

February 2023

London Luton Airport Expansion

Planning Inspectorate Scheme Ref: TR020001

Volume 5 Environmental Statement and Related Documents
5.01 Chapter 5: Approach to the Assessment

Application Document Ref: TR020001/APP/5.01

APFP Regulation: 5(2)(a)

The Planning Act 2008

**The Infrastructure Planning (Applications: Prescribed Forms and Procedure)
Regulations 2009**

**London Luton Airport Expansion Development Consent
Order 202x**

**5.01 ENVIRONMENTAL STATEMENT CHAPTER 5: APPROACH TO
THE ASSESSMENT**

Regulation number:	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference:	TR020001
Document Reference:	TR020001/APP/5.01
Author:	Luton Rising

Version	Date	Status of Version
Issue 1	February 2023	Application issue

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5 APPROACH TO THE ASSESSMENT

5.1 Introduction

5.1.1 This chapter provides an overview of the approach to the Environmental Impact Assessment (EIA), including the approach to the EIA assessment scenarios and general methodology used to provide consistency across assessment topics.

5.1.2 An EIA is a staged, iterative process, the final findings of which are reported in an Environmental Statement (ES) (this document [TR020001/APP/5.01 to 5.04]) submitted in support of the application for a Development Consent Order (DCO) for the Proposed Development. This ES reports the findings of the assessment of the likely significant effects of the Proposed Development and has been undertaken in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (SI/572) (as amended) (EIA Regulations) (Ref. 5.1) and relevant guidance. Each of the stages is described in the following sections.

5.1.3 The following sections describe the approach to:

- a. EIA process – sets out the overall legislative requirements and guidance to inform the EIA process, including the treatment of uncertainty and limitations of the assessment;
- b. EIA scoping – describes how the scope, including technical, temporal and spatial scope, for the assessment has been established;
- c. EIA methodology:
 - i. assumptions and limitations;
 - ii. parameters, uncertainty and flexibility;
 - iii. worst case scenario;
 - iv. baseline – describes the common baseline conditions, and future conditions;
 - v. defining significance – sets out how the magnitude of impact, and sensitivity or value of a receptor are considered in evaluating significance; and
 - vi. mitigation – describes how environmental measures to reduce, limit or eliminate effects through embedded, good practice and additional mitigation are considered within the assessment.
- d. in-combination and cumulative effects – describes what in-combination and cumulative effects are. **Chapter 21** In-combination and Cumulative Effects of this ES [TR020001/APP/5.01] provides the detail of the methodological approach;
- e. transboundary effects – sets out the legislative context and evidence to scope out further consideration of transboundary effects;
- f. stakeholder engagement – describes the approach to the stakeholder engagement process, meetings to date and identifies where additional information recording interactions are provided;
- g. supporting studies – provides details of the other studies which have been used to inform the EIA, including: Habitats Regulation Screening,

Water Framework Directive Compliance Assessment, Flood Risk Assessment, Light Obtrusion Assessment, Transport Assessment, and Equality Impact Assessment;

- h. monitoring – describes an outline approach to proposed monitoring; and
- i. air space change – describes how airspace change has been considered within this assessment.

5.1.4 Specific environmental aspect assessment methodologies are described in **Chapters 6 to 20** of this ES [TR020001/APP/5.01].

5.2 EIA Process

Overview of EIA process

5.2.1 An EIA is a systematic process that examines the likely significant effects (beneficial or detrimental) on the environment resulting from the future construction and operation of a proposed development. The findings of an EIA are presented in a document known as an Environmental Statement (ES) (this document), which can then be used to inform decision makers and the public about the possible environmental implications of a development and help the decision maker (in the case of an airport DCO, the Secretary of State (SoS) for Transport) determine the application for development consent. This is a process prescribed by the EIA Regulations which set out the procedures to be followed in relation to EIAs which must be undertaken for Nationally Significant Infrastructure Projects (NSIPs) in England and Wales.

5.2.2 Regulation 14 (2) and Schedule 4 to the EIA Regulations outline the requirements for information inclusion in environmental statements. This ES has been prepared in accordance with the EIA Regulations and the location of required information in this document is provided as detailed in **Chapter 1** Introduction, of this ES [TR020001/APP/5.01].

Scoping

5.2.3 The EIA Scoping Report, provided as **Appendices 1.1** and **1.2** of this ES [TR020001/APP/5.05], collated initial information on the Proposed Development. This included information regarding the construction and operation, topics to be assessed, aspects and matters to be scoped into or out of the EIA, how they will be assessed and the potential likely significant effects as a result of the Proposed Development. The EIA Scoping Report was submitted to the Planning Inspectorate on the 29 March 2019 with a request for the SoS to adopt a scoping opinion in relation to the Proposed Development. In considering the request for a scoping opinion, the SoS consulted with the relevant statutory stakeholder bodies.

5.2.4 Statutory stakeholders, including those identified by Section 43 of the Planning Act 2008 ('the Act'), had 28 days to respond to the SoS regarding the information provided. The SoS then provided a formal written Scoping Opinion on the information to be included in the ES within 42 days of receiving the scoping request, published 9 May 2019. The Scoping Opinion is available in

Appendix 1.3 of this ES [TR020001/APP/5.05] and on the Planning Inspectorate's projects portal (Ref. 5.2).

5.2.5 Responses attached to the Scoping Opinion were received from the following representatives:

- a. Affinity Water;
- b. Aylesbury Vale District Council;
- c. Buckinghamshire County Council;
- d. Cadent Gas Limited;
- e. Chilterns Conservation Board;
- f. Civil Aviation Authority;
- g. Dacorum Borough Council;
- h. Defence Infrastructure Organisation (Ministry of Defence);
- i. East Hertfordshire District Council;
- j. Environment Agency;
- k. ESP Utilities Group;
- l. Forestry Commission;
- m. Health and Safety Executive;
- n. Historic England;
- o. London Borough of Harrow Council;
- p. Milton Keynes Council;
- q. National Grid;
- r. National Highways;
- s. NATS (National Air Traffic Services);
- t. Natural England;
- u. Public Health England;
- v. Royal Mail;
- w. St Albans Council;
- x. Transport for London;
- y. Vincent and Gorbing (representing the 'host authorities' Hertfordshire County Council, North Hertfordshire District Council, Central Bedfordshire Council and Luton Borough Council); and
- z. Welwyn Hatfield Borough Council.

5.2.6 Individual responses to key aspect specific comments are provided in each aspect chapter (**Chapter 6 to 21**) of this ES [TR020001/APP/5.01]. Individual responses to each comment, developed with consultation throughout the EIA process, including how they have been addressed in the ES have been provided in **Appendix 1.4** of this ES [TR020001/APP/5.02].

- 5.2.7 The Proposed Development and some specific methods employed in the EIA have changed since the Scoping Opinion was published. Design evolution is described in **Chapter 3** of this ES [TR020001/APP/5.01], and any change in the assessment method, typically as a result of new guidance being published, was agreed with relevant consultees. For example, **Chapter 20** Water Resources and Flood Risk [TR020001/APP/5.01] uses National Highway's Design Manual for Roads and Bridges (DMRB) to inform the assessment methodology which was updated in 2020 (Ref. 5.3), **Chapter 19** Waste and Resources [TR020001/APP/5.01] employs guidance published by the Institute of Environmental Management and Assessment (IEMA) updated in 2020, and the approach to assessing the significance of greenhouse gas emissions was also updated by IEMA in February 2022 (Ref. 5.4) and publication of the Government's Jet Zero Strategy (Ref. 5.18). Where this has occurred it is described in the relevant aspect chapter (**Chapter 6 to 21**) of this ES [TR020001/APP/5.01].
- 5.2.8 The Applicant did not submit a request for a new scoping opinion as the Proposed Development or EIA has not changed substantially or materially since the Scoping Opinion was issued. Design changes since scoping did not introduce new receptors not already included in the study areas considered or require proposed assessment methodologies to change, and the nature and scale of the Proposed Development remains fundamentally the same. This ES therefore complies with the EIA Regulations as it is based on the most recent scoping opinion adopted.

EIA

Baseline data gathering and consultation

- 5.2.9 Consultation and baseline data gathering have been undertaken from 2017 to 2022 to inform the description of existing environmental conditions within the defined study area for each aspect (**Chapters 6 to 20** of this ES [TR020001/APP/5.01]). This included the collation of site survey data, information available through public records, and directly from stakeholders such as Historic England and the Environment Agency. Statutory consultation under section 42 and section 48 of the Act was undertaken in 2019 and 2022. Prescribed stakeholder bodies were consulted as part of the scoping process, supported by wider pre-application non-statutory stakeholder engagement activities undertaken as part of the DCO pre-application process.

Assessment of the environmental effects of the Proposed Development

- 5.2.10 An initial assessment has been undertaken to identify potential sensitive receptors which may be affected by the Proposed Development, their sensitivity to change and the potential magnitude of change that might be experienced as a consequence of the Proposed Development (described further in **Section 5.4**). These factors combined then allowed the assessment of the significance of the effects.

Identification of mitigation measures

- 5.2.11 Mitigation measures have been identified based on predicted likely significant effects. These include good practice measures or measures which will be embedded within the design of the Proposed Development (described further in **Section 5.4**). Additional mitigation has also been identified in response to significant adverse effects identified by the assessment. For example, for each topic assessment, specific additional measures may have been identified to include in the Code of Construction Practice (CoCP), provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**, which outlines control measures, procedures and standards that must be used during construction. The CoCP would then secure those measures and ensure their effective implementation. Where applicable, a summary of other mitigation measures is provided in each assessment chapter and securing mechanisms are identified in the **Mitigation Route Map [TR020001/APP/5.09]**.

Residual effects assessment

- 5.2.12 Residual environmental effects of the Proposed Development have been described, taking into account the effectiveness of proposed mitigation measures. A summary of these is provided in each of the topic assessments (**Chapters 6 to 20**) of this ES **[TR020001/APP/5.01]**.

Preliminary Environmental Information Reports

- 5.2.13 A Preliminary Environmental Information Report (PEIR) is a standalone report comprising preliminary environmental information and preliminary assessment based on the latest design proposals and information available during development stage on the project. A PEIR gives stakeholders and members of the public sufficient information considered reasonably required to develop an informed view of the likely significant environmental effects of a development.
- 5.2.14 A PEIR was prepared and consulted upon as part of the statutory consultation which took place between 16 October 2019 and 16 December 2019 (the 2019 PEIR).
- 5.2.15 The global pandemic impacted the aviation industry in 2021/22 and the Proposed Development was reviewed during this period. Changes were adopted in response to the prevailing conditions and also feedback from the 2019 consultation. The Applicant confirmed its continued intent to submit an application for development consent, and a further statutory consultation exercise was undertaken between 8 February 2022 and 4 April 2022 to consult on the amended proposals. A new PEIR (the 2022 PEIR) was prepared to support this consultation exercise.
- 5.2.16 The **2019 Consultation Feedback Report** published as part of the 2022 consultation, set out how the Applicant has had regard to feedback received during the 2019 statutory consultation. The **Consultation Report [TR020001/APP/6.01]** and **[TR020001/APP/6.02]** submitted as part of the application for development consent describes how the Applicant has had regard to feedback received during the 2022 statutory consultation.

Preparation of the ES

- 5.2.17 This ES reports on the findings of the EIA process and has been submitted as part of the application for development consent. The ES has responded to relevant feedback from stakeholder engagement and consultation including scoping, both PEIRs, and continued engagement with relevant consultees.

Guidance

- 5.2.18 This ES has been prepared in accordance with current, applicable, best practice EIA guidance and case law relating to EIA, including:
- a. the Planning Act 2008: Guidance on the Pre-application Process (March 2015) (Ref. 5.5);
 - b. Ministry of Housing, Community and Local Government (MHCLG) Planning Practice Guidance - Environmental Impact Assessment (2020) (Ref. 5.6);
 - c. Planning Inspectorate's Advice Notes (Ref. 5.7):
 - i. Advice Note Three: EIA consultation and notification (August 2017) (Ref. 5.8);
 - ii. Advice Note Seven: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping (June 2020) (Ref. 5.9);
 - iii. Advice Note Nine: Rochdale Envelope (July 2018) (Ref. 5.10);
 - iv. Advice Note Eleven: Working with public bodies in the infrastructure planning process (November 2017) (Ref. 5.11);
 - v. Advice Note Twelve: Transboundary impacts (March 2018) (Ref. 5.12); and
 - vi. Advice Note Seventeen: Cumulative effects assessment (August 2019) (Ref. 5.13).
 - d. Institute of Environmental Management and Assessment (IEMA) EIA "Guide to":
 - i. Shaping Quality Development (2015) (Ref. 5.14); and
 - ii. Delivering Quality Development (2016) (Ref. 5.15).
- 5.2.19 This assessment has sought to focus on matters where likely significant effects may occur in accordance with Paragraph 5.10 of the Planning Inspectorate Advice Note Seven (Ref. 5.16) to ensure proportionality.

5.3 EIA Scoping

Scoping

- 5.3.1 As recommended in the Scoping Opinion, the ES provides full responses to comments received from the Planning Inspectorate, and relevant stakeholders, and demonstrates how the assessment has taken into account the opinion and where in the ES comments have been addressed. Responses to key comments are provided in each relevant technical chapter of this ES (**Chapter 6 to 21 [TR020001/APP/5.01]**) and responses to all comments are provided in

Appendix 1.4 EIA Scoping Opinion Response, of this ES [TR020001/APP/5.02].

5.3.2 **Table 5.1** lists the aspects and matters scoped in, and those that have been scoped out of this assessment. Where aspects of the scope and methodology have changed in response to comments raised in the EIA Scoping Opinion, or from other consultations (for example the 2019 and 2022 consultations) or engagement, these are shown in brackets and italics in **Table 5.1**, and described in the relevant technical assessment methodology in **Chapters 6 to 21** of this ES [TR020001/APP/5.01].

Table 5.1: Topics scoped in and out of the EIA

Topic	Scoped In	Scoped Out
Agricultural land quality and farm holdings	Construction effects on: Best and most versatile agricultural land; Soil resources; and Local agricultural holdings.	Operational impacts on rural land designations and agricultural land quality and soils.
Air quality	Dust and particulate matter from construction; Emission from road traffic; Emission from aircraft. Emissions from on-site vehicles and operations. Qualitative odour assessment.	Emergency fuel jettison.
Biodiversity	Construction and operation effects on: Designated sites; Priority habitats; Protected species; and Notable flora and fauna. (<i>Junction 10 of the M1</i>)	Water vole, white-clawed crayfish, aquatic invertebrates. Great crested newt, hazel dormouse. (<i>Offsite Car Parks and Highway Interventions (with the exception of junction 10 of the M1)</i>)
Climate change	Construction and Operation: In-combination climate change impacts. Climate Change Resilience.	Impacts of sea level rise. Decommissioning.
Cultural heritage	Construction and operation effects on: Designated heritage assets, including Scheduled Monuments listed buildings, Registered Parks and Gardens and conservation areas. Non-designated heritage assets,	n/a

Topic	Scoped In	Scoped Out
	including locally listed buildings and archaeology.	
Economics and employment	Direct, Indirect and Induced Impacts on Employment and Gross Value Added (GVA) in the UK and locally through the construction and operational phases. Wider economic impacts arising from improved connectivity offered by the expanded operation of the airport. Effects on existing businesses and employment from environmental factors	(The tourism deficit ¹)
Greenhouse gases	Construction: Land clearance; Embodied carbon emissions in materials; On-site construction activity; Transport of construction materials; and Waste. Operation: Operation of the airport buildings, assets and vehicles; Surface access journeys from employees, passengers, and freight; and Operation of aircraft.	Decommissioning. Cumulative
Health and community	Effects on the health of the population, or on the lives of people within the local community, arising from direct and indirect environmental, social and economic impacts of construction and operation of the Proposed Development. <i>(Overall population exposure to air pollution)</i>	Electromagnetic interference. Health effects of water, groundwater, flooding or major accidents. Community impacts on individuals.

¹ the balance in which expenditures arising from travels of residents abroad exceed the international tourism receipts from foreign tourists.

Topic	Scoped In	Scoped Out
Landscape and visual	<p>Construction and operation effects on:</p> <ul style="list-style-type: none"> Constituent elements of the landscape; Specific aesthetic or perceptual qualities of the landscape; Character of the landscape; People who will be affected by changes in views or visual amenity – <i>(Residential Visual Amenity Appraisal; Tranquillity; Off-site highway works; and Views from residential properties).</i> 	n/a
Major accidents and disasters (MAD)	<p>Assessment of expected significant effects arising from the vulnerability of the construction and operation of the Proposed Development to MAD (man-made causes and natural phenomenon)</p>	<p>Airport activities not altered by the Proposed Development, hazards with no source-pathway receptor link or do not affect the vulnerability of the Proposed Development to MAD events. Members of the public who wilfully trespass. Events of any likelihood with a low consequence. Expected or planned impacts.</p>
Noise and vibration	<p>Noise and vibration from earthworks and construction of the airport infrastructure. Changes in air noise (including the taking off and landing of aircraft). Changes in on-site ground noise associated with the operational project. Changes in road traffic noise, including from the new road infrastructure.</p>	<p>Operational vibration. Traffic vibration.</p>
Soils and geology	<p>Construction and operation impacts on: Land quality with respect to soils</p>	<p><i>(All off-site planting, hedgerow enhancements or</i></p>

Topic	Scoped In	Scoped Out
	contamination including soil gases. Mineral resources. <i>(Human health; Buildings and buried infrastructure; and, Off-site Highway Interventions)</i>	<i>new hedgerows along field boundaries</i>); Geomorphological and geological features of scientific interest and importance.
Traffic and transport	Severance. Pedestrian delay. Pedestrian amenity. Driver stress and delay. Collisions and safety. Hazardous loads.	n/a
Waste and resources	Construction and operational waste generation and resource requirements. Impact on waste management infrastructure.	Waste arising from extraction, processing and manufacture of construction components and products. Environmental impacts associated with the management of waste.
Water resources	Construction and operation impacts on: Surface and ground water quality. Surface water flood risk. Surface water features. Groundwater features. <i>(Groundwater flood risk. Existing water infrastructure and assets).</i> Water Framework Directive (WFD) bodies. Abstractions and Source Protection Zones	Flooding associated with rivers and streams.

Technical scope

5.3.3 The technical scope of the EIA was determined during the scoping exercise. Aspects included in the assessment are those which were determined to have the potential to give rise to significant effects. The aspects addressed within this ES are listed below and are presented in detail in individual chapters (**Chapters 6 to 20** of this ES [TR020001/APP/5.01]):

- a. Agricultural land quality and farm holdings;

- b. Air quality;
- c. Biodiversity;
- d. Climate change;
- e. Cultural heritage;
- f. Economics and employment;
- g. Greenhouse gases;
- h. Health and community;
- i. Landscape and visual;
- j. Major accidents and disasters;
- k. Noise and vibration;
- l. Soils and geology;
- m. Traffic and transportation;
- n. Waste and resources;
- o. Water resources; and
- p. In-combination and cumulative effects.

Temporal scope

5.3.4 The temporal scope for the assessment refers to the timescale over which likely effects may occur and/or be experienced.

5.3.5 It is important to note that the Proposed Development is due to be delivered from 2025 to 2043, and therefore there may be instances where construction and operational activities coincide. These activities have been split into assessment phases described in **Section 5.4**, Assessment years and scenarios, and considered as part of each assessment. The proposed construction programme is outlined in **Chapter 4** The Proposed Development of this ES [TR020001/APP/5.01], with activities and sequencing described in further detail in **Appendix 4.1** of this ES [TR020001/APP/5.02].

Spatial scope

5.3.6 The geographical/spatial scope of the assessment is the area within which significant effects upon the environment receptors (including people, built and natural resources) are likely to occur.

5.3.7 The geographical scope for each assessment presented in this ES has been informed by the Order Limits as shown in **Figure 2.1** of this ES [TR020001/APP/5.03], the nature and scale of the Proposed Development, best practice and guidance for each aspect and matter, and likely receptors. These have been used to define study areas for each environmental aspect, and some individual matters, which are described in the relevant chapters (**Chapters 6 to 20** of this ES [TR020001/APP/5.01]).

5.4 EIA Methodology

Assumptions and Limitations

5.4.1 Known assumptions and limitations specific to individual assessments are detailed in aspect chapters of this ES (**Chapters 6 to 20 [TR020001/APP/5.01]**).

5.4.2 General limitations include:

- a. baseline conditions are specific to each aspect and are considered to be accurate at the time when surveys were undertaken, however, it is recognised that environmental conditions may change during the course of the Proposed Development, and these are described as appropriate as part of the Future Baseline;
- b. the assessment presented in this ES is based on construction information available at the time of writing based on the construction phases and programme described in **Section 5.4**, Assessment years and scenarios;
- c. aviation and transport forecasting has been undertaken to inform design. These have also been used to inform the EIA. Details of the methodology used and margins of error for aviation forecasting can be found in the **Need Case [TR020001/APP/7.04]** and for transport forecasting in the **Transport Assessment [TR020001/APP/7.02]**;
- d. air space is being redesigned across the south east of England as a separate process outside of this Proposed Development. The assessment presented within the ES assumes that existing flight paths remain. For further information regarding air space change, see **Section 5.11**; and
- e. the assessment of cumulative effects is dependent on the availability of information at the time of assessment in relation to other identified developments.

5.4.3 Where applicable, any technical deficiencies or, in some instances, lack of available data encountered in the collection of information is clearly described within each assessment chapter of this ES (**Chapters 6 to 20 [TR020001/APP/5.01]**).

Parameters, Uncertainty and Flexibility

5.4.4 The Proposed Development is planned to be constructed in increments from 2025 to 2041, with demand forecasts estimating that the design throughput capacity of 32 mppa (million passengers per annum) is likely to be reached by 2043. The delivery and continued use of infrastructure over this length of time means that a degree of flexibility needs to be retained to accommodate potential changes in airport operator, regulatory and policy regimes, and construction contractors over this period.

5.4.5 Uncertainty and flexibility has been considered in this ES by employing a Rochdale (Design) Envelope approach, which derives from the approach to a

parameters-based environmental assessment first established in the cases of *R v Rochdale Metropolitan Borough Council ex p Milne* (2000) and *R v Rochdale Metropolitan Borough Council ex p Tew* (1999).

- 5.4.6 The Planning Inspectorate’s Advice Note Nine defines key principles for how flexibility in design can be considered during an EIA when final design details are not available:

“The DCO application documents should explain the need for and the timescales associated with the flexibility sought and this should be established within clearly defined parameters;

The clearly defined parameters established for the Proposed Development must be sufficiently detailed to enable a proper assessment of the likely significant environmental effects and to allow for the identification of mitigation, if necessary within a range of possibilities;

The assessments in the ES should be consistent with the clearly defined parameters and ensure a robust assessment of the likely significant effects;

The DCO must not permit the Proposed Development to extend beyond the ‘clearly defined parameters’ which have been requested and assessed. The Secretary of State may choose to impose requirements to ensure that the Proposed Development is constrained in this way;

The more detailed the DCO application is, the easier it will be to ensure compliance with the Regulations.” (Ref. 5.17)

- 5.4.7 Consent can be granted for a development which is conditional on further details being agreed prior to construction of a proposed development on the basis of the Rochdale Envelope approach.

- 5.4.8 The existing operational airport and surrounding environment contain key physical and operational constraints which mean the key known components of the Proposed Development have needed to be located within certain areas, or ‘envelopes’ as indicated in the **Work Plans [TR020001/APP/4.04]** which provide the location and maximum extent of development components as individual Work Numbers (Work No.) as described in **Chapter 4** The Proposed Development of this ES **[TR020001/APP/5.01]**. **Figures 4.1, 4.2 and 4.3** of this ES **[TR020001/APP/5.03]** provide Illustrative Locations for each Work No. assumed in each assessment phase for ease of reference.

- 5.4.9 The assessments reported in this ES have been prepared based on the proposed infrastructure being located within these Work No. as shown on **Figures 4.1 to 4.3** of this ES **[TR020001/APP/5.03]**. Key engineering designs, fundamental to the operation of the airport, have been developed to a relatively high level, such as the airfield platform and apron. However, flexibility is required in assets that will ultimately be delivered following a detailed design stage taking into account changing regulations and requirements in the aviation industry. Parameters for certain Work No. have been developed to allow for that flexibility. Parameters provide a maximum horizontal and vertical extent within which each element of the Proposed Development will be constructed. For example, the choice of material or specification of a particular finish to a building

have not been provided, allowing for this to be defined at a date when a concessionaire to operate the facility and contractor for construction is appointed to deliver the Proposed Development. Detailed specifications will be required to meet the requirements of design standards and principles which are set out in the **Design Principles** document [TR020001/APP/7.10] and mitigation included in this ES, and the CoCP provided as **Appendix 4.2** to this ES [TR020001/APP/5.02].

- 5.4.10 The parameters described above have been used to assess the maximum physical extents in the EIA i.e. reasonable 'worst-case' physical extent and environmental impacts. Therefore, a degree of flexibility in final design details will be maintained, allowing detailed design to be developed without affecting the validity or robustness of the conclusions of the EIA.
- 5.4.11 Where linear infrastructure is proposed, such as new sections of off-line highway or rail, the horizontal alignment may be developed during detailed design but will be delivered within the maximum extent of the Work No. and area as described above. Maximum parameter heights are not practical over the whole length of proposed linear infrastructure and the concept of Limits of Deviation (LoD) is adopted. That is, the final designs, and assets as built, will be within the LoD for the vertical alignment that was considered during planning stages and has been granted planning consent.
- 5.4.12 There are two linear infrastructure assets included in the Proposed Development, namely the Airport Access Road and the Luton DART extension, as described in **Chapter 4** of this ES [TR020001/APP/5.01]. The proposed LoD for each asset is described below and in the **draft DCO** [TR020001/APP/2.01], and where appropriate and relevant the technical assessments of this ES describe how this is considered in the assessment. This includes Air Quality (**Chapter 7**), Landscape and Visual (**Chapter 14**) and Noise and Vibration (**Chapter 16**) [TR020001/APP/5.01].
- 5.4.13 The proposed vertical LoD for the linear assets of the Proposed Development are:
- a. AAR LoD = +/- 2m; and
 - b. Luton DART extension LoD = +0.5m, -1m.

Reasonable worst-case scenario

- 5.4.14 The physical extent of the Proposed Development is described in **Chapter 4** Proposed Development of this ES [TR020001/APP/5.01] employing a Rochdale (Design) Envelope approach as defined above.
- 5.4.15 The interface between construction of the Proposed Development with the continued operations at the Main Application Site (as defined in **Chapter 2** of this ES [TR020001/APP/5.01]) may have the potential to lead to compounded environmental impacts which differ between different aspect assessments at each of the assessment phases. Each aspect assessment defines within its methodology the reasonable worst-case assumptions which have been made as part of the assessments (**Chapters 6 to 20** of this ES [TR020001/APP/5.01]). These have been informed by the phasing description

provided below and further information provided in this section under the heading 'Baseline and future conditions'.

- 5.4.16 The demand forecast used for assessment purposes represents a reasonable approach, having regard to the probability of occurrence taking into account expected developments at other airports. A reasonable Core Planning Case forecast for each assessment year and scenario (as described in Methodology, Assessment years and scenarios in this section) has been defined and used in this assessment. It is recognised that passenger demand could increase at a rate higher or lower than predicted and Faster or Slower Growth Cases have also been set out. In any event, the forecasts used for assessment do not represent purely unconstrained forecasts and have been developed within known constraints at the Application Site (as defined in **Chapter 2** of this ES [TR020001/APP/5.01]) and the expected phasing of the Proposed Development. Further details of the assumption and limitations in developing these forecasts are provided in the **Need Case** [TR020001/APP/7.04]. The potential effects of faster and slower rates of growth have been considered as sensitivity tests as described later in this section and reported in each aspect assessment chapter of this ES.
- 5.4.17 There is a reasonable expectation that future airspace changes at the Application Site will include beneficial changes to aircraft climb profiles over neighbouring settlements and potential for respite routes. The assessment of current flightpaths is, therefore, likely to represent a reasonable worst-case scenario.
- 5.4.18 For most environmental aspects assessed and reported in this ES, the Core Planning Case assumes only those measures that are current legislative or policy requirements, known technology, or measures that can be secured by the DCO. However, a different Core Planning Case is needed for greenhouse gas emissions as compared to others such as air quality and noise.
- 5.4.19 The Government published its Jet Zero Strategy in July 2022 (Ref. 5.18) outlining the strategy to achieve net zero aviation by 2050, and the UK Transport Decarbonisation Plan in May 2022 describing actions needed to decarbonise the entire transport system in the UK (Ref. 5.19). These strategies, consider several measures, investment programmes and initiatives that are outside the control of the Applicant or scope of the application for development consent. For example, the nationally mandated introduction of Sustainable Aviation Fuels (SAF) into the aviation fuel supply, and the introduction of next generation aircraft which are currently not available but in development.
- 5.4.20 As these national and international measures to reduce and offset carbon emissions from the aviation sector and transport network are to be developed and implemented at a national level, and are committed targets through government policy and legislation to be developed, the Greenhouse Gas assessment reported in **Chapter 12** of this ES [TR020001/APP/5.01] considers these measures as implemented at the appropriate time in the programme for the Proposed Development in its Core Planning Case assessment. Such as, the Greenhouse Gas assessment using the Core Planning Case passenger forecasts but including the next generation aircraft assumptions in that Core

Planning Case rather than as the sensitivity test considered by other environmental aspects. This allows greenhouse gas emissions from the Proposed Development to be considered appropriately in the national context, against the national and sector carbon budgets and targets set to remain within a global target to minimise the effects of climate change.

- 5.4.21 These measures may also result in improvements in air quality and potentially noise, and offer further improvement during the period that the Proposed Development is being constructed and operated; however, as this quantification would be less certain, compared to greenhouse gas emissions, and these effects are assessed at a local, site specific, level they are not considered in the Core Planning Case. Therefore, these effects as reported in this ES are inherently a reasonable worst-case. Potential effects of assumed next generation aircraft are considered as a sensitivity test for all environmental aspects, other than greenhouse gases, as described later in this section and reported in each aspect assessment chapter of this ES where relevant.

Baseline and future conditions

Current baseline

- 5.4.22 The current environmental and physical conditions within the study areas ('the baseline') have been established so that a comparison of future changes as a result of the Proposed Development can be understood, and potentially significant effects can be identified, where relevant to the assessment methodology.
- 5.4.23 The baseline year has been established as 2019 and comprised a passenger throughput of approximately 18 mppa (Ref. 5.20). Further consideration of the actual baseline conditions in 2019 and a generated 2019 baseline in compliance with extant planning conditions regarding aircraft noise are limited to noise only and described in **Chapter 16** of this ES [TR020001/APP/5.01].
- 5.4.24 Site visits, walkover surveys, aspect and assessment method specific surveys, and desk-based baseline data collection have been undertaken to determine the baseline conditions. Relevant surveys have been undertaken between 2017 and 2022, details of specific visits and survey results are provided in individual assessment chapters of this ES and supporting appendices.
- 5.4.25 Due to the long timescales required to deliver the construction of the Proposed Development, the EIA has been carried out in relation to conditions that are likely to occur in future construction and operational years, defined further below.

Future baseline

- 5.4.26 As part of this assessment a 'without development' scenario has been explored to establish the environmental conditions in the event that the Proposed Development does not go ahead. This is typically referred to as a 'Do Minimum' and/or 'Future Baseline' for the Application Site without the Proposed Development.

- 5.4.27 In a ‘without development’ scenario, the airport’s future operations would be constrained by the limitations of its existing infrastructure/assets and those consented under an existing planning permission due for completion by 2026, and relevant planning conditions including a cap at 18 mppa.
- 5.4.28 On 1 December 2021, the local planning authority (Luton Borough Council) resolved to grant permission for LLAOL to grow the airport up to 19 mppa, from its previous permitted cap of 18 mppa. Since then, the application was called-in and referred to the Secretary of State for determination instead of being dealt with by the local planning authority. The inquiry to consider the called-in application opened on Tuesday 27 September 2022 running until Friday 18 November 2022. At the time of submission of the DCO application for development consent the outcome of the inquiry is still unknown. All assessment work to date, has been undertaken using a baseline of 18 mppa. However, in anticipation of LLAOL’s 19 mppa planning application, the environmental assessments include sensitivity analysis of the implications of the permitted cap increasing to 19 mppa, as described under the **Sensitivity Tests** section later in this chapter.
- 5.4.29 In predicting the most likely future scenario without the Proposed Development, against which the impact of the Proposed Development has been assessed, the following has been considered:
- a. the airport has a current permitted capacity of 18 mppa. For each assessment year, where applicable, predictions to estimate the future scenarios with the Proposed Development and without the Proposed Development (i.e. capped at 18 mppa in those future years) have been generated using the same assumptions for the expanded airport. For example, predicted fleet modernisations and changes to aircraft sizes (such as larger airplanes carrying more passengers on fewer flights) are broadly consistent across both predicted futures;
 - b. the present operators of the airport (LLAOL) have some flexibility in how they continue to deliver the final aspects of the existing planning permission to achieve 18 mppa. The final elements of Project Curium (as described in **Chapter 2** of this ES [TR020001/APP/5.01]), including the final airfield layout, have been adjusted in cognisance of the Proposed Development and are expected to be in place by 2026. Further information on the operational aspects of the existing airport that form the future baseline are provided in Section 8 of the **Need Case** [TR020001/APP/7.04];
 - c. Planning Inspectorate Advice Note Seventeen (Ref. 5.13) states “*Where other projects are expected to be completed before construction of the proposed NSIP and the effects of those projects are fully determined, effects arising from them should be considered as part of the baseline*” ... “*The ES should clearly distinguish between projects forming part of the dynamic baseline and those in the CEA [Cumulative Effects Assessment].*” A number of other developments have been identified, as outlined in **Table 5.2** that are under construction (Tier 1), have some environmental information available, and are located in the baseline

- study areas. Therefore, only these developments are assumed to be present in the future baseline rather than the cumulative assessment;
- d. there are a number of highway interventions proposed in the East Luton Project and National Highways future investment strategy, including for example the Smart Motorway Programme. These are assumed to be delivered, and present and operational in the future baseline, at the appropriate time in the traffic modelling and described in the **Transport Assessment [TR020001/APP/7.02]**. Therefore, these are inherently included in those assessments that employ traffic data. However, as design and environmental information is not available for those elements at this stage, and they will be delivered a considerable time in the future by others, not as part of this Proposed Development, they have been considered in the cumulative assessment for aspects other than those using traffic data, where appropriate; and
 - e. climate change is predicted to increase heatwaves, heavy rainfall events, dry spells and a decrease in frost days. These expected future conditions are described fully in **Chapter 9** Climate Change Resilience of this ES **[TR020001/APP/5.01]** under 'Future climate baseline'. Each environmental aspect assessment has provided an In-combination Climate Change Impacts assessment which considers this potential future change to baseline conditions and any change it may have to the conclusions of the assessment of effects, as described in **Section 5.6**.

Table 5.2: Developments forming part of the future baseline

Development Name	Description	Location	Application Reference and Status
Millbrook Power Station	DCO application for Gas fired peaking plant and connection infrastructure with a capacity of 299MW.	22km north west of Proposed Development	N/A (Application Permitted 13 March 2019). Unclear if construction has commenced (proposed to commence in 2020 for a period of 2 years). Current aim for commencement of operation in October 2024.
Napier Park and Stirling Place	A mixed use development for residential (625 units), office (30,150sqm), storage and distribution	Former Vauxhall Motors Site (Napier Park), Kimpton Road, Luton	13/00280/OUT (Application Permitted 16 April 2015) The residential units as part of this application are

Development Name	Description	Location	Application Reference and Status
	(16,500sqm), retail, hotel and casino uses, new landscaping, park and public realm, car parking, means of access, new access to Kimpton Road and other associated works.		being delivered by new applications: 16/01340/REM and 16/00900/FULEIA. The hotel is being delivered by: 18/00271/EIA. Under construction and expected to be completed prior to commencement of the Proposed Development in 2025.
Napier Park (smaller quantum)	A mixed use development – Residential, Retail, Office, storage and distribution, hotel and casino uses, new landscaping, park and public realm, car parking, means of access, new access to Kimpton Road and other associated works.	Former Vauxhall Motors Site (Napier Park), Kimpton Road, Luton	16/01340/REM (Permission granted 20 December 2016). Approval of Reserved Matters, including access, appearance, landscaping, layout and scale for 520 residential units on Plots 8, 9 and 10 of planning permission 13/00280/OUT dated 16 April 2015. Under construction and expected to be completed prior to commencement of the Proposed Development in 2025.
Napier Gateway	Erection of 685 flats comprised of 424 one bedroom and 261 two bedroom units, Retail and Leisure (Class A1-A5 / D2), Hotel comprising of 209 bedrooms, conferencing and	Former Vauxhall Motors Site (Napier Park), Kimpton Road, Luton	16/00900/FULEIA (Application Permitted 11 August 2017). Under construction and expected to be completed prior to commencement of the Proposed

Development Name	Description	Location	Application Reference and Status
	banqueting facilities (Class C1), Medical Wellbeing Centre (Class D1) together with landscaping, car parking, new access and associated works.		Development in 2025.
Luton Direct Air-Rail Transit (Luton DART)	Hybrid planning application for 2.2km Mass Passenger Transit system between Luton Parkway Station and Luton Airport	Luton Airport Parkway Station, Luton, Bedfordshire	17/00283/FUL (Application Permitted 30 June 2017). Constructed and expected to be operational in 2023.
London Luton Airport Spoil Reuse and Placement	London Luton Airport spoil reuse and placement. The movement and reuse of up to 331,400 cubic metres of spoil material and the permanent placement of spoil material on six sites within London Luton Airport.	London Luton Airport, Airport Way, Luton, Bedfordshire	17/02219/FUL (Application Permitted 02 March 2018). Partially implemented and ongoing. Due to complete prior to the commencement of the Proposed Development in 2025.
M1-A6 Northern Link Road	Construction of a new single and dual carriageway 2.75 miles (4.4km) road linking the M1 and the A6 between the M1 junction 11a and the A6 Barton Road. Comprising intermediate junctions, overbridges, underbridges, cycle paths, revisions to the Public Rights of Way network,	8.7km north west of Proposed Development	CB/18/02714/SCO / CB/19/00887/FULL (Full Application – Granted: 08 January 2020). Construction was due to commence in early 2022. Estimated completion of construction within 2 years, assumed complete by 2024.

Development Name	Description	Location	Application Reference and Status
	drainage and landscaping.		
Bartlett Square	Full planning application for the erection of a hotel, office building (7,830sqm) and an MSCP. Stated that construction is expected to take place over four phases, spanning a period of 6 years and 3 months from 2018 to the end of 2024.	500m north west of Proposed Development	18/00271/EIA Permission granted 16/01/20. Construction is expected to be complete by the end of 2024.
N/A	Erection of three storey building comprising of 11 two-bed flats and under-croft parking at ground floor level.	Crawley Green Road, 1km west of Main Application Site	19/01427/FUL (Application Permitted 03 August 2020). Under construction and expected to be completed prior to commencement of the Proposed Development in 2025.
Newlands Park	Hybrid planning application comprising of part full, covering the portion north of Newlands Road, and part outline (with all matters reserved), covering the portion south of Newlands Road, for new employment development with parking, landscaping, earthworks, access and utilities. It is expected that	2km south west of Proposed Development	22/00929/HYBEIA Associated with Newlands Park North (20/01588/OUTEIA) and South (20/01589/OUTEIA) applications. It is expected that construction will commence in late 2022/early 2023 and be completed by the end of approximately 2024.

Development Name	Description	Location	Application Reference and Status
	construction will commence in late 2022/early 2023 and be completed by the end of approximately 2024. Therefore, this development is part of the future baseline.		
N/A	Erection of a two bed attached dwellinghouse and alterations to existing dwelling. Resubmission. Insufficient information, assumed to commence within three year expiration date on Permission Notice. Expiry: January 2024.	230m south of Work No. 6e(j) on Lalleford road	20/01516/FUL. Assumed to commence within three-year expiration date on Permission Notice (January 2024). Likely complete prior to commencement of Proposed Development in 2025.
N/A	Erection of 1 x 3 bed dwelling following demolition of existing dwelling and outbuildings (as amended by drawings received 5th March 2018).	150m of Off-site Highways interventions in Hitchin	17/02423/1. Under construction and expected to be completed prior to commencement of the Proposed Development in 2025.
Morton House	Erection of second floor infill extension including associated works and change of use of Lower Ground Floor from General Industrial (Class B2) to Non-Residential Institutions (Class D1) with ancillary use for Cafe - Non Material	500m west	21/0190/AMEND. Permitted 02 November 2021. Assumed to commence within three-year expiration date on Permission Notice (November 2024). Likely complete prior to commencement of Proposed

Development Name	Description	Location	Application Reference and Status
	Amendment of Planning Permission No. 19/00969/FUL dated 16th September 2019 - (to add twenty small windows to southern elevation of upper floor).		Development in 2025.

5.4.30 Further descriptions of future baseline and ‘do nothing’ scenarios appropriate to individual aspect assessments have been assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge and are reported within **Chapters 6 to 20** of this ES [TR020001/APP/5.01].

Assessment years and scenarios

5.4.31 As described in **Chapter 4** of this ES [TR020001/APP/5.01], the construction of the Proposed Development is intended to be delivered in increments to deliver capacity in line with forecast demand. For the purposes of assessment, three assessment phases are identified and described in **Table 5.3**.

Table 5.3: Proposed Development assessment Phases

Assessment Phase	Passenger capacity	Construction start year	Construction completion year	Year predicted passenger capacity reached
Assessment Phase 1	21.5 mppa	2025	2027	2027
Assessment Phase 2a	27 mppa	2033	2036	2039
Assessment Phase 2b	32 mppa	2037	2041	2043

5.4.32 The Proposed Development will be implemented incrementally over approximately 18 years, therefore, several assessment years have been defined and considered in this ES. These have been defined by and are consistent with the aviation forecasts, surface access modelling and assessment, and predicted construction activity. The assessment scenarios are:

- a. 2019: Baseline conditions – this assessment scenario represents the information available and prevailing environmental conditions when the airport was last operating at around full permitted capacity;

- b. 2027: Assessment Phase 1 – 21.5 mppa: this assessment scenario represents the airport when forecast passenger demand reaches the design capacity of the assessment Phase 1 works for Terminal 1. Assessment Phase 1 works are expected to be constructed from 2025 to 2027;
- c. the year of predicted maximum environmental effect during construction – this assessment scenario is likely to be the year during which the highest number of construction vehicles, workers and activity is taking place on-site, but may be different for technical disciplines which will be defined by topic specific methodologies;
- d. 2039: Assessment Phase 2a – 27 mppa: this assessment scenario represents the year when forecast passenger demand reaches the design capacity of the assessment Phase 2a works, following the opening of Terminal 2 with a design capacity of 7 mppa. Assessment Phase 2a works are expected to be constructed from 2032 to 2037; and
- e. 2043: Assessment Phase 2b – 32 mppa: this assessment scenario represents the year of maximum aircraft movements, passengers and road vehicles i.e. when the final proposed maximum capacity of the Proposed Development is expected to be reached. Assessment Phase 2b works are expected to be constructed from 2037 to 2041.

5.4.33 Any additional years specific to particular assessments are outlined in the methodology sections of the relevant chapters (**Chapters 6 to 20** of this ES [TR020001/APP/5.01]).

5.4.34 Developments which are being delivered concurrently are addressed within **Chapter 21** In-combination and cumulative effects of this ES [TR020001/APP/5.01].

Sensitivity Tests

5.4.35 The principal assessment (above) has been based on a core set of assumptions (defined as the 'Core Planning Case' in **Paragraph 5.4.13**) regarding airport capacity and forecast passenger demand that are considered reasonable projections. There are certain known uncertainties or risks that may occur that could influence the conclusions of the core assessment.

5.4.36 To understand the likely environmental effects of these occurring and ensure that they have been considered appropriately in the assessment on which consent is to be granted, sensitivity tests have been undertaken and are reported in this ES.

5.4.37 Each aspect assessment has considered the situation described in each of the sensitivity tests (below) in the most appropriate way for that assessment approach and methodology, as described in that Chapter of this ES [TR020001/APP/5.01]. Typically, an assessment of the likely changes to the conclusions on significance of effects, should these uncertainties or risks be realised, is provided within each chapter after the Core Planning Case assessment. These sensitivity tests have been undertaken qualitatively or quantitatively depending on information available and the individual assessment

methodology. For example, forecast aircraft movements and surface access traffic data was available for both Faster and Slower Growth Cases and, therefore, noise and air quality effects have been quantified for these cases. Where aspects are more dependent on spatial impacts or professional judgment, qualitative assessment have been reported.

5.4.38 The sensitivity tests considered in this ES are described in **Table 5.4**.

Table 5.4: Sensitivity Tests

Scenario	Title	Description
1	19 mppa Application	There is a possibility that the current operator's (LLAOL) planning application to increase the capacity of the airport to 19 mppa is granted by the SoS, and that permission is granted prior to submission or during the determination of the application for development consent for the Proposed Development. This would have the effect of lifting the baseline capacity assumed in this assessment from 18 to 19 mppa and has been considered qualitatively across all aspects where adverse effects would be reduced relative to the Core Planning Case assessment, and where benefits would be reduced, that is, for Economics and Employment.
2	Faster growth	<p>Passenger demand rises more quickly than forecast in the Core Planning Case and higher passenger throughput occurs earlier than predicted. The higher rate of forecast passenger demand reported in the Need Case [TR020001/APP/7.04] is realised. Aircraft movements and surface access traffic data has been generated for this case and quantitative assessment has been undertaken for those aspects where passenger demand at a given time is relevant. The forecast aircraft movements data for this assessment also considers a slower transition of aircraft fleet to new generation aircraft (existing technology is known and available models of aircraft that will replace existing fleet over time).</p> <p>The assessments consider the same assessment capacity scenarios of 21.5, 27 and 32 mppa, with these capacities being reached in earlier years. In addition, where technical assessments are influenced by the rate of passenger increase and the rate of improvement being implemented, noise for example, this sensitivity test includes consideration of 23 mppa being reached by 2027 in assessment Phase 1 to ensure a reasonable worst case is considered across the assessment phases.</p>
3	Slower growth	The lower rate of forecast passenger growth reported in the Need Case [TR020001/APP/7.04] is realised, and a given passenger throughput is achieved later than forecast in the Core Planning Case. Aircraft movements and surface

Scenario	Title	Description
		<p>access traffic data has been generated for this case and quantitative assessment has been undertaken for those aspects where passenger demand at a given time is relevant. The assessments considered the same assessment capacity scenarios of 21.5, 27 and 32 mppa, with these capacities being reached in later years.</p>
4	Next generation aircraft	<p>An alternative long term fleet mix has been prepared which takes into account the next generation of aircraft (technology which is not fully developed or commercially available at scale but is likely to become available and start to enter the fleet within the Proposed Development timeframe, rather than existing new generation, such as the Max and Neo), which would have better environmental performance. The information considered assumed 3 types of next generation aircraft:</p> <ul style="list-style-type: none"> a. powered completely by Sustainable Aviation Fuels (SAFs), these are not assumed to be zero emissions and are based on further refinement of existing types of engine (albeit newer and more efficient/quieter); b. powered by Hydrogen which will be zero emissions in flight. These are assumed to have a similar noise profile to the SAF powered aircraft (though some literature suggests this could be higher); and c. powered by electric motor which will be zero emissions in flight. <p>Fleet mix for this test includes an element of 'Next Generation' aircraft for 2039 and 2043, and is only considered quantitatively for those aspects it affects i.e. noise, air quality and carbon emissions, to illustrate potential improvement but not mitigation secured by the DCO.</p> <p>Next generation aircraft are forecast to enter into service during the 2030s and have been assumed to comprise:</p> <ul style="list-style-type: none"> a. 2027 - 0% b. 2039 - 12% Next Generation (12% conventional, 0% zero emissions) c. 2043 = 52% Next Generation (37.5% conventional, 14.5% Zero Emissions) d. 2050 = 88% Next Generation (60.5% Conventional, 27% Zero Emissions). <p>These assumptions are consistent with the Government's Jet Zero Strategy (Ref. 5.18) and are considered as a</p>

Scenario	Title	Description
		<p>sensitivity test, as described above, in all environmental aspects other than greenhouse gases. Chapter 12 Greenhouse Gases of this ES [TR020001/APP/5.01] considers this assumed fleet mix within the single Core Planning Case assessed, as described in Paragraphs 5.4.18 and 5.4.20 above.</p>
5	<p>J10 without National Highways Smart Motorway upgrade (hard shoulder running scheme)</p>	<p>The Core Planning Case assumes the M1 south of Junction 10 will be upgraded to Smart Motorway, or other method, to provide all lane running and address current and predicted congestion on this stretch of the M1 in the future baseline without the Proposed Development, as agreed with National Highways. This sensitivity test assumes that all lane running is not delivered and the M1 continues to operate as is. Surface access traffic modelling has been undertaken and a quantitative assessment has been undertaken for those environmental aspects that employ traffic data where relevant.</p>
6	<p>Changes to airspace</p>	<p>The assessment reported in this ES is based on current flight paths as airspace change is being developed across the south east, not part of the Proposed Development, and will be subject to other planning, assessment and approval processes.</p> <p>A sensitivity test of potential changes to airspace has been undertaken. Changes have been made to arrival routes to the airport, through an airspace change known as AD6 were completed on 8 March 2022 and do not affect noise contour areas; however, there may be changes to departure paths in the future that may affect the shape of noise contours.</p> <p>As the airspace design is in the initial option appraisal stage, only a series of options for airspace change have been submitted to date (Ref. 5.21), this sensitivity test looks to identify how effects (including noise contour areas) may be affected if options that may change the environmental effects reported in this ES are brought forward. As noise is the primary reason for this sensitivity test, it is based on an airspace design option that provides the biggest change to the existing flight paths through provision of respite departure routes, known as Westerly Departures Option 6 as shown in Inset 5.1 Inset 5.1.</p> <p>As the airspace change process is still ongoing and will provide an assessment of potential impact as part of the consultation process, a detailed analysis of effects has not been undertaken. The sensitivity test aims to demonstrate that airspace changes can be accommodated within the assessed effects reported in this ES, and particularly the Noise Envelope. Consequently, the assessment only seeks</p>

Scenario	Title	Description
		to show how effects (including noise contour areas) may change as a result of potential changes to departure paths.

Inset 5.1: Potential airspace change considered as a sensitivity test (Image from Ref. 22)



Defining significance

- 5.4.39 The terms 'impact' and 'effect' in EIA are different. The EIA Regulations state that an assessment of project environmental impacts is required; however, the impacts of the Proposed Development may or may not result in significant effects on the environment. It is an assessment of effects that is required by Schedule 4 of the EIA Regulations.
- 5.4.40 To provide consistency across all topics within the EIA, and for ease of comparison, the methodology described in this section will be applied where appropriate. Where topic-specific alternatives exist (following industry-wide guidance or best practice) these have been presented within the relevant aspect assessment chapters of this ES.
- 5.4.41 For all aspects, effects are considered in terms of:
- a. construction – effects associated with both the temporary activities involved in building the Proposed Development e.g. demolition and the subsequent permanent presence of the Proposed Development once constructed;
 - b. operation – effects associated with the operation of the Proposed Development following completion of construction; and
 - c. cumulative – arising during either construction or operation, when the effects of the Proposed Development are considered with 'other developments' proposed within the study areas and the same timeframe.
- 5.4.42 In some circumstances in-combination effects are considered, where the Proposed Development may have more than one impact on a given receptor and these interact to give an in-combination effect. Where relevant to the proposed methodology this is described with the aspect assessment chapter e.g. Health and Community, or is further considered and described in **Chapter 21** In-combination and cumulative effects of this ES [TR020001/APP/5.01].

Impacts

- 5.4.43 The following factors have been taken into account when identifying potential impacts, in accordance with the EIA Regulations (Ref. 5.23):
- a. the magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected);
 - b. the nature of the impact (i.e. what the impact is and whether it is adverse, beneficial or neutral);
 - c. the transboundary nature of the impact;
 - d. the intensity and complexity of the impact;
 - e. the probability of the impact;
 - f. the expected onset, duration, frequency and reversibility of the impact;
 - g. the cumulation of the impact with the impact of other existing and/or approved development; and

h. the possibility of effectively avoiding or reducing the impact.

5.4.44 The main construction works for the Proposed Development are expected to take place between 2025 and 2041, although the duration, intensity and scale of construction will vary over this period. This ES has considered the construction phasing described in **Section 5.4**, Assessment years and scenarios. Further information and detail regarding construction phasing, sequencing and activities considered in this ES are provided in **Chapter 4 [TR020001/APP/5.01]**, and **Appendix 4.1** Construction Method Statement and Programme Report **[TR020001/APP/5.02]**.

5.4.45 Impacts may be direct or indirect; secondary; cumulative; adverse or beneficial; permanent or temporary; and short-, medium- or long-term. These terms are used to describe the nature of impacts, to provide the context within which the significance of effects can be understood. The criteria used to differentiate between temporary (between short-, medium- and long-term impacts) and permanent, vary between topics and are explained, where relevant, in **Chapters 6 to 20** of this ES **[TR020001/APP/5.01]**. For consistency, permanent is considered to mean there is no intention for the impact to be reversed or occurring for a period longer than 25 years.

Effects

5.4.46 Resulting effects are described as **significant** or **not significant** however the EIA Regulations do not define significance. The Institute of Environmental Management and Assessment propose that assessments of significance should take into consideration the sensitivity and value of a receptor, and the magnitude of impacts upon these receptors (Ref. 5.24).

5.4.47 The guidelines and generalised descriptions which follow are based on most recent experience of environmental assessments for NSIPs undertaken by the accredited professionals in the EIA team.

Receptor value/sensitivity

5.4.48 **Table 5.5** provides a general guide for the classification of value and sensitivity.

Table 5.5: General guide for the assessment of receptor value and sensitivity

Value/sensitivity	Guidelines
High	Value: Feature/receptor possesses key characteristics which contribute significantly to the distinctiveness, rarity and character of the site/receptor. For example, national or international designation. Sensitivity: Feature/receptor has a very low tolerance or capacity to accommodate the proposed changes.
Medium	Value: Feature/receptor possesses key characteristics which contribute significantly to the distinctiveness and character of the site/receptor. For example, national or regional designation. Sensitivity: Feature/receptor has a low tolerance or capacity to accommodate the proposed changes.

Value/sensitivity	Guidelines
Low	Value: Feature/receptor not designated or only designated at a district or local level. Feature/receptor only possesses characteristics which are locally significant. Sensitivity: Feature/receptor has some tolerance or capacity to accommodate the proposed changes.
Very low	Value: Feature/receptor not designated. Feature/receptor characteristics do not make a significant contribution to local character or distinctiveness. Sensitivity: Feature/receptor is tolerant or has a capacity to accommodate the proposed changes.

5.4.49 The baseline studies for each aspect assessment have enabled the identification of receptors that may be affected by the Proposed Development. Professional judgement of assessment leads (qualifications provided in each of the aspect **Chapter 6 to 20** of this ES [TR020001/APP/5.01]) and guidelines defined above have been applied as appropriate to define receptor sensitivity/value for each topic assessment.

Magnitude of change

5.4.50 Magnitude of change is defined by the extent of change from the identified baseline conditions, irrespective of the value/sensitivity of a receptors.

5.4.51 **Table 5.6** provides a general guide for the classification of magnitude of impact.

Table 5.6: General guide for the assessment of magnitude

Magnitude	Guidelines
High	Large-scale changes to key characteristics or features of the particular environmental aspect’s character or distinctiveness. Within the site and beyond.
Medium	Medium-scale changes to key characteristics or features of the particular environmental aspect’s character or distinctiveness. Within the site and potentially beyond.
Low	Noticeable but small-scale changes to key characteristics or features of the particular environmental aspect’s character or distinctiveness.
Very low	Noticeable, but very small-scale change, or barely discernible changes to key characteristics or features of the particular environmental aspect’s character or distinctiveness.

Significance

5.4.52 A generic matrix used for the classification of effects is provided in **Table 5.7**. As with the descriptions of value/sensitivity and magnitude, where topic-specific alternatives exist, these are presented in the relevant topic chapters of this ES.

Table 5.7: Generic effects matrix

Magnitude	Value and sensitivity of receptor			
	High	Medium	Low	Very low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Minor
Low	Moderate	Minor	Minor	Negligible
Very low	Minor	Minor	Negligible	Negligible

5.4.53 A generic description of effects is provided in **Table 5.8**.

Table 5.8: Generic description of effects

Effect level	Description
Major	A large or very large change to the environmental or socio-economic conditions. These are likely to include effects, positive or negative, associated with regional or national, or international issues, objectives or legislation and are crucial to the decision-making process.
Moderate	A medium change to the environmental or socio-economic conditions. These are likely to include effects, positive or negative, associated with local or regional issues, objectives or legislation and are likely to be of importance to the decision-making process.
Minor	A small change to the environmental or socio-economic conditions. These are likely to include effects, positive or negative, associated with local issues and are unlikely to be of importance to the decision-making process.
Negligible	No discernible change to the environmental or socio-economic conditions. An effect likely to have a neutral or negligible influence.

5.4.54 **Major** and **moderate** effects are considered to be **significant**, whilst minor and **negligible** effects are considered to be **not significant**. However, the professional judgement of technical experts may also be applied where necessary.

Mitigation

5.4.55 This ES includes a description of the measures envisaged to prevent or reduce any significant adverse effects. If necessary, monitoring may also have been prescribed.

5.4.56 In line with IEMA Guidance (Ref. 5.25) and professional best practice, consideration will be given to three key types of mitigation:

- a. Primary Mitigation (also known as Embedded or Inherent mitigation);
- b. Secondary Mitigation (also known as Additional or Foreseeable mitigation); and

- c. Tertiary Mitigation (also known as Good Practice or Inexorable mitigation).

5.4.57 All mitigation described in this ES and relied on in undertaking the assessment of significant of effects and conclusions of the EIA are described in the individual assessment chapters and then have been summarised and collated with the mechanism by which they would be secured in the **Mitigation Route Map [TR020001/APP/5.09]**.

Primary mitigation ('Embedded')

5.4.58 Defined as “an intrinsic part of the project design”, this mitigation is a result of design evolution. Embedded mitigation describes efforts undertaken to prevent or reduce potential significant adverse effects by iteratively altering design throughout the evolution of the Proposed Development. This is mitigation that will inherently be delivered and is therefore considered to form part of the Proposed Development and will be taken into account in the initial assessment of effects of the EIA. For example, the replacement public open space or appropriate drainage design.

Secondary mitigation ('Additional')

5.4.59 Individual topic assessments develop additional mitigation that is to be implemented to reduce identified significant adverse effects as part of the EIA process. These measures would be secured through the DCO application by various mechanisms. Mechanisms to secure this mitigation e.g. the CoCP or appropriate management plan are described in each aspect chapter (**Chapters 6 to 20** of this ES [TR020001/APP/5.01]).

Tertiary mitigation ('Good practice')

5.4.60 Defined as “required regardless of any EIA assessment”, this is mitigation which will be in place as a result of standard good practice and due to legislative requirements. For example, this would include practices to manage contractor activities and minimise nuisance effects contained within the CoCP that the contractor will be obliged to implement, and also license requirements for activities subject to legislation. This good practice mitigation will be delivered and therefore is considered to form part of the Proposed Development and will be taken into account in the assessment of effects in the EIA.

Code of Construction Practice

5.4.61 A CoCP has been prepared as part of this ES and is provided as **Appendix 4.2** of this ES [TR020001/APP/5.02].

5.4.62 Good practice measures have been included in the CoCP which will be secured by a Requirement in the draft DCO. The assessment has taken account of these as inherent and inexorable. If significant adverse construction effects are identified and further mitigation is required, additional foreseeable mitigation has been considered, developed and included in the CoCP as the mechanism for securing their delivery.

5.5 In-combination and Cumulative effects

5.5.1 As part of the EIA process, cumulative effects of the Proposed Development should be considered. This is required within Regulation 5(2)(e) of the EIA Regulations which requires the consideration of ‘interactions’:

“the interaction between the factors [population and human health; biodiversity; land, soil, water, air and climate; material assets, cultural heritage and landscape.”

5.5.2 Schedule 4 of the EIA Regulations describes cumulative effects as:

“the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources” (Ref. 5.26).

5.5.3 These effects are typically distinguished into two types:

- a. In-combination effects are inter-relationships within the Proposed Development; and
- b. Cumulative effects of the Proposed Development with ‘other developments’.

In-combination effects

5.5.4 In-combination effects occur when separate impacts associated with the Proposed Development act on the same receptor, with the potential to lead to a significant effect. These effects may be additive, for example where noise impacts from construction activities such as piling and noise impacts from increased traffic may act upon one receptor.

Cumulative Effects Assessment

5.5.5 Cumulative effects consider the impacts of other ‘reasonably foreseeable’ developments within the vicinity and context of the Proposed Development.

5.5.6 In-combination effects and Cumulative effects have been considered and reported in a standalone chapter of the ES and is consistent with the Planning Inspectorate’s Advice Note Nine (Ref. 5.27) and Advice Note Seventeen (Ref. 5.28). **Chapter 21** In-Combination and Cumulative Effects of this ES [TR020001/APP/5.01] provides a description of the approach applied to the In-combination Effects and Cumulative Effects Assessments including identification of ‘other developments’ and allocations relevant to the assessment.

5.6 In-combination climate change assessment

5.6.1 The In-combination Climate Change Impact (ICCI) assessment considers the extent to which climate change exacerbates effects on aspect receptors which have already been identified in the other assessment chapters. Further details of the approach to this assessment are provided in **Chapter 9** Climate Change

Resilience, and the results are reported within topic **Chapters 6 to 20** of this ES **[TR020001/APP/5.01]** as well as **Chapter 9**.

5.7 Transboundary effects

- 5.7.1 The United Nations Economic Commission for Europe's (UNECE) 'Espoo Convention' (Ref. 5.29), was adopted in 1991 to encourage and improve the cooperation between European Economic Area (EEA) States in assessing the transboundary environmental impacts of their developments. The Espoo Convention is implemented through the EIA Directive, and Regulation 32 of the EIA Regulations, and transposed into UK legislation post the UK's withdrawal from the EU by the European Union Withdrawal Act (Ref. 5.30). They require the Planning Inspectorate to consider the potential for transboundary impacts from a Proposed Development and consult with relevant European Member States.
- 5.7.2 The Planning Inspectorate's Advice Note Twelve (Ref. 5.31) outlines requirements for applicants for a NSIP undertaking an EIA to screen for likely significant effects on the environment of other EEA States, after which the Planning Inspectorate may identify potentially affected EEA States to notify and consult with (meeting obligations under Regulation 10 of the EIA Regulations).
- 5.7.3 The Applicant does not have a formal role in this process, however, it is advised that consultation is undertaken with appropriate parties to identify potential issues or concerns, and that sufficient information is provided by the applicant to allow the Planning Inspectorate to make a decision on whether or not the Proposed Development may lead to transboundary effects.
- 5.7.4 In accordance with Advice Note Twelve, potential transboundary effects arising from the Proposed Development were considered in the EIA Scoping Report through the completion of a transboundary screening matrix (Appendix B of the EIA Scoping Report, **Appendix 1.1** of this ES **[TR020001/APP/5.05]**).
- 5.7.5 The Planning Inspectorate expressed in the Scoping Opinion broad agreement with this approach, with a request for additional evidence with regards to potential transboundary effects associated with Greenhouse gases and Biodiversity, which was provided.
- 5.7.6 On 24 July 2019, the Planning Inspectorate published its Regulation 32 Transboundary Screening, stating the Proposed Development is not likely to have significant effect on the environment in another EEA State. This Screening note is provided as **Appendix 5.1** of this ES **[TR020001/APP/5.02]**. The information provided in this ES will allow the Planning Inspectorate to confirm its decision that Proposed Development would not lead to transboundary effects and advise the SoS appropriately.

5.8 Stakeholder engagement and consultation

- 5.8.1 The process of consultation and stakeholder engagement is important to undertaking a comprehensive and balanced EIA. The views of interested parties serve to focus the environmental studies and to identify specific issues that require further investigation.

- 5.8.2 This section describes a summary of the consultation undertaken to help understand the potential environmental effects likely to arise from the Proposed Development so far.

Direct engagement with prescribed consultees

- 5.8.3 A summary of meetings held with environmental stakeholders which have informed the preparation of this ES is provided within individual aspect chapters of this ES. Key considerations and additional direct engagement undertaken by topic specialists to address queries raised within the Scoping Opinion and the 2019 and 2022 Statutory Consultation exercises and discussed at these meetings are summarised within each aspect **Chapters 6 to 20** of this ES [TR020001/APP/5.01].

Non-statutory consultation

- 5.8.4 A programme of non-statutory consultation was completed between June and August 2018, which included 19 public exhibition events. Feedback received from both the general public, statutory bodies and other relevant stakeholders were considered to inform the EIA Scoping Report and the 2019 PEIR.
- 5.8.5 Further information on the outcome of non-statutory consultation and how feedback received has been considered by the project team is provided within the Non-statutory Consultation Report published by the Applicant.

Statutory consultation

2019

- 5.8.6 A programme of statutory consultation was undertaken between 16 October 2019 and 16 December 2019. This consultation included 35 public exhibition events. The 2019 PEIR was published as part of this statutory consultation, in accordance with Section 42 of the Act.
- 5.8.7 Responses were received from local authorities, organisations and public representatives. A list of statutory consultees who provided comments predominantly regarding issues related to the EIA is provided in the **2019 Statutory Consultation Feedback Report** which was made available on the Applicant's consultation website [REDACTED], alongside key issues raised and how/where these have been addressed.

2022

- 5.8.8 A further programme of statutory consultation was undertaken between 8 February 2022 and 4 April 2022. This consultation included 13 public exhibition events. The 2022 PEIR was published as part of this statutory consultation, in accordance with Section 42 of the Act.
- 5.8.9 Responses were received from local authorities, organisations and public representatives. A list of statutory consultees who provided comments predominantly regarding issues related to the EIA is provided in the **Consultation Report [TR020001/APP/6.01]**, alongside key issues raised and how/where these have been addressed. Where relevant, a brief summary of

issues raised in feedback, discussed through engagement, and how they have been addressed is provided in **Section 4** of each aspect assessment reported in **Chapters 6 to 21** in this ES [TR020001/APP/5.01].

5.9 Other supporting studies and documents

5.9.1 This ES is supported by several technical assessments undertaken in line with specific policy or legislation. These provide additional information to inform the design and assessment. An outline of these assessments is provided below for information.

Habitats Regulations Assessment

5.9.2 The European Habitats Directive (Ref. 5.32) is currently transposed into UK legislation by the Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations). These regulations set out procedures for dealing with the effects of development on the national site network, which comprises Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). As a matter of policy, the Government applies the same procedures to possible SPAs, possible SACs, Ramsar sites and proposed Ramsar sites.

5.9.3 Under Regulation 63 of the Habitats Regulations, an appropriate assessment is required where a plan or project (in this case an NSIP application) is likely to have a significant effect upon a European site, either individually or in combination with other projects. This information takes the form of a Report.

5.9.4 Further to this, Regulations 64 and 68 provides that where an appropriate assessment has been carried out and results in a negative assessment (that is, the development will adversely affect the integrity of the site(s) despite any proposed avoidance or mitigation measures or if uncertainty remains), consent can only be granted if there are no alternative solutions, there are Imperative Reasons of Overriding Public Interest (IROPI) for the development, and compensatory measures have been secured.

5.9.5 Paragraph 4.19 of the Airport National Planning Statement (ANPS) clarifies the role of the SoS in undertaking an Appropriate Assessment as the competent authority:

“Prior to granting development consent, the Secretary of State as competent authority must comply with the duties under the Conservation of Habitats and Species Regulations 2017. Under these regulations, if the competent authority considers that the proposed development is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects), and is not connected with or necessary to the management of that site, it must make an Appropriate Assessment of the implications for the site in view of the site’s conservation objectives.”

5.9.6 A HRA screening assessment was undertaken as part of the scoping exercise and has been updated as part of this ES, the findings of which are reported in a HRA No Significant Effects Report (NSER) provided as **Appendix 8.3** of this ES [TR020001/APP/5.08]. This concluded that there are no likely significant effects

on European Sites as a result of the Proposed Development and therefore, an appropriate assessment is not required under the Habitats Regulations.

Water Framework Directive

- 5.9.7 The Water Framework Directive (WFD) (2000) was enacted into domestic law by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003. It provides a structure for the protection and enhancement of surface fresh water, estuaries, coastal waters and groundwater.
- 5.9.8 The WFD Regulations aim to enhance the current status of all waterbodies (with a target to achieve Good Ecological Status) and prevent deterioration of waterbodies from their current status due to pollution. The requirements of the WFD Regulations have been taken into account when planning all activities that may impact the water environment.
- 5.9.9 **Chapter 20** Water Resources [TR020001/APP/5.01] details all surface water and groundwater receptors located within the study area of the Proposed Development. This includes a description of existing water quality, water quantity and WFD Status.
- 5.9.10 A WFD Compliance Assessment has been completed, in line with the methodology outlined in the EIA Scoping Report [TR020001/APP/5.05] and is provided as **Appendix 20.2** [TR020001/APP/5.02]. This concluded that the Proposed Development can be delivered in compliance with the WFD.

Flood Risk Assessment

- 5.9.11 A Flood Risk Assessment (FRA) has been undertaken in accordance with the National Planning Policy Framework (NPPF) (Ref. 5.33). This FRA is provided as **Appendix 20.1** to this ES [TR020001/APP/5.07] and has considered flood risk both to and from the Proposed Development. It demonstrates how this risk is intended to be managed in the future, including with the influence of climate change.
- 5.9.12 Sources of flood risk range from groundwater and surface water during high rainfall events, fluvial or man-made water bodies, and sewers. The EIA Scoping Opinion has confirmed *“The Inspectorate is content that the assessment of impacts associated with flooding from rivers and groundwater can be scoped out of the ES as significant effects are unlikely to occur”* (**Appendix 1.3** [TR020001/APP/5.05], ID 4.7.1). The relevant matters were considered as part of the FRA in accordance with the NPPF. **Chapter 20** Water Resources and Flood Risk of this ES [TR020001/APP/5.01] summarises the likely effects on flood risk, and the status of discussions with the Lead Local Flood Authority.

Lighting assessment

- 5.9.13 The Clean Neighbourhoods and Environment Act 2005 made artificial light pollution a statutory nuisance under the Environmental Protection Act 1990, while the NPPF requires new development to be appropriate to its location by accounting for pollution’s effect on health, the natural environment and general amenity, and the sensitivity of the surrounding area.

- 5.9.14 As part of this ES, a Light Obtrusion Assessment has been undertaken identifying potential impacts due to external artificial lighting for the Proposed Development. It describes any necessary light pollution mitigation measures and the lighting strategy to be adopted to prevent nuisance to local communities or disruption to local sensitive wildlife. This document is provided as **Appendix 5.2** of this ES [TR020001/APP/5.02] and has been used to inform the Biodiversity, Landscape and Visual, Cultural Heritage, Health and Community assessments.

Transport Assessment

- 5.9.15 The environmental effects of traffic and transport are addressed in relevant parts of this ES such as **Chapter 16** Noise and Vibration and **Chapter 7** Air Quality and **Chapter 18** Traffic and Transport [TR020001/APP/5.01].
- 5.9.16 **The Transport Assessment [TR020001/APP/7.02]** has also been prepared and submitted as part of the application for development consent. This includes the assessment of the surface traffic (road and rail) impacts of the Proposed Development during construction and operational traffic in and around Luton. The assessment considers the local, regional and national policy context, and details modelled surface traffic movements based on the latest guidance. This reports the assessment of the road and wider network capacity, the functionality of junctions, and potential impacts on journey times amongst other things.

Equalities Impact Assessment

- 5.9.17 An **Equality Impact Assessment (EqIA)** has been undertaken in accordance with the ANPS. This is provided as separate document as part of the application for development consent [TR020001/APP/7.12].
- 5.9.18 The EqIA process is designed to ensure that projects, policies and practices do not discriminate or disadvantage people, and to promote equality where possible. An EqIA considers the impact of a proposal on relevant groups who share characteristics which are protected under the Equality Act 2010. Decisions must be assessed based on their likely effects on people in respect of disability, gender, race, age, sexual orientation, gender reassignment and religion or belief; these are the ‘protected characteristics’ as set out in the Equality Act 2010.
- 5.9.19 The ANPS provides further matters for consideration for the EqIA and states at paragraph 4.27:

“For any application to be considered compliant with the Airports NPS, it must be accompanied by a project level Equality Impact Assessment examining the potential impact of that project on groups of people with protected characteristics. In order to benefit from the support of the Airports NPS, the results of that project level Equality Impact Assessment must be within the legal limits and parameters of acceptability outlined in the Appraisal of Sustainability that informs the Airports NPS.”

Sustainability Statement

- 5.9.20 The Applicant has explored ways to maximise sustainable opportunities during the design, procurement, construction and the operation of the airport into the future. A **Sustainability Statement [TR020001/APP/7.07]** has been prepared and published as part of the application for development consent.
- 5.9.21 The Sustainability Statement examines opportunities for the Proposed Development to progress the agenda of sustainable development in response to local, regional and national drivers whilst also reflecting the priorities of Luton Rising (a trading name for London Luton Airport Limited) as described in their Sustainability Strategy. A broad spectrum of issues are considered, with the Proposed Development being appraised for the degree of impact and the potential to influence.

Green Controlled Growth

- 5.9.22 Green Controlled Growth (GCG) is a binding framework of environmental limits with independent oversight, permanently linking airport growth to sustainable performance. The GCG approach provides assurance for ongoing operational impacts for noise, greenhouse gas emissions, air quality and surface access. A **Green Controlled Growth Framework** document **[TR020001/APP/7.08]** and **Explanatory Note [TR020001/APP/7.07]** have been published as part of the application for development consent.

Tranquillity

- 5.9.23 There is no universally accepted standard methodology for assessing tranquillity. However, a bespoke methodology has been developed by the relevant competent experts undertaking assessments for noise, cultural heritage, and landscape and visual impacts, in consultation with stakeholders. The approach to assessing tranquillity distinguishes between 'tranquillity' and 'relative tranquillity' and is further described in **Section 16.5 of Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]**.
- 5.9.24 Consideration of tranquillity is reported in the relevant aspect assessment chapters of this ES, namely **Chapter 10** Cultural Heritage, **Chapter 16** Noise and Vibration, and **Chapter 14** Landscape and Visual, including consideration of effects on the Chilterns Area of Outstanding Natural Beauty (AONB) **[TR020001/APP/5.01]** where aircraft fly over part of this area up to 7,000ft, in line with the CAP1616 process.

5.10 Monitoring

- 5.10.1 Where relevant, monitoring measures have been identified during each aspect assessment where required to ensure the ongoing efficacy of measures to mitigate significant effects as a result of the Proposed Development. These measures have been outlined in each individual aspect chapter of this ES (**Chapters 6 to 20 [TR020001/APP/5.01]**) and the **Mitigation Route Map [TR020001/APP/5.09]**.

5.11 Air space change

- 5.11.1 As described in **Section 4.14 of Chapter 4** of this ES **[TR020001/APP/5.01]**, air space is being modernised across the south east of England as a separate process outside of this Proposed Development. The assessment presented within this ES assumes that existing flight paths remain. As described in **Table 5.4** the airspace design is in the initial option appraisal stage, and only a series of options for airspace change have been submitted to date. This ES considers the option that provides the biggest change to the existing flight paths through provision of respite departure routes, and reports the findings of a sensitivity test in each aspect **Chapter 6 to 20 [TR020001/APP/5.01]**.
- 5.11.2 Paragraph 2.2.24 of the Scoping Opinion states that *“The Inspectorate understands the relationship between the Proposed Development and the future air space change process, which may not run in parallel. However, the Inspectorate considers that the ES methodology should be compatible with the methodological approaches outlined in the CAA’s CAP 1616 and CAP 1616a documents to ensure consistency and continuity between the two assessment processes. Where the ES methodology is not consistent with the CAA’s CAP approach, this should be identified and explained”* (**Appendix 1.3** of this ES **[TR020001/APP/5.05]**).
- 5.11.3 CAP 1616 (Ref. 5.34) provides guidance on the regulatory process for changing airspace design, including community engagement. CAP 1616a (Ref. 5.35) is a Technical Annex to assist those preparing airspace change proposals in providing sufficient environmental information for both consultation and to inform the decision-making process. It includes an outline of the relevant methodologies for use in environmental assessment, principally covering noise, but also climate change and CO₂ emissions, local air quality and tranquillity.
- 5.11.4 A comparison between the noise assessment methodologies adopted for the EIA and those recommended in CAP is presented in **Appendix 5.3** of this ES **[TR020001/APP/5.02]**. This shows that there is a good degree of consistency between the two approaches. The only exceptions are those that specifically relate to airspace design and are not relevant to the Proposed Development.
- 5.11.5 For Climate Change and carbon dioxide (CO₂) emissions there is alignment in terms of calculating CO₂ emissions using fuel burn (kerosene) based on aircraft types to estimate mass of CO₂. This has been undertaken for the do-minimum and do-something scenarios. Emissions are calculated for climb/cruise/decent

(above 3,000 feet) and landing take off cycle (below 3,000 feet) based on journey distances (km) between airports. The modelling does not however consider the impact on CO₂ emissions of alternative options such as aircraft operating at different altitudes/climbing at different rates and rerouting, which is not considered necessary for the EIA and these changes are not proposed as part of the Proposed Development.

- 5.11.6 In terms of Local Air Quality, the EIA method of assessment would only need to be adjusted if the future airspace changes occur below 1,000 feet.
- 5.11.7 For Tranquillity, CAP 1616a notes that there is no established method for assessing the impact of aircraft noise on National Parks and AONBs.
- 5.11.8 As noted under the Reasonable worst-case section of this chapter there is a reasonable expectation that future airspace changes will include beneficial changes to aircraft climb profiles over neighbouring settlements and potential for respite routes. The assessment of current flightpaths is, therefore, likely to represent a worst-case.

GLOSSARY AND ABBREVIATIONS

Term	Definition
the airport	London Luton Airport
AONB	Area of Outstanding Natural Beauty
AVDC	Aylesbury Vale District Council
CAA	Civil Aviation Authority
CBC	Central Bedfordshire Council
CO ₂	Carbon dioxide
CoCP	Code of Construction Practice
DBC	Dacorum Borough Council
DCO	Development Consent Order
EEA	European Economic Area
EIA	Environmental Impact Assessment
EqIA	Equality Impact Assessment
ES	Environmental Statement
FRA	Flood Risk Assessment
GCG	Green Controlled Growth
ICCI	In-combination Climate Change Impact
km	kilometre
IEMA	Institute of Environmental Management and Assessment
LBC	Luton Borough Council
LLAOL	London Luton Airport Operations Limited, the current operators of London Luton Airport
LPA	Local Planning Authority
Luton Rising	A trading name for London Luton Airport Limited, the owners of London Luton Airport
MHCLG	Ministry of Housing, Community and Local Government
mppa	Million passengers per annum
NATS	National Air Traffic Services
NHDC	North Hertfordshire District Council
NPPF	National Planning Policy Framework
NSIP	Nationally Significant Infrastructure Project, as defined under the Planning Act 2008
PEIR	Preliminary Environmental Information Report
SAC	Special Area of Conservation
SBC	Stevenage Borough Council

Term	Definition
SoCC	Statement of Community Consultation
TA	Transport Assessment
UNECE	United Nations Economic Commission for Europe
WFD	Water Framework Directive

REFERENCES

- Ref 5.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, Statutory Instrument, No. 572.
- Ref 5.2 National Infrastructure Planning (2019) Scoping Opinion: Proposed Expansion of London Luton Airport. [online] Available at: <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/TR020001/TR020001-000043-LUTN%20-%20Scoping%20Opinion.pdf> [Accessed on: 20/11/2019]
- Ref 5.3 Standards for Highways (2020), Design Manual for Roads and Bridges, LA 113 – Road drainage and the water environment, Version 1, March 2020. Available at [REDACTED] [Accessed 08/12/22]
- Ref 5.4 Institute of Environmental Management & Assessment (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance, 2nd Edition, February 2022.
- Ref 5.5 Ministry of Housing, Communities and Local Government (2015) Planning Act 2008: guidance on the pre-application process for major infrastructure projects [online].
- Ref 5.6 Ministry of Housing, Communities and Local Government (2020) Planning Practice Guidance – Environmental Impact Assessment
- Ref 5.7 The Planning Inspectorate (various) Advice notes [online]
- Ref 5.8 The Planning Inspectorate (2017) EIA Notification and Consultation Version 7]
- Ref 5.9 The Planning Inspectorate (2017), Advice Note Seven: EIA: Process, Preliminary Environmental Information, and Environmental Statements.
- Ref 5.10 The Planning Inspectorate (July 2018) Advice Note Nine: Rochdale Envelope]
- Ref 5.11 The Planning Inspectorate (November 2017), Advice Note Eleven: Working with public bodies in the infrastructure planning process
- Ref 5.12 The Planning Inspectorate (March 2018) Advice Note Twelve: Transboundary Impacts and Processes
- Ref 5.13 The Planning Inspectorate (August 2019) Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects]
- Ref 5.14 IEMA (November 2015) Environmental Impact Assessment Guide to Shaping Quality Development
- Ref 5.15 IEMA (2016) Environmental Impact Assessment Guide to Delivering Quality Development
- Ref 5.16 The Planning Inspectorate (2017), Advice Note Seven: EIA: Process, Preliminary Environmental Information, and Environmental Statements.
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- Ref 5.18 Jet Zero Strategy (July 2022), Delivering net zero aviation by 2050, Department for Transport.
- Ref 5.19 UK Government (2021) Decarbonising Transport: Building a Better, Greener Britain (Accessed 12 January 2023]
- Ref 5.20 Civil Aviation Authority (2019) Size of UK Airports January 2019 to December 2019.
- Ref 21 Civil Aviation Authority (2022). London Luton Airport, London Luton Airport Departures and Arrivals (FASI-S), ID: ACP-2018-70, 31 May 2022. Available at [REDACTED] [Accessed 02/12/22].
- Ref 22 London Luton Airport (2022) London Luton Airport Operations Ltd, Stage 2B Initial Options Appraisal Technical Appendix, FASI-S ACP-2018-70, V01 02 March 2022. Available at [REDACTED] [Accessed 02/12/22].
- Ref 5.23 Schedule 3, Paragraph 3 Types and characteristics of the potential impact, EIA Regulations
- Ref 5.24 Institute of Environmental Management and Assessment (IEMA). 2004. The Institute of Environmental Management and Assessment's Guidelines for Environmental Impact Assessment. Lincoln: IEMA.
- Ref 5.25 IEMA (2016) Environmental Impact Assessment Guide to: Delivering Quality Development.
- Ref 5.26 Schedule 4, Paragraph 5, EIA Regulations
- Ref 5.27 The Planning Inspectorate (July 2018) Advice note nine: Using the Rochdale Envelope. Version 3.
- Ref 5.28 The Planning Inspectorate (August 2010) Advice note seventeen: Cumulative Effects Assessment. Version 2
- Ref 5.29 Convention on Environmental Impact Assessment in a Transboundary Context
30 European Union (Withdrawal) Act 2018, UK Public General Acts, 2018. s.21(1). Available at <https://www.legislation.gov.uk/ukpga/2018/16/contents> [Accessed 24/08/22]

Ref 5.31 The Planning Inspectorate (December 2015) Advice note twelve: Regulation 24 of the EIA Regulations, Version 4.

Ref 5.32 On the Conservation of Natural Habitats and Wild Flora and Fauna (92/43/EEC)

Ref 5.33 National Planning Policy Framework (2021), Ministry of Housing, Communities & Local Government. www.gov.uk

Ref 5.34 Civil Aviation Authority (2018) Airspace Design: Guidance on the regulatory process for changing airspace design including community engagement requirements

Ref 5.35 Civil Aviation Authority (2017) Airspace Design: Environmental requirements technical annex]