of made ground and potential land contamination, which increase sensitivity to large-scale ground disturbance. Soils in the area play an important role in supporting drainage, flood regulation and ecological function, and are vulnerable to irreversible loss or degradation through sealing, compaction, contamination and excavation associated with major infrastructure development.

Comparison of effects

Scenario 1: Arora / HWL

6.4.168 The Arora / HWL scheme involves ground disturbance and permanent land take for a new runway and associated infrastructure. This would result in the loss and sealing of soils within the scheme footprint, reducing their ability to support agricultural uses and wider soil functions.

6.4.169 At a strategic level, the Arora / HWL scheme would result in:

- permanent loss of undeveloped soils and agricultural land within the scheme area;
- disturbance of soils during construction, increasing the risk of erosion, compaction and contamination; and
- interaction with areas of historic landfill and potentially contaminated land, requiring careful management.

6.4.170 A large proportion of the Arora / HWL scheme's runway footprint lies on land previously classified as Grade 1 agricultural land. As a result, the scheme would give rise to a higher proportionate loss of the highest-quality agricultural soils when assessed using pre-1988 agricultural land classification when compared to the HAL scheme.

6.4.171 However, when assessed against post-1988 agricultural land classification, differences between the two schemes are more limited. Both schemes affect areas of Grade 1 and Grade 2 land east of Sipson, with the Arora / HWL scheme affecting slightly more Grade 1 land, though the difference is marginal at a strategic level.

6.4.172 The more compact configuration of the Arora / HWL scheme may limit the overall spatial extent of soil loss and disturbance when compared with the HAL scheme. Nevertheless, construction activity would result in short-term adverse effects on soils through excavation, stockpiling and material movement, while long-term operation would lead to permanent soil sealing, representing an irreversible change.

6.4.173 Taking account of the sensitivity of soils, the loss of agricultural land and the absence of mitigation at this stage, the Arora / HWL scheme is assessed as resulting in **major (--) adverse effects** on soils.

6.4.174 The Arora / HWL proposal includes plans intended to manage contaminated land and protect remaining soil resources. These measures are not considered in the reasonable alternatives appraisal and would be addressed at later stages.

Scenario 2: HAL

6.4.175 The HAL scheme involves a larger physical footprint and more extensive land take, resulting in greater overall loss and disturbance of soils. A larger area of undeveloped and greenfield land would be affected, increasing impacts on soil resources at a broader scale.

6.4.176 When compared to the Arora / HWL scheme, at a strategic level, the HAL scheme is more likely to result in:

- greater overall loss of agricultural and undeveloped soils, reflecting the larger footprint of development;
- increased soil sealing and compaction due to the scale and extent of built infrastructure; and
- a higher likelihood of disturbance to historic landfill sites and contaminated land, increasing environmental risk.

6.4.177 In terms of agricultural land quality, the HAL scheme affects a wider range of land types, including areas classified (under pre-1988 grading) as Grade 1, some Grade 3, and areas identified as non-agricultural due to historic disturbance. As a result, while the HAL scheme would result in greater absolute soil loss overall, a smaller proportion of the affected land is Grade 1 agricultural land when compared with the Arora / HWL scheme.

6.4.178 Under post-1988 agricultural land classification, differences between the schemes are more limited. Both schemes affect similar extents of Grade 1 and Grade 2 land (west of Sipson), with only marginal variation between them.

6.4.179 The HAL scheme interacts with a greater number and extent of historic landfill sites than the Arora / HWL scheme, increasing complexity in soil handling, remediation requirements and environmental risk during construction. The broader extent of excavation would exacerbate soil degradation, while the larger footprint of permanent infrastructure would reduce opportunities for soil-based ecosystem services across a wider area.

6.4.180 Given the scale of land take, interaction with historic landfill sites, extent of soil sealing and overall loss of greenfield land, and prior to mitigation, the HAL scheme is assessed as resulting in **major (--) adverse effects** on soils, with effects of greater magnitude and spatial extent than those associated with the Arora / HWL scheme.

6.4.181 The HAL proposal includes commitments relating to land quality management and remediation. These measures are not applied in the reasonable alternatives appraisal and would be considered through subsequent project-level assessment.

Summary of effects

6.4.182 Both the Arora / HWL scheme and the HAL scheme are expected to result in **major (--) adverse effects** on soils, reflecting the permanent loss, degradation and sealing of soil resources and interaction with contaminated and previously disturbed land. The HAL scheme presents a greater overall level of risk, due to its larger footprint, additional greenfield land take, wider soil sealing and more extensive interaction with historic landfill sites (although it is noted that in relation to agricultural land, under post-1988 ALC, differences between the schemes are more limited). In both cases, adverse effects are significant and would require careful management through mitigation and remediation at later stages.

Water

	Scenario 1: Arora / HWL	Scenario 2: HAL
Significance	--	--

Context and baseline sensitivity

6.4.183 The water environment relevant to the two scheme scenarios is characterised by a complex network of rivers, watercourses, groundwater bodies and drainage infrastructure, alongside areas subject to flood risk and water resource stress. The area includes main rivers, ordinary watercourses and associated floodplains, as well as groundwater bodies that support public water supply.

6.4.184 Baseline conditions indicate that surface water and groundwater bodies are vulnerable to pollution, physical modification and increased abstraction. Parts of the area are susceptible to fluvial, surface water and groundwater flooding, reflecting low-lying topography, historic land modification and extensive areas of impermeable surface. Climate change is expected to exacerbate these pressures through increased rainfall intensity, higher peak flows and more frequent periods of water scarcity, increasing sensitivity to further development.

Comparison of effects

Scenario 1: Arora / HWL

6.4.185 The Arora / HWL scheme would introduce new infrastructure with implications for surface water management, groundwater, water quality and flood risk. Construction activity would involve earthworks, river and drainage diversions, and temporary works that increase the risk of sediment runoff and pollution entering nearby water bodies.

6.4.186 At a strategic level, the Arora / HWL scheme would result in:

- increased impermeable surface area, altering surface water runoff patterns;
- diversion and modification of watercourses and associated drainage features; and
- increased demand on water resources associated with expanded airport operations.

6.4.187 River diversions required under the Arora / HWL scheme would result in physical modification of river corridors, affecting channel form, riparian function and local hydrology. While the more compact configuration of the scheme may limit the geographical extent of interactions with watercourses and flood-prone areas when compared with the HAL scheme, significant adverse effects would nevertheless arise from both construction and long-term operation of this option.

6.4.188 Parts of the Arora / HWL scheme would extend into Drinking Water Safeguard Zones (DWSZs), increasing sensitivity to pollution risks during construction and operation. Although the proportion of land affected is relatively limited, development in these areas would require careful management to protect groundwater quality.

6.4.189 Operationally, the scheme would increase water demand in an area already subject to water stress, while also increasing the long-term challenge of managing surface water runoff and protecting water quality. It is noted that river restoration or improved drainage design may offer opportunities to enhance channel condition or flood management.

6.4.190 Taking account of the sensitivity of the water environment and the absence of mitigation at this stage, the Arora / HWL scheme is assessed as resulting in **major (--) adverse effects** on water, in relation to water quality and water resources.

6.4.191 The Arora / HWL proposal includes plans intended to manage water resources, drainage and flood risk. These measures are not considered in the reasonable alternatives appraisal and would be addressed at later stages.

Scenario 2: HAL

6.4.192 The HAL scheme involves a larger physical footprint and more extensive land take when compared to the Arora / HWL scheme, resulting in greater interaction with watercourses, floodplains and groundwater systems. The scale and distribution of development increase the complexity of managing water-related effects during both construction and operation.

6.4.193 When compared to the Arora / HWL scheme, at a strategic level, the HAL scheme is likely to result in:

- similar, or greater, extent of diversion and modification of watercourses, including main rivers and associated floodplains;
- a greater increase in impermeable surfaces, exacerbating surface water runoff and flood risk; and
- increased risk to water quality, arising from prolonged construction activity and higher long-term operational pressures.

6.4.194 A larger proportion of the HAL scheme footprint extends into a DWSZ than the Arora / HWL scheme, affecting approximately half of the new runway area. This increases the sensitivity of the local water environment and heightens the risk of impacts on groundwater quality during both construction and operation.

6.4.195 The scale of land take and construction activity increases the likelihood of altering existing flow paths, flood behaviour and groundwater recharge patterns. In addition, like the Arora / HWL scheme, higher levels of operational activity would place greater demand on water resources within an area already identified as water-stressed.

6.4.196 Given the extent of development, interaction with sensitive water environments, extensive DWSZ coverage and the absence of mitigation at this stage, the HAL scheme is assessed as resulting in **major (--) adverse effects** on water, with effects of greater magnitude and spatial extent than those associated with the Arora / HWL scheme.

6.4.197 The HAL scheme includes commitments relating to water efficiency and drainage management. These measures are not applied in the reasonable alternatives appraisal and would be considered through subsequent policy development and project-level assessment.

Summary of effects

6.4.198 Both the Arora / HWL scheme and the HAL scheme are expected to result in **major (--) adverse effects** on the water environment, reflecting river diversions, increased impermeable surfaces, additional water demand and interaction with flood-prone and water-sensitive areas.

6.4.199 However, differences in configuration and land take mean that the HAL scheme presents a greater water-related risk. Its larger footprint, potential for more extensive river diversions, significantly greater interaction with DWSZs and higher long-term water demand increase the likelihood of adverse effects on water quality and water resource availability. The Arora / HWL scheme performs more favourably in relative terms due to its more compact configuration and more limited interaction with DWSZ, but would still give rise to significant adverse effects requiring mitigation and careful management at later stages.

6.5. Summary of appraisal findings

6.5.1 The appraisal of reasonable alternatives shows that both the Arora / HWL scheme and the Heathrow HAL scheme give rise to significant environmental challenges, reflecting the scale of development required to deliver additional runway capacity at Heathrow and the sensitivity of the surrounding environment. Across most AoS themes (including **air quality, biodiversity, climate change**, **historic environment**, **landscape, noise, resources and waste, soils, and water**) both schemes are assessed as resulting in **major (--) adverse effects** at a strategic level, prior to the application of mitigation.

6.5.2 Despite these shared challenges, the appraisal identifies clear differences in the nature, scale and distribution of effects between the two schemes. In general, the Arora / HWL scheme performs more favourably in AoS themes where compactness, reduced land take and a smaller physical footprint are key determinants of effect, such as **biodiversity, climate change, historic environment, landscape, resources and waste, soils, and water**. Conversely, the HAL scheme performs less favourably in these areas due to its larger footprint, more extensive land take, longer construction programme and wider interaction with sensitive environmental receptors.

6.5.3 In contrast, the appraisal highlights that the Arora / HWL's more easterly location results in greater intensity of direct localised effects to communities and people (relevant to the **communities and quality of life** AoS themes), driven by higher levels of residential displacement and closer proximity of infrastructure to established settlements, notably Sipson and Harlington.

6.5.4 For the **noise** and **air quality** AoS themes, the appraisal concludes that both schemes result in **major (--) adverse effects** and are assigned equal overall effect rankings. This reflects differences in the way effects arise over the project lifecycle rather than a clear overall advantage of one scheme over the other. The HAL scheme gives rise to more extensive **construction-phase noise and air quality effects** due to its larger footprint and longer construction programme but, as a result of its more westerly alignment, is located further from established residential communities, moderating the intensity of operational effects. In contrast, the Arora / HWL scheme benefits from a shorter construction programme and more compact layout, but its more easterly alignment brings aviation and surface access infrastructure closer to existing residential areas, resulting in greater **operational noise and air quality effects**.

6.5.5 Both schemes are assessed as delivering **mixed major (++/--) effects** on the economy at a local scale, reflecting increased economic activity and employment creation, but also significant disruption to certain local businesses. **Uncertainty** remains for both schemes regarding their impact on the national economy. These effects are identified at a strategic level within the AoS, based on the scale and nature of development enabled by each scheme, rather than detailed economic appraisal or modelling.

Table 6-3: Reasonable growth scenarios appraisal summary – predicted significant effects

*Note: shading indicates significance (see **Table 6-1** for key)*

AoS theme	Scenario 1: Arora / HWL	Scenario 2: HAL
Air Quality	--	--
Biodiversity	--	--
Climate change	--	--
Communities and Quality of Life	-- (local)	-- (local)
	++ (national)	++ (national)
Economy	++/-- (local)	++/-- (local)
	? (national)	? (national)
Historic environment	--	--

AoS theme	Scenario 1: Arora / HWL	Scenario 2: HAL
 Landscape	--	--
 Noise	--	--
 Resources and Waste	--	--
 Soil	--	--
 Water	--	--

7. The scheme informing the draft HENPS

7.1.1 It should be noted that the appraisal above is high-level and based on indicative scheme information. On that basis, a smaller land take and more compact design, in part reflecting a shorter runway, may reasonably be expected to result in a reduced extent of certain impacts compared with a larger scheme footprint, although this would need to be confirmed through more detailed assessment at subsequent stages.

7.1.2 Overall, the assessment of reasonable alternatives indicates a relatively balanced score of the significant effects between both schemes assessed. Given neither scheme avoids significant adverse effects, the conclusions of the appraisal have not changed the Government's overall conclusions drawn from the assessment of schemes to inform the review that took place in summer 2025, and the comparative assessment process in November 2025. The assessment process examined criteria beyond sustainability considerations and included a focus on operational feasibility and deliverability of the schemes, which are critical factors for a programme of this scale. A summary of the conclusions is set out below.

7.1.3 The Government's view is that the Northwest runway scheme brought forward by HAL offers the most credible and deliverable option, principally due to the relative maturity of its proposal, the comparative level of confidence in the feasibility and resilience of its surface access plans, and the stronger comfort it provides in relation to the efficient, resilient and sustainable operations of the airport over the long-term.

7.1.4 The HAL scheme is considered comparatively more mature in its approach to road infrastructure. HAL have already progressed detailed work for their proposed changes to both the Strategic Road Network (SRN) and local roads, including for the M25 tunnel. DfT and National Highways have a clearer understanding of both feasibility and the next steps to address outstanding issues.

7.1.5 While the HAL scheme requires major works to the M25, assessment indicates that the HWL scheme would also have a considerable impact on the M25.

7.1.6 While HAL's scheme requires more land, we consider that it would require the acquisition of fewer residential properties around the airport than HWL's scheme.

7.1.7 The runway length proposed by HAL (up to 3.5 km) is considered to be advantageous in terms of providing greater resilience and potential futureproofing for next-generation aircraft when compared with the 2.8 km runway proposed by HWL.

7.1.8 The Government considers that overall, the HAL scheme provides the greatest likelihood of meeting its ambition for a decision on Development Consent application within this Parliament.

7.1.9 The Secretary of State was clear that any amendments to the ANPS will be subject to public consultation and Parliamentary scrutiny in 2026 in accordance with the requirements of the Planning Act 2008. Any scheme identified in an amended ANPS will still need detailed consideration (including matters such as runway length, layout and supporting infrastructure) in any DCO sought under planning legislation.

Part 2: Appraisal of the draft Heathrow Expansion NPS

8. Introduction to Part 2

8.1.1 Part 2 of this AoS Report presents an appraisal of the draft Heathrow Expansion NPS (HENPS). The draft HENPS has been appraised against the AoS Framework, with the findings presented under each of the AoS themes.

8.1.2 The appraisal in Part 2 has been prepared in accordance with the requirements of the SEA Regulations, assessing the likely significant environmental, social and economic effects of the strategic approach prior to adoption of the draft HENPS.

9. Draft HENPS appraisal

9.1. Introduction

Approach to the appraisal

9.1.1 The draft HENPS appraisal is presented below as a series of narrative discussions structured around the AoS themes. For each AoS theme, the appraisal describes the relevant baseline and policy context and considers the likely significant effects of the draft HENPS during construction and operation, concluding on the overall nature and significance of effects.

9.1.2 The AoS therefore focuses on identifying the likely direction, nature and significance of effects arising from the policy framework established by the draft HENPS, rather than determining whether those effects are ultimately acceptable in planning terms. Where the draft HENPS introduces policy requirements, safeguards or decision-making principles that would apply at subsequent stages, these are recognised and considered within the appraisal.

Role of scheme-level evidence

9.1.3 The draft HENPS is a national, strategic policy document that establishes Government support for additional airport capacity and identifies a new north-west runway at Heathrow Airport as the strategic approach to meeting this need. While the AoS is undertaken at a strategic level, the sustainability effects of the draft HENPS are inherently linked to the delivery of development of a defined scale and form. Accordingly, the appraisal is informed by reference to the HAL north-west runway scheme as identified by Government to inform the ANPS review.

9.1.4 The appraisal does not pre-judge the outcome of future development consent decisions, nor does it replace the need for project-level assessment. Instead, scheme-level evidence is used to inform conclusions on the likely sustainability implications of the draft HENPS itself, recognising that detailed design, mitigation and regulatory control would influence the final outcomes.

Appraisal baseline

9.1.5 For the purposes of this appraisal, the likely effects of the draft HENPS are assessed relative to a ‘no-expansion’ scenario, in which Heathrow Airport continues to operate with two runways. This provides a consistent reference point for evaluating the additional effects associated with expansion.

9.1.6 The baseline incorporates reasonable assumptions regarding future changes that would occur in any case, including technological improvements, operational efficiencies and regulatory controls (for example, ongoing improvements in aircraft efficiency and aircraft noise performance). As such, differences in effects between scenarios reflect the additional impacts associated with expansion, rather than changes that would be expected in the baseline without expansion.

9.1.7 This means that, while mitigation measures or technological advances may lead to improvements in environmental conditions compared with a static current (2024) baseline, significant adverse effects may still be identified where outcomes under the expansion scenario are worse than those expected under the no-expansion (two-runway) scenario.

9.1.8 The appraisal also recognises that, for many themes, the magnitude and significance of effects are influenced by assumptions regarding future conditions, including technological change, regulatory controls and the effectiveness of mitigation measures implemented at later stages. Where effects are dependent on such factors, this uncertainty is acknowledged within the assessment. The Government's four tests for expansion (climate change, air quality, noise and economic growth) are also recognised as key policy requirements, the achievement of which is dependent on detailed design and mitigation at subsequent stages.

Relationship to policy and decision-making

9.1.9 Recognising the scheme will still be required to go through the planning process (and associated environmental assessments), the draft HENPS includes policy provisions intended to inform subsequent decision-making on development consent, including the designation of development covered by the draft HENPS as Critical National Growth Infrastructure (CNGI) and the application of policy tests or presumptions.

9.1.10 Such provisions influence how impacts may be weighed in the planning balance at later stages but do not alter the nature, scale or significance of the environmental, social or economic effects identified through the AoS. Accordingly, the appraisal distinguishes clearly between the identification of sustainability effects arising from the scale and nature of development enabled by the draft HENPS, and the consideration of how such effects may later be weighed in decision-making.

Approach to significance

9.1.11 As with the appraisal of reasonable alternatives, the significance matrix in **Table 6-1** has been used to inform conclusions on significance in the draft HENPS appraisal.

9.1.12 Effects assessed as major or moderate are considered to be significant (indicated by **'--**' or '**++**'). Effects assessed as minor (indicated by '**-**' or '**+**') or negligible ('**0**') are not considered significant in the context of the appraisal.

9.2. Appraisal

Air quality

Baseline and policy context

9.2.1 Heathrow airport is located within an urban environment where air quality has historically been constrained by road traffic emissions, and where declared AQMAs, including within the London Borough of Hillingdon, reflect a history of exceedances of NO2 objectives. Elevated concentrations of particulate matter (PM10 and PM2.5) also contribute to local air quality pressures. While monitored concentrations of key pollutants have shown a long-term downward trend, driven by vehicle fleet improvements and wider national and local policy measures, the local environment remains sensitive to changes in air quality. While the most pronounced effects occur in the vicinity of the airport, air quality effects will extend more widely, particularly in relation to surface access traffic and regional pollutants such as PM2.5, which can affect areas beyond the immediate airport boundary.

9.2.2 At a strategic level, air quality represents one of the Government's four tests for Heathrow expansion. The draft HENPS makes clear that expansion must not cause any new breaches, or make existing breaches materially worse, of legal obligations on air quality. This includes those for NO2 and particulate matter (PM10 and PM2.5) set out in the Air Quality Standards Regulations 2010. This requirement applies alongside legally binding national air quality targets for PM2.5 introduced under the Environment Act 2021. The draft HENPS also requires that all reasonable steps are taken to reduce emissions of $PM_{2.5}$ and its precursor pollutants during both construction and operation, and that appropriate mitigation is applied to ensure that development does not delay compliance with relevant air quality objectives and targets. Emerging evidence relating to ultrafine particles (UFPs), while not currently subject to statutory limits, is also relevant in understanding potential future air quality risks.

9.2.3 The appraisal recognises that achieving compliance with these requirements is influenced not only by emissions directly attributable to airport operations and surface access, but also by assumptions regarding future background conditions, including transport decarbonisation, wider emissions reduction policies and trends in travel demand. Many of these factors sit outside the direct control of the draft HENPS itself, increasing uncertainty at the strategic level. This includes consideration of future baseline conditions without expansion, against which the effects of development are assessed, in line with the draft HENPS requirements.

Likely effects during construction

9.2.4 Development covered by the draft HENPS would involve prolonged, large-scale activity, including demolition, extensive earthworks, construction of the new runway and terminal infrastructure, and major changes to the strategic and local road network, most notably the realignment of the M25 and associated junction works.

9.2.5 At a strategic level, construction activity is expected to give rise to adverse effects on local air quality, particularly in areas close to construction zones, haul routes and junctions within or adjoining existing AQMAs. These effects would arise from increased heavy goods vehicle movements, emissions from non-road mobile machinery, traffic disruption and the generation of dust and particulate matter (PM10 and PM2.5) during earthworks and demolition. Construction traffic associated with the scheme may also affect a wider road network beyond the immediate vicinity of the airport, giving rise to more dispersed air quality effects along key transport corridors.

9.2.6 The scale, intensity and duration of works associated with the draft HENPS mean that construction would occur over many years and across a wide area, however the construction-phase air quality effects are expected to be temporary and subject to management through construction control measures. The appraisal, therefore, identifies **moderate (--) adverse effects** on air quality during construction at a strategic level, reflecting that effects are temporary and controllable through established mitigation but may still affect sensitive receptors locally over extended periods.

Likely effects during operation

9.2.7 In operation, the draft HENPS supports a substantial increase in airport capacity, resulting in higher passenger numbers and increased air traffic movements at Heathrow. This enables higher levels of aviation activity alongside increased surface access demand by passengers, workers and freight.

9.2.8 Operational air quality effects would arise from:

- Aircraft-related emissions during landing, take-off and ground operations;
- Increased road traffic along key strategic and local routes serving the airport; and
- Emissions associated with airport energy use and ground-based activities.

9.2.9 These effects are not confined to the immediate airport area and may extend across a wider affected road network, including strategic routes connecting to the airport, reflecting the distribution of surface access trips across the transport network.

9.2.10 The draft HENPS includes a comprehensive set of policy requirements and commitments intended to manage these emissions, including surface access mode share targets, cleaner vehicle fleets, emissions-based charging, and increased use of zero-emission vehicles. Taken together, these measures are intended to limit emissions associated with expansion and support compliance with relevant air quality objectives over time. However, at a strategic level, there remains potential for localised increases in emissions and associated air quality pressures, particularly where baseline conditions are already constrained.

9.2.11 The appraisal recognises that air quality outcomes remain uncertain, including assumptions about future background emissions, the pace of fleet turnover, and the delivery of measures beyond the direct control of the draft HENPS. In locations where AQMAs already exist and baseline headroom is constrained, the increase in activity enabled by the draft HENPS reduces resilience to future pressures and increases exposure to cumulative effects. This includes effects arising both locally and across the wider transport network, as well as more regional-scale changes in pollutant concentrations, particularly for fine particulate matter.

9.2.12 In accordance with the draft HENPS, any development brought forward must demonstrate that it would not result in any new breaches, or make existing breaches materially worse, of legal air quality limit values, taking account of appropriate mitigation, surface access strategies and operational measures. Accordingly, compliance with statutory air quality requirements is a fundamental policy requirement and is expected to be achieved and maintained through the application of these measures.

9.2.13 Despite this, the appraisal identifies **major (--) adverse effects** on air quality at a strategic level. This reflects: the scale of additional emissions-generating activity compared with the no-expansion scenario; the sensitivity of affected receptors (including existing AQMAs); and the reliance on mitigation and wider system-wide improvements to maintain compliance, rather than an inherent neutral or improving emissions position. This conclusion does not assume non-compliance, but rather recognises that significant effects may still arise even where legal thresholds can be met.

Supporting technical studies

9.2.14 Evidence prepared to support the draft HENPS includes a series of air quality technical notes produced by AECOM (2026), including a Review of Emissions Source Data and Trends, a Review of Airport Emissions, a Review of the PM2.5 Concentration Target and Exposure Reduction Target, and a literature review of UFPs. Together, these studies examine how airside activities and surface access associated with expansion at Heathrow could influence emissions, concentrations and population exposure, using updated data, modelling tools, and assumptions relative to those available when the 2018 ANPS was prepared.

Emissions source data and trends

9.2.15 The review of road vehicle emissions source data and trends for NOx and PM10 indicates that vehicle emission assumptions used in the 2018 ANPS are typically conservative, tending to overestimate future emissions. Whilst not presented in the 2018 assessment, ammonia (NH3) emissions are included in the 2026 review to provide additional understanding of emission concentrations. A general decreasing trend can be observed for all road types over the full projection period (2025-2050). Analysis of updated emissions factors, fleet composition and policy developments indicates that, had the assessment been undertaken using current evidence and assumptions, lower projected NOx emissions and, in most cases, lower PM10 emissions for surface access would likely have been identified compared to 2018, although some variation exists by road type. The review did not include an update of other assumptions such as congestion, speed and traffic growth via modelling. The review also identifies additional pollutant considerations, including NH3, which shows a general declining trend over time.

9.2.16 The indicative analysis suggests that, based on current evidence, the Government's conclusions for NO2 and PM10 impacts for the 2018 ANPS can be applied to the position as at 2026 (subject to the uncertainties identified in the analysis).

9.2.17 However, the evidence confirms that reductions in emissions arising from technological improvements and fleet turnover do not remove the adverse air quality effects associated with the increased activity enabled by expansion, particularly within an already constrained air quality environment.

Review of airport emissions

9.2.18 The review of airside emissions demonstrates that aircraft remain the dominant contributor to overall airside airport-related emissions. The study also found that, taking account of fleet evolution and operational practices, assumptions used about aircraft emissions in the 2018 ANPS remain largely unchanged for NOx and are considered to have been cautiously high for PM10. The review also suggests that emissions from sources such as ground support equipment and auxiliary power units are expected to be lower than previously assumed due to electrification and operational controls; however, these sources contribute a relatively small proportion of total emissions and do not materially alter the overall airside emissions profile.

9.2.19 On this basis, the review concludes that the overall scale of airside emissions remains broadly comparable (for NOx) or conservative (for PM10) to that assumed in the 2018 ANPS, due to increased uptake of lower emission technologies such as the decrease in Auxiliary Power Unit usage, increase in Ground Power Unit usage and the increasing electrification of the Ground Support Unit fleet.

PM2.5 concentration target and exposure reduction target

9.2.20 Assessment of PM2.5 indicates that concentrations are generally expected to decline over time as a result of improvements in vehicle emissions and wider policy measures. However, this reduction is likely to occur more slowly than for pollutants such as NO2, reflecting the continued importance of non-exhaust sources such as brake and tyre wear.

9.2.21 Against this background, indicative analysis identifies that expansion may give rise to localised increases in PM2.5 concentrations and population exposure, particularly in areas affected by new or realigned infrastructure and in proximity to airside activity. Increases are most likely to occur near the proposed new runway and along realigned surface access corridors, including areas to the north of the airport and along key routes to the east where traffic flows and proximity to emission sources are expected to change.

9.2.22 Results from this analysis, which is based on trends at existing monitoring sites only, suggest that Heathrow expansion is not expected to cause any new exceedances in targets. While most existing monitoring sites are projected to remain within with Annual Mean Concentration target with expansion, results suggest that one local authority monitoring site is at risk of exceedance in both the with and without expansion scenarios. As the assessment is limited to existing monitoring locations, these findings are indicative of conditions at those sites and may not fully reflect changes in areas affected by new or realigned emission sources. However, it should be noted that this analysis makes various conservative assumptions which may result in higher concentrations being projected than will be the case in reality. Furthermore, the impact of expansion on PM2.5 concentrations is assessed to be minimal in the scenario with illustrative surface access targets, even under reasonable worst-case assumptions for traffic impacts.

9.2.23 Changes in population exposure are also expected to vary spatially, with both increases and decreases depending on proximity to emission sources, as well as changes in the distribution of receptors resulting from demolition, relocation or infrastructure realignment. For example, exposure may reduce where properties in higher-exposure locations are removed or where major roads are rerouted or tunnelled, while increases may occur where new or existing communities are located closer to realigned roads or expanded airside operations. As such, the overall effect on exposure is complex and uncertain, and dependent on the balance of these factors.

Ultrafine particles

9.2.24 Assessment of ultrafine particles (UFPs) indicates that aviation activity is a significant contributor to local air quality effects in the vicinity of major airports, including Heathrow. Evidence from monitoring studies shows that UFP concentrations can be substantially elevated close to the airport, with aircraft engines identified as the dominant source, particularly during take-off, landing and taxiing. These emissions are characterised by very small particle sizes (typically below 20 - 30 nm) and can remain elevated over several kilometres downwind of the airport, influencing exposure in nearby communities depending on wind direction and proximity to runways. In the context of Heathrow, this suggests that communities around the airport, including those to the west and east depending on prevailing wind direction, and to the north in proximity to the proposed new runway, may experience elevated exposure relative to the wider urban background.

9.2.25 Although aviation-related UFP emissions are well evidenced, overall understanding of their distribution, behaviour and health impacts remains limited compared to pollutants such as NO2 and PM2.5. Monitoring coverage is sparse, measurement approaches are not fully standardised, and there are currently no legally binding thresholds or established air quality objectives. While research increasingly indicates potential associations between UFP exposure and adverse health effects, findings remain inconclusive.

Summary

9.2.26 Taken together, the supporting studies confirm that air quality remains a key consideration for the draft HENPS. While improvements in emissions technology, changes in fleet composition and surface access decarbonisation are expected to reduce emissions over time, the scale of additional activity associated with expansion means that long-term adverse air quality effects at a strategic level cannot be ruled out. The evidence indicates that while trends are improving, expansion increases absolute pressure on the system relative to a no-expansion baseline, particularly in localised areas, including through the release of pollutants such as UFPs, which are strongly associated with aviation activity but remain subject to greater uncertainty in terms of monitoring and health effects. This reinforces the need for effective mitigation and policy control.

Mitigation, uncertainty and policy safeguards

9.2.27 The draft HENPS includes a strengthened set of policy safeguards intended to manage air quality risks and to address the Government's air quality test for expansion. These include requirements for detailed air quality assessment at the project stage, demonstrably deliverable surface access strategies with enforceable outcomes, controls on airport-related traffic growth, construction emissions management, and operational measures aimed at minimising ground-based emissions within the airport's control or influence.

9.2.28 The draft HENPS sets out an extensive and largely comprehensive mitigation framework, consistent with the requirement that 'all reasonable mitigation' must be applied to prevent exceedances or delays in compliance. This includes a wide range of measures across surface access, airport operations and construction activities, and is supported by requirements for assessment, monitoring and enforcement at the DCO stage. In principle, this framework is capable of enabling policy compliance, provided measures are robustly implemented.

9.2.29 However, there are several challenges and uncertainties in relation to mitigation effectiveness at a strategic level, including:

- Many measures rely on behavioural change (such as modal shift) and external delivery partners (such as local authorities), which reduces certainty of outcomes, although delivery can be supported through planning obligations and DCO requirements;
- The effectiveness of mitigation is dependent on future technological change and background emissions reductions that lie outside the control of the draft HENPS;
- Some measures (such as emissions-based charging, traffic restrictions) require detailed design, enforcement mechanisms and stakeholder agreement to be effective, which are intended to be secured through the DCO process and associated controls; and
- Residual localised effects may persist even where overall compliance is achieved.

9.2.30 As such, while the mitigation framework is broadly appropriate and aligned with national policy expectations, it is heavily relied upon to offset the additional emissions associated with expansion. Additional focus at later stages may be required on ensuring deliverability, enforceability and early implementation of mitigation measures, particularly for surface access and local air quality hotspots.

Relationship with other assessments and next stages

9.2.31 The AoS has been prepared alongside an HRA. Where changes in air quality arising from the draft HENPS have the potential to affect Habitats sites (SACs, SPAs, and Ramsar sites), these implications have been considered and assessed through the HRA, which focuses specifically on effects on site integrity.

9.2.32 Detailed quantitative assessment of air quality effects will be undertaken at the DCO stage through the EIA process. These assessments will test compliance with the air quality policies and safeguards set out in the draft HENPS.

Overall policy-level effect

9.2.33 At a strategic level, the AoS appraisal concludes that the draft HENPS is expected to give rise to **major (--) adverse effects** on air quality when compared to a no-expansion scenario. This conclusion is consistent with the findings of the 2018 Airports NPS AoS and reflects the inherent challenge of accommodating substantial additional aviation and surface access activity within an area that has historically experienced air quality exceedances and high receptor sensitivity.

9.2.34 The AoS appraisal recognises that the policy framework within the draft HENPS includes safeguards and controls that are intended to ensure that expansion does not cause any new breaches, or make existing breaches materially worse, of statutory air quality limit values and targets. However, supporting indicative assessments have identified risk of exceedance of PM2.5 objectives at one existing monitoring location even without expansion. Achieving compliance is therefore dependent on the successful application of mitigation, further detailed assessment at later stages, and wider emissions reduction trends.

9.2.35 At the strategic level, therefore, the AoS identifies that expansion at Heathrow places additional pressure on an already constrained air quality environment and increases reliance on mitigation, regulatory control and external factors to achieve compliant outcomes. The determination of **major (--) adverse effects** therefore reflects the scale and distribution of impacts relative to the no-expansion scenario and the level of reliance placed on mitigation to avoid exceedance, rather than a conclusion that legal compliance will necessarily be breached. As such, air quality remains a key sustainability risk and constraint for the draft HENPS, to be addressed through rigorous application of policy safeguards and detailed assessment at subsequent stages.

Biodiversity

Baseline and policy context

9.2.36 While much of the existing Heathrow Airport footprint is highly modified, the surrounding environment supports a complex and sensitive ecological network. This includes internationally designated sites, notably the South West London Waterbodies SPA and Ramsar site, together with nationally and locally designated sites, priority habitats, river corridors and ecological networks associated with the River Colne and the wider Colne Valley. These sites perform an important ecological function at local, regional and international scales and are sensitive to land take, disturbance, hydrological change and fragmented habitat connectivity.

9.2.37 The policy context places strong emphasis on the protection of designated sites, the avoidance of harm to habitats and species where possible, and the application of the mitigation hierarchy. The draft HENPS also reflects strengthened national policy since 2018, including statutory requirements for biodiversity net gain (BNG) and the introduction of local nature recovery strategies. The draft HENPS further requires that development should avoid significant harm to biodiversity where possible, with mitigation and compensation applied as necessary, and that the Secretary of State will give significant weight to any residual harm. However, the AoS appraisal assesses likely effects with reference to the scale, location and permanence of development enabled by the draft HENPS, rather than assuming the effectiveness of future mitigation or compensation measures.

Likely effects during construction

9.2.38 Construction of development covered by the draft HENPS would involve extensive land take, earthworks, river and floodplain intervention and infrastructure development associated with the new runway, terminal expansion and surface access works. At a strategic level, this would result in clear adverse effects on biodiversity during the construction phase.

9.2.39 Direct and permanent loss of habitats would occur within the development footprint, including the partial loss of a locally designated site (Lower Colne SINC), priority habitats (including woodland) and undeveloped land contributing to ecological networks within the Colne Valley. Construction activity would also give rise to indirect effects, including habitat fragmentation, disturbance from noise and lighting, reduced air quality associated with dust deposition and emissions, increased human activity and construction traffic, and the potential introduction or spread of INNS through ground disturbance and movement of materials.

9.2.40 Significant works would be required to divert, realign and reconfigure watercourses within the Colne catchment, with implications for aquatic and riparian habitats and downstream ecological connectivity. Given the interconnected nature of the river catchment, these effects may extend beyond the immediate footprint of the scheme, including through pathways that facilitate the spread of INNS within connected watercourses.

9.2.41 Construction activity would also take place in proximity to internationally designated sites and functionally linked habitats. Disturbance during sensitive periods has the potential to affect qualifying bird species associated with the South West London Waterbodies SPA and Ramsar site.

9.2.42 Taking account of the scale of habitat loss, disturbance and hydrological modification, and the sensitivity of the ecological baseline, the AoS appraisal identifies **major (--) adverse effects** on biodiversity during construction at a strategic level, reflecting the extent of irreversible habitat loss and ecological disruption compared to the no-expansion scenario and the limited ability of mitigation to fully avoid these effects at this stage.

Likely effects during operation

9.2.43 In the operational phase, the permanent loss of habitats within the footprint of the development covered by the draft HENPS would remain. Expanded airport infrastructure and activity would continue to influence surrounding ecological receptors through ongoing disturbance, changes in land use, altered hydrology and long-term modification of ecological corridors.

9.2.44 The development covered by the draft HENPS includes policy commitments relating to habitat creation, ecological enhancement and long-term management, with an intention to deliver BNG and improve ecological linkages in parts of the surrounding area. Over time, newly created habitats may mature and contribute to ecological function at a landscape scale.

9.2.45 However, at the strategic level, the AoS appraisal recognises that habitat creation and compensation do not replicate the function, location or maturity of habitats lost, particularly where river corridors and functionally linked landscapes are permanently altered. The reconfiguration of the River Colne system would remain a defining feature of the scheme, representing a long-term change in hydromorphology and ecological processes.

9.2.46 Operational activity would also continue to introduce disturbance pressures affecting sensitive receptors, including designated waterbodies and associated species, albeit subject to operational controls and management.

9.2.47 On this basis, and notwithstanding the anticipated mitigation and enhancement measures set out in the draft HENPS, the AoS appraisal identifies ongoing **major (--) adverse effects** on biodiversity during operation, reflecting: the permanence of habitat loss; the alteration of ecological networks; and the persistence of disturbance pressures relative to a no-expansion scenario, even where enhancement measures are successfully delivered.

Mitigation, compensation and uncertainty

9.2.48 The draft HENPS anticipates a comprehensive approach to biodiversity management, including application of the mitigation hierarchy, delivery of BNG, habitat compensation where residual effects remain, and long-term ecological management. This framework is consistent with national policy expectations and includes a wide range of measures such as habitat avoidance, green infrastructure, connectivity enhancement, BNG and compensation for residual impacts, supported by requirements for long-term monitoring and management.

9.2.49 These measures form a central part of the policy framework and, if effectively implemented, have the potential to improve ecological outcomes relative to baseline conditions in some locations. In particular, opportunities exist for habitat creation, improved connectivity and delivery of wider ecosystem services. However, the effectiveness of these measures is constrained by several factors, including the availability of suitable land, operational restrictions associated with airport safety (such as bird strike risk), and the time required for habitats to mature and function effectively.

9.2.50 In addition, residual uncertainty remains in relation to the loss of existing habitats, the spread of INNS, and the long-term functionality of replacement habitats, particularly in the context of operational constraints associated with airport safety, including bird hazard management, which may influence the type and location of habitats that can be delivered in proximity to the airport.

9.2.51 The AoS also recognises that, consistent with the draft HENPS, where significant harm cannot be avoided or mitigated it must be compensated for, but compensation is a last resort and does not remove the original adverse effect. As such, even a comprehensive mitigation and compensation strategy is unlikely to fully address the loss of established ecological networks and irreplaceable ecosystem functions. Additional focus at later stages may therefore be required on ensuring early delivery of habitat creation, securing off-site compensation where necessary, and strengthening ecological connectivity beyond the immediate scheme boundary. The mitigation hierarchy should be fully addressed through the development of the proposals.

Relationship with other assessments and next stages

9.2.52 The AoS has been prepared alongside an HRA, which has specifically assessed the implications of the draft HENPS for European sites and their conservation objectives, including consideration of habitat loss, disturbance, air quality and hydrological change. The findings of this AoS appraisal therefore relate to the wider ecological baseline beyond habitats sites, while recognising the close interaction between the two assessment processes.

9.2.53 The HRA identifies that likely **significant adverse effects** cannot be excluded for a number of European sites, most notably the South West London Waterbodies SPA and Ramsar site, as a result of disturbance, changes in air quality, habitat loss and fragmentation (including functionally linked land), and hydrological change. A detailed Appropriate Assessment was therefore undertaken.

9.2.54 The Appropriate Assessment concludes that, at the level of the draft HENPS, there is uncertainty regarding the scale, location and effectiveness of mitigation measures, and therefore **adverse effects** on the integrity of European sites cannot be ruled out, either alone or in combination with other plans and projects. This reflects the strategic nature of the draft HENPS, where detailed design, operational controls and mitigation will be developed and tested at the DCO stage.

9.2.55 As a result, the draft HENPS is required to rely on the Habitats Regulations derogation provisions, with the HRA concluding that there are no less damaging alternative solutions and that a case for imperative reasons of overriding public interest (IROPI) has been identified in principle, subject to project-level confirmation and the delivery of appropriate compensation.

9.2.56 The HRA findings are consistent with the AoS in identifying the potential for **significant adverse effects** on biodiversity, particularly in relation to designated sites, waterbird populations and supporting habitats. Further detail, including the full assessment of impact pathways, mitigation and compensation measures, is provided in the HRA report accompanying this AoS.

9.2.57 Detailed assessment of biodiversity effects, including habitats, species, ecological networks and the effectiveness of mitigation and compensation measures, will be undertaken at the DCO stage through the EIA process and project-level HRA.

Overall policy-level effect

9.2.58 At a strategic level, the AoS appraisal concludes that the draft HENPS would result in **major (--) adverse effects** on biodiversity when compared to a no-expansion scenario. This conclusion is consistent with the findings of the 2018 Airports NPS AoS and reflects the high sensitivity of the ecological baseline, the scale of permanent habitat loss, extensive river diversion and modification of the River Colne system, and sustained interaction with internationally, nationally and locally designated sites.

9.2.59 While the draft HENPS includes strengthened policy safeguards and an intention to deliver BNG, these measures primarily act to offset and manage effects rather than avoid them entirely. The determination of major adverse effects therefore reflects: the permanence and irreversibility of key impacts (including habitat loss and hydrological change); the limited ability of mitigation and compensation to fully replicate lost ecological function; the sensitivity and importance of affected ecological receptors; and the increase in pressure on biodiversity relative to a no-expansion scenario.

9.2.60 Accordingly, biodiversity impacts remain significant at a policy level even where mitigation is effectively implemented and net gain is achieved. Biodiversity therefore remains a key sustainability challenge for the draft HENPS, requiring robust application of the mitigation hierarchy, effective compensation strategies and long-term ecological management at subsequent stages.

Climate change

Baseline and policy context

9.2.61 Under the Climate Change Act 2008, the UK is required to reduce greenhouse gas emissions by at least 100% by 2050 on 1990 levels, and meet carbon budgets (legally binding, five-year caps on emissions) on the pathway to 2050. Government policy now provides for the inclusion of the UK's share of international aviation emissions within carbon budgets from the Sixth Carbon Budget onwards and in the net zero target. Climate change mitigation therefore represents one of the Government's four tests for Heathrow expansion, with the Secretary of State required to be satisfied that any increase in emissions would not be so significant as to materially affect the UK's ability to meet its carbon budgets and net zero obligations.

9.2.62 Climate change adaptation is also a critical consideration for the AoS appraisal. Heathrow Airport is located within the Colne catchment, characterised by a dense and highly interconnected network of rivers, floodplains, drainage infrastructure and groundwater bodies. Baseline conditions already reflect vulnerability to fluvial, surface water and groundwater flooding, and parts of the catchment are subject to flood risk management interventions. Climate change projections indicate increased frequency and intensity of extreme rainfall events, alongside more frequent heatwaves, and increased variability in weather patterns including storm events and high winds, increasing the sensitivity of the receiving environment to major infrastructure development. National policy requires that new infrastructure is designed to avoid increased vulnerability to climate change and incorporates appropriate adaptation measures, informed by the latest UK Climate Projections and climate risk assessments, and taking account of the expected lifetime of the development.

9.2.63 The appraisal focuses on the scale, permanence and location of development enabled by the draft HENPS. While improvements in emissions intensity from technological, operational and policy developments are taken into account, the appraisal assumes that these improvements would also occur in a 'no-expansion' scenario and would not fully offset the increase in absolute emissions associated with the additional activity enabled by the draft HENPS.

Climate change mitigation

Likely effects during construction

9.2.64 Development covered by the draft HENPS would involve extensive earthworks, the provision of major new infrastructure, reconfiguration of the strategic road network and a prolonged construction programme. Construction-phase GHG emissions would arise from multiple sources, including:

- the production and transport of construction materials;
- on-site energy use;
- construction traffic and worker movements; and
- temporary operations associated with river diversion and flood infrastructure works.

9.2.65 At a strategic level, these emissions are time-limited and represent a relatively small proportion of total emissions over the lifetime of the scheme when compared with long-term operational aviation emissions. The AoS appraisal therefore identifies **minor (-) adverse effects** on climate change mitigation during construction, reflecting that heightened emissions are temporary, controllable through best practice and whole life carbon measures, and relatively limited in scale compared to operational emissions.

Likely effects during operation

9.2.66 In the operational phase, the draft HENPS supports a substantial increase in airport capacity and aviation activity at Heathrow. The dominant source of GHG emissions enabled by development covered by the draft HENPS would be aircraft operations, including emissions from additional air transport movements. Additional contributions would arise from:

- surface access travel by passengers, airport workers and freight;
- airport ground operations, energy use and servicing activities; and
- ongoing maintenance of expanded infrastructure.

9.2.67 While improvements in aircraft efficiency, the uptake of sustainable aviation fuels, and market-based mechanisms are expected to reduce emissions intensity over time, these developments are not specific to the draft HENPS and would occur to some extent irrespective of expansion. As such, they do not remove the increase in absolute emissions associated with the higher level of aviation activity enabled by the draft HENPS.

9.2.68 The AoS appraisal also recognises that the UK's share of international aviation emissions will now formally be included in all carbon budgets from the sixth carbon budget onwards, which places legal requirements on the UK to ensure emissions from all sectors, including aviation, do not exceed legislated targets. At a strategic level, expansion at Heathrow therefore increases reliance on economy-wide mitigation, technological deployment and international policy action, all of which sit beyond the direct control of the draft HENPS.

9.2.69 It is also recognised that national carbon budget analysis undertaken by Government includes assumptions regarding future aviation growth, including airport expansion within the UK airport system. As set out in the draft HENPS, this analysis incorporates expansion at Heathrow within its modelling of emissions trajectories, ensuring that plans to meet currently legislated carbon budgets take account of the emissions impacts of such development.

9.2.70 Accordingly, consistency with carbon budgets is considered within this wider policy and modelling context. However, the AoS recognises that this does not remove the need for project-specific assessment at the DCO stage to demonstrate that emissions associated with any scheme are compatible with legislated carbon limits, nor does it remove uncertainty associated with future aviation demand, technological development and the effectiveness of decarbonisation measures.

9.2.71 On this basis, the AoS appraisal identifies **major (--) adverse effects** on climate change mitigation, reflecting: the substantial increase in absolute aviation emissions relative to a no-expansion scenario; the limited ability of project-level mitigation to directly control the dominant emissions source (aircraft); and the increased reliance on external, national and international decarbonisation pathways to meet legally binding targets. This conclusion does not imply that climate obligations cannot be met, but recognises that compliance would depend on wider system-wide mitigation rather than measures secured through the draft HENPS itself.

Climate change adaptation

Likely effects during construction

9.2.72 Development covered by the draft HENPS would take place within a sensitive hydrological environment and would involve extensive works within and adjacent to rivers and floodplains, including the diversion, realignment and reconfiguration of watercourses within the Colne catchment. These works would occur in proximity to existing communities and low-lying areas, including settlements such as Stanwell Moor, and would require temporary alteration of drainage systems and floodplain connectivity during construction.

9.2.73 At a strategic level, the construction phase represents a period of heightened exposure to climate-related risk, particularly flooding during extreme rainfall events. This reflects the scale and complexity of works within river corridors and floodplains, and the reliance on temporary drainage, flood protection and construction management measures during this period. In addition, construction activities may be exposed to other climate hazards, including high temperatures and extreme weather events, which could affect working conditions, programme delivery and construction resilience. While such measures would be expected to reduce risks, the AoS appraisal identifies **major (--) adverse effects** on climate change adaptation during construction, reflecting the interaction between existing baseline vulnerability and large-scale temporary disturbance, and reliance on effective short-term risk management during construction.

Likely effects during operation

9.2.74 In the operational phase, the development covered by the draft HENPS would rely on a comprehensive suite of engineered flood risk management and drainage infrastructure, including reconfigured river channels, flood storage areas and surface water management systems designed to accommodate future climate conditions.

9.2.75 Long-term climate resilience would depend on detailed design performance, maintenance, governance arrangements and the accuracy of future climate projections. In addition to flood risk, the airport may be exposed to a wider range of climate-related hazards, including extreme heat, storms and high winds, which have the potential to affect airport operations, infrastructure performance and resilience of airspace operations over time.

9.2.76 These factors may also interact with other AoS themes, for example through effects on operational reliability, capacity and passenger experience, which could influence economic performance, transport efficiency and community impacts associated with disruption and delay. On this basis, the AoS appraisal identifies **major (--) adverse effects** in relation to climate change adaptation, reflecting the permanence of development within a flood-prone and climate-sensitive environment and the introduction of long-term residual risk.

Supporting technical analysis

9.2.77 Evidence prepared to support the draft HENPS includes retained non-aviation carbon emissions analysis from 2018 and a qualitative review of changes since then, along with updated quantitative analysis of aviation carbon emissions associated with expansion.

9.2.78 The analysis distinguishes between aviation and non-aviation carbon (surface access, airport operations and construction), sources, reflecting their different treatment when setting policy and conducting appraisal.

Non-Aviation carbon evidence

9.2.79 For non-aviation carbon sources quantitative analysis of carbon impacts across a 60-year appraisal period has been retained from the 2018 ANPS and reprofiled in line with updated assumptions on expected timing of impacts. For economic assessment of the impacts latest carbon values have also been applied. Qualitative evidence on changes since the 2018 ANPS is included in a Non-Aviation Carbon Evidence study, appended to the Heathrow Expansion Appraisal Report which reviews how developments since that time are likely to affect the direction of emissions.

9.2.80 The study indicates that carbon emissions from passenger surface access are likely to be lower than assumed in the 2018 ANPS, reflecting the introduction of the Zero Emission Vehicle Mandate, accelerating electrification of car, bus and coach fleets. However, it also confirms that emissions associated with freight movements were not included in the original assessment and remain a source of uncertainty and could mean overall surface access emissions are an underestimate.

9.2.81 For construction emissions, the study concludes that the scale and nature of works are likely to be broadly similar to those assessed previously and that embodied carbon continues to dominate construction emissions.

9.2.82 In relation to airport operation emissions, the study indicates that assumptions used in the 2018 ANPS were conservative, and that subsequent commitments to decarbonise the electricity grid and Heathrow Airport's own plans for zero-emission vehicles and low-carbon buildings mean that lower operational emissions would now be expected.

9.2.83 Taken together, the non-aviation carbon evidence confirms that expansion enabled by the draft HENPS would result in additional non-aviation carbon emissions over time, compared to a scenario without expansion. It therefore supports the AoS conclusion that the draft HENPS would give rise to **major (--) long-term adverse effects** on climate change objectives at a strategic level, while recognising uncertainties and reliance on delivering decarbonisation in line with current policy commitments, including for other sectors.

Aviation carbon evidence

9.2.84 In line with current practice, aviation emissions are now considered within the overall carbon assessment, including their role within legally binding carbon budgets. Results are presented for two future scenarios: a central Current Trends scenario and a Technology Development scenario. The Current Trends scenario reflects expected trends in demand, technology and policy, while the Technology Development scenario provides an indication of how outcomes may differ under more optimistic assumptions regarding technological advancement and decarbonisation.

9.2.85 The carbon analysis presented in this AoS relates to departing flights only and assumes that in Current Trends, aerocharges (costs airlines face for using an airport) are not passed through to passengers. An alternative scenario is tested in the Heathrow Expansion Appraisal Report (HEAR) where these costs are passed through. The increase in carbon emissions across the appraisal period is similar for both scenarios but slightly higher in the aerocharge passthrough scenario (192.9 million tonnes for the aerocharge pass through scenario and 185.6 million tonnes for the non aerocharge pass through scenario over a 60-year period). Current Trends is presented below to align with assumptions on aerocharge pass-through used in the Carbon Budget planning process, Energy and Emissions Projections and previous carbon publications such as Jet Zero Strategy 2022.

9.2.86 The HEAR presents a wider set of carbon metrics and ranges, including analysis with a global scope (covering both departing and arriving flights). These global outputs are primarily relevant to the economic case and appraisal requirements for the HEAR, and are therefore not reproduced here, where the focus is on meeting the statutory environmental and legal obligations underpinning the AoS (for which only departing flights are in scope). Current Trends is the central economic case and Technology Development is a relevant scenario for legal obligations as that is used for carbon budget planning purposes. Therefore, Current Trends and Technology Development's carbon impacts are presented here.

9.2.87 **Table 9-1** presents emissions forecasts for Current Trends and Technology Development scenarios over the period 2024 to 2095, showing the additional carbon emissions associated with development covered by the draft HENPS relative to a no-expansion scenario. Both scenarios indicate an absolute increase in emissions to 2095. For non-aviation sources (surface access, operations and construction), total emissions across the appraisal period are unchanged between Current Trends and Technology Development scenarios which are specific to the aviation sector (non-aviation impacts are approximately 23.5 MtCO2), with differences in aviation emissions accounting for the majority of the increase. Under the Current Trends scenario, aviation emissions are estimated at 185.6 MtCO2 for the period 2024 to 2095, reducing significantly to 88.3 MtCO2 under the Technology Development scenario.

9.2.88 **Table 9-3** presents aviation emissions broken down by carbon budget period. A small, negative carbon impact is shown in Carbon Budget 6 (CB6) due to route-switching occurring when capacity increases at Heathrow are low and a small net national reduction in long-haul ATMs in favour of less polluting short-haul ATMs.

9.2.89 It should be noted that there are accounting differences between carbon estimated for expansion, shown in **Table 9-3** and analysis for carbon budget planning purposes for the aviation sector. Emissions from SAF which feed into the carbon calculations below are estimated on a lifecycle basis. This considers the emissions impacts of SAF across the full fuel supply chain to provide a more complete assessment of SAF's overall emissions impact. This differs from the accounting approach used in other Government reporting, for example, in Carbon Budget delivery plans where aviation forecasts only include the emissions savings from SAF that can be attributed to the aviation sector. This also does not include emissions reductions delivered by the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). These savings were included in the Carbon Budget and Growth Delivery Plan however these savings occur outside of the aviation sector. Therefore, they have not been included within the draft HENPS appraisal.

9.2.90 These results demonstrate that the development enabled by the draft HENPS gives rise to an increase in absolute emissions, primarily driven by aviation activity. This supports the conclusion of **major (--) adverse effects** in relation to climate change mitigation.

Table 9-1: Summary of results of DfT assessment of emissions for a Current Trends scenario and a Technology Development scenario. Figures indicate the additional carbon generated between 2024 and 2095 (MtCO2) arising from development supported within the draft HENPS

Area of emissions	Current Trends scenario	Technology development scenario
Surface access	9.5	9.5
Construction*	11.3	11.3
Operations	2.7	2.7
Non-aviation (total)	**23.5**	**23.5**
Aviation carbon (UK account - departing only)	**185.6**	**88.3**

**Figures for construction emissions are expressed as carbon equivalent, or MtCO2e. All other figures are in terms of carbon, MtCO2.*

Table 9-2: Summary of results of DfT assessment of aviation emissions, broken down by carbon budget period, noting there may be differences due to rounding

Aviation carbon (UK carbon account)	Current Trends scenario	Technology development scenario
CB6	-0.6	-0.3
CB7	2.2	2.1
CB8	4.6	2.5
Remainder of appraisal period outside of CB periods specified	**179.3**	**83.9**

Mitigation, uncertainty and policy safeguards

9.2.91 The draft HENPS includes a strengthened set of policy requirements intended to address climate change, including expectations for whole-life carbon assessment, construction and operational efficiency, low-carbon surface access, and comprehensive flood risk assessment and climate resilience measures at the project stage.

9.2.92 The mitigation framework set out in the draft HENPS is extensive and reflects current best practice, including requirements to apply the carbon reduction hierarchy, undertake whole life carbon assessment, and minimise emissions across construction, operation and surface access. It also includes a broad suite of measures to support aviation decarbonisation, including supporting the uptake of sustainable aviation fuel and emerging technologies.

9.2.93 However, there are limitations in the effectiveness of this mitigation, including:

- The majority of emissions arise from aircraft operations, which are not directly controllable through project-level measures;
- Many mitigation measures (such as sustainable aviation fuels, engineered removals, zero emission aircraft) are dependent on future technological development and policy delivery at a national or international level; and
- There is a high degree of uncertainty associated with future decarbonisation pathways, particularly in relation to aviation.

9.2.94 While the policy framework may not be able to fully offset all additional emissions, it provides a suite of measures aligned with national climate objectives and is capable of contributing to emissions reduction, and managing associated risks. Through this, it has the potential to contribute to decarbonisation over time, although its effectiveness remains dependent on broader system-wide mitigation and decarbonisation pathways.

9.2.95 Mitigation in relation to climate change adaptation is more directly embedded within scheme design, including flood risk management, drainage systems and resilience planning. These measures are expected to be effective in reducing risk where appropriately designed and maintained, but residual risks remain due to uncertainty in future climate conditions and the scale and permanence of development. At present, the draft HENPS does not explicitly address climate change adaptation in relation to overheating or urban heat island effects, which could be an important consideration for future resilience, particularly given projected increases in temperature.

Relationship with other assessments and next stages

9.2.96 The AoS appraisal has been prepared alongside other assessments relevant to climate change, including analysis of flood risk and surface water management. Health-related climate impacts are considered through the HIAn where relevant.

9.2.97 Detailed assessment of greenhouse gas emissions, flood risk, drainage performance and long-term climate resilience will be undertaken at the DCO stage through the EIA and project-level Flood Risk Assessment. These processes will determine whether the detailed design of a scheme is capable of meeting statutory requirements and the policy safeguards set out in the draft HENPS.

Overall policy level effect

9.2.98 At a strategic level, the AoS appraisal concludes that the draft HENPS would give rise to **major (--) adverse effects** on climate change, in relation to both mitigation and adaptation when compared to a no-expansion scenario. This conclusion is consistent with the findings of the 2018 ANPS AoS.

9.2.99 In terms of climate change mitigation, adverse effects arise from the increase in aviation-related greenhouse gas emissions enabled by the draft HENPS, together with the associated growth in surface access and airport ground-based activity. While emissions intensity reductions are anticipated through future technological development, operational improvements and wider policy measures, the draft HENPS enables a scale of activity which results in higher absolute emissions than the no-expansion scenario. The determination of **major (--) adverse effects** reflects this increase in emissions, the limited influence of project-level mitigation on aviation emissions, and the reliance on wider economy-wide decarbonisation to maintain compliance with carbon targets.

9.2.100 In terms of climate change adaptation, adverse effects reflect the scale, permanence and location of development within a flood-vulnerable and climate-sensitive catchment. Although engineered flood risk management and drainage systems are anticipated and may enable the scheme to maintain operational resilience, the appraisal also recognises the influence of wider climate hazards, including heat and storm events, on the long-term operation and resilience of the airport. The determination of adverse effects reflects the introduction of long-term residual risk and reduced flexibility to respond to future climate change due to the permanence and scale of infrastructure.

9.2.101 Climate change therefore represents a key sustainability challenge for the draft HENPS. While the policy framework includes safeguards intended to limit emissions and enhance resilience, these measures reduce but do not eliminate impacts, and are dependent on long-term delivery, governance and external factors. The AoS appraisal identifies that the scale, location and longevity of development enabled by the draft HENPS inherently increase climate-related risks that cannot be fully resolved at the strategic level and must be addressed through rigorous application of policy requirements and subsequent project-level assessment.

Communities and quality of life

Baseline and policy context

9.2.102 Heathrow Airport is located within a densely populated part of west London and the surrounding area, characterised by established residential neighbourhoods, historic settlements, town centres, community facilities, schools, healthcare provision and extensive transport infrastructure. The airport already has a strong influence on local quality of life through aircraft noise, surface access traffic, air quality, visual impacts and patterns of movement and severance. These effects are experienced unevenly across communities depending on proximity to the airport, flight paths and transport corridors.

9.2.103 At the same time, Heathrow plays a significant socio-economic role, providing large-scale employment, supporting local and regional supply chains and contributing to economic activity at a national scale. As a result, communities experience both adverse and beneficial effects associated with the airport, creating a complex baseline against which the impacts of further expansion must be assessed.

9.2.104 The policy context recognises the need to minimise harm to communities where possible, to avoid or mitigate impacts on residential amenity and wellbeing, and to provide appropriate compensation where impacts cannot be avoided. There is also increased emphasis on the distribution of effects, equality considerations and the relationship between environmental exposure, health outcomes and social vulnerability. The draft HENPS further requires the provision of a comprehensive community compensation package, ongoing financial support and continued engagement with affected communities, and recognises that while some impacts are unavoidable, they should be minimised and mitigated as far as possible. The AoS appraisal therefore considers community effects in combination, recognising strong interrelationships with noise, air quality, transport and land-use change.

Likely effects during construction

9.2.105 Development covered by the draft HENPS would involve sustained, large-scale activity over an extended period, including land acquisition, demolition, earthworks, construction of a new runway and terminal infrastructure, realignment of the M25 and other major surface access works. Construction would take place across a wide geographical area and over many years.

9.2.106 At a strategic level, construction is expected to give rise to **major (--) adverse effects** on communities and quality of life, particularly for communities located close to the development footprint and key construction corridors. One of the most significant adverse effects would be the permanent displacement of residents and loss of established communities (particularly in Longford, Harmondsworth, and Sipson), including homes, places of worship, schools and other community assets, where land is required for the new runway and associated infrastructure.

9.2.107 In addition to permanent displacement, construction activity would result in prolonged exposure to noise, dust, visual intrusion and construction traffic for surrounding communities (such as Stanwell Moor and Poyle). The duration of works means that these effects would be experienced over many years, affecting daily routines, wellbeing and perceptions of place. Changes to local and strategic road networks would create temporary and, in some cases, permanent severance, affecting access to services, employment, social networks and green space.

9.2.108 While compensation, relocation support and construction management controls are anticipated within the draft HENPS framework, the AoS appraisal recognises that these measures primarily address the consequences of impact rather than avoiding it, and are not capable of offsetting the loss of established communities, social networks, identity and sense of place associated with long-established settlements. On this basis, the development covered by the draft HENPS gives rise to **major (--) adverse effects** on communities and quality of life at a strategic level, reflecting the scale, permanence and irreversibility of displacement and disruption relative to the no-expansion scenario.

Likely effects during operation

9.2.109 In the operational phase, effects on communities and quality of life are more mixed, reflecting the interaction between ongoing environmental pressures and longer-term socio-economic benefits arising from expansion.

9.2.110 Expanded airport operations under the draft HENPS would continue to influence local quality of life through aircraft noise, surface access traffic, air quality pressures and the presence of extensive airport infrastructure. Although the draft HENPS includes safeguards intended to manage noise, air quality and transport impacts, some communities (particularly those closest to the airport and transport corridors) would continue to experience reduced residential amenity as a consequence of intensified airport use.

9.2.111 These are considered to be **major (--) adverse effects** which are spatially concentrated and stable over time, affecting specific local communities. The determination of significance reflects the long-term exposure of sensitive receptors to multiple environmental stresses, the limited ability of mitigation to eliminate these effects fully, and the persistence of impacts relative to a no-expansion scenario.

9.2.112 Conversely, operation of the expanded airport would also deliver sustained socio-economic benefits. Development covered by the draft HENPS is expected to support long-term employment at the airport and across associated industries, provide opportunities for skills development and training, and contribute to wider economic activity linked to connectivity, trade and tourism. Improvements to transport infrastructure supported by the draft HENPS also have the potential to enhance accessibility for passengers, workers and businesses across a broad geographic area.

9.2.113 At a strategic level, these specific factors give rise to **moderate (++) beneficial effects** on communities and quality of life at regional and national scales, particularly in terms of employment opportunities and economic inclusion, although these benefits are distributed more widely and do not directly offset localised environmental and amenity impacts experienced by communities closest to the airport.

Supporting technical studies

9.2.114 Evidence prepared to support the draft HENPS also provides relevant context for potential health-related effects on communities. In particular, AECOM's Air Quality assessments (2026) identifies that expansion at Heathrow could result in localised increases in PM2.5 concentrations and changes in population exposure, especially for communities located close to new or realigned surface access infrastructure and north of the proposed new runway. The study highlights that while background PM2.5 concentrations are generally predicted to decline over time, redistribution of exposure arising from increased activity, proximity to emissions sources and population movement means that some communities may experience higher exposure levels. Given the established links between PM2.5 and adverse health outcomes, this provides supporting evidence that air quality remains a relevant consideration for community health and wellbeing in the context of the draft HENPS.

Distributional effects and equality considerations

9.2.115 The AoS appraisal recognises that the effects on communities and quality of life arising from the draft HENPS are unevenly distributed.

9.2.116 Adverse effects are concentrated in communities closest to the airport and surface access infrastructure, particularly those experiencing displacement, environmental exposure and severance. These effects may disproportionately affect certain groups, including children, older people, those with existing health conditions or reduced mobility, and households with fewer resources to adapt or relocate.

9.2.117 In contrast, many socio-economic benefits associated with expansion are distributed more widely across London and the UK, reflecting Heathrow's role as a national hub airport. Consequently, the geographic areas experiencing the greatest adverse effects are not necessarily those that benefit most directly from expansion.

9.2.118 Consideration of health impacts, social vulnerability and effects on protected groups is explored further through the HIAn and EqIA.

Mitigation, compensation and uncertainty

9.2.119 The draft HENPS includes a range of policy measures intended to manage community impacts, including compensation and relocation arrangements, noise mitigation, surface access strategies and requirements for sustained engagement with affected communities.

9.2.120 The compensation and mitigation framework is extensive and reflects established practice for major infrastructure schemes, including statutory compensation, enhanced discretionary compensation packages, noise insulation measures, and the establishment of a community compensation fund proportionate to environmental impacts. The emphasis on early engagement, consultation and community participation in decision-making is also a positive feature of the policy framework.

9.2.121 However, these measures are primarily compensatory in nature and do not avoid or fully mitigate the most significant impacts, particularly permanent displacement and long-term changes to living conditions. In particular:

- Financial compensation cannot replace community cohesion, social networks or the cultural and historic value of place;
- Community compensation funds, while beneficial, provide indirect and collective benefits rather than addressing individual impacts; and
- Delivery of mitigation depends on detailed design, eligibility criteria, governance arrangements and long-term funding commitments.

9.2.122 As such, while the mitigation and compensation framework is broadly appropriate and robust in policy terms, it is not sufficient to offset the scale and permanence of community impacts identified at a strategic level. Additional considerations at later stages may include ensuring timely delivery of compensation, strengthening support for displaced communities, and maximising local access to economic benefits, although these would not remove the underlying adverse effects.

9.2.123 There is also uncertainty regarding how communities' experiences may evolve over the long operational life of the development, influenced by factors such as operational practices, long-term traffic patterns and wider environmental change, which cannot be fully predicted or resolved at the strategic level.

Relationship with other assessments and next stages

9.2.124 The AoS appraisal has been prepared alongside a HIAn and an EqIA, which consider community wellbeing, health outcomes and equality impacts in greater depth. The findings of those assessments provide important additional context for understanding community effects.

9.2.125 The EqIA identifies that the effects of the draft HENPS on communities are unevenly distributed, with a number of protected characteristic and priority groups more likely to experience differential or **disproportionate adverse effects**, particularly in relation to displacement, environmental exposure, loss of community infrastructure and changes in accessibility. Groups identified as particularly sensitive include children, older people, disabled people, ethnic minority groups and low-income households.

9.2.126 The EqIA concludes that while the draft HENPS has the potential to generate **beneficial effects** through employment, skills and improved connectivity, these benefits are likely to be more widely distributed, whereas **adverse effects** are concentrated locally, particularly on communities subject to land acquisition, environmental change and long-term disruption. The assessment highlights the importance of project-level mitigation, including compensation and targeted support, but recognises that such measures do not fully offset the loss of homes, community networks and established patterns of life.

9.2.127 The HIAn identifies a similarly **mixed but broadly adverse** pattern of effects on health and wellbeing, with **significant adverse effects** arising in relation to housing displacement, access to social infrastructure, community cohesion, air quality and noise, particularly during construction and for vulnerable groups. These effects are often interrelated and may act cumulatively, for example where environmental exposure, severance and social disruption occur in combination.

9.2.128 While the HIAn identifies **major beneficial effects** associated with employment, income and skills generation at wider spatial scales, it concludes that many environmental and social determinants give rise to **significant adverse effects** at the local level, including long-term impacts on mental wellbeing, place identity and access to services. The assessment also highlights the potential for cumulative and in-combination effects to amplify **both adverse and beneficial effects**.

9.2.129 Overall, the findings of the EqIA and HIAn are consistent with the AoS appraisal in identifying **significant and unevenly distributed effects** on communities and quality of life. In particular, they reinforce the conclusion that localised environmental and social impacts, combined with existing vulnerability, give rise to substantial sustainability challenges that are not fully resolved at the strategic policy level.

9.2.130 Detailed assessment of community impacts, including noise exposure, accessibility, severance, amenity impacts and social infrastructure provision, will be undertaken at the DCO stage through the EIA process.

Overall policy-level effect

9.2.131 At a strategic level, the AoS appraisal concludes that the draft HENPS would give rise to **major (--) adverse effects** on communities and quality of life during construction, driven primarily by permanent displacement, loss of established communities and prolonged disruption within a densely populated environment.

9.2.132 When compared to a no-expansion scenario, during operation, the AoS appraisal identifies a combination of locally **major (--) adverse effects**, associated with long-term environmental exposure and reduced residential amenity for specific communities, and **moderate (++) beneficial effects** associated with employment, economic opportunity and improved connectivity at regional and national scales. These effects may be unevenly distributed, creating an inherent tension between localised harm and wider societal benefit. These conclusions are consistent with the findings of the 2018 Airports NPS AoS.

9.2.133 Communities and quality of life therefore represent a key sustainability challenge for the draft HENPS, demonstrated by the trade-offs involved in supporting large-scale airport expansion in an urban setting. While policy safeguards, mitigation and compensation can influence the magnitude and experience of impacts, the determination of significance reflects the permanence and distribution of impacts, the limits of mitigation and compensation in addressing community loss, and the imbalance between localised adverse effects and more widely distributed benefits. The AoS appraisal identifies that the scale, duration and spatial concentration of community effects enabled by the draft HENPS cannot be fully resolved at the strategic level.

Economy

Baseline and policy context

9.2.134 Heathrow Airport functions as the UK's only international hub airport and is a major contributor to economic activity at local, regional and national scales. The Airport supports a large concentration of direct employment on site, alongside extensive indirect and induced employment generated through supply chains, airport-related services and associated economic activity. Heathrow also plays a significant role in facilitating international trade, inward investment and tourism, particularly through long-haul connectivity and air freight movements serving high-value and time-sensitive sectors of the economy.

9.2.135 The draft HENPS is underpinned by economic objectives, including supporting economic growth across the country, maintaining the UK's global competitiveness and enabling private investment in nationally significant infrastructure. The Government's economic growth test for Heathrow expansion reflects the intention that additional capacity should deliver benefits beyond the immediate locality and contribute positively to the wider UK economy. The draft HENPS also places emphasis on the delivery of skills, employment and supply chain benefits, including through requirements for workforce development, apprenticeships and engagement with local and regional economies.

9.2.136 The AoS appraisal therefore considers economic effects at local, regional, and national scales, recognising that expansion gives rise to both locally experienced effects and wider economic implications. At the local level, effects are more directly observable, while at the national level economic outcomes may involve redistribution and displacement within and between sectors.

9.2.137 The AoS assessment is undertaken at a strategic and qualitative level and does not replicate detailed economic appraisal or modelling.

Likely effects during construction

9.2.138 Development covered by the draft HENPS would represent one of the largest privately financed infrastructure investment programmes in the UK, involving sustained expenditure on construction, engineering, professional services and materials over an extended period.

9.2.139 At a strategic level, construction is expected to give rise to **major (++) beneficial effects** on the economy. These effects would arise through the creation of construction and related jobs, demand across national and regional supply chains, and opportunities for skills development, training and apprenticeships linked to large-scale, long-duration infrastructure delivery. The determination of significance reflects the scale and duration of investment relative to the no-expansion scenario and its contribution to economic output, employment and skills development across multiple regions.

9.2.140 Economic activity generated during construction is expected to extend beyond the immediate Heathrow area, reflecting the national reach of construction supply chains and specialist services. While the airport expansion scheme is expected to be privately financed, investment at this scale may still involve competition for labour and capital within the wider economy, which can support economic productivity and skills development, although it may also displace or delay other investment activity.

9.2.141 Construction-phase economic activity would nevertheless contribute to economic output and employment at local and regional levels. However, the AoS appraisal also recognises that, alongside these benefits, construction would give rise to **major (--) adverse effects** at the local scale, reflecting disruption to existing economic activity, displacement of businesses, and short- to medium-term impacts on local communities arising from land take and construction activity.

Likely effects during operation

9.2.142 In the operational phase, the draft HENPS supports additional airport capacity at Heathrow intended to improve connectivity, resilience and choice within the UK aviation system. Development covered by the draft HENPS would enable increased passenger and freight activity, additional routes and enhanced network connectivity.

9.2.143 At a strategic level, expanded capacity at Heathrow is expected to support beneficial economic effects at the local and regional scale, including improved access to international markets for UK businesses, increased attractiveness of the UK as a destination for inward investment, and support for high-value, trade-dependent sectors such as advanced manufacturing, professional services, technology and life sciences. Within the AoS framework, these effects are assessed as **major (++) beneficial**, reflecting the scale and nature of activity enabled. However, this strategic assessment does not replicate detailed economic modelling, which indicates that the scale and additionality of national-level benefits may be **uncertain** and, in some cases, limited.

9.2.144 The AoS appraisal recognises that Heathrow's role as a national hub airport means that economic benefits may accrue beyond the immediate vicinity of the airport, including across other regions of the UK through improved global connectivity and supply-chain linkages. However, at the national level, a proportion of these benefits may reflect redistribution of economic activity rather than wholly additional growth, and the extent to which these benefits are realised in net terms remains **uncertain** based on available economic evidence.

9.2.145 Operational expansion would also support ongoing employment at the airport (economic analysis in the HEAR suggests 50,000 – 61,000 jobs will emerge in the local area as a result of the expansion by 2055) and within related sectors, including aviation, logistics, retail and support services. These effects would be sustained over the long term, although the scale and nature of employment may change over time in response to operational practices, technological developments and wider economic trends. At the local level, these effects contribute to **major (++) beneficial** effects, while the extent of national-level benefits remains **uncertain**.

9.2.146 The determination of **major (++) beneficial effects** at the strategic level therefore primarily reflects local and regional economic outcomes, including the scale of employment, connectivity and activity enabled, rather than a quantified assessment of net additional economic outcomes. At the national level, effects are identified as **uncertain** due to the influence of redistribution and wider economic factors.

Distribution, displacement and uncertainty

9.2.147 The economic benefits associated with the draft HENPS would not be evenly distributed. While expansion at Heathrow may generate national and regional economic benefits, some effects may involve redistribution within the aviation sector, including displacement of activity from other airports or changes in airline network patterns. More broadly, at a national level, economic activity associated with expansion may also reflect the reallocation of labour, capital and investment within the economy, rather than wholly additional activity. There may also be differential impacts between regions, sectors and communities, depending on their reliance on Heathrow-linked activity.

9.2.148 Economic outcomes are also subject to uncertainty arising from future demand patterns, airline behaviour, global economic conditions, technological change and complementary investment in surface access, skills and regional economic development. The scale and timing of benefits may therefore vary over the lifetime of the draft HENPS.

9.2.149 At the strategic level, the AoS appraisal acknowledges these uncertainties and the findings of detailed modelling, but adopts a proportionate, policy-based approach focused on the scale and nature of development enabled. On this basis, the direction of effect is considered to be beneficial, although the magnitude of net national economic benefit remains uncertain and may be lower than implied by the scale of activity alone.

Mitigation, policy alignment and uncertainty

9.2.150 The draft HENPS includes policy requirements intended to maximise the economic benefits of expansion, including expectations for skills development and employment strategies, surface access provision, supply-chain participation and alignment with wider national and regional economic objectives. This includes requirements for applicants to support 5,000 youth apprenticeships, traineeships and other recognised entry-level pathways. Applicants should develop a Youth Employment and Skills Plan, outlining commitments to apprenticeships and workforce development, and measures to support local participation in both construction and operational phases.

9.2.151 The AoS appraisal recognises that this policy framework is broadly appropriate and aligned with national economic objectives, and is capable of enhancing the scale and distribution of economic benefits where effectively implemented. In particular, targeted investment in skills, training and supply chains has the potential to increase local economic inclusion and maximise long-term economic value.

9.2.152 However, the realisation of these benefits is dependent on effective implementation, governance and coordination across multiple stakeholders. In addition:

- Some benefits are dependent on broader economic conditions and global demand for aviation services;
- A proportion of benefits may represent redistribution rather than net additional economic activity; and
- There is uncertainty regarding the geographic distribution of benefits and the extent to which local communities most affected by environmental impacts will benefit directly.

9.2.153 As such, while the mitigation and policy framework is not intended to reduce adverse effects but to maximise positive outcomes, it is unlikely to fully address issues of distribution, displacement or dependency on external economic conditions. Additional focus at later stages may include strengthening mechanisms to ensure local access to employment and skills opportunities, although these would not materially alter the overall beneficial effect at a strategic level.

Relationship with other assessments and next stages

9.2.154 The AoS appraisal considers economic effects at a strategic, policy level only. More detailed assessment of economic impacts, cost-benefit analysis and the distribution of economic effects, will be undertaken through the business case and at the DCO stage, informed by detailed scheme design and demand modelling. This includes consideration of outputs from SCGE economic modelling and economic case, which provide a more detailed assessment of net impacts and distributional effects.

Overall policy-level effect

9.2.155 At a strategic level, the AoS appraisal concludes that the HENPS would give rise to **major (++) beneficial effects** on the economy at the local and regional scale, reflecting the scale of construction activity, employment generation and economic output supported by expansion. However, during construction these benefits are accompanied by **major (--) adverse effects** at the local scale, including displacement of businesses, disruption to existing economic activity and impacts on communities arising from land take and construction activity.

9.2.156 During operation, the draft HENPS supports sustained economic activity at Heathrow, including long-term employment, supply chain activity and enhanced connectivity. These effects result in **major (++) beneficial** outcomes at the local and regional scale, reflecting Heathrow's continued role as a key economic driver.

9.2.157 At the national level, economic effects associated with both construction and operation are **uncertain**. While the draft HENPS has the potential to support economic activity through increased capacity and connectivity, a large proportion of activity may reflect the redistribution of labour, capital and demand within the wider economy, rather than wholly additional growth.

9.2.158 This conclusion is consistent with the findings of the 2018 ANPS' AoS and reflects the scale of activity, employment and connectivity enabled by expansion, rather than a quantified assessment of net economic benefit.

9.2.159 At the AoS level, these factors are considered qualitatively, reflecting the scale of activity supported and underpinning the Government's economic growth test for Heathrow expansion, rather than forming a quantified measure of net additional economic outcomes.

9.2.160 It is also important to note that economic modelling indicates that the scale of net economic benefits is **uncertain** and sensitive to underlying assumptions. Accordingly, this conclusion should be interpreted alongside detailed economic modelling, which may reach different conclusions in relation to the scale, distribution and additionality of potential effects.

Historic environment

Baseline and policy context

9.2.161 The area surrounding Heathrow contains a rich historic environment reflecting centuries of settlement, agricultural activity and landscape evolution. Notable historic settlements include Longford and Harmondsworth, both of which contain concentrations of listed buildings, conservation areas and historic street patterns. Individual assets of high significance, including the Grade I listed Harmondsworth Barn, lie in proximity to the proposed third runway. The wider area also contains buried archaeological remains associated with historic land use and settlement, including areas of high archaeological potential within the Heathrow APA.

9.2.162 National policy places strong emphasis on the conservation of heritage assets and on ensuring that harm to the historic environment is fully understood and clearly justified, recognising that harm is often irreversible. The draft HENPS further requires that weight is given to the conservation of heritage assets, particularly those of high significance, and that any harm or loss must be supported by clear and convincing justification, with the level of justification increasing with the significance of the asset. The AoS appraisal therefore assesses effects with reference to the scale, permanence and location of development enabled by the draft HENPS, rather than on the basis of future mitigation or recording measures.

Likely effects during construction

9.2.163 Development covered by the draft HENPS would involve extensive land take, demolition, excavation, earthworks and infrastructure development associated with the new runway, terminal expansion and major surface access works.

9.2.164 At a strategic level, construction would give rise to **major (--) adverse effects** on the historic environment. These effects would include the direct and permanent loss of heritage assets, particularly within affected historic settlements. This would include the demolition and removal of a substantial number of listed and non-designated historic buildings within conservation areas such as Longford and Harmondsworth, resulting in the irreversible loss of historic fabric and the fragmentation or removal of historic settlement patterns.

9.2.165 Construction activity would also result in significant and wide-ranging impacts on the setting of surviving heritage assets. Large-scale groundworks, construction compounds, lighting, plant movement and temporary structures would fundamentally alter the historic townscape and landscape context of remaining assets during the construction phase.

9.2.166 In particular, development covered by the draft HENPS would take place in proximity of Harmondsworth Barn, resulting in significant temporary and permanent changes to its setting. While the listed building itself may remain physically intact, construction-phase change would affect how this nationally important Grade I listed asset is experienced and understood in its historic context.

9.2.167 Extensive excavation and ground disturbance during construction would also occur within areas of high archaeological potential (especially works within the Heathrow APA), leading to the disturbance and loss of archaeological remains. Although archaeological investigation and recording would be expected at later stages, the construction phase would nevertheless increase the risk of irreversible change to the archaeological resource.

9.2.168 Taking account of direct asset loss, harm to setting and archaeological disturbance, the AoS appraisal identifies **major (--) adverse effects** on the historic environment during construction at a strategic level, reflecting the extent of permanent and irreversible change compared with the no-expansion scenario and the limited ability of mitigation to avoid or reduce these impacts at source.

9.2.169 While a proportion of development extends into areas of comparatively lower heritage sensitivity to the west of the airport, the overall significance of effect is driven by direct impacts on designated heritage assets and their settings, particularly within historic settlements to the east, where sensitivity is highest.

Likely effects during operation

9.2.170 In the operational phase, the effects of the development covered by the draft HENPS on the historic environment would be long-term and, in many instances, permanent. The presence of a new runway expanded terminal infrastructure and reconfigured transport corridors would fundamentally alter the character of the area to the north-west of the existing airport.

9.2.171 Heritage assets that remain following construction would continue to experience enduring changes to their setting, associated with the presence of large-scale airport infrastructure, aircraft movement, operational lighting and increased activity. These effects would be particularly relevant for heritage assets located in proximity to the expanded airport footprint and surface access infrastructure.

9.2.172 In relation to Harmondsworth Barn, the operational phase of the third runway would introduce lasting changes to the building's setting, including the proximity of major infrastructure and ongoing airport activity. While mitigation measures may reduce the prominence of development in certain views, the AoS appraisal recognises that the original rural and village context of this Grade I listed building would be permanently altered.

9.2.173 The operational phase would also reflect the permanent loss of historic settlements, buildings and landscape patterns removed during construction. Although landscaping and design measures may evolve over time, they would not restore the historic spatial relationships, settlement form or landscape character that previously contributed to the significance of affected heritage assets.

9.2.174 On this basis, the AoS appraisal identifies **major (--) adverse effects** on the historic environment during operation, reflecting both the permanent loss of heritage assets and sustained harm to the setting, significance and appreciation of surviving assets relative to a no-expansion scenario.

Mitigation, design and uncertainty

9.2.175 The draft HENPS anticipates that mitigation for historic environment impacts will include application of the mitigation hierarchy, sensitive scheme design, archaeological investigation and recording, and opportunities for interpretation, where appropriate. The policy framework also encourages measures to avoid harm through design, to minimise impacts on setting, and to enhance or better reveal the significance of heritage assets where possible.

9.2.176 The AoS appraisal recognises that such measures are important components of the policy framework for the historic environment and are consistent with national policy requirements. In principle, these measures can reduce the magnitude of impacts on setting and allow for the preservation of archaeological knowledge through recording.

9.2.177 However, these measures are inherently limited in their ability to address the most significant impacts identified, particularly:

- Direct loss of heritage assets, including designated and non-designated buildings and historic settlement patterns;
- Substantial harm to the setting of highly significant assets, including a Grade I listed building; and
- The irreversible nature of archaeological disturbance.

9.2.178 In line with the draft HENPS, archaeological recording preserves information rather than the asset itself and is not considered a substitute for conservation. Similarly, interpretation and enhancement measures cannot replace the cultural, evidential or communal value associated with lost heritage.

9.2.179 There is also uncertainty regarding the extent to which future design evolution could reduce impacts on the setting of heritage assets, given the scale of development and the safety and operational requirements associated with the development covered by the draft HENPS.

9.2.180 As such, while the mitigation framework is appropriate and reflects established best practice, it is not sufficient to avoid or fully offset the scale of harm identified. Residual impacts remain substantial and, in some cases, irreversible, requiring justification in planning terms rather than resolution through mitigation alone.

Relationship with other assessments and next stages

9.2.181 The AoS appraisal considers historic environment effects at a strategic, policy level only. Detailed assessment of heritage impacts, including asset-by-asset assessment of significance, setting and harm, will be undertaken at the DCO stage through the EIA process, informed by Heritage Impact Assessment and consultation with statutory consultees including Historic England.

Overall policy level effect

9.2.182 At a strategic level, the AoS appraisal concludes that the draft HENPS would give rise to **major (--) adverse effects** on the historic environment when compared to a no-expansion scenario. This conclusion is consistent with the findings of the 2018 Airports NPS AoS.

9.2.183 These effects arise from the permanent loss of designated and non-designated heritage assets within historic settlements such as Harmondsworth and Longford, extensive disturbance and loss of archaeological remains, and long-term harm to the setting of highly significant heritage assets, including the Grade I listed Harmondsworth Barn. The AoS appraisal identifies that these impacts are inherent to the scale, location and permanence of development enabled by the draft HENPS.

9.2.184 While mitigation, recording and interpretation measures form part of the policy framework, these measures reduce but do not remove harm and cannot address the fundamental loss of heritage assets or restoration of historic context. The determination of **major (--) adverse effects** therefore reflects: the irreversible loss of heritage assets and historic settlement patterns; the level of harm to the setting and significance of assets of high importance; the limited capacity of mitigation to offset these impacts; and the increase in impact relative to the no-expansion scenario.

9.2.185 The historic environment therefore represents a key area of significant adverse effect within the draft HENPS, reflecting the trade-offs involved in enabling major airport expansion within a historically sensitive landscape. In line with the draft HENPS, such harm would require clear and convincing justification in decision-making, rather than being fully mitigated through design or compensation.

Landscape

Baseline and policy context

9.2.186 Heathrow Airport is situated within a highly modified landscape, characterised by existing runways, terminal infrastructure, major transport corridors and associated industrial and commercial development. However, the surrounding area includes a mosaic of urban fringe settlements, designated open land, river corridors and designated green belt, which together provide spatial separation between communities, visual relief from development and opportunities for recreation.

9.2.187 Of particular importance is the Colne Valley, which supports a network of rivers, floodplains, waterbodies, open fields, parks and recreational routes. Areas such as Harmondsworth Moor provide accessible green space and contribute to local landscape character and amenity. Although there are no nationally designated landscapes immediately adjacent to Heathrow, the area includes valued local landscapes and recreational resources that are sensitive to large scale change.

9.2.188 The AoS appraisal considers landscape effects with reference to the scale, location and permanence of development enabled by the draft HENPS, rather than assuming the success of future mitigation in restoring baseline landscape character. The draft HENPS requires that development should be carefully designed to avoid or minimise harm to the landscape, with reasonable mitigation applied where this is not possible.

Likely effects during construction

9.2.189 Development covered by the draft HENPS would involve extensive land take, large scale earthworks, demolition, realignment of infrastructure and the introduction of construction compounds and plant across a wide area.

9.2.190 At a strategic level, construction would give rise to **major (--) adverse effects** on landscape, reflecting both physical change and experiential impact. Large areas of open land within the green belt, including parts of the Colne Valley and land around Harmondsworth, Longford and Sipson, would be subject to clearance, excavation and re profiling. This would result in a temporary but prolonged loss of openness and disruption to established landscape patterns.

9.2.191 Construction activity would introduce widespread visual intrusion through tall plant, cranes, lighting, spoil mounds and compounds, affecting views from nearby settlements, roads, public rights of way and recreational areas, including routes through the Colne Valley. The scale and duration of works mean that these effects would be experienced over many years, substantially altering the perception and enjoyment of the landscape during construction.

9.2.192 The diversion and reconfiguration of watercourses within the Colne Valley during construction would further disrupt the coherence of river corridor landscapes and associated floodplain character.

9.2.193 Taking these factors together, the AoS appraisal identifies **major (--) adverse effects** during construction, reflecting the scale, geographic extent and duration of landscape disruption relative to the no-expansion scenario, and the limited ability of mitigation to avoid or meaningfully reduce impacts during this phase.

Likely effects during operation

9.2.194 In the operational phase, development covered by the draft HENPS would result in permanent and large-scale change to landscape character. The introduction of a new runway, expanded terminal infrastructure and associated surface access works would fundamentally alter the landscape to the north west of the existing airport.

9.2.195 The loss of green belt land would result in a permanent reduction in openness, increased urbanisation and the erosion of the spatial distinction between Heathrow and surrounding settlements. Areas currently experienced as open or transitional, particularly within the Colne Valley, would be transformed into part of a continuous airport landscape dominated by infrastructure and activity.

9.2.196 Large-scale built elements, lighting and aircraft movement would become defining features in views from surrounding communities and transport corridors. While mitigation measures such as earth shaping, planting and landscape treatment may soften the appearance of development over time, they would not restore the original scale, openness or land use function of the affected landscape.

9.2.197 The permanent diversion and reconfiguration of rivers within the Colne Valley (likely including the River Colne, Wraysbury River, Longford River and Duke of Northumberland's River) would remain a defining element of the operational landscape. Although new river corridors and associated planting may establish over time, the engineered alignment, altered hydrology and proximity to airport infrastructure represent a lasting change from the existing riverine landscape and its informal, semi-natural character.

9.2.198 Recreational resources within the Colne Valley, including public access land and walking routes, would either be lost, altered or experienced in a very different visual and acoustic context. This represents a long-term change in how the landscape is perceived and used.

9.2.199 On this basis, the AoS appraisal identifies **major (--) adverse effects** on landscape during operation, reflecting permanent loss of openness, transformation of landscape character, and long-term changes to visual amenity and recreational experience relative to a no-expansion scenario.

Mitigation, design and uncertainty

9.2.200 The draft HENPS anticipates that landscape mitigation and the delivery of green infrastructure will form an integral part of the runway expansion scheme, including earth modelling, planting, habitat creation and, where practicable, the integration of open space to support landscape integration and visual screening. The policy framework also emphasises the importance of sensitive design, including materials, layout and landscaping, to minimise harm and to provide opportunities for landscape enhancement where possible.

9.2.201 The AoS appraisal recognises that landscape mitigation measures have the potential to reduce the visual prominence of development in certain locations and to provide localised improvements to amenity and landscape quality over time. In particular, mitigation such as planting, landform design and green infrastructure can contribute to screening, softening edges and providing recreational or ecological value.

9.2.202 However, it also recognises that such measures cannot mitigate the fundamental and permanent change in landscape character associated with large-scale airport expansion, including the loss of Green Belt openness and the transformation of river corridor and urban fringe landscapes.

9.2.203 The development covered by the draft HENPS incorporates elements of green infrastructure and public realm enhancement, such as the proposed 'Green Loop', intended to improve connectivity and landscape integration around the expanded airport. While these measures may contribute to localised improvements in access, function and amenity, their detailed form and effectiveness are dependent on subsequent design development and long-term management.

9.2.204 As such, while the mitigation and design framework is appropriate and aligns with policy requirements to minimise harm, it is not sufficient to offset the fundamental and permanent change in landscape character and openness associated with expansion.

9.2.205 There is also uncertainty regarding the extent to which mitigation will mature and function as intended over time, particularly in relation to planting establishment, long-term management and integration with surrounding land uses.

Relationship with other assessments and next stages

9.2.206 The AoS appraisal considers landscape effects at a strategic, policy level. Detailed assessment of landscape and visual impacts, including the identification of visual receptors, assessment of views and the design of mitigation measures, will be undertaken at the DCO stage through the EIA process and a Landscape and Visual Impact Assessment.

Overall policy level effect

9.2.207 At a strategic level, the AoS appraisal concludes that the draft HENPS would give rise to **major (--) adverse effects** on landscape when compared to a two-runway scenario. This conclusion is consistent with the findings of the 2018 Airports NPS AoS.

9.2.208 These effects arise from extensive and permanent land take within the green belt, loss of openness and rural character within the Colne Valley, large scale alteration of landform and river corridors, and the introduction of dominant airport infrastructure into landscapes currently valued for openness, recreation and the separation between settlements. The AoS appraisal identifies that these impacts are inherent to the scale, location and permanence of development enabled by the draft HENPS.

9.2.209 While landscape mitigation and green infrastructure are anticipated as part of the policy framework, these measures reduce but do not remove harm and cannot restore baseline landscape character or openness. The determination of major adverse effects therefore reflects: the scale and permanence of landscape transformation; the loss of Green Belt function and openness; and the increase in impact relative to the no-expansion baseline.

Noise

Baseline and policy context

9.2.210 Aircraft noise is one of the most significant local environmental effects associated with airport operations at Heathrow and has a direct influence on quality of life, health and wellbeing.

9.2.211 Large residential areas lie beneath existing arrival and departure routes associated with Heathrow Airport, exposing them to aircraft noise. Baseline conditions are therefore characterised by widespread exposure to aircraft noise, with varying intensity depending on distance from the airport, flight paths, runway use and time of day.

9.2.212 Noise policy has remained broadly similar since the designation of the 2018 ANPS.

9.2.213 The Government recognises that the impact of noise from airport expansion is a key concern for communities affected, which is why it is one of its four tests for expansion. The test requires that the development avoids significant adverse impacts on health and quality of life, by limiting, and where reasonably possible, reducing overall aircraft noise compared to 2024 baseline levels. The policy also requires the provision of predictable respite, including runway alternation and a night flight ban.

9.2.214 The AoS appraisal considers noise effects at a strategic, policy level, recognising that detailed flight path design and operational controls sit beyond the scope of the draft HENPS.

Likely effects during construction

9.2.215 Development covered by the draft HENPS would involve sustained and large-scale activity over an extended period, including earthworks, piling, demolition, construction of new airport infrastructure and significant surface access works.

9.2.216 At a strategic level, construction would give rise to **major (--) adverse effects** on noise, particularly for communities located close to the development footprint and major construction corridors. Construction noise would arise from heavy plant, vehicle movements and night time activities associated with critical infrastructure works.

9.2.217 These effects would be temporary but prolonged, given the duration of construction, and would affect several residential communities and sensitive habitats. While construction noise is typically less spatially extensive than aircraft noise, its intensity, duration and unpredictability can result in significant disturbance for affected communities.

9.2.218 Construction noise impacts are recognised as unavoidable given the scale of development, and although controls and management measures would be expected at later stages, the AoS appraisal identifies **major (--) adverse effects** during construction at a strategic level, reflecting the duration, intensity and spatial extent of disturbance relative to the no-expansion scenario.

Likely effects during operation

9.2.219 In the operational phase, the development covered by the draft HENPS would enable a substantial increase in airport capacity and aircraft movements at Heathrow, alongside changes to runway use and flight patterns.

9.2.220 At a strategic level, expansion would lead to changes in both the extent and distribution of aircraft noise exposure, with communities experiencing new or increased noise exposure as a result of additional flights and altered flight paths. The AoS appraisal recognises that noise effects will be widely distributed, although some uncertainty remains, with impacts depending on where flight paths are located and how often they are used (which is subject to the emerging Airspace Modernisation Strategy).

9.2.221 Night noise is a particularly sensitive issue, with greater potential health effects during the night. The draft HENPS includes specific policy safeguards relating to night operations, including the expectation of a night flight ban and requirements to limit overall noise exposure.

9.2.222 Taking account of the scale of expansion and the number of people affected, the AoS appraisal identifies **major (--) adverse effects** on noise during operation at a strategic level. This conclusion reflects: the population affected: the persistence of significant baseline noise exposure; and the redistribution of impacts across communities, including newly affected areas.

9.2.223 While modelling indicates that overall noise exposure with expansion may reduce over time compared with a 2024 baseline due to fleet modernisation and quieter aircraft, these improvements are not sufficient to offset the effects of increased aircraft movements when compared with a future scenario without expansion. Noise exposure is therefore higher than in the equivalent two-runway (no-expansion) scenario in later assessment years.

Health and community considerations

9.2.224 There is a well-established link between long term exposure to aircraft noise and adverse health outcomes, including annoyance, sleep disturbance and impacts on mental wellbeing. Noise effects therefore interact strongly with outcomes considered under communities and quality of life AoS theme.

9.2.225 The AoS appraisal recognises that certain groups may be disproportionately affected by noise, including children, older people, those with existing health conditions and communities experiencing exposure both during the day and at night. These considerations reinforce the importance of understanding noise not only as an environmental effect, but as a broader quality of life issue.

Supporting technical studies

9.2.226 Evidence prepared to support the draft HENPS includes detailed aircraft noise modelling undertaken on behalf of the Department for Transport by the Civil Aviation Authority (CAA), summarised in an Annex. This analysis uses the version 2.4 of the UK Civil Noise Contour Model (ANCON), informed by updated aviation demand forecasts and Heathrow operational data. The modelling assesses changes in daytime and night-time noise exposure for future assessment years, including the opening year, an intermediate year and a long-term future year when the expanded airport reaches full capacity.

9.2.227 The modelling indicates that fleet modernisation and the introduction of quieter aircraft are expected to deliver reductions in noise exposure over time compared with current (2024) baseline conditions, reflecting ongoing improvements in aircraft technology and operations. These improvements provide an important moderating effect on noise impacts at a strategic level. However, these reductions are not sufficient to offset the additional noise associated with the increased aircraft movements enabled by expansion when compared with a future scenario without expansion. As terminal capacity constraints are progressively lifted and activity levels increase, noise exposure is therefore higher than in the equivalent no-expansion scenario in later assessment years, despite the benefits of quieter aircraft.

9.2.228 The analysis also shows that noise effects vary over time, with a potential short-term reduction in impacts around the opening year due to increased operational flexibility arising from additional runway capacity ahead of full terminal build-out. However, this effect is temporary and does not alter the longer-term pattern of increased noise exposure (compared to a no-expansion scenario) as activity levels increase towards full operational capacity.

9.2.229 Supporting analysis also includes a number of sensitivity tests, undertaken to explore the influence of alternative assumptions. These include consideration of a scheduled night flight ban, and assessment against alternative thresholds informed by emerging evidence on community response to aircraft noise, including the Aviation Noise Attitudes Survey (ANAS) and the Aviation Night Noise Effects (ANNE) study.

9.2.230 In relation to night operations, the analysis considers the effect of a scheduled night flight ban between 23:30-06:00 (the exact timings of a night flight ban will be defined with engagement with local communities and relevant stakeholders). While such a measure is not expected to materially reduce overall night-time noise exposure when assessed using the LAeq,8hr metric, it is expected to reduce disturbance during the most sensitive parts of the night-time period, thereby improving outcomes in terms of sleep disturbance and health effects.

9.2.231 Separately, sensitivity testing based on ANAS and ANNE reflects evidence that adverse effects may occur at lower noise thresholds than previously assumed. These sensitivities therefore result in a greater number of people being identified as affected and a wider spatial extent of potential noise effects, indicating increased community sensitivity to both daytime and night-time noise exposure. However, these sensitivities also show that noise impacts assessed using these lower thresholds can still be limited to 2024 levels.

9.2.232 No new ground noise or surface access noise assessment has been undertaken for the draft HENPS. The 2018 AoS assessment for the HAL scheme indicated that total local population exposure to higher levels of ground noise would reduce relative to a no-expansion (two runway) scenario in the 2030 assessment year, primarily due to the relocation of noise sources away from more densely populated areas. On this basis, local effects of ground noise were assessed as beneficial.

9.2.233 In the absence of updated assessment, this conclusion is considered to remain indicative only and is subject to uncertainty. While overall population exposure may reduce, this does not remove the possibility that localised increases in noise may be experienced by specific communities, particularly in areas affected by changes in surface access patterns (such as increased traffic flows or changes in rail services). In addition, potential changes in airspace activity may influence the overall noise environment experienced by some receptors, which may offset benefits in certain locations.

9.2.234 Overall, the noise evidence confirms that expansion enabled by the draft HENPS would result in **long-term adverse noise** effects for communities around Heathrow, supporting the AoS conclusion that noise remains a significant sustainability issue at a strategic level, notwithstanding technological improvement and potential mitigation.

Mitigation, management and uncertainty

9.2.235 The draft HENPS includes a range of policy measures intended to manage aircraft noise, including operational controls, noise envelopes, requirements for quieter aircraft, principles for respite, insulation schemes and compensation measures. Together, these measures are intended to influence both the scale and distribution of noise impacts associated with expansion.

9.2.236 The mitigation framework is comprehensive and reflects the International Civil Aviation Organization's 'balanced approach' to noise management, including controls on operations, design of airspace, and community-focused measures such as respite and insulation. The requirement to limit overall noise exposure to 2024 levels represents a key constraint on the scale of impacts at a strategic level.

9.2.237 The AoS appraisal recognises that these measures are central to the application of the noise test and have the potential to influence how aircraft noise is experienced by communities over time. The inclusion of defined noise management frameworks, requirements for ongoing monitoring, and the embedding of respite principles represent a strengthening of the policy approach to the management of noise impacts over time, rather than their elimination.

9.2.238 However, the effectiveness of mitigation is limited by:

- The dominant driver of noise exposure being aircraft movements, which increase under expansion;
- The 2024 cap limiting overall exposure but does not prevent redistribution of noise to new communities (resulting in mixed effects, with some communities experiencing lower levels of noise, and others experiencing higher levels of noise, relative to a two-runway scenario);
- Measures such as insulation and compensation, which mitigate effects rather than remove them; and
- Uncertainty regarding detailed design, operational practices and future fleet composition.

9.2.239 In addition, policy measures such as the night flight ban improve outcomes in terms of sleep disturbance but do not necessarily reduce overall night-time noise exposure when assessed using standard metrics, highlighting the distinction between quantitative noise indicators and health outcomes.

9.2.240 Uncertainty also remains regarding future flight path design and the spatial distribution of noise impacts, which cannot be resolved at the strategic stage and will be determined through subsequent airspace design and the emerging Airspace Modernisation Strategy.

9.2.241 As such, while the mitigation framework is capable of enabling compliance with the Government's noise test, it is not sufficient to prevent significant residual effects at a strategic level when compared to a no-expansion scenario.

Relationship with other assessments and next stages

9.2.242 The AoS appraisal has been prepared alongside a HIAn, which considers noise-related health outcomes in greater detail. Where health effects are identified, the findings of that assessment provide important additional context.

9.2.243 Detailed assessment of aircraft noise impacts, including modelling of noise contours, assessment of flight path options and evaluation of mitigation and compensation measures, will be undertaken at the DCO stage through the EIA process.

Overall policy level effect

9.2.244 At a strategic level, the AoS appraisal concludes that the draft HENPS would give rise to **major (--) adverse effects** on noise when compared to a no-expansion scenario. This conclusion is consistent with the findings of the 2018 Airports NPS AoS.

9.2.245 These effects arise from the increase in aviation activity, surface access and ground noise enabled by the draft HENPS, and the proximity of surrounding communities. Noise therefore represents a key sustainability challenge for the draft HENPS, requiring rigorous application of policy safeguards, controls and compensation at subsequent stages.

9.2.246 The determination of major adverse effects reflects: the increase in noise exposure relative to a no-expansion scenario; the redistribution of impacts across communities; and the limited ability of mitigation to eliminate adverse effects despite enabling compliance with policy tests.

9.2.247 The AoS appraisal identifies that the scale and distribution of noise impacts enabled by the draft HENPS cannot be fully resolved at the strategic level and must be addressed through detailed design, regulation and decision-making beyond the draft HENPS itself.

Resources and waste

Baseline and policy context

9.2.248 Large scale infrastructure projects have the potential to place significant pressure on natural resources, generate substantial volumes of waste and influence patterns of material use over long periods.

9.2.249 Heathrow Airport currently operates within a highly developed urban and peri urban environment, with established waste management systems supporting airport operations, commercial activities and passenger use. Existing baseline conditions include ongoing consumption of materials and generation of waste associated with airport maintenance, construction activity, terminal operations and aircraft servicing.

9.2.250 At a national policy level, there is increasing emphasis on the efficient use of resources, waste minimisation, reuse and recycling, and the transition towards a circular economy. Policy also seeks to reduce reliance on primary materials, prevent waste where possible and ensure that unavoidable waste is managed appropriately and as close to source as practicable. The draft HENPS further establishes that adherence to the waste hierarchy represents minimum acceptable practice and that proposals should aim for high levels of resource efficiency and circularity.

9.2.251 The AoS appraisal assesses resources and waste effects with reference to the scale, duration and permanence of development enabled by the draft HENPS, rather than presuming specific construction methodologies or operational practices that would be defined at later stages.

Likely effects during construction

9.2.252 Development covered by the draft HENPS would involve extensive use of construction materials, including aggregates, concrete, steel and asphalt, associated with runway construction, terminal development, surface access works and river diversions. Large quantities of excavated material would also be generated through earthworks and infrastructure realignment (notably the realignment and tunnelled sections of the M25, as well as associated highway and junction works).

9.2.253 At a strategic level, construction would give rise to **major (--) adverse effects** in relation to resource use and waste generation. The scale and duration of construction mean that demand for primary materials would be substantial, with associated impacts on supply chains and embedded carbon. Significant volumes of construction and demolition waste would be generated, requiring management through reuse, recycling and disposal. Depending on the availability and capacity of recycling and recovery infrastructure, a proportion of this waste may require disposal to landfill or other off-site facilities, potentially increasing pressure on landfill capacity and giving rise to the need to transport waste beyond the immediate area.

9.2.254 In addition to waste arisings generated directly by construction, the AoS appraisal recognises that development covered by the draft HENPS would require the displacement and relocation of several existing waste processing and management facilities, notably those located to the west of the M25 within the footprint of airport and surface access works. These facilities currently perform an important role in the management of commercial and municipal type waste in the area.

9.2.255 Relocating such facilities would require replacement capacity to be identified and developed elsewhere, potentially involving additional material use, new construction activity and waste transport implications. This may alter the spatial distribution of waste management infrastructure, potentially increasing waste transport distances and placing additional demand on facilities in other locations.

9.2.256 Taking these factors together, the AoS identifies **major (--) adverse effects** during construction, reflecting the scale of material demand, the volume of waste generated, the loss of existing waste infrastructure capacity, and the associated pressure on regional waste management systems relative to the no-expansion scenario.

Likely effects during operation

9.2.257 In the operational phase, the development covered by the draft HENPS would support a larger airport with increased passenger numbers, aircraft movements and commercial activity. This would result in increased generation of operational waste, including municipal type waste from terminals, catering waste, packaging, maintenance waste and aircraft related waste streams.

9.2.258 Operational resource use would also increase, including materials required for maintenance, replacement and refurbishment of airport infrastructure over its long operational life.

9.2.259 The AoS appraisal also recognises that the loss and relocation of existing waste processing facilities associated with the development covered by the draft HENPS may have longer term implications for waste management patterns in the wider area. While replacement facilities are expected to be brought forward, this may lead to changes in waste transport distances, facility efficiency and the spatial distribution of waste infrastructure.

9.2.260 At a strategic level, the AoS appraisal therefore identifies **major (--) adverse effects** on resources and waste during operation, reflecting increased waste arisings, ongoing demand for materials, and continued reliance on external waste management capacity following the reconfiguration of existing waste management capacity. These effects extend beyond the immediate airport area and reflect regional pressures relative to the no-expansion scenario.

Mitigation, management and uncertainty

9.2.261 The draft HENPS anticipates that the runway expansion would incorporate a comprehensive approach to managing resources and waste, including application of the waste hierarchy, minimisation of waste generation, reuse of materials where practicable and high levels of recycling during construction and operation. These measures are intended to reduce demand for primary resources and limit the volume of waste requiring disposal.

9.2.262 The policy framework is aligned with national circular economy objectives and places strong emphasis on minimising waste and maximising reuse and recycling. It also requires that sufficient replacement waste management capacity is secured where existing facilities are lost, including reasonable efforts to address the loss of the Lakeside Energy from Waste plant.

9.2.263 The AoS appraisal recognises that such measures are essential to managing resource and waste effects, including opportunities to reuse excavated material on site and to recover value from construction and operational waste streams. In principle, these measures could significantly reduce the proportion of waste requiring disposal and improve overall resource efficiency.

9.2.264 However, there are significant challenges and limitations in delivering these outcomes at the scale required, including:

- The very high volumes of material required and waste generated over a prolonged construction period;
- The need for sufficient available recycling, recovery and disposal capacity within the region;
- The logistical complexity of reusing materials on-site or within tight delivery programmes; and
- The uncertainty associated with the timing and effectiveness of replacement waste infrastructure.

9.2.265 As such, while the mitigation framework is appropriate and capable of reducing impacts, it is not sufficient to eliminate the substantial pressures on materials and waste systems associated with the scale of development. Residual effects are therefore expected, particularly in relation to material demand, landfill use and waste transport.

Relationship with other assessments and next stages

9.2.266 The AoS appraisal considers resources and waste at a strategic, policy level. Detailed assessment of construction material use, waste arisings, relocation of waste management facilities and operational waste management arrangements will be undertaken at the DCO stage through the EIA process and supporting management plans.

Overall policy level effect

9.2.267 At a strategic level, the AoS appraisal concludes that the draft HENPS would give rise to **major (--) adverse effects** on resources and waste when compared to a no-expansion scenario. This conclusion is consistent with the findings of the 2018 Airports NPS AoS.

9.2.268 These effects arise from the very high demand for construction materials, substantial volumes of construction and operational waste, and the need to relocate existing waste processing and management facilities, particularly to the west of the M25, including the loss of the Lakeside Energy from Waste facility.

9.2.269 While waste minimisation, reuse and recycling measures, together with replacement waste infrastructure, are expected to manage these effects, the determination of major adverse effects reflects: the scale and duration of material demand and waste generation; the reliance on external waste infrastructure and capacity; the uncertainty associated with replacement facility provision; and the limited ability of mitigation to fully offset these pressures at a strategic level.

9.2.270 The scale and duration of development enabled by the draft HENPS would therefore result in unavoidable pressure on material resources and waste management systems.

Soil

Baseline and policy context

9.2.271 Large scale infrastructure development has the potential to result in permanent soil loss, degradation and compaction, particularly where development extends beyond previously developed land.

9.2.272 The area surrounding Heathrow comprises a mix of previously developed land within the existing airport boundary and areas of open land, agricultural land and river corridors beyond it. Soils in the surrounding area include a range of agricultural grades, with some land classified as best and most versatile (BMV) agricultural land, as well as soils that contribute to floodplain function and the integrity of the Colne Valley landscape.

9.2.273 Baseline conditions also include areas of historic land use, industrial activity and transport infrastructure where soils may already be disturbed or contain contamination. However, undeveloped land around the airport still provides important soil functions, including food production, infiltration, carbon storage and support to habitats and landscapes.

9.2.274 National policy recognises the importance of protecting soils as a non-renewable resource, minimising soil sealing and reuse of excavated material where possible. The draft HENPS further sets out that impacts on soil resources, including BMV agricultural land, should be minimised where possible, and that soil is sustainably managed, that soil reuse should be carefully considered, and that contamination risks are appropriately addressed. The AoS appraisal considers soil effects with reference to the extent, permanence and irreversibility of development enabled by the HENPS, rather than assuming detailed construction or remediation techniques.

Likely effects during construction

9.2.275 Development covered by the HENPS would involve extensive excavation, earthworks, land reprofiling and ground improvement works associated with the new runway, terminal infrastructure, surface access works and diversion of watercourses.

9.2.276 At a strategic level, construction would give rise to **major (--) adverse effects** on soils. Large areas of undeveloped land, including agricultural land and open land within the green belt and Colne Valley, would be permanently disturbed or removed. This includes areas of BMV agricultural land (including Grade 1).

9.2.277 The presence of numerous historic landfill sites within the footprint of the development covered by the draft HENPS would significantly increase the complexity of soil handling during construction. Excavation within these areas would require careful management, with implications for soil segregation, remediation requirements and environmental risk. The scale and breadth of excavation across the scheme would exacerbate short- to medium-term soil degradation, including compaction, and loss of structure.

9.2.278 Although opportunities are anticipated to strip, store and reuse soils where practicable, the AoS appraisal recognises that soil handling itself can reduce soil quality and that not all soils can be successfully reused or restored, particularly where soils are heavily disturbed or contaminated.

9.2.279 Taking these factors together, the AoS identifies **major (--) adverse effects** during construction, reflecting the scale of soil disturbance, the permanent loss of high-quality agricultural land, and the limited ability of soil management practices to fully preserve soil function relative to the no-expansion scenario.

Likely effects during operation

9.2.280 In the operational phase, soil effects would largely reflect the permanent loss and sealing of soil resources beneath airport infrastructure and associated surface access development. Once developed, soils would no longer perform agricultural, ecological or hydrological functions.

9.2.281 The footprint of permanent infrastructure enabled by the HENPS would be extensive, reducing opportunities for soil-based ecosystem services across a wide area. This includes loss of agricultural potential, reduced infiltration and drainage functions, and loss of soil carbon storage capacity.

9.2.282 In areas influenced by reconfigured river corridors, flood management features and engineered landforms, soils would be permanently altered in composition and function. Although landscaped areas may establish new soil profiles over time, these would not replicate the depth, continuity or functional capacity of the original soils.

9.2.283 The AoS appraisal therefore identifies **major (--) adverse effects** on soils during operation, reflecting irreversible soil loss, permanent sealing of soil resources, and long-term reduction in soil functionality across the scheme area relative to a no-expansion scenario.

Mitigation, land management and uncertainty

9.2.284 Soil management measures will be applied to the development covered by the draft HENPS, including the stripping, storage and reuse of soils where practicable, the management and remediation of contaminated land, and the appropriate restoration of soils within landscaped and green infrastructure areas. These measures are intended to reduce adverse effects on soil resources and manage risks associated with disturbed ground conditions.

9.2.285 The draft HENPS promotes the use of Soil Management Plans, sustainable reuse of soils in line with best practice, and requires that contaminated land is remediated to make it suitable for its intended use. These measures are consistent with good practice in minimising secondary impacts on soils.

9.2.286 The AoS appraisal recognises that such measures are essential to managing complex soil conditions, particularly in areas affected by historic landfill and contamination. In principle, these measures can reduce degradation during construction and retain some soil resource value where reuse is feasible.

9.2.287 However, the majority of soil-related effects arising from the draft HENPS are permanent and irreversible, particularly where soils are excavated and not reused, or sealed beneath infrastructure. Mitigation is therefore inherently limited in effectiveness, as it cannot restore soil functions such as agricultural productivity, carbon storage or natural soil structure once lost. Soil reuse may retain some material value but does not replicate original soil systems or ecosystem services.

9.2.288 There is also uncertainty regarding the success of soil storage and reuse over extended time periods, particularly where soils are stored for prolonged durations or subject to repeated handling.

Relationship with other assessments and next stages

9.2.289 The AoS appraisal considers soils at a strategic, policy level only. Detailed assessment of ALC, soil quality, contamination, landfill interaction, soil handling and reuse strategies will be undertaken at the DCO stage through the EIA process and supporting land management and remediation plans.

Overall policy level effect

9.2.290 At a strategic level, the AoS appraisal concludes that the draft HENPS would give rise to **major (--) adverse** effects on soils when compared to a no-expansion scenario. This conclusion is consistent with the findings of the 2018 Airports NPS AoS.

9.2.291 These effects arise from the permanent loss and degradation of soils across a large area, including the loss of high-quality agricultural land, disturbance of soils associated with extensive historic landfill sites, and long-term reduction in soil-based ecosystem services resulting from permanent infrastructure.

9.2.292 While soil management, reuse and remediation measures are expected to manage some impacts during construction, the determination of major adverse effects reflects: the irreversible loss of soil resources through sealing and removal; the loss of BMV agricultural land; the limited effectiveness of mitigation in restoring soil function; and the increased impact relative to the no-expansion scenario.

9.2.293 Therefore, the scale, extent and irreversibility of soil loss enabled by the draft HENPS represents a significant effect at the strategic level, with mitigation reducing but not preventing long-term impacts.

Water

Baseline and policy context

9.2.294 Heathrow Airport is located within the Colne catchment, a highly modified hydrological system comprising the River Colne, multiple tributaries, artificial channels and former gravel extraction waterbodies. These surface waters are closely connected to underlying groundwater bodies that support public water supply and contribute to baseflows within the catchment.

9.2.295 A large proportion of the development footprint covered by the draft HENPS extends into a DWSZ associated with groundwater resources used for potable supply. These areas are designated because groundwater quality is vulnerable to pollution from surface activities, including runoff, infiltration and historic land uses.

9.2.296 The regional context further heightens sensitivity. The South East of England is classified as a water-stressed region, reflecting high population density, competing demands and limited scope for additional abstraction without environmental harm. Protection of water quality and careful management of water demand are therefore strategic policy considerations.

9.2.297 National policy places strong emphasis on preventing deterioration of surface water and groundwater status, safeguarding drinking water resources, managing abstraction sustainably, including through compliance with the Water Framework Directive Regulations.

9.2.298 The draft HENPS reflects the national approach, requiring that development avoids deterioration of water bodies and has regard to the objectives of the relevant River Basin Management Plan and the Water Framework Directive Regulations, including the need to meet environmental objectives or demonstrate compliance with relevant exemptions. The draft HENPS also requires that potential impacts on surface water and groundwater are appropriately assessed and mitigated, including through the application of regulatory controls such as environmental permitting. Measures to promote water efficiency and sustainable drainage are supported as part of this framework, although detailed approaches to water demand management are addressed at the project level. The AoS appraisal therefore focuses on water quality and water availability across the lifetime of the development covered by the draft HENPS.

Likely effects during construction

9.2.299 Development covered by the draft HENPS would involve extensive and sustained interaction with surface water and groundwater systems. Works would include large scale excavation, tunnelling, land re-profiling, piling and the diversion, realignment and temporary reconfiguration of multiple watercourses within the Colne catchment (including the River Colne, Wraysbury River, Longford River and Duke of Northumberland's River).

9.2.300 At a strategic level, construction would give rise to **major (--) adverse effects** on water quality and water quantity.

9.2.301 A defining feature of construction would be the diversion and re-engineering of watercourses, including permanent and temporary channel alignments to facilitate runway construction, terminal infrastructure and surface access works. These interventions would disrupt established flow paths, alter connectivity between surface water and groundwater and modify residence times that influence dilution and pollutant attenuation.

9.2.302 Channel diversions and temporary works would increase risks of sediment release, bank erosion and mobilisation of historic contaminants, particularly where works intersect areas of made ground or historic landfill. Changes in flow velocities and channel morphology during construction would reduce the capacity of watercourses to buffer pollution and maintain baseline water quality.

9.2.303 Construction activities would also pose risks to groundwater quality and availability, particularly given the extensive overlap with DWSZ. Deep excavations, dewatering and tunnelling could locally alter groundwater pathways and levels, potentially affecting abstractions, baseflows and the migration of contaminants.

9.2.304 Taking these factors together, the AoS identifies **major (--) adverse effects** during construction, reflecting the scale, spatial extent and intensity of hydrological disturbance, the heightened risk of pollution incidents, and the sensitivity of receptors relative to a no-expansion scenario .

Likely effects during operation

9.2.305 In the operational phase, the development covered by the draft HENPS would give rise to long term and sustained pressures on water quality and water quantity, reflecting the permanent transformation of the hydrological environment and the intensity of airport activity.

9.2.306 Permanent diversion and reconfiguration of watercourses within the Colne catchment would fundamentally alter hydrological interactions between surface waters and groundwater. New channel alignments and engineered systems would change flow regimes, dilution capacity and the resilience of water bodies to pollution, particularly during low flow conditions.

9.2.307 Expanded airport infrastructure would substantially increase the extent of impermeable surfaces, leading to greater volumes of surface water runoff requiring collection and treatment. Runoff from these surfaces is likely to contain a range of pollutants, including fuels, oils, de-icing agents, rubber residues, metals and other chemicals associated with aircraft operations, surface access traffic and maintenance activities. Operational runoff would contain pollutants associated with aircraft operations, surface access traffic, maintenance activities and airport servicing. Over the long term, these diffuse pressures increase the risk of deterioration in surface water and groundwater quality if not continuously managed.

9.2.308 Operation of the expanded airport would also increase demand for water supply, including potable water use within terminals and operational uses. In a water-stressed region, this represents an incremental but persistent pressure on constrained water resources, increasing reliance on regional supply systems and reducing flexibility during drought conditions. Opportunities to reduce demand, including water efficiency measures and reuse systems such as greywater recycling, will therefore be important to limit pressures on water resources.

9.2.309 Because a large proportion of the development covered by the draft HENPS would continue to operate within DWSZ, the consequences of long-term leakage, infiltration or accidental pollution are high, given the role of underlying groundwater in public supply. Even low frequency events could have significant implications for water quality and treatment requirements.

9.2.310 On this basis, the AoS appraisal identifies ongoing **major (--) adverse effects** on water quality and water quantity during operation, reflecting sustained pressure on sensitive receptors, altered hydrological systems and increased demand on water resources relative to the no-expansion scenario.

Climate change and water stress

9.2.311 Met office climate change projections for the South East indicate hotter, drier summers, reduced baseflows and more frequent drought conditions. These trends increase vulnerability of both surface water and groundwater systems to abstraction and pollution and reduce the natural capacity of catchments to recover from disturbance.

9.2.312 At a strategic level, the AoS appraisal recognises that the development covered by the draft HENPS would operate throughout periods of increasing water stress, reducing headroom for error in both water quality protection and water demand management. Climate change therefore acts as a risk amplifier for water quality and water quantity effects.

Mitigation, water management and uncertainty

9.2.313 The development covered by the draft HENPS would incorporate a comprehensive approach to water management, including measures for pollution control, surface water drainage and treatment, groundwater protection, flood risk management and water efficiency.

9.2.314 The draft HENPS requires that mitigation measures are sufficient to prevent deterioration of water bodies, and appropriately manage risks to groundwater and surface water, including through assessment, mitigation and regulatory controls. This includes: support for sustainable drainage systems; requirements for pollution control and water efficiency; and engagement with regulators such as the Environment Agency.

9.2.315 The AoS appraisal recognises that such measures are essential to managing water-related effects and would be subject to detailed design, regulation and monitoring at subsequent stages. Well-designed drainage, treatment systems and pollution controls have the potential to significantly reduce risks associated with runoff and operational contamination, and water efficiency measures can help limit demand.

9.2.316 However, important limitations and uncertainties remain, relating to:

- The scale and complexity of hydrological modification within the Colne catchment;
- The ongoing generation of diffuse pollutants associated with airport operations;
- The reliance on long-term performance of drainage, treatment and monitoring systems; and

- The interaction with climate change, including reduced flows and increased stress on water systems.

9.2.317 As such, while the mitigation framework is robust and capable of enabling regulatory compliance, it is highly dependent on design, operation and long-term management, and does not remove the underlying pressures introduced by development. Residual risks remain, particularly in relation to water quality deterioration and resource demand.

Relationship with other assessments and next stages

9.2.318 The AoS appraisal considers water quality and water quantity at a strategic, policy level. Detailed assessment of watercourse diversion, water quality impacts, abstraction demand, groundwater protection and operational water management will be undertaken at the DCO stage through the EIA process and supporting water environment and resources assessments.

Overall policy level effect

9.2.319 At a strategic level, the AoS appraisal concludes that the draft HENPS would give rise to **significant (--) adverse effects** on water quality and water quantity when compared to a no-expansion scenario. This conclusion is consistent with the findings of the 2018 Airports NPS AoS.

9.2.320 These effects arise from extensive diversion and reconfiguration of watercourses during construction, long-term alteration of surface water and groundwater interactions within the Colne catchment, development within DWSZ, increased demand for water supply in a water-stressed region and reduced resilience of water systems under future climate change.

9.2.321 They also reflect the increased risk of routine operational pollution from runoff associated with expanded impermeable surfaces and more intensive airport activity.

9.2.322 While mitigation and water management measures (included in the draft HENPS, and required under regulatory controls such as environmental permitting) are expected to manage risk, the determination of major adverse effects reflects: the scale and permanence of hydrological change; the sensitivity of receptors, including drinking water sources; the reliance on long-term management to prevent deterioration; and the residual risk of pollution and resource pressure relative to the no-expansion scenario.

9.2.323 Water therefore represents a key sustainability challenge for the draft HENPS. While the policy framework provides mechanisms to avoid regulatory breaches, it does not eliminate the underlying pressures on water systems introduced by expansion, and effects remain significant at a strategic level.

Designation of CNGI

9.2.324 The draft HENPS identifies development within its scope as CNGI, recognising the need for the identified expansion at Heathrow, and the economic and other strategic benefits it would provide.

The CNGI policy presumption applies where:

- applicants have identified negative impacts arising from its proposal;
- Applicants have demonstrated that the mitigation hierarchy has been applied, to avoid, reduce, or offset impacts; and
- the Government's four tests (relating to climate change, air quality, noise and economic growth) have been met.

9.2.325 In those circumstances, the need for CNGI to achieving economic growth objectives, together with the national resilience, connectivity, freight, passenger and wider strategic benefits, means that a presumption in favour of granting consent for CNGI will apply and it is unlikely that consent will be refused on the basis of residual impacts.

9.2.326 The CNGI policy presumption does not override any legal requirements (including under section 104 of the Planning Act 2008).

9.2.327 CNGI policy does not create an additional or cumulative need case or weighting to that which is already outlined for infrastructure covered by this NPS. The policy applies following the normal consideration of the need case, the impacts of the project, and the application of the mitigation hierarchy. As such, it is relevant during Secretary of State decision making and specifically in reference to non-Habitats Regulations Assessment (HRA) residual impacts that have been identified. It should therefore also be given consideration by the Examining Authority when it is making its recommendation to the Secretary of State.

9.2.328 Exceptional circumstances may outweigh the CNGI presumption. These include where residual impacts remain which present an unacceptable risk to, or unacceptable interference with human health, public safety, defence, irreplaceable habitats or flood risk.

9.2.329 Where residual non-HRA impacts remain after the mitigation hierarchy has been applied, such impacts are unlikely to outweigh the urgent need for CNGI. Therefore, in all but the most exceptional circumstances, it is unlikely that consent will be refused on the basis of these residual impacts.

9.2.330 The CNGI policy does not remove the requirement to assess impacts or comply with legal and regulatory requirements.

9.2.331 The policy also informs the approach to the Habitats Regulations Assessment (HRA), including the consideration that the national growth facilitated by the expansion of Heathrow is, in principle, capable of amounting to imperative reasons of overriding public interest (IROPI), subject to the requirements of the Habitats Regulations.

9.2.332 At a strategic level, the AoS reflects the implications of this policy across relevant AoS themes. When compared to a no-expansion scenario, the designation of CNGI is associated with **major (++) beneficial effects**, particularly in relation to **economic growth, employment, productivity** and **international connectivity**. However, the infrastructure supported by the draft HENPS also gives rise to the potential for **major (--) adverse effects**, notably in relation to **biodiversity, natural resources, landscape and communities**, where large-scale development may result in significant environmental change and localised disruption. The overall effect of CNGI is therefore identified as **mixed**.

Cumulative and in-combination effects

9.2.333 Cumulative and in-combination effects consider the combined influence of the draft HENPS, and the Heathrow expansion it supports, alongside other relevant plans, programmes and development activities. These effects may arise where multiple initiatives affect the same environmental receptors over time, or where impacts interact spatially or temporally to intensify overall outcomes.

9.2.334 Given the strategic nature of the draft HENPS, cumulative and in-combination effects are considered primarily at a policy and sectoral level, rather than through detailed project-by-project interaction. This reflects the role of the AoS in identifying strategic sustainability implications of the policy framework, rather than undertaking detailed cumulative impact modelling, which will be addressed at subsequent stages of planning and consent.

9.2.335 The assessment therefore focuses on cumulative pressures arising from aviation growth, surface transport investment and wider infrastructure delivery, and on in-combination interactions between aviation policy and other strategic plans and programmes.

Cumulative effects

9.2.336 Cumulative effects arise where the impacts associated with Heathrow expansion add to those arising from other plans, programmes or policies affecting the same sustainability objectives over time.

9.2.337 At a national level, the most important cumulative interactions relate to climate change mitigation, noise, air quality and resource use, reflecting the cumulative effects of aviation growth alongside surface transport and infrastructure development.

9.2.338 In relation to climate change mitigation, cumulative effects arise from the combined greenhouse gas emissions associated with aviation growth supported by the draft HENPS, together with emissions from other transport modes and infrastructure sectors. Expansion at Heathrow contributes to cumulative aviation emissions in absolute terms, alongside growth at other UK airports. While these effects are addressed through economy-wide carbon budgets and sector-level strategies, reliance on such mechanisms does not remove the AoS conclusion that cumulative aviation growth gives rise to **adverse effects** in relation to climate change mitigation at a strategic level.

9.2.339 For air quality, cumulative effects are shaped by the interaction between airport activity, surface access traffic, background emission trends and wider land use change. While air quality impacts remain predominantly localised, cumulative pressures arise where growth coincides with existing urban areas, transport corridors and air quality management areas. At a strategic level, these interactions reinforce **adverse air quality effects**, reflecting reduced headroom and increased sensitivity.

9.2.340 In relation to noise, cumulative effects arise primarily from overall increases in aviation activity rather than from spatial overlap between individual airports. While communities affected by different airport expansions are generally distinct, cumulative aviation growth contributes to increased national exposure to aircraft noise. At a strategic level, this reinforces **adverse noise effects**, consistent with the sector-wide implications of expanded capacity.

9.2.341 Cumulative **adverse effects** are also identified in relation to natural resource use, water and land take, where major infrastructure and development activity increases pressure on finite environmental resources over time.

9.2.342 **Adverse effects** on biodiversity and ecological networks are anticipated where multiple large infrastructure projects such as HS2 and Heathrow expansion affect the same environmental systems. This is particularly relevant in areas such as the Colne Valley, where multiple projects interact with the same river corridors, floodplains and ecological networks. In these locations, cumulative effects may increase pressure on biodiversity and reduce the resilience of water systems to future climate change.

9.2.343 Taken together, cumulative effects associated with the draft HENPS give rise to **adverse effects** in key theme areas, particularly climate change mitigation, noise and environmental pressure on constrained systems, reflecting the additive nature of aviation and infrastructure growth at a national scale.

In-combination effects

9.2.344 In-combination effects arise where the impacts of Heathrow expansion enabled by the draft HENPS interact with those of other plans, projects or programmes in ways that may intensify, compound or alter overall outcomes.

9.2.345 Relevant in-combination interactions arise in particular in relation to other airport expansion proposals, strategic transport infrastructure, and wider growth and development strategies and plans.

Aviation sector interactions

9.2.346 In-combination effects arise from the interaction between capacity expansion at Heathrow and growth at other UK airports, including Gatwick and Luton. While each airport affects a distinct local environment, expansion across multiple airports contributes collectively to sector-wide changes in aviation capacity, aircraft movements and passenger demand.

9.2.347 At a national scale, the combined effect of airport expansion reinforces **adverse effects** in relation to climate change mitigation, reflecting the additive contribution of aviation growth to overall greenhouse gas emissions. Similarly, although noise effects are geographically distinct between airports, in-combination expansion contributes to **adverse effects** at a national policy level relating to population exposure to aviation noise.

9.2.348 In relation to air quality, adverse effects are primarily experienced at a local level, reflecting the way pollutants disperse around individual airports. However, as with noise, expansion across multiple airports contributes to an overall increase in population exposure to air pollution at a national scale, even where local effects remain geographically distinct. In-combination expansion may also increase pressures on regional transport networks, reinforcing adverse air quality effects along key corridors.

Strategic transport infrastructure

9.2.349 Major strategic transport projects, including High Speed Two (HS2) and ongoing strategic road investment, have the potential to interact in combination with Heathrow expansion by influencing travel behaviour, surface access patterns and modal choice.

9.2.350 HS2 may improve long-distance rail connectivity to Heathrow, with implications for aviation demand, surface access emissions and passenger distribution. Strategic road investment, including motorway upgrades and capacity enhancements, may also interact with airport expansion by affecting traffic flows on key corridors serving the airport and surrounding areas. These may lead to **beneficial effects** on the economy, and accessibility to the airport.

9.2.351 However, these projects (especially road-related projects), may also reinforce **adverse effects** for climate change mitigation, air quality and communities, reflecting the combined influence of transport growth and infrastructure delivery over similar timescales.

Wider growth and development

9.2.352 In-combination effects also arise through the interaction between Heathrow expansion and wider economic growth, housing delivery and commercial development supported by improved connectivity. Increased development pressure (including through the provisions of the London Plan, strategic development strategies and local plans) may compound **adverse effects** on local infrastructure, community amenity and environmental resources, particularly where growth is concentrated around transport corridors and employment locations.

9.2.353 Conversely, these interactions also reinforce **beneficial effects** on the economy, reflecting increased investment, employment and productivity at regional and national scales. As with other in-combination effects, adverse impacts are more locally concentrated, while economic benefits are more widely distributed.

Overall in-combination effects

9.2.354 Taken together, the AoS identifies that in-combination interactions between Heathrow expansion, other airport growth (including Gatwick and Luton), strategic transport infrastructure such as HS2, and wider development strategies and plans reinforce the **adverse effects** identified at a strategic level for climate change mitigation, noise and environmental pressure on constrained systems.

9.2.355 At the same time, these interactions may also reinforce **beneficial effects** on the economy, reflecting the combined role of aviation capacity and supporting infrastructure in enabling connectivity and growth.

9.3. Summary of draft HENPS appraisal

9.3.1 At a strategic level, the AoS identifies adverse effects arising from the development supported by the draft HENPS across a range of environmental and social themes. **Major (--) adverse effects** are identified in relation to climate change, biodiversity, air quality, noise, landscape, the historic environment, water resources, economy, soils, and resources and waste. These effects reflect the scale, permanence and location of development, including substantial land take, increased aviation activity, and long-term pressures on sensitive environmental systems.

9.3.2 **Major (--) adverse effects** are also identified in relation to communities and quality of life, particularly at the local level, driven by displacement, environmental exposure and long-term changes to amenity. These effects are spatially concentrated and occur within a densely populated area, resulting in uneven distribution of impacts across communities.

9.3.3 Against this, the AoS identifies **major (++) and moderate (++) beneficial effects**, most notably in relation to the economy and connectivity. At a local level, expansion is expected to support employment, investment and improved international connectivity, reflecting the strategic role of Heathrow. However, at a national level, these benefits are subject to **uncertainty** and may partly reflect redistribution of activity rather than wholly additional growth.

9.3.4 Across several themes, including air quality, climate change and water, the appraisal identifies a strong reliance on mitigation measures, regulatory controls and system-wide improvements to achieve acceptable outcomes. While the draft HENPS provides a comprehensive policy framework, outcomes are dependent on effective implementation, resulting in **uncertainty** at the strategic level.

9.3.5 Cumulative and in-combination effects reinforce this pattern, with aviation growth and wider infrastructure development contributing to increased pressure on climate change, noise, air quality and natural resources, while also supporting economic activity and connectivity at a national scale.

9.3.6 Overall, the strategic appraisal concludes that the draft HENPS enables economic and connectivity benefits but gives rise to widespread and, in some cases, permanent adverse effects.

Part 3: Next steps

10. HENPS finalisation

10.1. Further work

10.1.1 Following the current consultation, the Government will undertake further work to refine and finalise the HENPS. This will include consideration of consultation responses received on the draft HENPS and the accompanying AoS, HRA, HIAn, and EqIA, and other supporting documents.

10.1.2 Further analytical or technical work may also be required to support policy development in specific areas where consultation responses, updated evidence or emerging Government policy indicate that additional clarity or refinement is necessary. This may include further work in relation to:

- policy requirements to be applied at the DCO stage;
- alignment with updated national policy or legislative frameworks; and
- specific theme areas where new or updated technical evidence is expected.

10.1.3 Where any material changes to the policy approach are proposed as a result of further work, the implications for sustainability will be considered, including whether additional or updated appraisal of reasonable policy alternatives is required in line with SEA requirements.

10.2. Publication of the final HENPS

10.2.1 Once further work has been completed, the intention is for the Government to proceed towards publication of the final HENPS in accordance with the Planning Act 2008 and relevant statutory requirements. The final AoS will be published alongside the final HENPS, presenting the appraisal of the policy and the reasonable alternatives that have been considered.

10.2.2 The designated HENPS will set out the Government's policy framework for expansion at Heathrow Airport, and will have effect in relation to applications for development consent that cover any of the following criteria:

- A Northwest Runway at Heathrow Airport;
- Any new terminal infrastructure or the reconfiguration of terminal facilities associated with the Northwest Runway at Heathrow Airport; and
- Any associated infrastructure and surface access facilities.

10.3. Relationship with the Development Consent Order stage

10.3.1 Following designation of the HENPS, detailed proposals for airport expansion will be brought forward by a scheme promoter through the DCO process. At that stage, project-specific assessment will be undertaken, including preparation of an EIA and a project-level HRA.

10.3.2 The AoS does not determine whether a particular scheme is acceptable in detail, but provides a strategic assessment of the sustainability implications of the HENPS policy framework. Matters relating to detailed design, mitigation, compensation and compliance with regulatory standards will be considered through the DCO process, guided by the policy requirements set out in the HENPS.

10.4. Monitoring

10.4.1 In accordance with SEA requirements, the AoS identifies the need for monitoring of the significant sustainability effects of the HENPS, in order to identify unforeseen adverse effects and enable appropriate remedial action where necessary.

10.4.2 Given the strategic nature of the HENPS, monitoring focuses on significant and uncertain effects identified at a strategic level, and is designed to draw primarily on existing monitoring arrangements, regulatory controls and project-level monitoring undertaken through the DCO process, rather than duplicating detailed scheme-specific requirements.

10.4.3 The proposed monitoring framework is presented in **Table 10-1** and is structured in the same manner as the monitoring framework included within the 2018 ANPS AoS, providing continuity in approach and supporting comparison over time. The table sets out, for each AoS theme:

- the relevant sustainability objective;
- a summary of the significant effect identified;
- the proposed monitoring approach;
- indicative responsibility; and
- proposed monitoring frequency, where appropriate.

10.4.4 At this stage, the monitoring proposals are indicative and high-level, reflecting the role of the HENPS in establishing a policy framework rather than consenting individual schemes. The detailed specification of monitoring indicators, responsibilities and reporting arrangements will be confirmed through subsequent stages of policy implementation and, where relevant, through project-level assessment, regulation and consent.

10.4.5 The monitoring framework will be reviewed and refined as necessary alongside designation of the HENPS, taking account of consultation responses, updated evidence and the availability of relevant data sources.

Table 10-1: Monitoring of significant or uncertain effects for the HENPS

AoS Theme		AoS Objective/s	Summary of Effect	Proposed Monitoring	Responsibility	Proposed Frequency
	Air Quality	Limit contributions to air pollutants so that air quality objectives (targets) are met in the Heathrow area consistent with international, national and local standards and requirements	Major (significant) adverse effects associated with increased emissions and reduced headroom in constrained areas	• Trends in concentrations of key air pollutants using established national and local monitoring networks • Monitoring of surface access mode share to the airport • Monitoring compliance with statutory air quality objectives	Government, regulators and scheme promoter through existing monitoring and reporting regimes	Regular reporting intervals in line with established air quality monitoring programme

AoS Theme		AoS Objective/s	Summary of Effect	Proposed Monitoring	Responsibility	Proposed Frequency
	Biodiversity	• To protect and enhance designated sites for nature conservation. • To conserve and enhance undesignated habitats, species, valuable ecological networks and ecosystem functionality, and support the delivery of Biodiversity Net Gain.	Major (significant) adverse effects associated with habitat loss, disturbance and river modification	• Condition monitoring of internationally, nationally and locally designated sites • Monitoring of habitat creation, enhancement and compensation areas delivered through expansion schemes • Monitoring of species conservation status where relevant	Statutory nature conservation bodies, regulators and scheme promoter	Monitoring aligned with designated site condition assessment cycles and project-level commitments

AoS Theme		AoS Objective/s	Summary of Effect	Proposed Monitoring	Responsibility	Proposed Frequency
	Climate Change (mitigation)	• To minimise carbon emissions in airport construction and operation, including flight emissions.	Major (significant) adverse effects associated with increased greenhouse gas emissions	• Monitoring of aviation emissions using national and sectoral carbon accounting frameworks • Monitoring of surface access and airport operational energy use and emissions • Construction carbon monitoring where expansion schemes proceed	Government and scheme promoter	Regular reporting in line with national carbon budgeting and reporting cycles
	Climate Change (adaptation)	• To minimise flood risk and ensure resilience to climate change.	Major (significant) adverse effects associated with scale of intervention and climate risk exposure	• Monitoring performance and functionality of flood risk management infrastructure • Review of operational resilience during extreme weather events	Scheme promoter and regulators	Periodic review informed by flood risk management and operational performance

AoS Theme		AoS Objective/s	Summary of Effect	Proposed Monitoring	Responsibility	Proposed Frequency
	Communities and Quality of Life	• To avoid or minimise negative effects on community viability, including housing, facilities and indirect effects. • To avoid or minimise disproportionate impacts on any social group. • To maintain and where possible improve the quality of life for local residents and the wider population.	Major (significant) adverse effects during construction and adverse effects during operation	• Monitoring delivery and implementation of community compensation and relocation measures • Monitoring provision and use of replacement community facilities • Use of related noise, air quality and transport monitoring to inform quality-of-life considerations	Government and scheme promoter	Regular intervals during construction and early operation

AoS Theme		AoS Objective/s	Summary of Effect	Proposed Monitoring	Responsibility	Proposed Frequency
€ $ £ ¥	Economy	• To maximise economic benefits and to support the competitiveness of the UK economy. • To promote employment and economic growth in the local area and surrounding region	Major (significant) beneficial effects for employment and the economy	• Monitoring job creation associated with construction and operation • Monitoring delivery of apprenticeships and skills initiatives • Monitoring employment outcomes at local, regional and national levels • Monitoring changes in regional economic output (e.g. Gross Value Added) associated with the development	Scheme promoter, supported by Government	Annual reporting

AoS Theme		AoS Objective/s	Summary of Effect	Proposed Monitoring	Responsibility	Proposed Frequency
	Historic Environment	• To conserve and where possible enhance the historic environment including buildings, structures, townscapes and landscapes and archaeological remains.	Major (significant) adverse effects associated with loss and change	• Monitoring implementation of heritage mitigation strategies • Monitoring predicted versus actual harm to heritage assets and their setting • Monitoring archaeological investigation and recording	Scheme promoter	Regular intervals during construction and early operation

AoS Theme		AoS Objective/s	Summary of Effect	Proposed Monitoring	Responsibility	Proposed Frequency
	Landscape	• To promote the protection and improvement of landscapes, townscapes, waterscapes and the visual resource, including areas of tranquillity and dark skies.	Major (significant) adverse effects associated with permanent character change and loss of green belt land	• Monitoring changes in landscape and townscape character • Monitoring changes to views and settings of designated areas • Post-implementation review of landscape mitigation measures	Scheme promoter	Pre-construction baseline, during construction and post-construction review
	Noise	• To minimise and where possible reduce noise impacts on human receptors.	Major (significant) adverse effects associated with construction and operational noise	• Monitoring population exposure to aircraft and ground noise • Monitoring compliance with operational noise controls and respite arrangements • Review of night-flight and operating restrictions	Scheme promoter and regulators	Regular reporting aligned with operational monitoring arrangements

AoS Theme		AoS Objective/s	Summary of Effect	Proposed Monitoring	Responsibility	Proposed Frequency
	Resources and Waste	• To minimise consumption of natural, particularly virgin non-renewable, resources. • To minimise the generation of waste in accordance with the principles of the resource efficiency hierarchy. • To protect sites designated for geodiversity.	Major (significant) adverse effects associated with material use and waste	• Monitoring quantities of construction materials used • Monitoring recycled and re-used content • Monitoring waste generated, reused, recycled and diverted from landfill	Scheme promoter and construction supply chain	Regular monitoring during construction; periodic review during operation

AoS Theme		AoS Objective/s	Summary of Effect	Proposed Monitoring	Responsibility	Proposed Frequency
	Soil	• To minimise loss of undeveloped soils and protect soils against erosion, contamination and degradation.	Major (significant) adverse effects associated with land take and sealing	• Monitoring loss of soil resources and agricultural land • Monitoring soil handling, reuse and storage practices • Monitoring soil contamination management where relevant	Scheme promoter	Pre-construction and post-construction review
	Water	• To protect and enhance the quality of surface and ground waters, and promote the efficient use of water resources.	Major (significant) adverse effects associated with river modification and water demand	• Monitoring waterbody status and hydromorphological change • Monitoring compliance with discharge consents and abstraction controls • Monitoring performance of flood risk and drainage infrastructure	Scheme promoter and regulators	Monitoring aligned with regulatory and catchment management review cycles

Appendix A : Regulatory Requirements

As discussed in Section 1, Schedule 2 of the Environmental Assessment of Plans Regulations 2004 explains the information that must be contained in the Environmental Report, which comprises the AoS Report for the current assessment. **Table A-1** links the structure of this report to an interpretation of Schedule 2. **Table A-2** then presents a discussion of how the information in this AoS Report reflects the requirements for Environmental Reports.

Table A-1: Questions answered by this AoS Report, in line with an interpretation of regulatory requirements

Questions answered	As per regulations… the AoS Report must include…
Introduction	
What's the draft HENPS seeking to achieve?	• An outline of the contents, main objectives of the HENPS and relationship with other relevant plans and programmes
What's the AoS scope? *(supported by the AoS Scoping Report)*	
What's the sustainability 'context'?	• Relevant environmental protection objectives, established at international or national level • Any existing environmental problems which are relevant to the HENPS including those relating to any areas of a particular environmental importance
What's the sustainability 'baseline'?	• Relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the HENPS • The environmental characteristics of areas likely to be significantly affected • Any existing environmental problems which are relevant to the HENPS including those relating to any areas of a particular environmental importance
What are the key issues and objectives that should be a focus?	• Key environmental problems / issues and objectives that should be a focus of (i.e. provide a 'framework' for) assessment
Part 1	

What has policy-making / AoS involved up to this point?	• Outline reasons for selecting the alternatives dealt with (and thus an explanation of the 'reasonableness' of the approach) • The likely significant effects associated with alternatives • Outline reasons for selecting the preferred approach in light of alternatives assessment / a description of how environmental objectives and considerations are reflected in the draft HENPS
Part 2	
What are the AoS findings at this current stage?	• The likely significant effects associated with the draft HENPS • The measures envisaged to prevent, reduce and offset any significant adverse effects of implementing the draft HENPS
Part 3	
What happens next?	• A description of the monitoring measures envisaged

Table A-2: Checklist of how and where (within this report) regulatory requirements are reflected

Regulatory requirement	Information presented in this report
Schedule 2 of the regulations lists the information to be provided within the AoS Report:	
• An outline of the contents, main objectives of the plan or programme, and relationship with other relevant plans and programmes;	**Section 2** ('The draft HENPS') presents this information.
• The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme; • The environmental characteristics of areas likely to be significantly affected; • … environmental problems which are relevant… …areas of a particular environmental importance…;	These matters were considered in detail at the scoping stage, which included consultation on a Scoping Report. The outcome of scoping was an 'AoS framework', which is presented within **Section 3**. The AoS scope – in terms of key sustainability issues and objectives, including accounting for evolution of the baseline without the draft HENPS – is then discussed within the appraisal sections as appropriate, i.e. in light of the options and proposals that are a focus of the appraisal.
• The environmental protection objectives, established at international, community or national 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;	The Scoping Report presented a detailed context review and explained how key messages from this (and baseline review) fed into the 'AoS framework', which is presented within **Section 3**. Also, information on the AoS scope is presented as part of appraisal work in **Sections 6 and 9**. With regards to explaining *"how… considerations have been taken into account"*, **Section 7** explains reasons for supporting the preferred option, i.e. how/why the preferred option is justified in-light of alternatives appraisal.
• The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets,	**Section 6** presents alternatives appraisal findings in respect of reasonable alternatives, whilst **Section 9** presents an appraisal of the HENPS as a whole. All appraisal work involved

cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors.	giving consideration to the AoS scope and the various effect characteristics.
• The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan…	**Section 9** flags potential elements that can be a focus of further work if required ahead of HENPS finalisation. In addition, environmental recommendations have been fed into the development of the HENPS through the AoS process on an iterative basis.
• An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;	**Section 5** deals with 'reasons for selecting the alternatives dealt with', with an explanation of reasons for focusing on two shortlisted Heathrow scheme options. **Sections 7** explains 'reasons for supporting the preferred approach', i.e. explains how/why the preferred approach is justified in light of the alternatives / scenarios appraisal. Methodology is discussed at various places, ahead of presenting appraisal findings.
• … measures envisaged concerning monitoring;	**Section 10** presents this information.
• a non-technical summary… under the above headings	The NTS is at the start of the document.
The AoS Report must be published alongside the draft plan, in-line with the following regulations:	
• Authorities… and the public, shall be given an early and effective opportunity within appropriate time frames to express their opinion on the draft plan or programme and the accompanying environmental report before the adoption of the plan…	This AoS Report is published alongside the draft HENPS in order to inform the consultation and then subsequent policy finalisation.

The AoS Report must be taken into account, alongside consultation responses, when finalising the plan.	
• The environmental report prepared pursuant to Article 5 [and] the opinions expressed pursuant to Article 6… shall be taken into account during the preparation of the plan… and before its adoption or submission to the legislative procedure.	This AoS Report will be taken into account when finalising the HENPS for publication (see **Section 10**).