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London Luton Airport Expansion

Planning Inspectorate Scheme Ref: TR020001

Volume 5 Environmental Statement and Related Documents
**5.05 Appendix 1.1 Scoping Report (Volume 1- Main
Report)**

The Planning Act 2008

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

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

**5.05 ENVIRONMENTAL STATEMENT APPENDIX 1.1 SCOPING
REPORT (VOLUME 1 – MAIN REPORT)**

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Environmental Impact Assessment Scoping Report

Volume 1: Main Report

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Future LuToN: Making best use of our runway

Environmental Impact Assessment Scoping Report
Volume 1: Main Report

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EXECUTIVE SUMMARY

London Luton Airport Ltd (LLAL) propose to increase the capacity of London Luton Airport (LTN) to 32 million passengers per annum (mppa) (the Proposed Development) as part of their Vision for Sustainable Growth 2020 to 2050 published in 2017. The location of LTN and the Proposed Development is shown in Figure 1.1 (Volume 2).

LTN is currently operated under concession by London Luton Airport Operations Ltd (LLAOL) and has a planning permission for a capacity of 18mppa. Forecast passenger demand shows that this limit is likely to be achieved earlier than previously predicted, by 2020. LLAL propose to apply for a Development Consent Order (DCO) under the Planning Act 2008 as the Proposed Development is a Nationally Significant Infrastructure Project (NSIP) for the purposes of that Act.

The Proposed Development will increase LTN's annual air transport movements (ATMs) from around 135,500 in 2017 to approximately 212,500 by around 2038. The current consented capacity equates to approximately 140,000 ATMs.

Reasonable alternative options to achieve this increase were consulted upon during a non-statutory public consultation exercise undertaken in summer of 2018. Further design and appraisal work has confirmed the preferred option as a two terminal solution, with the new terminal located to the east near the existing terminal.

The Proposed Development includes the following works:

1. Creation of an extended airfield platform: earthworks from on-site excavation.
2. New terminal with boarding piers.
3. Additional taxiways and aprons (aircraft stands).
4. Vehicle forecourt and multi-storey short-stay/mid-stay car parking adjacent to the terminal. Additional mid and long stay surface parking, including replacement where the existing facilities are disturbed.
5. Airfield facilities: Relocated engine run-up bay, compass swing bay and de-icing area, and fire training facilities.
6. Landside facilities: Airport associated support buildings such as snow base, energy centre, logistics centre and service yard, and new fuel line connection and storage facilities.
7. Surface access: Road and infrastructure provision and adjustments. Bus station, taxi ranks and extension of Luton Direct Air to Rail (DART) system to the new terminal.

8. Surface and foul water management, including drainage, interceptors, surface water attenuation and treatment, foul water collection and treatment, effluent storage and discharge to ground.
9. Landscaping: Improvement or replacement of existing and planned public open space and amenities.

This Scoping Report has been prepared to support a request by LLAL for a written Scoping Opinion from the Secretary of State as to the scope, and level of detail, of the information to be provided in the Environmental Statement (ES) to support the application. This request is made under Regulation 10 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ('the EIA Regulations').

This Scoping Report provides a description of the Proposed Development for which consent is being sought, including;

- an indicative plan showing the land affected;
- a description of the Proposed Development including the location and its technical capacity, and where uncertainty remains and how that will be addressed;
- the proposed specialist topics that will be covered in the Environmental Impact Assessment (EIA) (including the Study Area, baseline and assessment methodologies used to identify likely significant effects for each subject); and
- a description of the likely significant effects on the environment.

This Scoping Report also describes the engagement with statutory consultees and other stakeholders undertaken to date, and proposed future engagement. This includes the preparation of a Preliminary Environmental Information Report (PEIR) to support statutory consultation later in 2019, and the likely structure of the ES.

Table 1 below provides a summary of the proposed scope of the assessment to be undertaken and reported in the ES.

Table 1: Summary of proposed scope of the assessment

Topic	Scoped In	Scoped Out
Air quality	Dust and particulate matter from construction, Emission from road traffic, Emission from aircraft, Emissions from on-site vehicles and operations, and Qualitative odour assessment.	Emergency fuel jettison

Topic	Scoped In	Scoped Out
Traffic and transportation	Severance, Pedestrian delay, Pedestrian amenity, Driver stress and delay, Accidents and safety, and Hazardous loads.	n/a
Climate change	Construction and Operation: In-combination climate change impacts, and Climate Change Resilience	Impacts of sea level rise Decommissioning
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 Operation of aircraft.	Decommissioning Cumulative
Noise and vibration	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, and Changes in road traffic noise, including from the new road infrastructure.	Operational vibration Traffic vibration
Soils and geology	Construction and operation impacts on: Land quality with respect to soils contamination including soil gases, and Mineral extraction.	Geomorphological and geological features of scientific interest and importance Off-site Highway Interventions
Water resources	Construction and operation impacts on: Surface water flood risk, Surface water features, Groundwater features,	Flooding associated with rivers and groundwater.

Topic	Scoped In	Scoped Out
	Water Framework Directive (WFD) bodies, and Abstractions and Source Protection Zones.	
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.
Economics and Employment	Direct, Indirect and Induced Impacts on Employment and Gross Value Added (GVA) in the United Kingdom (UK) and locally through the construction and operational phases, and Wider economic impacts arising from improved connectivity offered by the expanded operation of the airport, and Effects on existing businesses and employment from environmental factors.	n/a
Health and Community impacts	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.	Overall population exposure to air pollution, Electromagnetic interference, Health effects of water, groundwater, flooding or major accidents, and Community impacts on individuals.
Agricultural Land Quality and Farming Circumstances	Construction effects on: Best and most versatile agricultural land, Soil resources, and Local agricultural holdings.	Operational impacts Rural land designations
Biodiversity	Construction and operation effects on: Designated sites, Priority habitats, Protected species, and Notable flora and fauna.	Water courses, otter, water vole, white-clawed crayfish, aquatic invertebrates Great crested newt, hazel dormouse
Landscape and visual	Construction and operation effects on: Constituent elements of the landscape, Specific aesthetic or perceptual qualities of the landscape,	Effects on private views

Topic	Scoped In	Scoped Out
	Character of the landscape, and People who will be affected by changes in views or visual amenity.	
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, including locally listed buildings and archaeology	n/a
Major accidents and disasters (MA&D)	Assessment of expected significant effects arising from the vulnerability of the construction and operation of the Proposed Development to MA&D	LTN activities not altered by the Proposed Development or do not affect the vulnerability of the Proposed Development to MA&D events, Members of the public who wilfully trespass, and Events of any likelihood with a low consequence. Expected or planned impacts

1 INTRODUCTION

- 1.1.1 In December 2017, London Luton Airport Limited (LLAL) published its 'Vision for Sustainable Growth 2020-2050'¹. The Vision outlines LLAL's intention "*to make best use of the existing runway at LTN to provide the maximum benefit to the local and sub-regional economy; to deliver good levels of service; and to actively manage environmental impacts at the local and wider levels in line with our wider commitment to responsible and sustainable development.*"
- 1.1.2 LLAL wishes to submit a Development Consent Order (DCO) application for works that will allow London Luton Airport (LTN) to expand to accommodate 32 million passengers per annum (mppa). This Scoping Report sets out the proposed scope of the Environmental Impact Assessment (EIA) that will be undertaken and reported in the Environmental Statement (ES) that will accompany the DCO application.
- 1.1.3 LTN is presently the fifth largest airport in the United Kingdom (UK), providing for almost 16.8 mppa in 2018². It is the only major UK airport that is publicly owned, with Luton Borough Council (LBC) being the sole shareholder of LLAL. In 2017, it sustained around 27,000 jobs across the UK, strongly supporting the sub-regional economy, and contributes approximately £1.8billion to the UK economy¹. Current passenger growth trends show LTN to be one of the fastest growing airports in the UK, and it is forecast to reach its currently permitted capacity of 18mppa by 2020 (ahead of the 2026/27 planned delivery date).
- 1.1.4 LLAL has identified an opportunity to further expand the offering at LTN to continue meeting the growing demand for air travel in the south-east of England, in turn helping the Government to meet its ambitions to increase freight and passenger movement capacity³.
- 1.1.5 LLAL's Proposed Development, known as the 'Future LuToN: Making the best use of our runway', will comprise the following principal elements:
- creation of an earthworks platform from onsite excavation;
 - a new terminal with boarding piers;
 - refurbishment works to existing terminal;

¹ London Luton Airport Limited (2017) London Luton Airport Vision for Sustainable Growth 2020-2050. LLAL, Luton.

² Civil Aviation Authority (2018), Airport Data 2018: size of reporting Airports, December 2018.

³ Department for Transport (2018) Beyond the Horizon. The future of UK aviation: Making the best use of existing runways. DfT, London.

- additional aircraft stands;
- additional taxiways;
- vehicle forecourt and multi-storey short stay/mid-stay car parking adjacent to the terminal;
- replacement and additional long stay surface parking;
- off-site mid-stay car parking to the south west of LTN;
- bus, coach and taxi facilities;
- an extension to the Luton Direct Air to Rail Transit (DART) to the new terminal;
- on-site highway access infrastructure;
- associated support facilities; which may include, relocated engine run-up bay, fire training facilities, snow base, energy centre, logistics centre, service yard and hangars;
- highway network improvements;
- new fuel storage facilities with facility for pipeline delivery;
- surface and foul water collection, treatment and storage; and
- replacement of existing and planned public open space and amenities.

1.1.6 The location of LTN and the Proposed Development is shown in Figure 1.1 (Volume 2). The final layout and design of these facilities is under development, however, a further description is provided in **Chapter 3 The Proposed Development**.

1.2 Nationally Significant Infrastructure Projects

1.2.1 LLAL proposes to apply for a DCO under the Planning Act 2008 as the Proposed Development is a nationally significant infrastructure project under section 23 of that Act. This is because:

- under section 23(1)(b) the Proposed Development involves the alteration of an airport in England, the effect of which to increase by more than 10 million per year the number of passengers for whom the airport is capable of providing air passenger transport services. For the purposes of section 23(6), “alteration” is satisfied in this case because the Proposed Development includes (amongst other things) the construction of a new terminal building; and
- under section 23(1)(c) the Proposed Development involves an increase in the permitted use of an airport in England of more than 10 million per year in the number of passengers for whom the airport is currently permitted to provide air passenger transport services. “Permitted” means permitted

by planning permission or development consent (section 23(7)). The current planning permission is capped at 18mppa.

1.3 The need for an Environmental Impact Assessment

- 1.3.1 Environmental Impact Assessment (EIA) is a systematic process that examines the potential impacts 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), which can then be used to inform decision makers and the public about the possible environmental implications of a development, and help the planning authority (or in the case of a DCO, the Secretary of State) determine the application. This is a process prescribed by the European Community Directive 2011/92/EU as amended by Directive 2014/52/EU⁴ (EIA Directive), which requires the EIA to determine 'likely significant environmental effects' caused by a development.
- 1.3.2 For qualifying NSIPs, the requirements of the EIA Directive are transposed into the UK legislation by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (SI.572) (the EIA Regulations). The EIA Regulations require that an EIA is always undertaken for certain projects, which are defined under Schedule 1. Projects which do not fall within Schedule 1 can also require an EIA if they fall within development descriptions in Schedule 2 to the EIA Regulations, and are considered likely to give rise to significant effects on the environment due to its nature, size or location (with due regard to the selection criteria set out within Schedule 3 to the EIA Regulations).
- 1.3.3 The Proposed Development falls within the development description of both paragraphs 10(e) and 13(1) of Schedule 2⁵ EIA Regulations due to the Proposed Development requiring construction and change/extension of an existing airfield, and the potential to give rise to significant environmental effects.
- 1.3.4 Therefore, LLAL is undertaking an EIA for the Proposed Development in accordance with the EIA Regulations to support

⁴ Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.

⁵ EIA Regulations 2017, Schedule 2 paragraph 10(e) construction of airfields and 13(1) any change to or extension of development of a description listed in Schedule 1 to these Regulations (other than a change or extension falling within paragraph 21 of that Schedule) or in paragraphs 1 to 12 of this Schedule, where that development is already authorised, executed or in the process of being executed, and the change or extension may have significant adverse effects on the environment

the DCO application and to identify and, where possible, mitigate potential significant environmental effects.

- 1.3.5 In accordance with Regulation 6 of the EIA Regulations, LLAL has written to the Secretary of State via the Planning Inspectorate to provide notification of the intention to undertake an EIA as part of the DCO application for LTN.

1.4 Purpose of this report

- 1.4.1 This EIA Scoping Report sets out the proposed scope of the EIA and content of the ES to be submitted with the DCO application. It accompanies a written request to the Planning Inspectorate for a Scoping Opinion in accordance with Regulation 10(1) of the EIA Regulations.
- 1.4.2 Table 1-1 identifies the requirements defined within Section 10(3) of the EIA Regulations and the Planning Inspectorate's Advice Note Seven in relation to applications for a Scoping Opinion, and where in this Scoping Report the requirements are addressed.

Table 1-1: Requirements and guidance for scoping identified in the EIA Regulations and Planning Inspectorate Advice Note Seven⁶

Requirement	Location in the Scoping Report
Regulation 10(3) of the EIA Regulations	
A plan sufficient to identify the land [required for the Proposed Development];	See Figure 2.1 (Volume 2 of this Scoping Report) The red line boundary shown in the Figures of this Scoping Report represents that land identified as required for the Proposed Development at this stage, but is subject to change as part of ongoing development work.
A description of the Proposed Development, including its location and technical capacity;	Chapter 3 The Proposed Development
An explanation of the likely significant effects of the development on the environment; and	Individual topic chapters (Chapters 6-21)
Such other information or representations as the person making the request may wish to provide or make.	Table 1-2 summarises the remaining information provided as part of this report.
Planning Inspectorate Advice Note Seven	
An explanation of the approach to addressing uncertainty where it remains in relation to elements of the Proposed Development e.g. design parameters;	Section 3.4

⁶ The Planning Inspectorate (2017), EIA: Process, Preliminary Environmental Information, and Environmental Statements. Available at <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2017/12/Advice-note-7.pdf> [Accessed March 2019]

Requirement	Location in the Scoping Report
Referenced plans presented at an appropriate scale to convey clearly the information and all known features associated with the Proposed Development;	See supporting Drawings to this report
An outline of the reasonable alternatives considered and the reasons for selecting the preferred option;	Section 3.3: Alternatives
A summary table depicting each of the aspects and matters that are requested to be scoped out allowing for quick identification of issues;	Executive Summary with further details in individual topic chapters (Chapters 6-21)
A detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided;	Individual topic chapters (Chapters 6-21)
Results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters;	Individual topic chapters (Chapters 6-21)
Aspects and matters to be scoped in, the report should include details of the methods to be used to assess impacts and to determine significance of effect e.g. criteria for determining sensitivity and magnitude;	Section 5.3: The Environmental Impact Assessment Process, with further detail in individual topic chapters (Chapters 6-21)
Any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects;	Individual topic chapters (Chapters 6-21)
References to any guidance and best practice to be relied upon;	Individual topic chapters (Chapters 6-21)
Evidence of agreements reached with consultation bodies (for example the statutory nature conservation bodies or local authorities); and	Section 5.3 The Environmental Impact Assessment Process identifies Stakeholder engagement to date. Each individual discipline chapter outlines topic specific communications.
An outline of the structure of the proposed ES.	Chapter 22 Proposed Structure of the Environmental Statement

1.4.3 The information provided within this report is intended to enable stakeholders to engage with the EIA scoping process and to assist the Planning Inspectorate in reaching a Scoping Opinion.

1.5 Structure of this report

1.5.1 This Scoping Report comprises 2 Volumes that should be read in conjunction:

- Volume 1: Main Report (document reference number LLADCO-3B-ARP-00-00-RP-YE-0001) - describing the main findings of the scoping exercise; the structure of this report is presented in Table 1-2; and

- Volume 2: Figures (document reference number LLADCO-3B-ARP-00-00-RP-YE-0002) - providing A3 colour figures containing visual or geographic information referred to in Volume 1.

Table 1-2: Scoping Report structure

Chapter	Contents
Chapter 1 Introduction	Provides an overview of the background of the Proposed Development, the need for an EIA, the purpose of this Scoping Report, its structure and an introduction to the project team.
Chapter 2 Application sites and surroundings	Describes the existing site and its surroundings, including existing operational activities within LTN.
Chapter 3 The Proposed Development	Provides a detailed description of the Proposed Development, its components and main alternatives considered as part of a sifting process.
Chapter 4 Policy context	Describes the policy and regulatory context for the Proposed Development
Chapter 5 Approach to assessment	Provides details of the proposed approach to the EIA, including mitigation, inter relationships with 'other developments' and potential cumulative effects
Chapter 6-20 – Technical topic chapters	Outline the scope of the assessment for each of the topics considered in the EIA. These have been grouped to reflect the interrelationships between topics. These are: <ul style="list-style-type: none"> • Air quality, traffic and transport, climate change, greenhouse gases and noise and vibration; • Soils and geology, water resources, and waste and resources; • Economics and employment, and health and community; • Agricultural land quality and farming circumstances, biodiversity, landscape and visual, and cultural heritage; and • Major accidents and disasters.
Chapter 21 In-combination and Cumulative effects	The approach to the cumulative impact assessment has been provided
Chapter 22 Proposed structure of the Environmental Statement	Describes the proposed structure of the ES and the next steps in the process

1.6 Project team

1.6.1 The ES will be prepared by a large project team of topic specialists from AECOM, Arup and Capita. AECOM and Arup are registered with the Institute of Environmental Management and Assessment's (IEMA) EIA Quality Mark. This is a voluntary standard that requires organisations to commit to excellence in their EIA activities, and to be independently reviewed to ensure

seven key commitments are met. All specialists have demonstrable expertise in their fields. These credentials demonstrate the ES is to be prepared by 'competent experts'⁷.

Table 1-3: Summary of wider project team

Title	Team
Applicant	London Luton Airport Limited
Legal Advisors	BDB Pitmans LLP
Planning Consultants	GL Hearn
Aviation Consultants	York Aviation
Land Referencing	WSP
EIA	
EIA Lead and Manager	Arup
EIA Technical Advisor	AECOM
EIA Technical Leads	<p>AECOM: Cultural Heritage, Noise and Vibration, Waste and Resources.</p> <p>Arup: Air Quality, Biodiversity, Greenhouse Gases, Climate Change, Soils and Geology, Major Accidents and Disasters, Health and Community, Water Resources, and Traffic and Transport.</p> <p>Capita: Landscape and Visual, Agricultural Land Quality and Farming Circumstances, Economics and Employment.</p>

⁷ The EIA Regulations, Regulation 14(4)(a).

2 APPLICATION SITES AND SURROUNDINGS

2.1 Introduction

2.1.1 This chapter presents a description of the sites where aspects of the Proposed Development will be located. It also includes a description of the existing LTN infrastructure and operations. It should be noted that the Proposed Development Boundary, as shown in Figure 2.1 (Volume 2) is indicative at this stage, but is sufficient to identify land likely to be required for the Proposed Development and therefore consistent with information required to form a Scoping Opinion as described in the EIA Regulations. For the purposes of this description the Proposed Development can be described in three key aspects and in various locations:

- The Main Application Site;
- Off-site Car Parks; and
- Off-site Highway Interventions.

2.2 Location and context

Main Application Site

2.2.1 LTN is located approximately 45km north west of London in the south east of England. It is located to the east of Luton town centre, and lies within the administrative boundary of LBC. The indicative Main Application Site boundary encompasses approximately 360 hectares (ha) to the east of LTN, across Luton and North Hertfordshire to the east. The indicative Main Application Site boundary and site context are shown in Figure 2.1 (Volume 2).

2.2.2 LTN is located on a raised platform at the north eastern end of the Chiltern Hills. Land to the north of the Main Application Site is predominantly residential and mixed industrial residential to the west, and rural with arable fields to the east and south.

2.2.3 A closed historical landfill is located in the north of the Main Application Site adjacent to the existing eastern boundary of LTN, which forms part of Wigmore Valley Park. This landfill site was operated by LBC between 1925 and 1986. Part of the Proposed Development will be constructed over the disused landfill.

2.2.4 Wigmore Valley Park is located within the boundary of the Main Application Site, directly east of LTN. It provides open space and recreational facilities including Wigmore Valley Park Pavilion, children's play and sport facilities. The park is designated as an Area of Local Landscape Value and parts of the park are designated as a County Wildlife Site (CWS).

- 2.2.5 The east of the Main Application Site is largely agricultural with arable fields and with hedgerow boundaries with scattered trees. This area crosses the LBC and Hertfordshire County Council (HCC) administrative boundary, which also marks the Green Belt boundary to the east of LBC. The Main Application Site is bordered by Darley Road to the north and Winch Hill Lane a rural road running through the area of Winch Hill to the east. There is a network of Public Rights of Way in this area including the Chiltern Way approximately following the alignment of Darley Road. There is a ridge with a band of woodland running approximately north west to south east through this area, and Winch Hill Wood, a block of ancient woodland, in the south east.
- 2.2.6 There are no occupied residential properties in the Main Application Site. Winch Hill Farmhouse, a disused Grade II listed building in a dilapidated state, is located in the far east of Main Application Site. Winch Hill Cottages and, and Winch Hill House, isolated barns, and some properties at Wandon End are close to, but outside of, the Main Application Site boundary.
- 2.2.7 Archaeological records suggest historical human activity in this area with a known Iron Age/Romano British Settlement in the field to the east of Wigmore Valley Park.
- 2.2.8 Luton town centre is approximately 2.5km to the west of LTN. The town has a population of approximately 200,000 people. The town was traditionally dominated by manufacturing (Vauxhall Motors and others), however, the area is now strongly supported by service industries, including LTN.
- 2.2.9 The Main Application Site is approximately 4km from Junction 10 of the M1 motorway. The A1081 connects the M1 to LTN. The A505 passes through Luton connecting the town to Dunstable in the west and Hitchin in the north east.
- 2.2.10 The Midlands Mainline railway line passes to the west of LTN. This is serviced by Thameslink and East Midlands trains which connect Luton Airport Parkway railway station, located approximately 1.5km from LTN, with London, and northern urban areas such as Sheffield. Luton Airport Parkway railway station will be directly connected to LTN via the Luton Direct Air to Rail Transit (DART) system which is currently under construction. Further details on the Luton DART are provided in Section 2.4.
- 2.2.11 Luton Airport Business Park is located to the west and north west of LTN.
- 2.2.12 The River Lea flows to the south in a valley directly at the western end of LTN. This is an Environment Agency designated Main River.

- 2.2.13 Someries Castle, a scheduled monument, lies approximately 250m south of the LTN. This fortified manor house is regarded as one of the first brick-built buildings in England.
- 2.2.14 Luton Hoo Registered Park and Garden (Grade II*) is located approximately 300m south west of LTN at its closest point. This estate contains several listed structures including the Luton Hoo Hotel and terraced wall garden (Grade I); stables (Grade II*); boathouse, bridge, lodges and garden centre (Grade II). The airfield is located on a raised platform, however only part of the control tower and the top of airport buildings are visible from Luton Hoo.

Off-site Car Parks

- 2.2.15 There are two locations proposed for additional off-site car parking. These are to the south west of LTN near Luton Airport Parkway railway station, on land owned by LLAL, and are shown on Figure 2.1 (Volume 2).
- 2.2.16 The larger of the two sites is currently a trailer park, the smaller a disused area of hardstanding. The sites are located in a commercial area dominated by existing transport infrastructure; bordered by Parkway Road and the A1081 to the south, New Airport Way and the A1081 to the east, Kimpton Road and industrial units to the north. The Midlands Mainline Railway passes between the two sites. Each site contains a border of trees and scrub.
- 2.2.17 These sites are partially located in LTN's Public Safety Zone (PSZ), an area at the end of runways where planning restrictions apply. The development of car parks in this zone is permitted.

Off-site Highway Interventions

- 2.2.18 The Proposed Development will include several sites where highway improvements will be required to facilitate the increasing airport capacity. The location and nature of these interventions is under development and dependent on detailed traffic modelling; however, current expected locations are shown in Figure 2.1 (Volume 2) and described in outline in Section 3.4.
- 2.2.19 As improvements to existing highway infrastructure, each location is urban and has been subject to previous development and disturbance. The proposed work will be restricted to existing highway boundaries as far as possible and no buildings are expected to be directly impacted as result of highway improvements.

2.3 Current airport infrastructure and operations

- 2.3.1 LTN is operated by London Luton Airport Operations Limited (LLAOL) under concession agreement lasting until 2031.
- 2.3.2 Current operations are dominated by 'low cost' commercial operations using International Civil Aviation Organisation (ICAO) Code C aircraft; typically, A319/320/321 and B737 aircraft together with occasional cargo aircraft. Smaller business aviation/private jets account for approximately 25% of the annual movements as LTN is one of the most important airports for business aviation serving London. Whilst the runway is capable of accommodating larger ICAO Code E aircraft such as B787 and A330/350 aircraft, such movements are currently limited due to the lack of suitable aircraft stands and facilities.
- 2.3.3 LTN operates flights to approximately 90 destinations, with most passengers flying on commercial scheduled and charter services. There are currently around 136,500 aircraft movements per annum (around 415/day at peak), of which around 105,000 are by commercial passenger or cargo operations. The majority of flights are to international destinations, while around 8% are domestic flights.
- 2.3.4 Scheduled service operators include easyJet, Ryanair and Wizz Air. Business and private operators are serviced by facilities operated by Harrods and Signature Flight Support.
- 2.3.5 LTN Cargo Centre provides freighter operations, handling approximately 28,000 tonnes of cargo each year⁸.
- 2.3.6 LTN and its associated business park also accommodate a range of aircraft and airport production and maintenance businesses. All are located to the north of the runway and generally to the north west of the passenger terminal area. These are characterised by a range of hangars and supporting facilities dating from the original pre-World War II manufacturing facilities through to structures constructed as recently as 2014.
- 2.3.7 LTN consists of a single runway with associated taxiways, stands and aprons. It has a single commercial passenger terminal, with supporting hangars, maintenance facilities, and airport related offices. LTN also has a number of car parks (short, mid- and long stay). These elements are described further below and shown in Figure 2.2 (Volume 2).
- 2.3.8 The current airport infrastructure remains characterised by progressive development from its pre-World War II opening to its

⁸ London Luton Airport (2018) LLA Corporate Site: LLA Cargo Centre. Available at: <https://www.london-luton.co.uk/corporate/lla-cargo-centre> [Accessed March 2019]

most recent expansion projects consented in 2014 and largely complete at the end of 2018.

- 2.3.9 The terminal and aprons have a somewhat unusual 'island' layout, with landside access to the terminal being via the New Airport Way road passing under the taxiway to a bus station, drop off area, taxi rank and short stay car park on the runway side of the terminal building. Mid and long stay surface parking is provided at the western and eastern fringes of the terminal zone with hangars and support buildings generally located around the northern perimeter road. Connection to the national rail system is provided by shuttle bus to Luton Airport Parkway railway station. Local bus, regional coach and taxi facilities are located adjacent to the terminal in the 'island' site.
- 2.3.10 The compact nature of the airport infrastructure effectively limits the operation largely to short haul airlines favouring Boeing 737 and Airbus A319/320/321 aircraft. The predominance of 'low cost' operations at LTN are reflected in the majority of flights originating from and bound for European destinations and, hence, characterised by the busy early morning and early evening peaks and to a lesser extent during early afternoon reflecting the large number of aircraft based at LTN and their patterns of operation. In these busy periods, stand availability and efficiency around the taxiway system are key considerations.
- 2.3.11 With recent passenger growth, LTN is increasingly constrained in these busy hours by a lack of aircraft stands and passenger processing space resulting from both the original airport layout and the physically restrictive nature of historic terminal expansion.

Runway infrastructure

- 2.3.12 LTN possesses a single runway, running conventionally roughly east to west (as prevailing winds are south westerly in the UK), with a length of 2,162m and width of 46m at an elevation of 160m Above Ordnance Datum (AOD).
- 2.3.13 The runway is equipped with an Instrument Landing System (ILS) rated to Category IIIB, allowing LTN to continue operating in conditions of poor visibility.

Taxiway infrastructure

- 2.3.14 The runway is served by a parallel northern taxiway linked to a circulatory taxiway arrangement around the 'island' terminal site. A new link at the western end of the runway has been completed as part of the works consented in 2014 and a similar link is planned at the eastern end. These, together with a new taxiway Foxtrot parallel to taxiway Delta, were consented as part of the 18mppa permission in 2014 (Project Curium, further detailed

provided in Section 2.4). However, these links still do not extend to the full length of the runway.

Apron areas

- 2.3.15 There are approximately 40 stands available for commercial passenger aircraft, with the remaining apron areas used for business aviation and cargo activity. Many of these stands are located on the north western side of the terminal building, away from the runway and connected to it by a 'U' shaped set of taxiways and aprons that together encircle the terminal. There is also a cul-de-sac between two piers to the east of the terminal and additional stands to the south of the terminal. In addition, there are aircraft parking areas used primarily for business aviation aircraft and two stands for cargo aircraft adjacent to the cargo centre.

Terminal building and forecourt

- 2.3.16 LTN features one single, two storey passenger terminal building which has been expanded and rearranged several times. The ground floor features a main hall equipped with 62 check-in desks, a separate security screening hall, as well as some shops, service counters and the arrivals facilities. After the security screening hall, escalators lead to the departures lounge on the upper floor, with more retail facilities and access to 28 departure gates.
- 2.3.17 The forecourt has been rearranged progressively to serve the terminal expansion and currently the drop off and collection zone has been located in the surface parking area adjacent to the terminal. This zone will be relocated within the multi-storey car park complex which is currently under construction.

Cargo

- 2.3.18 LTN has just one modest cargo handling facility in the extreme north east corner of the north apron.

Aircraft maintenance

- 2.3.19 The north western side of the U-shaped apron is encircled by a continuous line of hangars and other buildings, as LTN is a major maintenance base for several airlines including TUI Airways, easyJet and, previously, Monarch Airlines. There are also substantial maintenance facilities associated with the two business aviation companies.

Landside facilities

- 2.3.20 LTN has a conventional range of facilities in the landside terminal area including bus, coach and taxi stands. A range of supporting

facilities are located around the airport boundary, as well as airline offices.

- 2.3.21 A large fuel farm is located close to the terminal area with a landside-airside road crossing point. This is a registered Control of Major Accident Hazards (COMAH) site currently operated by Shell UK. There is no pipeline delivery to the fuel farm or hydrant fuelling on the apron so all fuel is delivered to LTN by tanker and distributed to aircraft by smaller fuel delivery vehicles.
- 2.3.22 A range of hotels are located in the landside area near LTN and the access road leading to the terminal area.

Airside facilities

- 2.3.23 The airfield benefits from conventional major airport navigational aids as well as an air traffic control tower commissioned in the mid 1990's. The airfield fire station is located adjacent to both the parallel taxiway and taxiway Alpha. A fire training ground is also located on the east side of LTN.

Airport road network

- 2.3.24 LTN is around 4km north east of Junction 10 of the M1 motorway, which runs south to London, connecting to the M25, and to the north. The majority of vehicles accessing LTN do so from the M1 and Luton via New Airport Way (the A1081). From the Airport Way roundabout, Percival Way goes north around LTN, providing access to various facilities around the airport business park to the north of LTN and the long stay car park to the edge of the eastern terminal area boundary.
- 2.3.25 The Airport Approach Road, from the Airport Way roundabout, passes through the taxiway tunnel to serve the short stay car park and terminal.
- 2.3.26 Due to increasing demand at LTN in recent years, improvement works to Junction 10 of the M1 have been carried out.

Car parks

- 2.3.27 There are short stay car parks adjacent to the terminal including the recently completed multi-storey car park, together with mid-stay and long stay on airport car parks. These are located to the west and east of the terminal respectively and linked to the terminal by shuttle buses. An additional multi-storey car park is under construction to the south of the existing terminal. Pre-booked off airport parking is also available from several independent operators.

Public transport

- 2.3.28 Local buses connect LTN with Luton town centre. Conventional bus services also operate, connecting LTN with towns and cities in the region and parts of north London, including the 100, operated by Arriva, which offers an hourly daytime connection to the nearby towns of Hitchin and Stevenage.
- 2.3.29 Direct coach services to London include the 757 operated by Green Line Coaches and the A1 operated by National Express which operate competing services to and from Victoria Coach Station. EasyBus services provide a connection to Liverpool Street station. A range of longer distance National Express services link LTN to Stansted, Heathrow and Gatwick Airports as well as destinations in the Midlands and north of England.
- 2.3.30 Luton Airport Parkway railway station links both the East Midlands St. Pancras to Derby service as well as the extensive Thameslink service from the southern Home Counties via London to Bedford. Daytime rail services are frequent with an hourly service overnight. A shuttle bus link between LTN and Luton Airport Parkway railway station operates 24 hours a day - every 10 minutes from 5am to 12am and between 12am to 5am, it is timed to meet each overnight train service.

2.4 Existing airport related developments

- 2.4.1 A number of airport related developments are currently underway or under consideration by the local planning authority. These include:
- Project Curium;
 - Luton DART;
 - Reuse and placement of spoil from DART and Project Curium under a separate planning consent;
 - Enterprise Zone:
 - Bartlett Square; and
 - New Century Park (planning application under consideration).
- 2.4.2 The location and extent of the LLAL developments is shown in Figure 2.3 (Volume 2).

Project Curium

- 2.4.3 Project Curium involves extensions to the passenger terminal, construction of additional aircraft stands and new taxiways, improvements to transport links (including new car parking facilities and remodelling of the bus and coach interchange) to increase the capacity of LTN from 12mppa to 18mppa.

2.4.4 Planning permission was granted in 2014 for works to accommodate passenger capacity up to 18mppa, by as early as 2021 (subject to demand) (LBC ref: 12/01400/FUL).

2.4.5 Works already completed include:

- extension of the Southern Apron for additional aircraft contact stands (to deliver additional commercial contact and remote stands);
- reconfiguration of external areas for surface access improvements including works to the Temporary Drop Off Zone (TDOZ) and new long stay parking deck;
- extension and reconfiguration of the passenger terminal; and
- construction of a new multi-storey car park no. 1.

2.4.6 Works underway or remaining include:

- construction of a second multi-storey car park no. 2;
- construction of Taxiway Foxtrot; and
- additional apron and taxiway works.

Luton Direct Air to Rail Transit (DART)

2.4.7 Planning permission was granted in 2017 (LBC ref: 17/00283/FUL) for the construction of a 2.2km twin track cable-driven system between Luton Airport Parkway railway station and LTN Central Terminal.

2.4.8 The Luton DART comprises a terminal connected to Luton Airport Parkway railway station, tracks mounted on a viaduct adjacent to the Midlands Mainline railway, which join a bridge over the A1081 (Airport Way) road, leading to a cut, trough and tunnel within the airport, terminating at another terminal at LTN Central. The new two storey terminal constructed adjacent to Luton Airport Parkway railway station will provide a connecting over bridge link between the two stations.

2.4.9 Construction for the project started in 2018 and is due to be completed in 2021.

Spoil reuse and placement from the Luton DART and Project Curium

2.4.10 Planning permission was granted in 2018 (LBC ref: 17/02219/FUL) for the movement, reuse and placement of spoil material generated from Project Curium and Luton DART.

2.4.11 The spoil from the Luton DART and Project Curium will be used to re-profile slopes around LTN to improve essential maintenance operations for the airport, and to prevent large volumes of traffic movements on the public network. Up to

331,400 cubic metres (m³) of spoil material will be moved and placed permanently on five sites within LTN and the airside perimeter road at the eastern end of the airport will be diverted.

- 2.4.12 Construction of the Luton DART commenced in Quarter (Q4) of 2018, with spoil placement and permanent landscaping to be completed by Q3 2020.

Enterprise Zone

- 2.4.13 LLAL has plans to develop a combined office and hotel development, and a business park within LTN Enterprise Zone (designated in 2015). These developments, known respectively as Bartlett Square and New Century Park, seek to support LTN and provide employment generation for the local community. Together they constitute 1.5 million square feet of commercial space sited on 'regeneration' zones being an ex-Vauxhall factory site and a household landfill site respectively. The two schemes are described further in the following sections.

Bartlett Square

- 2.4.14 Bartlett Square, formerly known as Stirling Place, is located to the west of the Luton Airport Parkway railway station, adjacent to the Luton DART terminal under construction. A planning application for a hotel with a capacity for 172 rooms, incorporating Hart House, one six storey office building, and a multi-storey car park, with an outline application for another nine storey office building with commercial space was submitted in February 2018 (LBC ref: 18/00271/EIA) and granted in November 2018.

New Century Park

- 2.4.15 New Century Park is a proposed high quality mixed-use business park to the east of LTN, which includes the construction of a new access road (referred to as Century Park Access Road (CPAR)) connected to Airport Way to the west of LTN.
- 2.4.16 The planning application (LBC ref: 17/02300/EIA) comprises office space (Class B1), warehouse and industrial space (Class B2 and B8), mixed employment space (Class B1/B2/B8), a hotel (Class C1), café space (Class A3); energy recovery centre (sui generis), internal access roads, car parking, landscaping and associated works including earthworks, utility diversions, sustainable drainage systems, tree removal and tree protection.
- 2.4.17 An outline application was submitted in December 2017 to LBC, and a decision is yet to be determined.

3 THE PROPOSED DEVELOPMENT

3.1 Introduction

3.1.1 This chapter presents a description of the Proposed Development for which a DCO will be sought. At this stage, the description is indicative and subject to change before the DCO application is submitted. It is, however, considered appropriate for this scoping exercise. It begins with an overview of the need for the development and an outline of the aviation policy that supports airport growth in the UK. That is followed by a summary of the work that has been undertaken to date to consider various development options and the reasons for their discontinuation, or selection for further consideration.

3.2 Project background

3.2.1 The Government's 2003 Aviation White Paper⁹ identified LTN as an airport capable of supporting 30mppa. Work undertaken by LLAL the owners, and LLAOL who run the concession and have operational control of all day to day activities of LTN, demonstrates that the airport is potentially capable, through careful planning, of handling up to 36-38mppa from its single runway in the longer term.

3.2.2 In 2017, the Government reaffirmed the importance of the aviation sector as a vehicle for growth and success of the UK economy with its call for evidence document in preparation of a new Aviation Strategy¹⁰. In June 2018, the Government published the Airports National Policy Statement (ANPS)¹¹ relating specifically to the provision of a new runway at Heathrow. Accompanying this document was a policy statement¹² encouraging all airports to make best use of their existing runways:

"Therefore the government is supportive of airports beyond Heathrow making best use of their existing runways. However, we recognise that the development of airports can have negative as well as positive local impacts, including on noise levels. We therefore consider that any proposals should be judged by the relevant planning authority, taking careful account of all relevant considerations, particularly economic and environmental impacts and proposed mitigations." (paragraph 1.29)

⁹ Department for Transport (2003). The future of air transport, Aviation White Paper [Withdrawn].

¹⁰ Department for Transport (July 2017) A new aviation strategy for the UK: call for evidence.

¹¹ Department for Transport (June 2018) Airports National Policy Statement.

¹² Department for Transport (June 2018) Beyond the Horizon. The future of UK Aviation: Making best use of existing runways.

- 3.2.3 Both of these documents have been driven by forecasts of rising demand in air travel, the need for an integrated approach to the sector, and the impending departure of the UK from the European Union.
- 3.2.4 The Draft Aviation Strategy was published for consultation in December 2018 and supports regional growth and connectivity. It states “*Airports are vital hubs for local economies, providing connectivity, employment, and a hub for local transport schemes*”¹³.
- 3.2.5 In 2014, planning permission was granted to LLAOL to increase the capacity of LTN to 18mppa (see Section 2.4 Project Curium). It was forecast at that time that this would be achieved by 2026/27 at the earliest. Since then, passenger numbers have increased by around one mppa in each of the last four years. Capacity is therefore now expected to be reached within the next two years.
- 3.2.6 Set against this context for growth, LLAL believes that LTN has the potential to become the airport of choice for north London and England’s economic heartland, and has prepared a business case to support further growth. There is an opportunity for LTN to play a substantially bigger role in the UK aviation market, notwithstanding the opening of the Heathrow third runway. In order to do this, LTN needs to be able to expand its landside and airside infrastructure to take advantage of the available capacity offered by its existing single runway.
- 3.2.7 There is therefore a clear need to plan for LTN’s long-term future to ensure the regional economy can benefit from this expected growth and it is LLAL’s responsibility to deliver this to the best of its ability. LLAL has started to plan for this growth and publicly launched its ‘Vision for Sustainable Growth 2020-2050’ for LTN in December 2017. This Vision set out the airport’s key principles:
- to make best use of the existing runway;
 - to maximise benefits to the local and sub-regional economy;
 - to deliver good levels of service to customers;
 - to minimise and mitigate environmental impacts in line with commitments to responsible and sustainable development; and
 - to support LBC in the delivery of the ‘Luton Investment Framework’.

¹³ Department for Transport (December 2018) Aviation 2050 the Future of UK Aviation, A consultation, Executive Summary.

- 3.2.8 LLAL has commissioned a consultant team to prepare a strategy for growth for LTN, including an application for a DCO.

3.3 Alternatives

- 3.3.1 Schedule 4 of the EIA Regulations requires that an ES should include “a description of reasonable alternatives [...] studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option”¹⁴. There is no statutory requirement for an assessment of alternatives within the Scoping Report, however, Planning Inspectorate Advice Note Seven recommends the inclusion of “an outline of the reasonable alternatives considered and the reasons for selecting the preferred option”.

- 3.3.2 In addition, the ANPS states:

“The applicant should be able to demonstrate in its application how the design process was conducted and how the proposed design evolved. Where a number of different designs were considered, the applicant should set out the reasons why the favoured choice has been selected” (paragraph 4.35).

- 3.3.3 To progress the design of the Proposed Development, a number of alternative options were developed and considered during a sifting process. Key alternatives and their selection through the sifting process have been described further below.

- 3.3.4 In the preparation of the ES, full consideration will be given to the reasonable alternatives studied (in terms of development design, technology, location, size and scale), and the ES will detail the reasoning behind the preferred choice, taking into account environment, social and economic effects.

Do Nothing

- 3.3.5 A ‘No Development’ or ‘Do Nothing’ option was discounted from the sifting process on the basis that it does not deliver the strategic economic objectives.

- 3.3.6 As part of continuing assessment, a ‘Do Nothing’ scenario will be explored to establish a future baseline for LTN without the Proposed Development. This will be described in full within the ES along with a final description of the alternatives.

Sift process

- 3.3.7 The sift process for the selection of alternatives has comprises a number of stages:

¹⁴ EIA Regulations 2017 Schedule 4, Part 2,

- Sift 1 - the purpose of the first sift, carried out during the autumn/winter of 2017 was to undertake an initial appraisal of the long list of options to produce a short list of preferred options to recommend to the LLAL Board. Options were considered against a set of high level, qualitative criteria and either recommended for further consideration and design development, or discontinued to avoid abortive work.
- Sift 2 – the purpose of the second sift was to appraise the options which remained under consideration after Sift 1. These options had the benefit of further research and understanding and some initial design development in order to inform the decision process, with some additional informational available for each option. As such, the appraisal process has been designed to an improved level of detail than in Sift 1. The options that performed most strongly against the criteria (based on the Sift 1 criteria with further refinement) after Sift 2 were presented as the preliminary preferred options for non-statutory consultation during the summer of 2018.
- Sift 3 – following non-statutory consultation and consideration of stakeholder and community feedback, a third round of the sift process was undertaken to identify the preferred option to take forward in the DCO application.

3.3.8 Sift 1, 2 and 3 reports are available on the Future LuToN website¹⁵, a summary of the process followed and key findings is provided below.

Sift 1

3.3.9 Sift 1 was undertaken in autumn 2017 and appraised seven options against a set of qualitative criteria based on LTN's Vision and key strategic objectives for the project.

3.3.10 Each option was appraised by the technical specialist team against the strategic objectives of Strategic Fit, Economic, Social, Sustainability and Environment, Surface Access, Deliverability, Operational Viability and Cost. Environmental sub-criteria included: noise impact, air quality, natural habitats and biodiversity, carbon emissions, flood risk, archaeology and cultural heritage, landscape and visual impact, climate change resilience, surface and groundwater, and landfill.

3.3.11 Options included:

- Option 1 – new terminal and apron capacity to the north of the existing runway, either:

¹⁵ Available at: <https://futureluton.llal.org.uk/> [Accessed March 2019]

- Option 1a – a double terminal solution with a new terminal built on the long stay car park and part of Wigmore Valley Park with associated aprons to provide the required increase in capacity, resulting in LTN operating with two distinct terminals
- Option 1b – a single terminal complex located on the west of the site, with the first phase built as a free-standing second terminal on the long stay car park land and part of Wigmore Valley Park, and with the existing terminal complex being incorporated/replaced to form a single new terminal complex in the longer term
- Option 1c – a single terminal complex located on the east of the site, with the first phase built as a free-standing second terminal on the existing Wigmore Valley Park, and with the existing terminal complex being replaced by a single new terminal complex in the longer term
- Option 2 – new terminal, taxiways, aprons, stands, car parks and access capacity to the south of the existing runway; or
- Option 3 – new terminal development with runway changes, either:
 - Option 3a – realigning the runway e.g. tilting its alignment towards the north-east / south-west
 - Option 3b – extending the existing runway eastwards, resulting in a longer single runway than at present
 - Option 3c – adding a new second runway to the south of the existing runway

3.3.12 In summary, options 1a, 1b and 1c and option 2 performed well in terms of supporting emerging Government policy for aviation, increasing airport capacity and delivering economic and social benefits, with options 1a and 1c performing best overall. On this basis options 1a, 1b, 1c and option 2 were taken forward for further consideration at Sift 2.

3.3.13 Options 3a, 3b and 3c were discontinued because they were not considered to be consistent with emerging Government policy in terms of making best use of existing runways and also performed poorly on financial and technical viability as each entailed significant additional cost, buildability or operational challenges.

Sift 2

3.3.14 Following Sift 1, a more detailed appraisal of the options taken forward was undertaken based on a refined set of sub-criteria and further information generated as the project developed.

3.3.15 After a scoring exercise and series of workshops, general conclusions were determined:

- All of the options were capable of providing beneficial impacts to a greater or lesser degree, with the exception of Option 2 which was considered currently unworkable as it was highly unlikely to be capable of securing the consents required at the present time. This is due to the entirety of land required to deliver all buildings and infrastructure being designated as Green Belt. The National Planning Policy Framework (NPPF)¹⁶ requires 'very special circumstances' for development to take place in the Green Belt. As long as other options with a lesser impact on Green Belt remain viable, this option was considered unlikely to meet that test. Both single terminal options, 1b and 1c, scored less well in terms of delivering the additional capacity and connectivity than the two terminal options, 1a and 2, due to the increased ability of the two terminal options to phase development in line with demand and the potential operational disruption of reconfiguring a single terminal.
- Economic (criteria S4 and S5) – All the options were considered capable of delivering benefits nationally and regionally (to both users and airlines) and locally in terms of increased job opportunities. The single terminal options, 1b and 1c, were likely to have less beneficial impacts than the two terminal options, due to their comparative disruption to the existing terminal operations.
- Social (criterion S6) – All options were considered likely to maintain and improve the quality of life for residents of Luton and the wider area, with an overall appraisal of slight beneficial for all options.
- Sustainability and Environmental (criteria S7-S15) – For the majority of the sustainability and environment criteria, all four options score less well than for other strategic objectives. All options were considered likely to have slight to moderate beneficial impacts in terms of their resilience to climate change. Option 2 scored less well than the others in terms of the impact on noise levels, cultural heritage, landscape and visual impact, and land use.
- Surface Access (criteria S16-S18) – The three northern options are expected to produce positive increases in public transport modal share, whilst option 2 would require a more difficult Luton DART design solution, which would also be less likely to be attractive to operators and users. Options 1b, 1c and 2 would require additional highway works compared to option 1a. A single terminal option would require more significant infrastructure provision over and above what is currently proposed, compared to the two terminal options,

¹⁶ Ministry of housing, communities & Local Government (2019) National Planning Policy Framework

though it was considered more attractive in public transport terms.

- Deliverability (criteria S19-S22) – The three options which focus development north of the runway all propose occupying part of the area underlain by landfill and would require earthworks to create a platform at an appropriate level, with cost implications. Both the two terminal options scored more positively compared to the single terminal options, being considered more deliverable within the context of the current concession to 2031, as well as being more attractive to future concessionaires. However, Option 2 would require a large area of additional land beyond current LLAL land holdings which reduced its appraisal score.
- Operational Viability (criterion S23-S27) – All options were considered likely to deliver benefits in terms of enhancing LTN's system efficiency and resilience as well as being attractive to airline operators. The two terminal options improved resilience but Option 2, with operations split either side of the runway, was deemed less efficient due to the need to cross the active runway. Two terminal options also could make it easier to safeguard existing levels of maintenance, business aviation and cargo activity, which could remain operational during construction.
- Cost/benefit (criterion S28) – All options were considered likely to deliver positive beneficial impacts, with both two terminal options offering greater financial benefits than the single terminal options

3.3.16 The options were ranked from 'most preferred' to 'least preferred'. Option 2, the southern option, was discontinued due to a substantially greater number of criteria scoring 'large adverse', and a 'currently unworkable' scoring on the conformity to national and local planning policies. Option 1a was ranked the most preferred, and therefore was selected as the preferred option for further development.

3.3.17 The outcomes of the Sift 2 exercise were then shared with the public during Non-Statutory Consultation, which took place between June and August 2018. As part of the consultation, feedback was sought from the public, local authorities and relevant organisations on the options considered at Sift 2, the siting process and the results of the analysis.

Sift 3

3.3.18 The purpose of Sift 3 was to undertake a further appraisal of the options presented in the Non-Statutory Consultation, taking into account the consultation feedback in relation to the sift process as well as further technical work undertaken since Sift 2. The full

results of the Sift 3 work are reported in the Sift 3 Report (February 2019) and summarised in the following sections.

- 3.3.19 The two main changes for appraisal at Sift 3 were:
- Development of a new sub-option, option 1d, which retains Wigmore Valley Park in its current location; and
 - Revision of the Sift 2 option layouts to achieve a target capacity of 32mppa, as opposed to 36-38mppa as originally considered in Sift 1 and Sift 2.

Option 1d

- 3.3.20 One of the concerns raised as part of the consultation regarding the options proposed for the north-side of the existing runway was the potential impact on Wigmore Valley Park. In response to comments from stakeholders and the public a new sub-option, option 1d, was therefore developed which accommodates expansion north of the existing runway whilst retaining Wigmore Valley Park in its current location.

- 3.3.21 Option 1d was appraised using the same method adopted at Sift 2 and when compared with the Sift 2 options was judged to be, by some distance, the least preferred option. This was due to a number of adverse impacts, including the extent of land within the Green Belt and land outside of LLAL's ownership. It also performed poorly against a number of the environmental criteria including Landscape and Visual Impact and Environmental Land Use, as well as operational criteria.

32mppa

- 3.3.22 The options considered in Sift 1 and Sift 2 were assumed to be capable of supporting LTN's expansion up to 36-38mppa, with each option appraised on this basis, in line with LLAL's vision for best use of the runway. However, subsequent assessments, informed by the responses to consultation on this issue, have indicated that the scale of highway capacity enhancement required to achieve 36-38mppa would be beyond the scope of the current DCO project.

- 3.3.23 As a result of these considerations, LLAL has decided to pursue a lower target capacity for the expansion of LTN of 32mppa, subject to further detailed assessment and modelling.

- 3.3.24 All four options from Sift 2 and, additionally option 1d, were reappraised based on 32 mppa layouts instead of the original 36-38mppa. The results of the appraisal were very similar to the original appraisal, with option 1a performing best and option 1d performing worst.

3.3.25 Based on this consideration of all of the available evidence, the Sift 3 process lead to the selection of the preferred option to be developed further and ultimately taken forward to statutory consultation.

Appraisal of alternative elements

3.3.26 Key design elements have been identified where several reasonable alternatives are feasible within the preferred strategic option identified. These alternatives were subject to an appraisal process, using similar criteria to those used in the sift process, and the preferred solution adopted into the developing option layout. These key elements included:

- Landform – the way in which earth is excavated to provide material to construct the airfield platform is being developed with careful consideration of environmental impact. On-site excavation was preferred as this eliminates the need to import material from off-site and associated highway and environmental impacts from HGV movements. Key considerations in selecting the current preferred option were:
 - the provision of replacement open space and habitat before construction commences, that then remains undisturbed;
 - the retention of a ridgeline and trees to provide visual screening and historic landscape value; and
 - the protection of ancient woodland.
- Car Parks – each potential location identified for car parking was reviewed for its suitability for surface or multi-storey car parking, taking into account visual amenity and proximity of sensitive receptors, as well as operational considerations. Several combinations of car parking were developed and appraised. The key considerations in selecting the preferred option were visual impacts, land availability and ability to contribute the deliverability of the surface access strategy.
- Surface and foul water management - The discontinuation of discharging surface water to the underlying aquifer and the capacity of the existing sewerage network mean that on-site treatment with sustainable discharge to ground is the only feasible option for the expanded airport. Options for surface or underground storage were explored, with underground storage selected on the basis of space constraints and the potential safety risk of surface water bodies attracting birds.
- Fuel Farm – There are several options considered in the future fuel manage strategy. Key decisions were whether to expand the existing tank facility or provide a new tank farm, fuel delivery by pipeline or tanker, and fuel distribution by hydrant or bowser. A combination of options, maintaining the

existing facility but providing a new tank farm in the east to allow pipeline connection and hydrant distribution for the new terminal, was selected. Key considerations were minimising the number of additional tanker movements on the roads and bowser movements on site, whilst maintaining the current operation of the existing airport.

- Location of new terminal – with the preferred alternative from the appraisal described above included in the layout, three options for the location of new terminal were appraised. The option closest to the existing terminal was selected for notable construction and airport operational advantages.

Design development

3.3.27 As the design develops through subsequent stages of the project, the environmental team will work closely with the aviation and engineering teams to ensure that environmental considerations are taken into account in decision making. This will include regular interdisciplinary reviews and environmental contribution to design decisions.

3.3.28 An environmental appraisal of key reasonable engineering design and construction options for the Proposed Development will be undertaken as the design develops and uncertainty reduced.

3.4 Description of the Proposed Development

3.4.1 The Proposed Development is characterised by retention of the existing passenger terminal and the provision of a new passenger terminal on land owned by LLAL to the north east of the runway, to give an overall passenger capacity of 32mppa.

3.4.2 To achieve this additional capacity the total number of aircraft stands needs to increase; therefore, the extent of the apron needs to expand and additional taxiways provided. Additional infrastructure to serve increased passengers numbers, including terminal, surface access, and expanded airport support facilities need to be provided.

3.4.3 The main elements of the Proposed Development are described below and the zones in which the different types of development will be located are shown in Figure 3.1 (Volume 2):

- creation of an airfield platform: earthworks from on-site excavation;
- new terminal with boarding piers;
- additional taxiways and aprons (aircraft stands);
- vehicle forecourt and multi-storey short stay/mid-stay car parking adjacent to the terminal. Additional mid- and long stay

surface parking, including replacement where the existing facilities are disturbed;

- airfield facilities: Relocated engine run-up bay, compass swing bay and de-icing area, and fire training facilities;
- landside facilities: Airport associated support buildings such as snow base, energy centre, logistics centre and service yard, and new fuel line connection and storage facilities;
- surface access: Road and infrastructure provision and adjustments. Bus station, taxi ranks and extension of Luton DART to the new terminal;
- surface water and foul management, including drainage, interceptors, surface water attenuation and treatment, foul water collection and treatment, effluent storage and discharge to ground; and
- landscaping: Improvement or replacement of existing and planned public open space and amenities.

3.4.4 Uncertainty remains regarding the exact location and design of certain elements of the Proposed Development. Where possible, uncertainty associated with specific design elements has been highlighted below. The wider approach to uncertainty within the EIA has been described in Section 3.5.

3.4.5 It is considered that there is sufficient understanding of the Proposed Development to allow the identification of likely significant effects and define the scope of the proposed assessment.

Airfield platform

3.4.6 Earthworks will be needed to construct an extension to the airfield platform for the extended apron and create a new landform suitable for the new terminal, car parks, auxiliary airport uses.

3.4.7 This will involve the movement approximately 4,000,000m³ of material. This material will be excavated from the Main Application Site to the east of the platform. The approximate extent of these earthworks is shown as excavation embankments on Figure 3.1 (Volume 2).

3.4.8 The new apron will be approximately 680m long and 280m wide at existing apron height. The side slopes are likely to be a 1 in 3 gradient up to 80m wide. The thickness of the platform will increase moving east from the existing apron to a maximum height of approximately 30m above existing ground level.

3.4.9 The excavation area will vary in depth up to approximately 20m in the north of the area. This remains notably above predicted

groundwater levels. The side slopes of the excavation are expected to have a 1 in 3 gradient.

- 3.4.10 Excavation will result in part of the current open space provision being lost. The replacement open space will be in place prior to the main excavation works commencing, and excavation will take place to the south of that open space. Works, and the Proposed Development within that excavated area, will therefore be screened from residential and recreational receptors to the north of the airport.
- 3.4.11 Part of the Proposed Development will be on an area of the former landfill. It will be necessary to excavate approximately 500,000m³ of landfill material to allow for the construction. This material will be processed under an appropriate environmental permit and the majority will be reused on-site. Foundations will be piled through the landfill to support the new buildings and infrastructure. These will be designed and constructed to protect the underlying groundwater and in close liaison with the Environment Agency.
- 3.4.12 Work to the landfill will be undertaken in a separate screened area towards the middle of the Main Application Site, likely to be hundreds of meters from the boundary. A specialist contractor and best practice will be employed to carefully control birds, dust and odour.

Terminals

- 3.4.13 The new additional passenger terminal will be ultimately sized to process up to 14mppa, taking the total airport capacity from 18mppa to 32mppa. The new terminal is likely to adopt the conventional vertical stacking of Baggage Hall and support at lower ground level with Arrivals and the Departures processing areas stacked in subsequent upper levels. The new terminal is therefore expected to be no more than 2 storeys above ground with a footprint in the region of 40,000m². The new terminal will include boarding piers serving contact stands, that is, aircraft stands connected to the terminal building.
- 3.4.14 The exact location and form of the terminal building will be developed during the subsequent design stages of the project, however, it will be located on the earthworks platform within the envelope shown in Figure 3.1 (Volume 2).
- 3.4.15 The existing terminal will require some refurbishment and minor works in the early phase of delivery to accommodate an increase in passenger capacity until the new terminal is operational. The exact nature of these works is not yet known and will need to be carefully planned with LLAOL to minimise disruption to the operation of LTN. Any proposed works will be to existing infrastructure within an operational airport and therefore not

expected to significantly impact receptors outside of the airport. Once defined, the works will be included in the assessment as appropriate.

Taxiways, aprons and stands

- 3.4.16 The intention is to improve the ratio of contact stands at the expanded airport so that 70% of all commercial passenger stands associated with the new terminal building are contact stands. It is estimated that around 34 new stands will be required around the new terminal, with two thirds of these served directly by piers from the main terminal building.
- 3.4.17 The Proposed Development would contain up to 11 of the passenger aircraft stands capable of servicing larger Code E aircraft, enabling LTN to handle some flights to longer haul destinations.
- 3.4.18 Associated taxiways and aprons will provide the necessary aircraft manoeuvring areas between the terminal and the runway. The exact configuration of taxiways will be optimised during design development and will be located within the envelope shown in Figure 3.1 (Volume 2). Once defined, aviation planners will provide the appropriate information on aircraft ground movements, distance and times, to the assessment team to be incorporated into the assessment as described in this report.
- 3.4.19 These facilities will incorporate the necessary drainage and lighting facilities.

Forecourts, drop off/pick up and car parks

- 3.4.20 The terminal forecourt, bus, coach and taxi stands as well as the drop off and pick up zones will all be incorporated into the lower levels of a multi-storey car park (MSCP) complex at the front or northern side of the new terminal.
- 3.4.21 The exact configuration of this system, and the number of storeys required for the MSCP are under development and not yet confirmed. However, this MSCP will be located between the new terminal, to the south, and the multi-storey hotel and commercial facilities provided as part of the New Century Park development, to the north. Once confirmed, this MSCP can be assessed within the methodology described in this report.
- 3.4.22 The exact number of parking spaces required to accommodate the increase in passenger capacity to 32mppa, is under development. The exact number is dependent upon many factors that are to be agreed in the surface access strategy. The aim of the surface access strategy is to achieve 45% of passengers arriving by public transport. The increase to 32mppa represents a 78% increase in passenger numbers; however, it is expected

that the number of additional parking spaces will represent a notably lower proportional increase.

- 3.4.23 Proposed areas for mid and long stay car parking facilities are shown in Figure 3.1 (Volume 2). Although the exact numbers of parking spaces are not known at this stage, the likely maximum areas required are included in the Proposed Development for the purposes of this Scoping Report.
- 3.4.24 Areas of long stay car parking will be located to the east of the new terminal within the area excavated as part of the earthworks. As long stay parking some distance from the terminal these are likely to be surface level parking. Additional parking may be provided through the provision of a decked area in one of these parking areas closer to the new terminal. This area will be notably lower than the new area of open space provided to the north, and the platform to the south. The configuration of the parking will be confirmed during design development, however, any variation in parking area or height in this area can easily be accommodated in assessment described in this report.
- 3.4.25 There are two areas south west of LTN, along New Airport Way near Luton Airport Parkway railway station, currently under consideration for use as mid stay and/or employee parking, and car hire and return. These are shown on Figure 3.1 (Volume 2). These are previously developed sites located within a commercial area dominated by transport infrastructure at a notably lower level than the existing airfield. If developed as part of this project, these facilities are likely to be multi-storey, require highway access provision, and connective facility to the new Luton DART system. This provides the advantage of taking private cars off the network and allowing passengers or staff to arrive at either terminal by rail. The design of these facilities and associated works will be developed, however, their use as multi-storey car parks has been taken into account in this report.

Airfield facilities

- 3.4.26 It is anticipated that the existing air traffic control tower and fire station will remain in their current locations and continue to service the whole airport.
- 3.4.27 The existing fire training ground, currently located to the east of the long stay car parking, south of Wigmore Valley Park will need to be re-located. It is expected that will be to an area of available space south of the runway within the existing airport boundary.
- 3.4.28 The area of hardstanding currently used as an engine run up pen is located adjacent to the parallel taxiway to the south of the long stay car parking. This will need to be relocated. This facility needs to be in an accessible area of the apron, which is the east end of

the new platform. This dedicated facility will be designed with appropriate noise attenuation.

- 3.4.29 The expanded apron will include appropriate drainage designed to collect surface water for appropriate storage and treatment before discharge. Lighting will also be provided to appropriate safety standards.
- 3.4.30 A range of ground handling facilities and vehicle holding facilities will be located around the apron areas. These are expected to be single storey industrial units the location of which will be defined as the airfield layout is refined.

Landside facilities

- 3.4.31 The increased capacity at LTN will require a larger aviation fuel storage facility than currently available. The existing fuel farm (an area of several tanks) in the west of LTN will be retained and continue to service the present terminal. Aviation fuel will continue to be delivered to this facility site by road tanker and distributed to aircraft by bowser.
- 3.4.32 A new fuel farm will be provided to the east of the new apron allowing a new underground fuel pipeline to be installed connecting to an existing pipeline to the east of LTN. This connection is within the Main Application Site shown on Figure 3.1 (Volume 2). Fuel will be distributed from the new fuel farm to the new aircraft stands by a dedicated hydrant system installed within the new apron. This system eliminates the need for fuel to be transported by road vehicle for the expanded airport.
- 3.4.33 The height of the tanks in the new fuel farm will be confirmed during detailed design. They will be located in the excavated area at the foot of the slope at the end of the extended platform; therefore, screened by the topography with the opportunity to provide further screening vegetation.
- 3.4.34 Hangars, cargo and airport support facilities including service yard, energy centre, and potentially a logistics centre and relocated snow base, will be provided and are expected to be centred around the new terminal and forecourt, to provide appropriate access.
- 3.4.35 These facilities will be located in the areas between the existing airport, the New Century Park proposed hotel and commercial buildings, and the new terminal and apron. The exact size, location and alignment of these low level buildings will be further defined during design development; however, they will be incorporated into the massing of new buildings considered with assessment proposed in this report.
- 3.4.36 Three existing buildings, located along President Way between Airport Approach Road and Prince Way, are likely to be replaced.

They are to the north of the existing terminal as shown in Figure 3.1 (Volume 2). These are currently standard commercial units and are likely to be demolished and new general aviation or maintenance hangars erected in their place.

Surface access

Highways

- 3.4.37 The majority of passengers arriving by road approach and depart through Luton and via the M1 motorway. A new access road, known as the Century Park Access Road (CPAR), is currently proposed as part of the New Century Park planning application under consideration by LBC. This CPAR is included in the baseline for traffic modelling and this assessment, it is not part of the Proposed Development. Modifications to the CPAR design have been identified as required and these modifications are included in the Proposed Development and are described in the Table 3-1.
- 3.4.38 Additional roads connecting to the roundabout at the east end of CPAR located to the north of LTN will provide access to the new forecourt area and airport support facilities, and to the new parking areas in the east of the Main Application Site.
- 3.4.39 Local and strategic traffic models are currently under development and traffic modelling, based on passenger forecasts is underway. This modelling will identify a series of Off-site Highway Interventions that will need to be designed and modelled, to confirm what appropriate highway mitigation will be included in the Proposed Development.
- 3.4.40 Current preliminary results have identified several areas likely to require highway works. These have been considered as part of the Proposed Development in this report, are shown within the Proposed Development boundary in Figure 2.1 (Volume 2), and a brief outline description of the works is provided in Table 3-1 below.
- 3.4.41 Works are within the highway boundary on land controlled by LBC. No buildings are directly impacted by the proposed highway works.

Table 3-1: Potential Indicative Off-site Highway Interventions in the Proposed Development

Junction Name	Outline Description of Potential Works
Windmill Road / Kimpton Road	Minor widening to accommodate three-arm mini roundabout with two lane entries along Windmill Road. Kerb re-alignment.
A505 Gipsy Lane / Parkway Road	Minor widening to accommodate left turns onto A1081 and kerb realignment. Carriageway

Junction Name	Outline Description of Potential Works
	widening to south on A1081 to provide straight ahead lanes.
A505 Kimpton Road / Vauxhall Way	Roundabout replaced with four arm signalised junction. Segregated left turns, widening of approaches, kerb realignment.
Eaton Green Road / Lalleford Road	Mini roundabout replaced with three arm signalised junction
Wigmore Lane / Crawley Green Road / Raynham Way	Roundabouts replaced with signalised junctions with pedestrian facilities. Widening to provide two lane approaches.
Wigmore Lane / Eaton Green Road	Roundabout replaced with four arm signalised junction with pedestrian facilities. Four arm signalised junction with CPAR. Widening to provide two lane approaches. Mini roundabout to be replaced with three arm signalised junction on Wigmore Lane.
A1081 / London Road (North)	Roundabout partially signalised, widening to roundabout circulatory, spiral markings for lane discipline and signage.
Windmill Road / St. Mary's Road / Crawley Green Road Gyratory	Widening to gyratory to provide four circulatory lanes. Widening to approaches and subway portals.
Crawley Green Road / Lalleford Road	Mini roundabout to be replaced with three arm signalised junction.
CPAR / A1081 Junction	Junction tighten and realigned. A1081 realignment, widening for dedicated left turn. Widening of CPAR to provide free flow segregated left turn.
CPAR / Frank Lester Way	Widening of CPAR to give dedicated right turn lanes.
CPAR / Eaton Green Road Link	Roundabout replaced with four arm signalised junction.
Pirton Road / Offley Road	Mini roundabout replaced with four arm signalised junction
A505 Upper Tilehouse Street / A602 Park Way	Roundabout replaced with four arm signalised junction.
A602 Park Way / Stevenage Road	Roundabout signalised.
A602 Stevenage Road / Whitehill Road	Priority junction replaced with three arm signalise junction.
M1 Junction 10	Works under development in consultation with Highways England

3.4.42 The feasibility of removing the Eaton Green Road link provided as part of the CPAR will be explored. The implications on the network will be tested by modelling before a decision on whether to adopt this into the Proposed Development.

Uncertainty

- 3.4.43 The location, nature and extent of Off-site Highway Intervention works will be confirmed by traffic modelling and appropriate outline highway designs will be developed. It is expected that all proposed works to achieve 32mppa will be local improvements to existing highway infrastructure. These will be in urban areas subject to previous development and within the existing highway boundary. No buildings are expected to be directly impacted by highway improvement works.
- 3.4.44 The preliminary modelling and design considered in this report have allowed locations, survey areas, potentially sensitive receptors, and appropriate assessment methodologies to be identified. The developing design and any changes to the proposed works will be developed in collaboration with the environment team and subject to the same assessment process described in this report.

Rail

- 3.4.45 The Luton DART, which provides a rail link between Luton Airport Parkway railway station and the existing passenger terminal, will be extended to serve the new passenger terminal to maximise the modal shift to rail access. This is will be an underground link with a station either below or near the new terminal. The approximate alignment of the extension and location of the new station is shown in Figure 3.1 (Volume 2).

Surface and foul water management

- 3.4.46 The Proposed Development, with new buildings and new areas of apron, will increase the area of hardstanding and remove the existing soakaways currently discharging surface water directly to ground in the east side of LTN. An appropriate drainage strategy including sustainable drainage principles to prevent contaminated surface water from entering the ground and groundwater, with no discharge to surface water courses, has been developed and will be adopted by the developing design.
- 3.4.47 This strategy has been discussed and agreed in principle with the Environment Agency and Lead Local Flood Authorities (LBC, CBC and HCC). The design will be further developed in consultation with them, to ensure proposals are acceptable.
- 3.4.48 The drainage system will collect surface water for storage in underground attenuation tanks for treatment in a dedicated Surface water Treatment Plant constructed as part of the Proposed Development.

- 3.4.49 The system will include appropriate monitoring to allow control, isolation and treatment or disposal in the event of spillage or incident on the apron.
- 3.4.50 A dedicated Effluent Treatment Plant will be provided as part of the Proposed Development to accommodate the increase in sewage generation from the expanded airport.
- 3.4.51 Both treatment facilities will discharge treated effluent into underground storage tanks before final discharge to ground. Accounting for current and proposed topography the treatment plants and discharge point will be located in the excavated area in the east of the Main Application Site as shown in Figure 3.1 (Volume 2). The location is at notably lower elevation than surrounding areas and over 200m from the nearest residential property.

Landscaping

- 3.4.52 Areas of extensive landscaping are proposed in replacement open space to the north east of the proposed infrastructure as shown in Figure 3.1 (Volume 2). This will include maintaining the improved area of Wigmore Valley Park to the north, proposed as part of the New Century Park planning application. Connected to this, an area of open space to replace that lost from Wigmore Valley Park and provide potential screening planting, will be provided stretching east to the south of Darley Road towards Winch Hill.
- 3.4.53 This replacement open space will be provided before major earthworks commence and is expected to be maintained throughout construction of the Proposed Development.
- 3.4.54 During development of the landscape design the landscape architect will collaborate closely with ecologists to ensure that appropriate habitats and biodiversity features are incorporated into the design.

3.5 Uncertainty

- 3.5.1 The existing operational airport and surrounding environment contain key physical and operational constraints which mean the key known components of the Proposed Development will be located in the zones or envelopes indicated in Figure 3.1 (Volume 2).
- 3.5.2 This scoping report, and the proposed assessment methodologies described within it, have been prepared based on the infrastructure being located within these zones. The design of the known elements of the Proposed Development, and expected mitigation, will be developed to further establish location, orientation, height, layout and appearance but are

expected to remain within the flexibility inherent to the assessment methodologies proposed.

- 3.5.3 Key engineering designs, fundamental to the operation of the airport will be 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.
- 3.5.4 Remaining uncertainty will be considered in the ES using Rochdale (Design) Envelope approach set out 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).
- 3.5.5 The Planning Inspectorate's Advice Note Nine defines key principles for how flexibility in design can be considered during the EIA when final design details are not available. Consent can be granted for a development conditional to further details being agreed prior to construction of a proposed development on the basis the Rochdale Envelope approach.
- 3.5.6 Using this approach, design parameters will be used to assess the maximum adverse scenarios in the EIA i.e. a reasonable 'worst case scenario'. Realistic worst-case scenarios will be based on parameter plans within which a degree of flexibility in final design details can be maintained; therefore, allowing detailed design to be developed without affecting the validity or robustness of the conclusions of the EIA.
- 3.5.7 There has been no concerted effort to reduce the scope of the EIA based on specific locations of elements of the Proposed Development. Variations in the exact location or massing of key elements are not likely to result in additional subjects or fundamental changes to assessment methodologies being required.
- 3.5.8 This approach will be clearly reported in the ES and will reassure the Secretary of State that potential significant environmental effects have been fully assessed.

3.6 Phasing and construction

Capacity phasing

- 3.6.1 The Proposed Development will be constructed to meet forecast aviation demand. Table 3-2 shows the current forecast passenger demand and the currently proposed airport capacity phasing required to meet that demand between existing and new terminals.

Table 3-2: Forecast Passenger Demand and Capacity Phasing

Year	Passenger Demand	Existing Terminal Capacity (mppa)	New Terminal Capacity (mppa)
2020	18	18	-
2021	18.8	18	-
2022	19.5	21	-
2027	22	18	7
2030	25.4	18	10
2036	28.7	18	14
2038	31.6	18	14

Construction phasing

3.6.2 The construction of infrastructure will be phased to allow the airport to have capacity in time to meet passenger demand and ensure good standards of customer service, within financial constraints. Key to unlocking this capacity is the construction of the earthworks for the airfield platform followed by the incremental construction of the required infrastructure on top of it. Therefore, construction is likely to be in two key phases:

- Phase 1 - to achieve a design capacity of 25mppa opening in 2027
- Phase 2 - to achieve a design capacity of 32mppa by 2036

3.6.3 The actual throughput of the airport will then follow in line with passenger demand as described in Table 3-2.

3.6.4 Within these phases the sequencing and any sub-phases of construction activities will be defined as the design develops, and further details will be provided by the design and constructability teams to inform the construction impact assessments described in this report.

3.6.5 A brief indicative outline of the key elements of work to be undertaken during these main phases is provided below:

Phase 1

3.6.6 During Phase 1 works may include:

- provision of additional stands and interim capacity works to the existing terminal;
- enabling works & site set-up;
- works to underground utilities;
- construction of temporary car parks and access roads;
- replacement open space;

- construction of a landfill treatment compound;
- construct of a fuel farm;
- installation of sheet piling;
- landfill treatment;
- construction of water and effluent treatment plants, fire training ground, and taxiways;
- installation of new drainage and diversions and disconnections;
- excavation and platform construction
- car parks;
- DART extension;
- construction of a new terminal, apron, taxiways, ancillary buildings; and
- installation of security and fencing.

Phase 2

3.6.7 During Phase 2 works may include:

- enabling works & site set-up
- excavation and construction of platform extension;
- apron extension;
- extension to the new terminal;
- construction of ancillary buildings;
- provision of additional forecourt and car parks.

Code of Construction Practice

3.6.8 A project specific Draft Code of Construction Practice (Draft CoCP) will be prepared that will describe the environmental management and mitigation requirements to be implemented for the delivery of the Proposed Development. The Draft CoCP will describe best practice measures and mitigation to be implemented and assumed in place during the EIA, and provide a mechanism for securing additional mitigation measures specifically identified during the EIA.

3.6.9 The Draft CoCP will be submitted as part of the application, the preparation of a final CoCP will be a requirement placed on the appointed contractor and must be agreed with Local Planning Authority before work commences.

3.6.10 The Draft CoCP will be presented in two parts, the first providing an outline of the general provision for environmental management for the construction of the Proposed Development,

and a description the documents and plans that will be developed in detail as the project progresses.

3.6.11 The second part of the Draft CoCP will include draft plans to secure all recommended mitigation incorporated from the ES and act as the implementation mechanism that must be agreed with the local planning authority in advance of construction activity. These plans will be developed in detail during the detailed design stage and in advance of construction as a condition of the DOC.

3.6.12 The draft plans proposed to be provided as part of the Draft CoCP are:

- Construction Environmental Management Plan;
- Site Waste Management Plan;
- Construction Traffic Management Plan;
- Materials Management Plan;
- Soils Management Plan;
- Construction Noise Management Pan;
- Air Quality Management Plan; and
- Surface Water Management Plan.

4 POLICY CONTEXT

4.1 Introduction

4.1.1 This chapter sets out the policy context within which the Proposed Development will be considered. This includes national, regional, and local planning policy and aviation policy.

4.1.2 As a NSIP, the statutory framework for deciding applications for development consent is contained in the Planning Act. Section 104 sets out the considerations that the decision maker must have regard to:

- any national policy statement which has effect in relation to development of the description to which the application relates;
- any local impact report;
- any matters prescribed in relation to development of the description to which the application relates; and
- any other matters which the Panel or Council thinks are both important and relevant to its decision.

4.1.3 The Secretary of State must take national policy and local development plans into consideration if they are thought 'both important and relevant' to the decision. The indicative Application Sites' boundaries for the Proposed Development lies within LBC and Central Bedfordshire Council (CBC), and North Hertfordshire District Council (NHDC).

4.1.4 The purpose of considering national and local planning policy at the scoping stage for this EIA is threefold:

- to identify policy that could help understand the characteristics of resources and receptors (and therefore the significance of effects), including designations and policies to protect resources that could be affected by the project;
- to identify policy that could influence the methodology and approach to EIA for a specific topic; and
- to identify policy that could influence the type of mitigation measures that could be incorporated into an Airport development during construction or operation.

4.1.5 Policies relevant for different environmental topics are described in the introductory sections for each of the topic specific chapters of the Scoping Report.

4.2 National planning and aviation policy

Airports National Policy Statement – June 2018

- 4.2.1 National Policy Statements (NPS) set out the government's objectives for the development of NSIPs in a particular sector. The 'Airports National Policy Statement: new runway capacity and infrastructure at airports in the south-east of England' (the ANPS)¹⁷ was designated on 26 June 2018, providing a policy framework for new runway capacity and infrastructure at airports in the South East of England.
- 4.2.2 The ANPS focuses on the Heathrow Northwest Runway and associated new terminal capacity and "has effect" in relation to this development at Heathrow. However, the general provision in the ANPS will be "*an important and relevant consideration in respect of applications for [...] airport infrastructure in London and the South East of England*"¹⁷. The ANPS therefore does not meet criteria (a) of Section 104(2) of the Planning Act and will not "have effect" in relation to the development at LTN. It will however be an important and relevant consideration in the determination of a DCO application for LTN¹⁸. The ANPS will be relevant alongside other considerations, such as, national and local planning policy and aviation policy, in determining a DCO application for LTN.
- 4.2.3 The support for growth of existing airports in the South East is set out in paragraphs 1.39 and 1.42 of the ANPS, noting that any developer is expected to submit an application for planning permission or development consent. It accepts that existing airports may be able to demonstrate sufficient need for their proposals, additional to (or different from) the need which is met by the provision of a Northwest Runway at Heathrow.
- 4.2.4 Paragraph 4.4 states that "*in considering any proposed development, and in particular when weighing its adverse impacts against its benefits, the Examining Authority and the Secretary of State will take into account:*
- *Its potential benefits, including the facilitation of economic development (including job creation) and environmental improvement, and any long term or wider benefits; and*
 - *Its potential adverse impacts (including any longer term and cumulative adverse impacts) as well as any measures to avoid, reduce or compensate for any adverse impacts."*

¹⁷ Paragraph 1.12, ANPS

¹⁸ Paragraph 1.12 and 1.41, ANPS

- 4.2.5 A summary of the ANPS policies of relevance to specific environmental topics are set out in the relevant topic chapters of this Scoping Report.

National Policy Statement for National Networks – December 2014

- 4.2.6 The National Policy Statement for National Networks (NPS NN)¹⁹ sets out the need for development of road, rail and strategic rail freight interchange projects on the national networks and the policy against which decisions on major road and rail projects will be made.
- 4.2.7 The nature and extent of works that may be required at or near Junction 10 of the M1, as part of the Proposed Development, or implemented by Highways England during the development programme for the Proposed Development, is not yet fully known. However, should the NPS NN become relevant, it will be taken into consideration.

Aviation Policy Framework – March 2013

- 4.2.8 The Aviation Policy Framework (APF)²⁰ sets out the Government's current policy on aviation. The APF is a high-level strategy setting out the Government's overall objectives for aviation, and the policies they will use to achieve to these objectives. It states support for a growth in the aviation sector, which is a major contributor to the national economy. The APF sets out a framework which aims to maintain a balance between the benefits of aviation and its costs, particularly associated with climate change and noise.
- 4.2.9 The key parts of the APF relevant to the environmental impact assessment are set out below:
- Part 12 refers to ensuring that global and local environmental impacts of aviation are balanced with an aviation sector which makes a significant and cost-effective contribution towards reducing global emissions.
 - Part 17 refers to an aim to limit or reduce the number of people significantly affected by aircraft noise.
 - Part 20 highlights an objective to encourage close working between communities and airline industries and refers to the 'particular burden' of those who live closest to airports and benefits from employment or convenient air travel.

¹⁹ Department for Transport (2014) National Policy Statement for National Networks Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/387222/npsnn-print.pdf [Accessed March 2019]

²⁰ Secretary of State for Transport (2013), Aviation Policy Framework

Aviation Strategy

- 4.2.10 The Government has prepared a draft of the Aviation Strategy²¹ which will replace the APF when finalised. This is currently subject of consultation. This sets out the Government's policy for the more intensive use of existing airports across the UK. The Strategy recognises that "*airports are vital hubs for local economies, providing connectivity, employment, and a hub for local transport schemes*". This Strategy will also be a relevant consideration for the DCO application and will need to be taken account of for the environmental impact assessment.
- 4.2.11 As part of the emerging Aviation Strategy, the Government published the policy paper entitled 'Beyond the horizon: The future of UK aviation, Making best use of existing runways'¹². In this paper, the Government sets out its support for airports beyond Heathrow making best use of their existing runways, subject to related economic and environmental considerations being taken into account.

National Planning Policy Framework (NPPF) – February 2019

- 4.2.12 The revised NPPF was published in February 2019. The NPPF sets out the Government's planning policies for England, and how they should be adopted.
- 4.2.13 The Framework does not contain specific policies for nationally significantly infrastructure projects, however some of the policies are likely to be important and relevant for determining a DCO application, as confirmed at paragraph 5 of the NPPF.
- 4.2.14 At the heart of the NPPF is a presumption in favour of sustainable development. Paragraph 11 sets out the core planning principles to underpin both plan-making and decision-taking.
- 4.2.15 Chapter 2 of the NPPF centres on how the planning system should contribute to the achievement of sustainable development. Paragraph 8 sets out the three overarching objectives for achieving sustainable development – an economic objective, a social objective, and an environmental objective, each of which are "*interdependent and need to be pursued in mutually supportive ways*".
- 4.2.16 Chapter 6 of the NPPF sets out the planning policies and decisions which should help to create the conditions in which businesses can invest, expand and adapt. Paragraph 80 states

²¹ HM Government (December 2018) Aviation 2050 – the future of UK Aviation. A consultation. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/769695/aviation-2050-web.pdf [Accessed March 2019]

“significant weight should be placed on the need to support economic growth and productivity, taking into account both local business needs and wider opportunities for development.”

- 4.2.17 Chapter 9 of the NPPF promotes sustainable transport in relation to new developments. Paragraph 104 notes that planning policies should *“provide for any large scale transport facilities that need to be located in the area, and the infrastructure and wider development required to support their operation, expansion and contribution to the wider economy”*. In addition, it states that planning policies should *“recognise the importance of maintaining a national network of general aviation airfields, and their need to adapt and change over time- taking into account their economic value in serving business, leisure, training and emergency service needs, and the Government’s General Aviation Strategy”*
- 4.2.18 Chapter 13 of the NPPF relates to protecting Green Belt land. Paragraph 133 notes that the fundamental aim of Green Belt policy is *“to prevent urban sprawl by keeping land permanently open; the essential characteristics of Green Belts are their openness and their permanence”*. As with previous Green Belt policy, paragraph 143 states *“inappropriate development is, by definition, harmful to the Green Belt and should not be approved except in very special circumstances”*.

4.3 County planning policy

Hertfordshire Local Transport Plan (2018-2031) – May 2018

- 4.3.1 HCC adopted the Hertfordshire Local Transport Plan (LTP) in May 2018²². The LTP recognises the planned growth initiative at Luton Airport, acknowledge the desire to make *“best of use of the existing runway with assessments identifying the capacity of the existing runway being 36-38 mppa”*.
- 4.3.2 Draft Policy 11 – Airports, states:
- “The county council, working in partnership with neighbouring local authorities and airport operators, will seek improvements to surface access to Luton and Stansted Airports, and promote and where possible facilitate a modal shift of both airport passengers and employees towards sustainable modes of transport.*
- The county council is opposed to new runway development at Luton and Stansted Airports.”*

²² Hertfordshire County Council, (2018): Local Transport Plan 2018-2031

4.4 Local planning policy

Luton Borough Council

Luton Local Plan 2011-2031 – November 2017

- 4.4.2 The Luton Local Plan²³, is supportive of the sustainable growth of LTN. Strategic Objective 1 is to:

“Retain and enhance Luton’s sub-regional role as a place for economic growth and opportunity including the safeguarding of London Luton Airport’s existing operations and to support the airport’s sustainable growth over the Plan period based on its strategic importance”

- 4.4.3 Policy LLP6 relates specifically to airport development, as set out below:

Policy LLP6 – London Luton Airport Strategic Allocation

“The London Luton Airport Strategic Allocation (approximately 325 hectares) includes land within the airport boundary, Century Park and Wigmore Valley Park (as identified on the Policies Map). The allocation serves the strategic role of London Luton Airport and associated growth of business and industry, including aviation engineering, distribution and service sectors which are important for Luton, the sub-regional economy, and for regenerating the wider conurbation.

Airport Safeguarding A. *Development that would adversely affect the operational integrity or safety of London Luton Airport will not be permitted...*

Airport Expansion B. *Proposals for expansion of the airport and its operation, together with any associated surface access improvements, will be assessed against the Local Plan policies as a whole taking account of the wider sub-regional impact of the airport...*

Airport-related Car Parking C. *Proposals for airport related car parking should be located within the Airport Strategic Allocation, as shown on the proposals plan (excluding Century Park and Wigmore Valley Park) and will need to demonstrate that the proposals: meet an objectively assessed need; do not adversely affect the adjoining highway network; and will not lead to detriment to the amenity of the area and neighbouring occupiers...*

²³ Luton Borough Council (2017). *Local Luton Plan 2011-2031*. Available at: <https://www.luton.gov.uk/Environment/Lists/LutonDocuments/PDF/Local%20Plan/adoptio n/Luton-Local-Plan-2011-2031-November-2017.pdf> [Accessed March 2019]

Century Park D. *Development of Century Park will be supported where proposals make provision for office, manufacturing and distribution employment. Particular support will be given and provision made for engineering and manufacturing for both aerospace and automotive purposes that demonstrate a need to locate close to the airport. In addition a range of accommodation types, including small scale affordable B2 units, to facilitate the expansion and relocation of existing Luton-based businesses, new business start-ups as well as significant inward investments will be allowed provided that it does not generate bad neighbour issues. Warehousing-only developments must demonstrate a need to co-located near the airport. Small scale retail, related services and leisure (as defined in Use Classes A1 to A3 and D2) will be permitted in order to serve the needs primarily, of employees in the area, as well as a hotel (Use Class C1). The Council will require proposals to be subject to a comprehensive development brief or Master Plan which shall set out the proportion and phases of development and which shall include the following:*

- *Details of the proposed access, which shall be via the extension of New Airport Way (which connects the airport to M1 J10A) and shall link Percival Way through to Century Park (as shown by the arrow on the Policies Map), such access shall be designed so as to ensure that no use is made of Eaton Green Road to provide access to Century Park or the Airport, except for public transport, cyclists, pedestrians and in case of emergency; and*
- *secure opportunities to link site access via walking, cycling and bridleways to the wider network of routes via Wigmore Valley Park and access to the countryside to the east and south.*

Wigmore Valley Park E. *Wigmore Valley Park is integral to the London Luton Airport Strategic Allocation. In delivering development and access under clause D (i.e. Century Park) above, including any reconfiguration of the land uses that may be necessary, the following criteria will need to be satisfied:*

- *provision will be made to ensure that the scale and quality of open space and landscaping in the area is maintained, and if feasible, ensure that there is a net increase in open space provision;*
- *bio-diversity will be enhanced and improved within the Borough;*
- *that the new open space to replace Wigmore Valley Park offers facilities of at least equal quality and is available and accessible before any development takes place on the existing Wigmore Valley Park; and*

- *the long-term management of open space, landscaping and bio-diversity interest is compatible with that for safe airport operations and will be of a high quality and secured through a legal agreement establishing long term funding.*

Design and Drainage F. Development proposals for the London Luton Airport Strategic Allocation will ensure:

- *appropriate strategic landscaping to be provided both on and off site, which shall have regard to the potential for significant visual prominence within the wider area of built development at Century Park and which does not increase risk to aviation operations arising from structures, lighting, bird strike or open water and having regard to operational and national security considerations;*
- *the height and design of buildings will reflect the site's rural fringe setting, its high visibility from surrounding countryside and its proximity to London Luton Airport;*
- *provision is made for sustainable drainage and the disposal of surface water in order to ensure protection of the underlying aquifer and prevent any harm occurring to neighbouring and lower land; and*
- *that development proposals, where applicable / appropriate will fully assess the impacts upon heritage assets and their setting, and should be designed to avoid harm to the setting of any heritage assets. Proposals will be considered in line with Policy LLP30 (historic environment)."*

4.4.4 In addition, several topic specific policies are applicable to development at the airport. Policies will be set out within appropriate topic chapters of this Scoping Report:

- Policy LLP1 – Presumption in Favour of Sustainable Development
- Policy LLP4 – Green Belt
- Policy LLP13 – Economic Strategy
- Policy LLP27 – Open Space and Natural Greenspace
- Policy LLP28 – Biodiversity and Nature Conservation
- Policy LLP29 – Landscape & Geological Conservation
- Policy LLP30 – Historic Environment

Central Bedfordshire Council

South Bedfordshire Local Plan 2004-2011

4.4.5 The existing Local Plan for Central Bedfordshire comprises the South Bedfordshire Local Plan 2004-2011. Although LTN is not

within the district, the South Bedfordshire Local Plan recognises its importance. The Local Plan supports raises concerns about the environmental impact particularly on local communities below the flight paths. It requests that any future expansion is kept within acceptable environmental limits.

4.4.6 The following policies should also be taken into consideration relating to the future expansion of LTN. Policies will be set out within appropriate chapters of this Scoping Report.

- Policy GB1 – Green Belt
- Policy NE3 – Control of Development in the Areas of Great Landscape Value
- Policy NE6 – The Protection of Features of Nature Conservation Value
- Policy BE1 – Control of Development affecting Scheduled Ancient Monuments and Areas of Archaeological Importance

Central Bedfordshire Local Plan 2035: Pre-Submission – January 2018

4.4.7 A key spatial objective of the Central Bedfordshire pre-submission Local Plan²⁴ is to identify opportunities for strategic growth, including relating to the expansion of LTN.

4.4.8 Within the Local Plan, identified locations for future growth “respond to proposals for future strategic infrastructure delivery; namely the realignment of the A1 or significant improvements through Central Bedfordshire, East West Rail, the Expressway and the expansion of Luton Airport”.

North Hertfordshire District Council

Saved policies from the North Hertfordshire District Local Plan No. 2 with Alterations (April 1996)

4.4.9 As North Hertfordshire does not have an adopted local plan, the saved policies of the North Hertfordshire District Local Plan No. 2 with Alterations (April 1996) currently forms the most up to date plan.

4.4.10 Of relevance to the airport expansion is ‘Policy 2 – Green Belt’.

“In the Green Belt, as shown on the Proposals Map, the Council will aim to keep the uses of land open in character. Except for proposals within settlements which accord with Policy 3, or in very special circumstances, planning permission will only be granted for new buildings, extensions, and changes of use of

²⁴ Central Bedfordshire Council (2018). *Central Bedfordshire Local Plan 2035: Pre-Submission*. Available at: http://www.centralbedfordshire.gov.uk/Images/pre-submission-local-plan-compressed-v2_tcm3-27081.pdf [Accessed March 2019]

buildings and of land which are appropriate in the Green Belt, and which would not result in significant visual impact.”

North Hertfordshire District Council Proposed Submission Local Plan 2011-2031 - October 2016²⁵

- 4.4.11 No reference is made regarding the potential expansion of LTN, however implications of noise from flight paths to the airport is highlighted as a constraint for housing allocations EL1, EL2 & EL3 – East of Luton and KW1 – Breachwood Green.
- 4.4.12 ‘Policy SP5 – Countryside and Green Belt’ will also be relevant to the application for the development consent.

²⁵ North Hertfordshire District Council (2016). *Local Plan 2011-2031*. Available at: <https://www.north-herts.gov.uk/sites/northherts-cms/files/Proposed%20Submission%20Local%20Plan.pdf> [Accessed March 2019]

5 APPROACH TO ASSESSMENT

5.1 Introduction

5.1.1 This chapter provides an overview of the approach to the EIA, including the approach to the EIA assessment scenarios, and general methodology used to provide consistency across assessment topics. Information on other proposed assessments associated with, but separate to the EIA, is also provided.

5.2 Approach to the scope of assessment

5.2.1 Regulation 14 and Schedule 4 of the EIA Regulations identifies the information for inclusion in an ES. This includes the identification of environmental aspects considered likely to be significantly affected by the Proposed Development. These significant effects may be direct or indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent or temporary, positive or negative²⁶.

5.2.2 Aspects of the environment that should be considered as part of the EIA²⁷, and where they will be addressed further in this Scoping Report are shown in Table 5-1.

Table 5-1: EIA environmental aspects and their location in the Scoping Report

Aspects within the EIA Regulations	Topics in this Scoping Report
Population	Health and Community is considered in Chapter 15 Economics and Employment is considered in Chapter 14 Traffic and transportation is considered in Chapter 7 Noise and Vibration is considered in Chapter 10
Human health	Health is considered in Chapter 15
Biodiversity (for example fauna and flora)	Biodiversity is considered in Chapter 17
Land (for example land take)	Land Use and Agriculture is considered in Chapter 16 Public open space is addressed in Chapter 15 Land of ecological value is considered in Chapter 17
Soil (for example organic matter, erosion, compaction, sealing)	Soil is considered in Agriculture, and Soils and Geology in Chapter 11 and 16 respectively.

²⁶ Schedule 4, Paragraph 5, EIA Regulations

²⁷ Schedule 4, Paragraph 4, EIA Regulations

Aspects within the EIA Regulations	Topics in this Scoping Report
Water (for example hydromorphological changes, quantity and quality)	Water Resources and Flood Risk Assessment are considered in Chapter 12
Air	Air quality is considered in Chapter 6
Climate (for example greenhouse gas emissions, impacts relevant to adaptation)	Climate Change, including greenhouse gases and resilience and adaptation, is considered in Chapter 8 and Chapter 9
Material assets	Agriculture is considered in Chapter 16 Waste and resources is considered in Chapter 13 Community is considered in Chapter 15 Cultural Heritage is considered in Chapter 19
Cultural heritage (including architectural and archaeological aspects)	Cultural Heritage is considered in Chapter 19
Landscape	Landscape and Visual aspects are considered in Chapter 18

5.2.3 The EIA will not address all of the Proposed Development's potential environmental impacts, but rather, will focus on the elements which are likely to lead to significant environmental effects, in accordance with the EIA Regulations and the Planning Inspectorate's Advice Note 7. Therefore, elements which are not considered to lead to significant effects may be 'scoped out'. This may include whole topics, or particular matters within topics which is described further in the following sections of this Scoping Report.

5.2.4 Table 5-2 presents an overview of the proposed scope of the EIA and the topics which have been considered.

Table 5-2: Summary of Scoped In/Out topics

Topic	Scoped In	Scoped Out
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
Traffic and transportation	Severance. Pedestrian delay. Pedestrian amenity. Driver stress and delay. Accidents and safety. Hazardous loads.	n/a
Climate change	Construction and Operation:	Impacts of sea level rise.

Topic	Scoped In	Scoped Out
	In-combination climate change impacts. Climate Change Resilience.	Decommissioning.
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.
Noise and vibration	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.	Operational vibration. Traffic vibration.
Soils and geology	Construction and operation impacts on: Land quality with respect to soils contamination including soil gases. Mineral extraction.	Geomorphological and geological features of scientific interest and importance. Off-site Highway Interventions.
Water resources	Construction and operation impacts on: Surface water flood risk. Surface water features. Groundwater features. Water Framework Directive (WFD) bodies. Abstractions and Source Protection Zones.	Flooding associated with rivers and groundwater.
Waste and resources	Construction and operational waste generation and resource requirements.	Waste arising from extraction, processing and manufacture of construction components and products.

Topic	Scoped In	Scoped Out
	Impact on waste management infrastructure.	Environmental impacts associated with the management of waste.
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.	n/a
Health and Community impacts	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.	Overall population exposure to air pollution. Electromagnetic interference. Health effects of water, groundwater, flooding or major accidents. Community impacts on individuals.
Agricultural Land Quality and Farming Circumstances	Construction effects on: Best and most versatile agricultural land; Soil resources; Local agricultural holdings.	Operational impacts. Rural land designations.
Biodiversity	Construction and operation effects on: Designated sites; Priority habitats; Protected species; and Notable flora and fauna	Water courses, otter, water vole, white-clawed crayfish, aquatic invertebrates. Great crested newt, hazel dormouse.
Landscape and visual	Construction and operation effects on: Constituent elements of the landscape; Specific aesthetic or perceptual qualities of the landscape; Character of the landscape; and People who will be affected by changes in views or visual amenity.	Effects on private views.
Cultural Heritage	Construction and operation effects on: Designated heritage assets, including Scheduled Monuments,	n/a

Topic	Scoped In	Scoped Out
	listed buildings, Registered Parks and Gardens and conservation areas. Non-designated heritage assets, including locally listed buildings and archaeology.	
Major accidents and disasters	Assessment of expected significant effects arising from the vulnerability of the construction and operation of the Proposed Development to MA&D	LTN activities not altered by the Proposed Development or do not affect the vulnerability of the Proposed Development to MA&D events. Members of the public who wilfully trespass. Events of any likelihood with a low consequence. Expected or planned impacts.

5.2.5 The assessment of potentially significant effects arising from the decommissioning of the Proposed Development has been scoped out of the EIA. It is considered that the airport, once operational, will be a permanently functional airport, and that the site will not be undertaking activities that pose a long-term risk requiring detailed decommissioning plans or assessment.

5.3 The Environmental Impact Assessment process

Overview

5.3.1 The EIA will be undertaken in accordance with the EIA Regulations, the Planning Act, and relevant guidance, including the Planning Inspectorate’s Advice Notes.

5.3.2 The EIA will be carried out in a number of stages as follows:

- **Scoping:** The Scoping Report collates initial information on the Proposed Development. This includes information regarding the construction and operation, topics to be scoped into the EIA or out, how they will be assessed and the potential likely significant effects as a result of the Proposed Development. The Scoping Report is submitted to the Planning Inspectorate who consults with the prescribed relevant stakeholder bodies prescribed under Sections 42 and 43 of the Planning Act. The prescribed stakeholder bodies have 28 days to respond to the Secretary of State regarding the information provided. The Secretary of State can then provide a formal written opinion on the information to be included in the ES within 42 days of receiving the scoping request.

- **Baseline data gathering and consultation:** this provides the description of existing environmental conditions within the defined Study Area for each topic. This may include site survey data, or information available through public records or directly from stakeholders such as Historic England or the Environment Agency. Consultation will be undertaken in accordance with Section 42 of the Planning Act. Prescribed stakeholder bodies will be consulted as part of the scoping process, supported by wider pre-application non-statutory stakeholder engagement activities undertaken as part of the DCO process.
- **Initial assessment of the environmental effects of the Proposed Development.**
- **Identification of mitigation measures:** This includes measures beyond those embedded within the design of the Proposed Development. For example, this will include the preparation of a Draft CoCP which outlines control measures, procedures and standards that must be used during construction. Additional mitigation will be identified in response to significant adverse effects identified in the EIA.
- **Residual effects assessment:** Residual environmental effects of the Proposed Development will be described, taking into account the effectiveness of proposed mitigation measures.
- **Preliminary environmental information:** A Preliminary Environmental Information Report (PEIR) will be produced containing information for inclusion in the ES. This document will be consulted upon as part of the statutory consultation.
- **Preparation of the ES:** This involves the final reporting of the whole EIA process in an ES which may comprise several documents, volumes and appendices and will be supported by a non-technical summary. These documents will be submitted with the application for the DCO.

5.3.3 Throughout this process, the EIA team will work in close collaboration with the design and engineering team to iteratively influence the design of the Proposed Development, ensuring impacts are avoided, reduced, minimised and appropriate mitigation is embedded or adopted where practicable.

Establishing the baseline conditions

5.3.4 The current environmental and physical conditions of the site ('the baseline') need to be 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.

5.3.5 Site visits, walkover surveys and initial desk-based baseline data collection has been undertaken prior to scoping to inform this

report. Details of specific visits and surveys are provided in individual topic chapters of this Scoping Report. Further, more extensive, studies will be undertaken to inform the EIA.

- 5.3.6 Due to the long timescales required to deliver the construction of the Proposed Development, the EIA will need to be carried out in relation to conditions that are likely to occur in future construction and operational years, defined further below.

Assessment scenarios/years

- 5.3.7 For each topic, the likelihood of significant effects will be considered in terms of:

- Construction – effects associated with the demolition or construction activities required for the Proposed Development.
- Operation – effects associated with the operation of the Proposed Development following completion of construction.
- 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.

- 5.3.8 As described in **Chapter 3 The Proposed Development**, the construction of the Proposed Development is intended to commence in 2021, and will be delivered over two phases. Sub-phases and construction activities during these two phases will be defined during further design development.

- 5.3.9 The Proposed Development will be implemented over a number of years; therefore, several assessment years will be defined and considered in the EIA. These will be defined by and a consistent with the aviation forecasts, surface access modelling and assessment, and predicted construction activity. The assessment scenarios considered are proposed to be:

- Existing baseline conditions;
- Future baseline conditions – multiple future baseline scenarios will be described, taking into account ongoing and proposed airport developments and predicated changes that would take place without the Proposed Development, for example, changes in airline fleet mix;
- Maximum capacity of the existing terminal;
- Phase 1 capacity of the new terminal – This will be when Phase 1 initial design capacity is reached as defined by forecast demand, sometime after opening physical capacity;
- The year of predicted maximum environmental effect during construction – This 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;

- Year of maximum ATMs, passengers and road vehicles i.e. when the final proposed maximum capacity of the Proposed Development is expected to be reached.

5.3.10 Within each assessment discipline there may be additional years considered in the assessment, these will be identified in the specific methodologies if required.

Assumptions and limitations

5.3.11 Known assumptions and limitations specific to individual topic assessments are detailed in topic chapters of this Scoping Report.

5.3.12 General limitations include:

- Baseline conditions are specific to each topic and are considered to be accurate at the time when surveys are 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.
- Air space is being redesigned across the south east of England as a separate process outside of this Proposed Development. The assessment will assume existing flight paths remain. Further details are provided in section 5.4.
- The assessment of cumulative effects is dependent on the availability of information at the time of assessment in relation to other identified developments.

Defining significance

5.3.13 The terms 'impact' and 'effect' in EIA are distinctly 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.

5.3.14 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 are presented within the relevant topic chapters of this Scoping Report.

Impacts

5.3.15 The following factors will be taken into account when identifying potential impacts, in accordance with the EIA Regulations²⁸:

- the magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected);
- the nature of the impact;
- the transboundary nature of the impact;
- the intensity and complexity of the impact;
- the probability of the impact;
- the expected onset, duration, frequency and reversibility of the impact;
- the cumulation of the impact with the impact of other existing and/or approved development; and
- the possibility of effectively reducing the impact.

Effects

5.3.16 Resulting effects will be described as **significant** or **not significant**. This will take into consideration the sensitivity and value of a receptor, and the magnitude of impacts upon these receptors.

Receptor value/sensitivity

5.3.17 Table 5-3 provides a general guide for the classification of value and sensitivity.

Table 5-3: 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.
Low	Value: Feature/receptor not designated or only designated at a district or local level. Feature/receptor only possesses characteristics which are locally significant.

²⁸ Schedule 3, Paragraph 3 Types and characteristics of the potential impact, EIA Regulations

Value/sensitivity	Guidelines
	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.

Magnitude

5.3.18 Table 5-4 provides a general guide for the classification of magnitude of impact.

Table 5-4: 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

5.3.19 A generic matrix used for the classification of effects is provided in Table 5-5. As with the descriptions of value/sensitivity and magnitude, where topic-specific alternatives exist, these are presented in the relevant topic chapter of this Scoping Report.

Table 5-5: 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

5.3.20 A generic description of effects is provided in Table 5-6.

Table 5-6: 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 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.

5.3.21 Major and moderate effects are considered to be **significant**, whilst minor and negligible effects are considered to be **not significant**. However, professional judgement can also be applied where necessary.

5.3.22 Topic specific assessment methodologies are described further in **Chapters 6 to 20** based on guidance and legislation appropriate to that topic.

Approach to mitigation

5.3.23 The ES will include a description of the measures envisaged to prevent, reduce and, where relevant, offset any significant adverse effects.

5.3.24 In line with IEMA Guidance and professional best practice, consideration will be given to three key types of mitigation:

- Primary Mitigation (also known as Embedded or Inherent mitigation);
- Secondary Mitigation (also known as Additional or Foreseeable mitigation); and
- Tertiary Mitigation (also known as Good Practice or Inexorable mitigation).

Primary mitigation ('Embedded')

5.3.25 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, compensatory green space for protected species and public use.

Secondary mitigation ('Additional')

- 5.3.26 Individual topic assessments will develop additional mitigation that is to be implemented to reduce identified significant adverse effects. These measures are expected to be secured through the application of appropriate planning mechanisms.

Tertiary mitigation ('Good practice')

- 5.3.27 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 Draft CoCP that the contractor will be obliged to implement, and 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 initial assessment of effects of the EIA.

Draft Code of Construction Practice

- 5.3.28 As described in section 3.6, a Draft CoCP will be prepared as part of the DCO Application. Embedded and good practice measures will form part of the Proposed Development and the initial Draft CoCP. The assessment will take account of these as inherent and inexorable. If significant adverse construction effects are identified and further mitigation is required, additional foreseeable mitigation will be considered, developed and included in the Draft CoCP as the mechanism for securing their delivery.

In-combination and Cumulative effects

- 5.3.29 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 required 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].”

- 5.3.30 And Schedule 4 of the EIA Regulations which 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*²⁹.

- 5.3.31 These effects are typically distinguished into two types:
- In-combination effects are inter-relationships within the Proposed Development; and
 - Cumulative effects of the Proposed Development with ‘other developments’.

In-combination effects

- 5.3.32 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

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

- 5.3.34 In-combination effects and Cumulative effects will be considered in a standalone Cumulative Effects Assessment chapter of the ES consistent with Planning Inspectorate’s Advice Note Nine³⁰ and Advice Note 17³¹. **Chapter 21 In-Combination and Cumulative Effects** of this Scoping Report provides a detailed description of the methodology applied to the Combined and Cumulative Effects Assessments including identification of ‘other developments’ and allocations relevant to the assessment.

Transboundary effects

- 5.3.35 The United Nations Economic Commission for Europe’s (UNECE) ‘Espoo Convention’³², 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. They require the Planning Inspectorate to consider the potential for transboundary impacts

²⁹ Schedule 4, Paragraph 5, EIA Regulations

³⁰ The Planning Inspectorate (April 2012) Advice note nine: Rochdale Envelope. Version 2.

³¹ The Planning Inspectorate (December 2015) Advice note seventeen: Cumulative Effects Assessment. Version 1

³² Convention on Environmental Impact Assessment in a Transboundary Context

from a Proposed Development and consult with relevant European Member States.

- 5.3.36 The Planning Inspectorate's Advice Note 12³³ outlines requirements for 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).
- 5.3.37 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.
- 5.3.38 In accordance with the Advice Note 12, potential transboundary effects arising from the Proposed Development have been considered through the completion of a transboundary screening matrix, provided in Appendix B this Scoping Report.
- 5.3.39 Based on the information provided in this report, it is not envisaged that transboundary effects will arise from the Proposed Development.

Stakeholder engagement and consultation

- 5.3.40 The process of consultation 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.
- 5.3.41 Consultation is an ongoing process and comments will be fed back into the design of the Proposed Development, as appropriate. The ES will provide a summary of:
- Stakeholders consulted (and what they have been consulted on);
 - Key issues, pertinent to the EIA, that have been raised by consultees;
 - How these issues have been addressed; and
 - Should any issues pertinent to the EIA not have been dealt with in the ES, a clear justification will be provided for this.
- 5.3.42 Early engagement has been undertaken to inform the preparation of this Scoping Report.

³³ The Planning Inspectorate (December 2015) Advice note twelve: Regulation 24 of the EIA Regulations, Version 4.

5.3.43 A summary of meetings held which have informed the preparation of this Scoping Report is presented in Table 5-7. In addition to the meetings listed in Table 5-7, regular updates on EIA consultation with local planning authorities (LPAs) have been provided at the monthly Luton Airport Planning Officers Coordination Group meetings.

5.3.44 Further details of specific discussions can be found within individual topic chapters of this Scoping Report.

Table 5-7: Early engagement activities

Consultee	Topic discussed	Date
Planning Inspectorate	General	30 January 2018
Environment Agency, CBC, LBC, and HCC	General	26 February 2018
Historic England	Cultural Heritage	27 February 2018
LBC, HCC, CBC	Water Resources and Flood Risk	28 March 2018
Environment Agency	Soils and Geology/ Water Resources	28 March 2018
LBC, HCC, CBC	Biodiversity	6 April 2018
Historic England, CBC	Cultural Heritage	9 April 2018
CBC, NHDC, LBC	Landscape and Visual	10 April 2018
NHDC, CBC	Air Quality/ Noise and Vibration	12 April 2018
HCC	Health and Communities	12 July 2018
LBC	Health and Communities	13 July 2018
Environment Agency	Water Resources and Flood Risk	16 August 2018
Environment Agency	Soils and Geology	10 October 2018
HCC	Cultural Heritage	9 November 2018
LBC, HCC, CBC	Biodiversity	20 November 2018
LBC, HCC, CBC, NHDC, Buckinghamshire Council, Healthy Places	Health and Communities	26 November 2018
LBC, CBC, NHDC, Aylesbury Vale District Council	Air Quality	11 January 2019
LBC, HCC, CBC	Waste and Resources	18 January 2019
LBC, CBC, NHDC, Dacorum Borough Council, Stevenage Borough Council, Welwyn Hatfield Borough Council, Aylesbury Vale District Council, St Albans City & District Council, East	Noise and Vibration	25 January 2019

Consultee	Topic discussed	Date
Hertfordshire District Council		
LBC, CBC, NHDC, HCC, South East Midlands LEP, Hertfordshire LEP, Hertfordshire Chamber of Commerce	Employment and Economics	19 March 2019
LBC, CBC, NHDC	Major Accidents and Disasters	14 March 2019 26 March 2019

- 5.3.45** In addition, 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 has been considered to inform this Scoping Report. 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 LLAL.
- 5.3.46** A further statutory consultation programme in accordance with Section 42 of the Planning Act will take place in 2019, during which the general public, statutory consultees and other relevant stakeholders will be presented the PEIR.
- 5.3.47** In parallel, ongoing engagement with key consultees will continue, with the aim to agree Statements of Common Ground, where appropriate, as the design of the Proposed Development is developed and technical topic assessments of the EIA progress.
- 5.3.48** A Consultation Report will be submitted with the DCO application which will outline the outcomes of consultation undertaken to inform the DCO application for the Proposed Development.

5.4 Associated assessments

- 5.4.1** The EIA will be supported by several technical assessments undertaken in line with specific policy or legislation. These provide additional information to inform the design and ES. The scope of these assessment will be agreed with relevant stakeholder during separate consultation outside of the EIA scoping exercise. An outline of these proposed assessments is provided below for information.

Habitats Regulations Assessment

- 5.4.2** The European 'Habitats Directive'³⁴ is transposed into UK legislation through the Habitats Regulations. These regulations

³⁴ On the Conservation of Natural Habitats and Wild Flora and Fauna (92/43/EEC)

set out procedures for dealing with the effects of development on Natura 2000 sites, which comprise 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.

5.4.3 Under Article 6(3) of the Habitats Directive, an appropriate assessment is required where a plan or project (in this case an NSIP) 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.

5.4.4 Further to this, Article 6(4) states that where an appropriate assessment has been carried out and results in a negative assessment (that is, the development will adversely affect the site(s) despite any proposed avoidance or mitigation measures or if uncertainty remains), consent will 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.

5.4.5 Paragraph 4.19 of the ANPS clarifies the role of the Secretary of State 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.”

5.4.6 A HRA screening assessment has been undertaken as part of this scoping exercise and determined that there are no likely significant effects on Natura 2000 sites as a result of the Proposed Development and therefore, an appropriate assessment is not required under the Habitats Regulations. The results of this screening can be found in Appendix C of this Scoping Report.

Water Framework Directive

5.4.7 The EU 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.

- 5.4.8 The WFD aims 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 will be taken into account when planning all activities that may impact the water environment.
- 5.4.9 A WFD assessment will form part of the ES to determine the status of the waterbodies in the vicinity of the Proposed Development.

Flood Risk Assessment

- 5.4.10 A Flood Risk Assessment (FRA) will be undertaken in accordance with the NPPF. This FRA will form part of the ES as an appendix, and it will consider flood risk both to and from the Proposed Development. It will also demonstrate how this risk is intended to be managed in the future, considering the influence of climate change.
- 5.4.11 Sources of flood risk may range from groundwater and surface water during high rainfall events, fluvial or man-made water bodies, and sewers. These will all be considered as part of the FRA in accordance with the NPPF. **Chapter 12 Water Resources** of this Scoping Report summarises the approach of the FRA, and the status of discussions with the Lead Local Flood Authority. Current understanding of the Proposed Development and receiving environment mean that fluvial modelling is not considered required.

Transport Assessment

- 5.4.12 A Transport Assessment (TA) will accompany the DCO application as a separate document. This will include the assessment of the traffic impacts of the Proposed Development during construction and operational traffic in and around Luton. The assessment will consider the local, regional and national policy context, and will model traffic movements based on the latest guidance. This will allow the assessment of the road and wider network capacity, the functionality of junctions, and potential impacts on journey times amongst other things. Results of the TA will inform a wider LTN transport strategy.
- 5.4.13 The environmental effects of traffic and transport will be addressed in relevant parts of the ES such as Noise & Vibration and Air Quality and in a specific Traffic & Transport chapter.

Equality Impact Assessment

- 5.4.14 The DCO application for the Proposed Development will be accompanied by an Equality Impact Assessment (EqIA) in accordance with the Equality Act 2010.

5.4.15 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.

5.4.16 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

5.4.17 LLAL is exploring ways to maximise sustainable opportunities during the design, procurement, construction and the operation of LTN into the future.

5.4.18 The Sustainability Statement will examine 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 LLAL. A broad spectrum of issues will be considered, with the Proposed Development being appraised for the degree of impact and the potential to influence.

Lighting Assessment

5.4.19 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.

5.4.20 As part of the ES, a lighting assessment will be undertaken identifying potential impacts due to external artificial lighting for the Proposed Development, and detailing any necessary light pollution mitigation measures to prevent nuisance to local communities or disruption to local sensitive wildlife.

5.4.21 The lighting assessment will be based on key guidance for light obtrusion and EIA, including:

- Commission Internationale de l’Eclairage’s (CIE) Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations³⁵.
- Institution of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light³⁶.
- ILP Guidance on Undertaking Environmental Lighting Impact Assessments³⁷.

5.4.22 An initial survey of the site and its surroundings will be undertaken, in accordance with ILP and CIE guidance, to establish the baseline lighting conditions. This will require the establishment of key sensitive viewpoints from which the lighting survey will be undertaken, and measures of nocturnal lighting conditions (illuminance and luminance) will be taken from each viewpoint.

5.4.23 The lighting assessment will then consider the Proposed Development’s lighting plans, advising the likely impact of providing external lighting on the proposed Main Application Site. In particular, it will consider the construction phase and operational phase lighting in comparison with the baseline scenario.

5.4.24 Mitigation measures for the construction phase of the Proposed Development will be developed as part of the assessment, informed by other environmental assessments. These will include site-specific light obtrusion recommendations, which may be included within the Draft CoCP, for example, floodlight aiming, maximum intensity, or shielding.

5.4.25 During operation, the proposed lighting design will be modelled and used to verify if the recommendations of CIE/ILP can be upheld. In particular, the data will be assessed in context with the viewpoints and specific sensitive receptors (e.g. bat roosts) identified in the baseline study.

5.5 **Airspace change process**

5.5.1 Outside of the scope of this project, work is ongoing to redesign the airspace over London, including the aim to remove the current constraints that each airport imposes on the others as well as to provide sufficient airspace capacity to accommodate future growth in air transport, including Heathrow’s 3rd runway, and to reduce the environmental impacts of growth. This programme is known as FASI South and the work is being led by

³⁵ CIE (2003) Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations, 2nd Edition as amended. CIE150:2017

³⁶ ILP (2011) Guidance Notes for the Reduction of Obtrusive Light. GN01:2011

³⁷ ILP (2013) Guidance on Undertaking Environmental Lighting Impact Assessments. PLG04

National Air Traffic Services (NATS) under the supervision of the Department for Transport and the Civil Aviation Authority (CAA).

- 5.5.2 This is a collaborative process, involving all of the London airports, and therefore not part of the DCO application. NATS is responsible for airspace redesign above 7,000ft and, each airport will need to promote its own airspace change programme for the routes below 7,000ft.
- 5.5.3 LLAOL are the aerodrome licence holders for LLA and will be developing their proposals to fit with the FASI South implementation, targeted at 2026, in parallel to the DCO process and working in collaboration with LLAL. subject to a programme outside of the control of LLAL. These proposals will be subject to a separate assessment and consultation exercise to be carried out by LLAOL, including the consideration of environmental effects. Any proposed airspace change will need to follow the process outlined in the Civil Aviation Authority's (CAA) Civil Aviation Publication 1616, and cannot be consented under the DCO.
- 5.5.4 The timescale for this exercise means that confirmed flightpaths will not be available for consideration in the assessment for this DCO application as they will not be available within the project programme. Therefore, the assessment in the ES will be based on existing flightpath designs.
- 5.5.5 LLAL with work in close collaboration with LLAOL to allow proposed air space changes to consider the expansion proposals and environmental mitigation measures to be consistent and deliverable as both proposals develop.
- 5.5.6 Should emerging flightpath designs become available within a timeframe suitable to be included in the DCO application, consideration will be given to their inclusion in the assessment as a sensitivity test to illustrate potential environmental improvements that may be achievable as a result of the broader airspace redesign being undertaken by NATS.

6 AIR QUALITY

6.1 Introduction

6.1.1 This chapter presents the proposed approach to the assessment of the likely significant environmental effects of the Proposed Development on air quality.

6.1.2 The main issues and impacts predicted, and therefore to be assessed in the ES, include:

- the generation of dust and elevated levels of particulate matter (PM₁₀, PM_{2.5}) arising from demolition and construction works;
- increased staff and passenger journeys to and from the airport on the road network;
- increased emissions from aircraft engines;
- increased exhaust emissions from vehicles operating at the airport, on airside and on landside;
- potentially increased emissions from energy and heating plant (i.e. boilers); and
- miscellaneous emissions from other airport activities, such as aircraft fire training and engine testing.

6.1.3 The assessment will consider potential air quality impacts at sensitive human and ecological receptors in the Study Area defined in section 6.4.2.

6.2 Legislation, policy and guidance

Legislation

European air quality management

6.2.2 In 1996 the European Commission published the Air Quality Framework Directive on ambient air quality assessment and management (96/62/EC)³⁸. This Directive defined the policy framework for 12 air pollutants, including nitrogen dioxide (NO₂) and particulate matter, which are known to have harmful effects on human health and the environment. Limit values (pollutant concentrations not to be exceeded by a certain date) for each specified pollutant were set through a series of Daughter Directives, including Directive 1999/30/EC (the 1st Daughter

³⁸ Directive 96/62/EC of 27 September 1996 on ambient air quality assessment and management

Directive)³⁹ which sets limit values for NO₂ and particulate matter (amongst other pollutants) in ambient air.

- 6.2.3 In May 2008 the Directive 2008/50/EC⁴⁰ on ambient air quality and cleaner air for Europe came into force. This Directive consolidates the above (apart from the 4th Daughter Directive) and makes provision for extended compliance deadlines for NO₂ and PM₁₀. The Directive has been transposed into national legislation in England by the Air Quality Standards Regulations 2010⁴¹. The Secretary of State has the duty of ensuring compliance with the air quality limit values.

Environment Act 1995

- 6.2.4 Part IV of the Environment Act 1995⁴² places a duty on the Secretary of State to develop, implement and maintain an air quality strategy with the aim of reducing atmospheric emissions and improving air quality. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland⁴³ provides the framework for ensuring compliance with air quality limit values based on a combination of international, national and local measures to reduce emissions and improve air quality. This includes the statutory duty, also under Part IV of the Environment Act 1995, for local authorities to undergo a process of local air quality management and declare Air Quality Management Areas (AQMAs) where necessary.

Air quality standards

- 6.2.5 The air quality limit values set by the European legislation and transposed into national law (UK objectives) are quality standards for clean air. Some pollutants have standards expressed as annual average (long-term) concentrations due to the chronic way in which they affect health (i.e. effects occur after a prolonged period of exposure to elevated concentrations) and others have standards expressed as 24-hour, 1-hour or 15-minute average (short-term) concentrations due to the acute way in which they affect health (i.e. after a relatively short period of exposure). Some pollutants have standards expressed in terms of both long-term and short-term concentrations.
- 6.2.6 In this Scoping Report, the term 'air quality standard' has been used to refer to both the UK objectives and European limit values. Table 6-1 sets out the air quality standards for the pollutants

³⁹ Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air

⁴⁰ Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

⁴¹ The Air Quality Standards Regulations 2010, SI 2010/1001

⁴² Environment Act 1995, Chapter 25, Part IV Air Quality

⁴³ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Volume 1, July 2007

relevant to this study (NO₂, PM₁₀ and PM_{2.5}). Other pollutants have been screened out of this assessment since they are not likely to cause exceedances of their respective standards. The Clean Air Strategy states that NO₂ is the only pollutant for which the UK is currently failing to meet the standards. The local air quality management regime, managed by Defra, has identified the pollutants in Table 6-1 are the main pollutants of concern in the UK⁴⁴.

Table 6-1: Air quality standards

Pollutant	Averaging period	Air quality standard
Nitrogen dioxide (NO ₂)	Annual mean	40µg/m ³
	1-hour mean	200µg/m ³ not to be exceeded more than 18 times a year
Particulate matter (PM ₁₀)	Annual mean	40µg/m ³
	24-hour mean	50µg/m ³ not to be exceeded more than 35 times a year
Fine particulate matter (PM _{2.5})	Annual mean	25µg/m ³
Oxides of nitrogen (NO _x)*	Annual mean	30µg/m ³
Notes: *For protection of vegetation & ecosystems rather than human health.		

National planning and aviation policy

Airports National Policy Statement – June 2018

6.2.7 Paragraph 5.33 of the ANPS¹¹ outlines the scope of assessment for air quality and, although it was written in relation to new runway capacity and infrastructure at Heathrow, it will be an important and relevant consideration for the development of other airports, in particular in London and the South East of England. It states:

“The environmental statement should assess:

- *Existing air quality levels for all relevant pollutants referred to in the Air Quality Standards Regulations 2010 and the National Emission Ceilings Regulations 2002 (as amended) or referred to in any successor regulations;*
- *Forecasts of levels for all relevant air quality pollutants at the time of opening, (a) assuming that the scheme is not built (the ‘future baseline’), and (b) taking account of the impact of the scheme, including when at full capacity; and*

⁴⁴ Defra (2016) Local Air Quality Management Technical Guidance.TG(16) Section 1.08

- *Any likely significant air quality effects of the scheme, their mitigation and any residual likely significant effects, distinguishing between those applicable to the construction and operation of the scheme including any interaction between construction and operational changes and taking account of the impact that the scheme is likely to cause on air quality arising from road and other surface access traffic.”*

6.2.8 Paragraphs 5.42 and 5.43 set out the considerations for decision-making with regard to air quality and these have been taken account of in the assessment methodology described in this Scoping Report.

National Planning Policy Framework (NPPF) – February 2019

6.2.9 The NPPF was updated in February 2019 with the purpose of planning to achieve sustainable development. Paragraph 181 of the NPPF on air quality states that:

“Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan.”

6.2.10 In addition, paragraph 170 states that decisions should contribute to and enhance the natural and local environment by:

“e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality.”

Aviation Strategy

6.2.11 The emerging Aviation Strategy²¹ was published for consultation in December 2018. Paragraphs 3.123 to 3.127 are concerned with Air Quality and state, *“the government recognises the need to take further action to ensure aviation’s contribution to local air*

*quality issues is properly understood and addressed*²¹. Paragraph 3.127 therefore proposes a set of measures including:

- *“improving the monitoring of air pollution, including ultrafine particles (UFP), in order to improve understanding of aviation’s impact on local air quality*⁴⁵;
- *ensuring comprehensive information on aviation-related air quality issues is made available to better inform interested parties;*
- *requiring all major airports to develop air quality plans to manage emissions within local air quality targets;*
- *validation of air quality monitoring to ensure consistent and robust monitoring standards that enable the identification of long-term trends; and*
- *supporting industry in the development of cleaner fuels to reduce the air quality impacts of aviation fuels*⁴⁶.

Aviation Policy Framework – March 2013

- 6.2.12 The APF²⁰ was published in March 2013. With regards to air quality, the policy identifies that the main problem with regard to NO_x emissions is the road traffic around the airports and that NO_x emissions from aviation related operations “*reduce rapidly beyond the immediate area around the runway*”.

Airports Commission: Appraisal Framework

- 6.2.13 The Airports Commission was appointed by Government and produced an appraisal framework⁴⁷ in 2014. The document was produced to provide recommendations to Government for the assessment and selection of a new runway in the South East of England, and to inform the Government in preparation of national policy. Its appraisal framework should be taken into account in the appraisal of any large airport expansion in the UK.
- 6.2.14 In the Air Quality appraisal module, the key objective is “*To improve air quality consistent with EU standards and local planning policy requirements*”. The framework provides an outline for an assessment, which does not describe anything beyond the assessment methodology in this Scoping Report.

⁴⁵ Ultrafine particles (UFP) are the smallest group of particles in the atmosphere and comprise a minor component of PM_{2.5} and PM₁₀. UFPs are believed to contribute to the toxicity of airborne particulate matter but the magnitude of their contribution is currently unclear.

⁴⁶ Paragraph 3.127 -HM Government (December 2018) Aviation 2050 the Future of UK Aviation

⁴⁷ Airports Commission (2014) Airports Commission: Appraisal Framework

Local policy

Luton Borough Council

- 6.2.15 LBC adopted its Local Plan for 2011-2031 in 2017⁴⁸. Policy LLP6 relates to LTN. Regarding proposals for airport expansion, the policy states the following:

“Proposals for development will only be supported where the following criteria are met, where applicable/appropriate having regard to the nature and scale of such proposals: [...]

iv. they fully assess the impacts of any increase in Air Transport Movements on surrounding occupiers and/or local environment (in terms of noise, disturbance, air quality and climate change impacts), and identify appropriate forms of mitigation in the event significant adverse effects are identified;”

- 6.2.16 Air quality is also mentioned in policy LLP38 regarding pollution and contamination. The policy states:

“Evidence on the impacts of development will need to demonstrate whether the scheme (individually or cumulatively with other proposals) will result in any significantly adverse effects with regard to air, land or water on neighbouring development, adjoining land or the wider environment. Where adverse impacts are identified, appropriate mitigation will be required. This policy covers chemical, biological and radiological contamination and the effects of noise, vibration, light, heat, fluid leakage, dust, fumes, smoke, gaseous emissions, odour, explosion, litter and pests.”

Central Bedfordshire Council Local Plan 2035: Pre-Submission (January 2018)

- 6.2.17 CBC produced a Pre-submission version of their Local Plan for 2015-2035⁴⁹ in 2018.

- 6.2.18 The CBC Local Plan 2015-2035 Strategic Objective SO13 states:

“Support the necessary changes to adapt to climate change by minimising emissions of carbon and local air quality pollutants”

- 6.2.19 Policy HQ1 states:

“The Council will ensure that all developments are of the highest possible quality and respond positively to their context. All development proposals, including extensions and change of use, must ensure that:

⁴⁸ LBC (2017) Local Luton Plan (2011-2031)

⁴⁹ Central Bedfordshire Council (2018) Pre-submission, Local Plan 2015-2035

[...] There is not an unacceptable adverse impact upon nearby existing or permitted uses, including impacts on amenity, privacy, noise or air quality”.

6.2.20 Policy CC8 also refers to airborne pollution and states:

“Development proposals which are likely to cause pollution or land instability, or are likely to be exposed to potential unacceptable levels of pollution or land instability will only be permitted where it can be demonstrated that:

- measures can be implemented to minimise impacts to an acceptable level which protects health, natural and historic environment, water quality, property, infrastructure and amenity; and*
- conditions can be suitably mitigated for the proposed end use and cause no adverse effects.*

Where necessary the Council will use planning conditions and/or legal agreements to help limit the impact of pollution.”

North Hertfordshire District Council

6.2.21 NHDC produced a Proposed Submission Draft Local Plan for 2011-2031⁵⁰ in 2016. Policy D4 addresses air quality and states:

“Planning permission will be granted where development proposals:

- a. Give consideration to the potential or actual impact on local air quality, both during the demolition/ construction phase and as a result of its final occupation and use;*
- b. Propose appropriate levels of mitigation to minimise emissions to the atmosphere and their potential effects upon health and the local environment; and*
- c. Carry out air pollution impact assessments, where required, to determine the impact on local air quality of the development, otherwise the development may be refused.*

Where air pollution impact assessments are not required there will still be a requirement on developers to provide appropriate levels of mitigation to address emissions of pollutants to the atmosphere.”

6.2.22 NHDC has also produced an Air Quality Planning Guidance Document⁵¹ in support of their Local Plan. The document provides guidance for impact assessment and mitigation.

⁵⁰ NHDC (2016) Local Plan 2011-2031, Proposed Submission

⁵¹ NHDC (2016) Air Quality Planning Guidance Document (to support the NHDC Local Plan 2011-2031)

Local Air Quality Action Plans

6.2.23 The Environment Act 1995 requires local authorities to review and assess air quality with respect to the objectives for seven pollutants specified in the National Air Quality Strategy. Where objectives are predicted not to be met, local authorities must declare the area as an Air Quality Management Area (AQMA). In addition, local authorities are required to produce an Air Quality Action Plan (AQAP) that includes measures to improve air quality in the AQMA.

Luton Borough Council

6.2.24 LBC is currently in the process of compiling an AQAP⁵² for AQMA No. 3 (Stuart Street and Dunstable Road areas). The plan was approved by Council Executive in June 2018 and was due to be published in 2018. An action plan has been produced as part of the Local Transport Plan 3⁵³ for AQMA No. 1 and No. 2 (each AQMA includes properties to the east and the west of the M1 motorway, near Junction 11). Policy 19 of the Local Transport Plan relates to improving air quality:

“Where AQMAs are declared as a result of traffic sources from a trunk road, we will work closely with the Highways Agency to develop and implement an appropriate Air Quality Action Plan for reducing air pollution emissions within those AQMAs.

In order to ensure that no new Air Quality Management Areas are declared in Luton, we will require an Air Quality Assessment for all development proposals that:

- *result in increased congestion, or a change in traffic volumes and/or speeds;*
- *significantly alter the traffic composition in an area, such as bus stations, lorry parks and new road layouts;*
- *include new car, coach or lorry parks;*
- *adversely affect sensitive areas or areas nearing air quality threshold limits;*
- *would be close to known sources of air pollution and which would include Relevant Receptors, e.g. housing, schools, hospitals.”*

⁵² Luton Borough Council. We are seeking views on a proposed Air Quality Action Plan. Available at: <https://www.luton.gov.uk/news/Pages/We-are-seeking-views-on-a-proposed-Air-Quality-Action-Plan-.aspx> [Accessed: March 2019]

⁵³ Luton Borough Council (2011) Luton Local Transport Plan 2011-2026, Luton Local Transport Plan 3

Central Bedfordshire Council

- 6.2.25 In the 2018 Annual Status Report⁵⁴ (ASR), CBC states that an AQAP was produced in 2006 regarding the AQMA in Dunstable. The ASR states that CBC would commence work to update the AQAP as soon as possible.

North Hertfordshire District Council

- 6.2.26 NHDC produced an AQAP⁵⁵ for its two AQMAs (Stevenage Road and Payne's Park). The document outlines the actions and measures that will be taken to improve air quality in North Hertfordshire between 2017 and 2021. These actions and measures are in line with the D4 policy in their Local Plan⁵⁰.

Guidance

Local Air Quality Management Technical Guidance

- 6.2.27 The LAQM Technical Guidance⁵⁶, TG(16) is designed to support local authorities in carrying out their duties to review and assess air quality in their area. It provides the technical guidance for carrying out air quality assessments using existing air quality tools. Where relevant, this guidance will be taken in to account in the assessment.

Institute of Air Quality Management Dust Guidance

- 6.2.28 The 2016 Institute of Air Quality Management (IAQM) guidance⁵⁷ provides guidance to development consultants and environmental health officers on how to assess air quality impacts from construction. The IAQM guidance provides a method for classifying the significance of effect from construction activities based on the 'dust magnitude' (high, medium or low) and proximity of the site to the closest receptors. The guidance recommends that once the significance of effect from construction is identified, the appropriate mitigation measures are implemented. Experience has shown that once the appropriate mitigation measures are applied in most cases the resulting dust impacts can be reduced to negligible levels.

EPUK/IAQM Land Use Planning & Development Control

- 6.2.29 The 2017 Land-Use Planning & Development Control guidance document⁵⁸ produced by Environmental Protection UK (EPUK)

⁵⁴ CBC (2018) 2018 Air Quality Annual Status Report (ASR)

⁵⁵ NHDC (2018) Air Quality Action Plan for the Stevenage Road, Hitchin Air Quality Management Area and the Payne's Park, Hitchin Air Quality Management Area

⁵⁶ Defra (2016) Local Air Quality Management Technical Guidance.TG(16)

⁵⁷ IAQM (2016) Guidance on the Assessment of Dust from Demolition and Construction

⁵⁸ EPUK/IAQM (2017) Land-Use Planning & Development Control: Planning for Air Quality

and the IAQM provides a framework for professionals operating in the planning system to provide a means of reaching sound decisions, having regard to the air quality implications of development proposals.

- 6.2.30 The document provides guidance on when air quality assessments are required by providing screening criteria regarding the size of a development, changes to traffic flows/composition energy facilities or combustion processes associated with the development.

Institute of Air Quality Management: odour and planning guidance

- 6.2.31 The Institute of Air Quality Management (IAQM) has published guidance⁵⁹ for assessing odour impacts (on amenity) for planning purposes. This includes information on various assessment methods to be used to undertaken odour assessments for planning. Where relevant, this guidance will be taken in to account in the assessment.

Highways England Design Manual for Roads and Bridges (DMRB) HA207/07

- 6.2.32 The DMRB HA207/07⁶⁰ contains criteria for identifying roads to be included in the assessment. This guidance will be taken in to account in the assessment.

International Civil Aviation Organisation: Airport Air Quality Manual (2011)

- 6.2.33 The International Civil Aviation Organization (ICAO) has published a manual for assessing air quality at airports⁶¹. This document describes the methods for calculating emissions during different operating modes of the aircraft, as well as different sources of air pollution found at airports.

Defra and Environment Agency: Air emissions risk assessment

- 6.2.34 Defra and the Environment Agency published guidance⁶² for undertaking a risk assessment of air emissions. This guidance will be taken in to account in the assessment.

⁵⁹ IAQM (2014) Guidance on the assessment of odour for planning.

⁶⁰ DMRB HA207/07 Highways England

⁶¹ ICAO (2011) Airport Air Quality Manual

⁶² Defra and Environment Agency (2016) Guidance, Air emissions risk assessment for your environmental permit. Available at: <https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit> [Accessed: March 2019]

6.3 Stakeholder engagement and consultation

6.3.1 Local authorities which may experience impacts from the Proposed Development, have been identified and direct engagement has been undertaken and recorded. Details of these consultations are included in Table 6-2. Consultation will continue throughout the pre-application stages of the project.

6.3.2 Those other districts and unitary councils which responded to the non-statutory consultation have been engaged with through this process. Aylesbury Valley District Council (AVDC) has been included in the direct consultation, having requested it through the non-statutory consultation.

6.3.3 Local authorities directly consulted:

- LBC Environmental Health Officer;
- CBC Environmental Health Officer;
- NHDC Environmental Health Officer; and
- AVDC Environmental Health Officer.

6.3.4 These local authorities were consulted on the location of the NO₂ diffusion tubes for the baseline survey. These communications were via email between February 2018 and January 2019.

Table 6-2: Stakeholder consultations

Meeting, name and date	Attendees	Discussion
Environmental Health Officer (EHO) EIA Scoping Meeting 12 April 2018	NHDC CBC Arup AECOM Stephen Turner Acoustics Limited (STA) Apologies: LBC	It was agreed that the LBC AQMAs (AQMA 1, 2 and 3), the CBC AQMA in Dunstable (AQMA 1) and the two NHDC AQMAs in Hitchin (Stevenage Road and Payne's Park) would be included in the assessment (see Figure 6.1, Volume 2) if the traffic modelling data provided sufficient information.
Air Quality Technical Stakeholder Meeting 11 January 2019	LBC CBC NHDC Arup Apologies: AVDC	The general approach and method of assessment was agreed. This included considering the odour impact, specifically from the work involving the landfill at Wigmore Valley Park. The assessment of intermediate scenarios, before the full operational year, was also agreed. Consideration of freight traffic as a result of the airport was also agreed.

6.4 Baseline conditions

6.4.1 This section presents a description of the existing site conditions based on desk-based data gathering. Further data gathering and survey proposals are set out in Section 6.5 below.

Study Area

6.4.2 The Study Area for the air quality assessment will be a 15km by 15km grid area centred on the Main Application Site and additional roads outside of this area which exceed the DMRB screening criteria (see section 6.4.10). The Study Area will capture all of the Zones of Influence (ZOIs) with regards to air quality.

Zone of Influence

Construction

6.4.3 Following IAQM guidance⁵⁷, the effects on human receptors will be assessed for those within:

- 350m of the Main Application Site and Off-site Car Parks; and
- 50m of the routes used by the construction vehicles on the public highway, up to 500m from the site entrances.

6.4.4 Ecological receptors will be assessed for those within:

- 50m of the Main Application Site and Off-site Car Parks; and
- 50m of the routes used by the construction vehicles on the public highway, up to 500m from the site entrances.

Operation

6.4.5 Following IAQM/EPUK guidance⁵⁸, sensitive human receptor locations that will be assessed include:

- residential and other properties close to and in the Proposed Development; and
- residential and other properties on roads significantly affected by the Proposed Development.

6.4.6 The Defra and the Environment Agency's guidance⁶² for environmental permits, that strictly applies to industrial Part A processes, states that the following designated conservation areas should be included in the assessment if they are within 10km of the Main Application Site:

- Special Protection Areas (SPAs);
- Special Areas of Conservation (SACs); and

- Ramsar sites (protected wetlands).
- 6.4.7 There are no SPAs, SACs or Ramsar sites located within 10km of the Main Application Site. The closest international designated site is Chiltern Beechwoods Special Area of Conservation (SAC), located approximately 13km south-west of the Main Application Site. Further details are provided in section 17 (Biodiversity).
- 6.4.8 The Defra and the Environment Agency's guidance that the following designated conservation areas within 2km of the Application should also be included:
- Sites of Special Scientific Interest (SSSIs); and
 - Local Nature Sites (ancient woods, local wildlife sites and national and local nature reserves).

- 6.4.9 There are no SSSIs within 2km of the Main Application Site, but there are Local Nature Sites within 2km. These are detailed in section 17 (Biodiversity).

Affected road network

- 6.4.10 The criteria from the IAQM/EPUK guidance⁵⁷ will be used to determine the affected road network (ARN) in the 15km by 15km Study Area. The ARN will include all roads in the traffic model, in the 15km by 15km grid area, which are predicted to experience the following changes due to the Proposed Development:
- a change of Light Duty Vehicle (LDV) flows of more than 500 Annual Average Daily Traffic (AADT) movements; and
 - a change of Heavy Duty Vehicle (HDV) flows of more than 100 AADT movements.
- 6.4.11 The roads not included in the traffic model in the 15km by 15km Study Area are not expected to experience changes of this magnitude. However, in order for the modelling to be more complete, some roads within the 15km by 15km Study Area that do not fall in the criteria stated will be included, using professional judgement. For example, roads located in the key AQMAs being considered will be assessed regardless of the predicted changes.
- 6.4.12 The DMRB criteria⁶⁰ will be used to identify roads outside the 15km by 15km domain that will be included in the assessment. A road will be included in the ARN if one or more of the following criteria is true:
- road alignment will change by 5m or more;
 - daily traffic flows will change by more than or equal to 1,000 AADT;
 - HDV flows will change by more than or equal to 200 AADT;

- daily average speed will change by more than or equal to 10kph; and
- peak hour speed will change by more than or equal to 20kph.

Data gathering and survey

6.4.13 A desk-based review of the following data sources has been undertaken to determine baseline conditions of air quality in this assessment:

- Local authority review and assessment reports;
- The Environment Agency's Environmental Permitting Regulations website⁶³;
- The UK Air Information Resource website⁶⁴;
- Hertfordshire and Bedfordshire Air Quality Network website⁶⁵; and
- LLAOL monitoring data.

Existing conditions

6.4.14 Existing or baseline ambient air quality refers to the concentration of relevant substances that are already present in the environment. These are present from various sources, such as industrial processes, commercial and domestic activities, traffic and natural sources.

Sources of air pollution

Industrial processes

6.4.15 Industrial air pollution sources are regulated through a system of operating permits or authorisations, requiring stringent emission limits to be met and ensuring that any releases to the environment are minimised or rendered harmless. Regulated (or prescribed) industrial processes are classified as Part A or Part B processes and are regulated through the Environmental Permitting system^{66, 67, 68}. The larger more polluting processes are regulated by the Environment Agency (EA), and the smaller

⁶³ Environment Agency. Environmental Permitting Regulations – Installations. Available at: <https://environment.data.gov.uk/public-register/view/search-industrial-installations> [Accessed: March 2019]

⁶⁴ Defra. UK-AIR: Air Information Resource. Available at: <http://uk-air.defra.gov.uk> , [Accessed: March 2019]

⁶⁵ Ricardo Energy & Environment (2018) Air Quality England, Hertfordshire and Bedfordshire. Available at: http://www.airqualityengland.co.uk/local-authority/?la_id=408 [Accessed: March 2019]

⁶⁶ Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control).

⁶⁷ The Environmental Permitting (England and Wales) (Amendment) Regulations 2013, SI 2013/390.

⁶⁸ The Environmental Permitting (England and Wales) Regulations 2016 (as amended).

less polluting ones by the local authorities. Local authorities also regulate only for emissions to air, whereas the Environment Agency regulates emissions to air, water and land.

- 6.4.16 There are no Part A process with emissions to air listed on the Environment Agency website within approximately 10km of the Main Application Site.
- 6.4.17 Emissions from Part B process are assumed to be included in the Defra background concentrations given in Table 6-15 and in monitored concentrations.

Local air quality

Air Quality Management Areas

- 6.4.18 Table 6-3 provides details of the AQMAs that will be considered in the assessment and gives information on the relevant monitoring in the AQMAs. The location of the Luton AQMAs in relation to the Proposed Development are shown in Figure 6.1 (Volume 2).

Table 6-3: AQMA details and NO₂ monitoring results

Details of AQMAs
<p>Luton AQMA 1</p> <p>Declared in 2003 due to exceedances of the NO₂ annual mean standard. The AQMA includes residential properties either side of the M1 motorway near Junction 11.</p> <p>No monitoring has been undertaken in the AQMA from 2013 to 2017.</p>
<p>Luton AQMA 2</p> <p>Declared in 2005 due to exceedances of the NO₂ annual mean standard. The AQMA also includes residential properties either side of the M1 motorway near Junction 11, but south of AQMA 1.</p> <p>There are 9 monitoring locations in the AQMA (LN15 to LN18, LN81 to LN86). From 2013 to 2017 only two monitoring locations have recorded exceedances of the NO₂ annual mean standard. LN17 recorded 41µg/m³ in 2014 and LN86 recorded 42µg/m³ in 2017. Both locations are at roadside locations. Details of the concentrations recorded are given in Table 6-10 and the locations are shown in Figure 6.2 (Volume 2).</p>
<p>Luton AQMA 3</p> <p>Declared in 2016 due to exceedances of the NO₂ annual mean standard. The AQMA extends from Dunstable Road (A505) near the junction with Kenilworth Road through to Stuart Street and Chapel Viaduct by Latimer Road, including Castle Street to Holly Street and Telford Way.</p> <p>There are five monitoring locations in the AQMA (LN52, LN60 to LN63, LN66). LN52 and LN61 to LN63 have recorded exceedances in the years they have operated from 2013 to 2017. LN60 and LN66 did not record an exceedance in 2017. Details of the concentrations recorded are given in Table 6-10 and the locations are shown in Figure 6.3 (Volume 2).</p>
<p>CBC AQMA 1 Dunstable</p> <p>Declared in 2005 due to exceedances of the NO₂ annual mean standard. The AQMA extends from High Street North (A505), through Dunstable town centre to Borough Road (A5183). It also includes West Street (B489) from St Marys Gate, through the</p>

Details of AQMAs

town centre to the junction of Church Street (A505), Poynters Road and Dunstable Road (A505).

There are seven monitoring sites in the AQMA (sites 1, 18, 27, 33, 34, 36 and 37) and three located close to the AQMA boundary (sites 50, 55 and 57). Between 2013 and 2017, seven of the 10 sites recorded exceedances of the NO₂ annual mean standard. The maximum concentration recorded in the AQMA was 55.2µg/m³ in 2014 at site 18. Sites 34, 37, 50 and 55 recorded exceedances in 2017. The maximum concentration recorded in the AQMA in 2017 was 50.8µg/m³. The recorded concentrations from 2013 to 2017 are given in Table 6-12 and the locations are shown in Figure 6.4 (Volume 2).

NHDC AQMA Stevenage Road

Declared in 2012 due to exceedances of the NO₂ annual mean standard. The AQMA is located along a section of Stevenage Road, Hitchin and includes properties on the south side of the road.

There are eight diffusion tube monitoring sites in the AQMA (NH45, NH92, NH103 to NH105, NH110 to NH112). Sites NH45, NH92, NH105, NH110, NHG111 and NH112 recorded exceedances of the NO₂ annual mean standard, which range from 43.3µg/m³ to 49.6µg/m³. There are also two additional monitoring sites located adjacent the AQMA (NH87 and NH107) and none of the sites recorded exceedances from 2013 to 2017. Details of the concentrations are given in Table 6-14 and the locations are shown in Figure 6.5 (Volume 2).

NHDC AQMA Paynes Park

Declared in 2017 due to exceedances of the NO₂ annual mean standard. The AQMA is located along the roads surrounding Paynes Park Roundabout in Hitchin.

There is one monitoring location in the AQMA (NH93) which recorded exceedances every year from 2013 to 2017, ranging from 45.5µg/m³ to 54.1µg/m³. Details of the concentrations are given in Table 6-14 and the locations are shown in Figure 6.6 (Volume 2).

Automatic monitoring

- 6.4.19 Automatic monitoring of pollutants is undertaken by LBC at three locations, by NHDC at two locations and by CBC at one location. LLAOL also operates an automatic monitor at LTN. The details of the monitoring locations are shown in Table 6-4 and Figures 6.2, 6.3 and 6.5 (Volume 2). The results for recent years are shown in Table 6-5 and Table 6-6.
- 6.4.20 Exceedances of the NO₂ annual mean standard were recorded at L01, and NH1 from 2015 to 2017. LN60 did not record an annual mean NO₂ exceedance in 2017.
- 6.4.21 No exceedances of the PM₁₀ and PM_{2.5} annual mean standards were recorded from 2015 to 2017.
- 6.4.22 Automatic monitoring is also carried out by CBC. However, the monitoring results have not been presented as the monitoring station is located 28km from the Main Application Site and is therefore not relevant to the Study Area.

Table 6-4: Site details for automatic air quality monitors

ID	Name	Type	Pollutants monitored	Easting	Northing	Distance from Main Application Site (km)
LN60	Dunstable Road East	Roadside	NO ₂ ; PM ₁₀ ; PM ₄ ; PM _{2.5} ; PM ₁	508708	221352	2.5
LA08	LLAOL	Urban background	PM ₁₀	511871	221142	0
L01	AURN A505 Dunstable Road	Roadside	NO ₂	505927	222644	5.5
NH1	Stevenage Road NO _x	Roadside	NO ₂	518740	228348	10.0
NH2	Stevenage Road PM	Roadside	PM ₁₀ ; PM _{2.5}	518713	228349	10.0

Table 6-5: Monitored NO₂ concentrations at the automatic monitor

ID	Annual mean NO ₂ concentrations (µg/m ³)			No. of hours when hourly mean NO ₂ concentrations are greater than 200µg/m ³		
	2015	2016	2017	2015	2016	2017
LN60	43	47	39	0	2	0
L01	45	50	44	1	16	6
NH1	42	50	48	0	10	4
Air quality standard	40			18 exceedances		

Note: Exceedances are shown in bold

Table 6-6: Monitored PM₁₀ and PM_{2.5} concentrations at the automatic monitor

ID	Annual mean PM ₁₀ concentrations (µg/m ³)			Annual mean PM _{2.5} concentrations (µg/m ³)		
	2015	2016	2017	2015	2016	2017
LN60	15(5)	15(3)	16(4)	19	9	10
LA08	15(0)	18(1)	18(1)	N/A	N/A	N/A
NH2	20(1)	20(4)	19(7)	11	13	12
Air quality standard	40 (35 exceedances)			25		

Note: Exceedances are shown in bold
In brackets () are number of hours when PM₁₀ daily mean is greater than 50µg/m³ (35 allowed)

Diffusion tube monitoringLondon Luton Airport Operations Limited

6.4.23 London Luton Airport Operations Limited (LLAOL) operates 17 diffusion tube sites in and in the vicinity of LTN. The details of these monitoring sites, and the monitored concentrations for annual mean NO₂ for 2013 to 2017, are shown in Table 6-7 and Table 6-8 respectively. The locations are shown in Figure 6.7 (Volume 2). Exceedances of annual mean NO₂ have been recorded at LA05 (Runway apron), LA07 (Terminal car park), LA16 (Set down area) and LA20 (Short-term car park) in 2017, with a maximum concentration of 46µg/m³ recorded at LA07. These sites do not represent relevant long-term human exposure and therefore the annual mean air quality standard does not apply at these locations. The LA05 exceedance is attributed to airside vehicles and aircraft on the apron. The exceedances at LA07, LA16 and LA20 are attributed to emissions from road traffic.

Table 6-7: LLAOL diffusion tube monitoring location details

ID	Site name	X	Y	Site type
LA01	Terminal patio	511847	221336	Other
LA02	Airport approach road	511586	220978	Roadside
LA03	Runway threshold western	511156	220437	Other
LA04	Runway threshold eastern	513634	221198	Other
LA05	Runway apron	511703	221320	Other
LA06	President Way junction	511645	221679	Roadside
LA07	Terminal car park	512181	221352	Other
LA08	BAM co-located	511871	221142	Other
LA09	Stagenhoe Bottom Farm	517637	222554	Rural
LA10	Grove Farm slip end	507623	217724	Rural
LA14	Stand 60 Luton Airport	511861	221579	Roadside
LA15	Eaton Green Road	511899	222051	Roadside
LA16	Set down area	511954	221313	Kerbside
LA17	Dane End	513125	220664	Kerbside
LA18	Breachwood Green	515053	221778	Kerbside
LA19	Kensworth	502848	218161	Kerbside
LA20	Short Term Car Park	- ¹	- ¹	Kerbside
Notes: ¹ Location details of LA20 are not available.				

Table 6-8: LLAOL diffusion tube monitored NO₂ concentrations

ID	Annual mean NO ₂ concentrations (µg/m ³)				
	2013	2014	2015	2016	2017
LA01	34	35	28	31	33
LA02	32	33	29	40	38
LA03	23	22	17	24	23
LA04	19	18	13	17	19
LA05	36	38	34	43	40
LA06	30	32	26	34	35
LA07	26	25	23	36	46
LA08	26	28	24	34	32
LA09	12	11	7	10	11
LA10	13	13	9	12	11
LA14	32	33	29	39	38
LA15	26	27	21	27	25
LA16	32	37	30	41	40
LA17	-	11	11	15	15
LA18	-	-	-	14	14
LA19	-	-	-	12	-
LA20	-	-	-	-	41

Notes: Exceedances of the standard are shown in bold.

Luton Borough Council

6.4.24 LBC operates 47 diffusion tube sites, six of which are within 1km of the Main Application Site (monitoring locations LN22 to LN27 on Eaton Green Road). The details of the monitoring locations and the monitored results from 2013 to 2017 are shown in Table 6-9 and Table 6-10 respectively. The locations of the LBC monitoring sites are shown in Figures 6.2 and 6.3 (Volume 2). No exceedances of annual mean NO₂ have been recorded at LN22 to LN27 from 2013 to 2017.

6.4.25 The LBC diffusion tube monitoring network recorded exceedances at eight roadside locations in 2017. Five of the exceedances were recorded in AQMA 2 and AQMA 3. Details of the monitoring recorded in the AQMAs in LBC are given in Table 6-3. Three exceedances were recorded outside the AQMAs in 2017 (LN28, LN67 and LN73). LN28 is near the M1 motorway, near Junction 10. LN67 is on Castle Street which leads into the Luton AQMA 3, in the Town Centre. LN73 is on Mill Street which leads to Luton railway station, in the town centre. All of these exceedances are attributed to road traffic emissions.

Table 6-9: LBC diffusion tube monitoring location details

ID	Site name	X	Y	Site type
LN07	Guildford Street/Bute Street	509227	221455	Roadside
LN11	Upper George Street	508910	221321	Roadside
LN15*	Armitage Garden	505557	222325	Roadside
LN16*	Belper Road	505492	222607	Roadside
LN17*	Wyndham Road	505324	222812	Roadside
LN18*	Copperfields	505014	223538	Roadside
LN22	1 Mistletoe Hill	511341	221864	Urban background
LN23	Eaton Green Road 1	511377	221814	Roadside
LN24	19 Barnston Close	511902	222144	Urban background
LN25	Eaton Green Road 2	511893	222068	Roadside
LN26	8 Keeble Close	512109	222234	Urban background
LN27	Eaton Green Road 3	512134	222198	Roadside
LN28	Caddington Road	507798	219832	Roadside
LN52*	Dunstable Rd/Cardigan St Residential	508689	221379	Roadside
LN53	3rd Floor Bagshawe Court F.F.	507717	219923	Suburban
LN54	M1 Corner Bagshawe Court F.F.	507712	219915	Suburban
LN55	M1 Corner Wyatt Court FF	507732	219886	Suburban
LN56	20 Wyatt Court FF	507747	219894	Suburban
LN57	Hitchin Rd/Cannon Lane Resi 1	510747	224311	Roadside
LN58	Hitchin Rd/Cannon Lane Resi 2	510747	224311	Roadside
LN59	Hitchin Rd/Cannon Lane Resi 3	510747	224311	Roadside
LN61*	Dunstable Road East – co-located with LN60	508708	221352	Roadside
LN62*	Dunstable Road East – co-located with LN60	508708	221352	Roadside
LN63*	Dunstable Road East – co-located with LN60	508708	221352	Roadside
LN64	Park Viaduct – Park Street	509563	220952	Roadside
LN65	Park Viaduct – Queens Close	509486	220865	Roadside
LN66*	Park Viaduct	509288	220925	Roadside
LN67	Castle Street	509083	220709	Roadside
LN68	London Road	508969	220487	Roadside
LN69	John Street	509326	221357	Roadside
LN70	Crawley Green Road	509813	221161	Roadside
LN71	Crescent Road	509549	221623	Urban background

ID	Site name	X	Y	Site type
LN72	Hucklesby Way	508937	221745	Urban background
LN73	Mill Street	508959	221633	Roadside
LN74	Dunstable Road - Bury Park	508165	222002	Roadside
LN75	New Bedford Road	508745	222122	Roadside
LN76	Leagrave Road	507574	222948	Urban background
LN77	Marsh Road	506496	224018	Roadside
LN78	Hibbert Street	509109	220676	Roadside
LN79	Castle Street 2	509050	220634	Roadside
LN80	Windsor Street	509038	220719	Roadside
LN81*	Bank Close	505034	223729	Suburban
LN82*	11 Withy Close	504828	223999	Suburban
LN83*	b/h 9 Copperfields	505116	223467	Suburban
LN84*	97 Lime Avenue	505230	223304	Suburban
LN85*	26 Belper Road	505481	222545	Suburban
LN86*	Bradley Road (by M1 Bridge)	505586	222235	Roadside

Notes: *Located in an AQMA.

Table 6-10: LBC diffusion tube monitored NO₂ concentrations

ID	Annual mean NO ₂ concentrations (µg/m ³)				
	2013	2014	2015	2016	2017
LN07	-	-	-	30	27
LN11	39	37	35	39	34
LN15*	33	32	30	31	30
LN16*	36	37	35	36	35
LN17*	39	41	36	39	36
LN18*	31	30	26	28	24
LN22	23	23	21	25	23
LN23	32	32	32	36	37
LN24	23	24	21	24	22
LN25	29	31	28	30	29
LN26	21	22	21	21	20
LN27	28	28	28	30	30
LN28	44	49	43	46	46
LN52*	54	52	46	49	43
LN53	34	34	33	34	33

ID	Annual mean NO ₂ concentrations (µg/m ³)				
	2013	2014	2015	2016	2017
LN54	33	40	32	34	34
LN55	38	36	31	34	33
LN56	33	33	32	34	31
LN57	-	33	31	33	-
LN58	-	33	31	32	-
LN59	-	33	31	34	-
LN61*	-	-	43	45	43
LN62*	-	-	43	46	41
LN63*	-	-	41	46	42
LN64	-	-	32	34	31
LN65	-	-	26	27	26
LN66*	-	-	37	39	39
LN67	-	-	44	48	42
LN68	-	-	32	35	33
LN69	-	-	29	33	31
LN70	-	-	31	34	34
LN71	-	-	28	32	31
LN72	-	-	27	31	30
LN73	-	-	37	44	42
LN74	-	-	39	41	39
LN75	-	-	38	41	38
LN76	-	-	30	34	32
LN77	-	-	35	37	36
LN78	-	-	-	34	32
LN79	-	-	-	37	33
LN80	-	-	-	36	34
LN81*	-	-	-	-	38
LN82*	-	-	-	-	32
LN83*	-	-	-	-	25
LN84*	-	-	-	-	27
LN85*	-	-	-	-	-
LN86*	-	-	-	-	42
Notes: Exceedances of the standard are shown in bold.					
*Located in an AQMA.					

Central Bedfordshire Council

- 6.4.26** Diffusion tube monitoring is undertaken by CBC and details of the monitoring locations are presented in Table 6-11 and Figure 6.4 (Volume 2). Monitoring results for recent years are shown in and Table 6-12. All diffusion tube monitoring has been carried out at roadside locations.
- 6.4.27** Monitoring sites of particular relevance are located in or near to the Dunstable AQMA, approximately 7km from the Main Application Site. They are relevant to this baseline assessment as the Proposed Development may result in changes to traffic in this area. Details about the AQMA, monitoring locations and description of recorded results are presented in Table 6-3.

Table 6-11: CBC diffusion tube monitoring location details

ID	Site name	X	Y	Site type
N1*	A1 Sandy	516485	249202	Roadside
N4	A1 Beeston	517160	248190	Roadside
N6*	Bedford Rd Sandy	516621	249100	Roadside
N16*	Bedford Rd Sandy	516593	249083	Roadside
N17*	Bedford Rd Sandy	516569	249074	Roadside
N18*	Eddie's Cottage Sandy	516579	249070	Roadside
N20*	A1 Carter St Sandy	516534	249974	Roadside
N21*	Amphthill 1	503444	238197	Roadside
N22*	Amphthill 2	503466	238141	Roadside
N23*	Amphthill 3	503458	283039	Roadside
N25*	Akbar A1 Sandy	516568	250174	Roadside
N26	Woburn	494900	233230	Roadside
N27*	Church St Amphthill	503576	238167	Roadside
N28*	Carter St Sandy	516551	249967	Roadside
N30*	A1/Carter St Sandy	516261	244544	Roadside
N31	Bedford Rd Sandy	516690	249108	Roadside
N32	Chandos Amphthill	503399	237912	Roadside
N33	-.1	-.1	-.1	Roadside
1*	High St South Dunstable	501936	221837	Roadside
10	Houghton Regis	501991	223965	Roadside
17	Mayfield/London Rd Dunstable	502848	220688	Roadside
18*	Argos High St North Dunstable	501705	222089	Roadside
27*	Luton Rd Dunstable	503195	222119	Roadside
33*	Church St Dunstable	501962	221884	Roadside

ID	Site name	X	Y	Site type
34*	High St South Dunstable	501911	221853	Roadside
36*	Luton Rd Dunstable	503849	222326	Roadside
37*	Luton Rd Dunstable	502838	222071	Roadside
39	Houghton Rd Dunstable	501151	222821	Roadside
48	Poynters/Katherine Dunstable	503745	222914	Roadside
49	Poynters/Hadrian Dunstable	503569	223034	Roadside
50	Luton Rd Dunstable	502815	222065	Roadside
52	Hockliffe St Leighton Buzzard	492512	225235	Roadside
54	High St North/Vauxhall Dunstable	500938	222899	Roadside
55	West St Dunstable	501662	221768	Roadside
56	West St Leighton Buzzard	491800	225041	Roadside
57	Church St Dunstable	502456	222023	Roadside
58	Moggerhanger	514233	249189	Roadside
Notes: *Located in an AQMA. ¹ Location details are not available.				

Table 6-12: CBC diffusion tube monitored NO₂ concentrations

ID	Annual mean NO ₂ concentrations (µg/m ³)				
	2013	2014	2015	2016	2017
N1*	39.3	39.1	43.2	43.0	44.0
N4	36.6	33.5	37.2	37.2	33.9
N6*	35.5	33.4	36.6	34.3	33.5
N16*	35.5	34.4	43.2	40.6	40.8
N17*	49.1	42.1	50.2	48.3	54.0
N18*	28.6	28.3	30.5	29.9	30.2
N20*	80.3	70.1	74.0	69.8	66.3
N21*	27.1	25.5	25.8	25.9	24.5
N22*	41.0	39.9	43.7	42.0	39.7
N23*	43.3	45.1	46.2	46.4	44.1
N25*	-	-	37.6	38.1	36.8
N26	-	-	39.2	40.7	34.8
N27*	-	-	31.5	34.4	33.8
N28*	-	-	21.8	24.6	25.1
N30*	-	-	-	59.9	57.1
N31	-	-	-	27.9	27.4
N32	-	-	-	27.9	27.5

ID	Annual mean NO ₂ concentrations (µg/m ³)				
	2013	2014	2015	2016	2017
N33	-	-	-	-	29.7
1*	44.8	38.8	38.7	41.5	35.6
10	33.3	39.1	31.4	35.5	33.8
17	32.1	32.3	29.9	33.5	29.2
18*	43.7	55.2	38.4	40.1	35.1
27*	36.4	32.2	31.2	33.2	29.8
33*	35.0	39.0	36.8	39.5	37.4
34*	45.9	49.0	45.0	48.2	40.6
36*	39.9	46.0	30.8	35.6	33.5
37*	45.3	40.9	44.7	54.6	48.0
39	36.8	32.9	32.3	35.3	31.6
48	32.4	34.5	36.1	37.1	33.4
49	32.5	36.6	32.0	32.8	29.9
50	43.0	48.4	45.7	52.2	50.8
52	-	-	33.2	38.9	38.4
54	-	-	-	28.2	23.5
55	-	-	-	44.3	41.9
56	-	-	-	-	26.2
57	-	-	-	-	26.2
58	45.3	40.9	44.7	54.6	48.0

Notes: Exceedances of the standard are shown in bold.
*Located in an AQMA.

North Hertfordshire District Council

- 6.4.28** The details of diffusion tube monitoring locations carried out by NHDC and is presented in Table 6-13 and Figures 6.5 and 6.6 (Volume 2). Diffusion tube NH120 is a rural site. All of the other monitoring sites are located roadside. There are eight locations located in the Stevenage Road AQMA and one location in the Paynes Park AQMA. The results of monitored annual average NO₂ concentrations are shown in Table 6-14.
- 6.4.29** There were eight exceedances recorded in 2017, all at roadside locations. Six of the exceedances were recorded in the Stevenage Road AQMA and one in the Paynes Park AQMA. NH88 was the only exceedance recorded outside of an AQMA. Details of the results of the monitoring locations in the AQMAs are described in Table 6-3.

6.4.30 The monitoring sites located in and surrounding the AQMAs of NHDC in Hitchin are of relevance and are situated within 10km of the Main Application Site. The sites are relevant as the scheme may change traffic flows in this area.

Table 6-13: NHDC diffusion tube monitoring location details

ID	Site name	X	Y	Site type
NH06	Melbourn Road, Opposite Town Hall, Royston	535906	240794	Roadside
NH45*	Stevenage Road A, Hitchin	518708	228347	Roadside
NH59	(NH04a) Clothall Road, Baldock	524649	234061	Roadside
NH60	(NH13a) Willian Road, Hitchin	519916	230099	Roadside
NH61	(NH53a) Whitehorse Street, Baldock (nr town hall)	524428	233882	Roadside
NH63	(NH02a) Library Hitchin	518160	229092	Roadside
NH67	Cadwell Court, Hitchin	519225	230553	Roadside
NH69	64 Grove Road, Hitchin	518821	229993	Roadside
NH70	Nr Bus Stop Hitchin Street Baldock	524298	233784	Roadside
NH72	Opp Rose Crown, Whitehorse Street, Baldock	524502	233948	Roadside
NH77	Upper Tilehouse Street, Hitchin (traffic lights)	518006	229032	Roadside
NH78	West Hill, Hitchin	518099	229229	Roadside
NH82	Upper Tilehouse Street, Nr Roundabout	518129	229065	Roadside
NH83	Hitchin Station, Roundabout A	519366	229806	Roadside
NH87	11 Stevenage Road, Hitchin	518731	228362	Roadside
NH88	Church St, Baldock (Opp. Town Hall)	524448	233898	Kerbside
NH89	London Road, Hitchin	518706	228293	Roadside
NH90	Gosmore Road, Hitchin	518593	228304	Roadside
NH91	St John's Road, Hitchin	518656	228406	Roadside
NH92*	Stevenage Road (Griffin), Hitchin	518872	228305	Roadside
NH93*	Park Way, Hitchin	518130	229036	Roadside
NH94	Offley Road, Hitchin	517915	228967	Roadside
NH95	Pirton Road, Hitchin	517886	228975	Roadside
NH97	Queen Street, Hitchin	518666	229149	Roadside
NH98	Walsworth/Radcliffe Road, Hitchin	519080	229510	Roadside
NH99	Nightingale Road, Hitchin	518953	229786	Roadside
NH103*	Westbrook Court, Hitchin	518773	228342	Roadside

ID	Site name	X	Y	Site type
NH104*	Dower Court (A), Stevenage Road, Hitchin	518757	228334	Roadside
NH105*	94-98 Stevenage Road, Hitchin	519067	228255	Roadside
NH106	Morello Gardens, Stevenage Road, Hitchin	519250	228218	Roadside
NH107	Whitehill Rd, Hitchin	518720	228335	Roadside
NH108	Hitchin – Hermitage Road (97)	518534	229302	Roadside
NH110*	Stevenage Road, AQ Analyser 1, Hitchin	518740	228348	Roadside
NH111*	Stevenage Road, AQ Analyser 2, Hitchin	518740	228348	Roadside
NH112*	Stevenage Road, AQ Analyser 3, Hitchin	518740	228348	Roadside
NH114	Old Park Road, Hitchin (number 20)	518150	229160	Roadside
NH115	Old North Road, Royston	535373	241466	Roadside
NH116	6 Horseshoe, Park Street, Hitchin	518492	228669	Roadside
NH117	Hitchin – Fishponds Road	518278	229752	Roadside
NH118	High Street (27) Graveley	523125	227954	Roadside
NH119	High Street (125) Codicote	521767	218110	Roadside
NH120	Five House Farmhouse Sandon Rd, Therfield	533805	233823	Rural

Notes: *Located in an AQMA.

Table 6-14: NHDC diffusion tube monitored NO₂ concentrations

ID	Annual mean NO ₂ concentrations (µg/m ³)				
	2013	2014	2015	2016	2017
NH06	29.7	29.3	26.8	25.9	26.5
NH45*	42.0	46.6	42.3	45.2	42.3
NH59	30.6	29.1	26.4	27.8	26.3
NH60	31.5	29.0	29.5	29.9	29.4
NH61	35.1	33.5	29.2	30.4	27.7
NH63	36.6	40.8	35.5	37.2	35.8
NH67	28.9	26.6	25.3	27.2	28.3
NH69	32.2	28.8	26.9	28.3	26.3
NH70	27.4	28.2	25.3	27.3	26.4
NH72	31.8	23.7	30.4	32.1	31.3
NH77	42.0	41.6	37.8	39.0	36.9

ID	Annual mean NO ₂ concentrations (µg/m ³)				
	2013	2014	2015	2016	2017
NH78	29.0	29.3	25.9	26.9	24.3
NH82	40.3	40.3	34.5	36.5	33.3
NH83	32.9	34.1	30.4	32.4	31.4
NH87	27.9	27.4	26.3	26.9	26.9
NH88	38.4	42.4	39.0	39.9	40.5
NH89	28.4	28.7	26.3	29.7	28.2
NH90	27.7	25.8	24.2	26.2	24.0
NH91	32.0	29.9	31.2	31.9	32.2
NH92*	47.6	48.1	45.8	46.1	44.4
NH93*	52.1	54.1	45.5	49.0	45.5
NH94	36.0	36.3	33.8	34.1	34.3
NH95	33.2	34.7	31.7	31.8	33.0
NH97	30.8	32.4	29.7	29.4	28.4
NH98	32.7	31.9	30.3	30.4	28.6
NH99	32.2	29.1	28.2	30.7	29.8
NH103*	41.7	40.8	39.1	39.8	38.6
NH104*	31.5	30.4	27.9	30.8	32.2
NH105*	47.0	51.4	46.2	46.0	43.3
NH106	44.6	42.7	36.1	37.7	35.3
NH107	29.4	29.6	28.4	29.0	27.8
NH108	36.5	40.2	36.1	34.0	33.1
NH110*	-	-	49.6	50.2	48.2
NH111*	-	-	58.6	56.4	54.3
NH112*	-	-	48.7	54.2	49.6
NH114	-	-	-	30.5	29.0
NH115	-	-	-	26.5	26.8
NH116	-	-	-	-	35.8
NH117	-	-	-	-	28.1
NH118	-	-	-	-	21.3
NH119	-	-	-	-	26.1
NH120	-	-	-	-	13.7

Notes: Exceedances of the standard are shown in **bold**.
*Located in an AQMA.

Background concentrations

- 6.4.31 The Defra website⁶⁹ includes estimated background air pollution data for each 1km by 1km OS grid square in the UK. Baseline concentrations for 2017 have been taken from the latest Defra maps and are presented in Table 6-15 for the grid squares that cover the Main Application Site. Defra's estimated background concentrations are well below the air quality standards for annual mean NO₂ and PM₁₀ (40µg/m³) and PM_{2.5} (25 µg/m³).
- 6.4.32 The urban background results from the LBC 2017 monitoring sites have been compared to the Defra background NO₂ concentrations. On average, the urban background monitoring results are 31% higher than the Defra predicted backgrounds. This suggests that the Defra numbers may be underpredicting the urban background concentrations.
- 6.4.33 For the detailed assessment a more detailed approach which includes all sources of emissions in the Study Area will be taken to produce background concentrations. This is explained in the assessment methodology in Section 6.5.14.

Table 6-15: Defra background pollutant concentrations for 2017

OS grid square		Annual mean concentration (µg/m ³)			
X	Y	NO _x	NO ₂	PM ₁₀	PM _{2.5}
511500	222500	23.1	16.4	13.6	9.2
512500	222500	21.6	15.4	13.1	8.9
510500	221500	25.2	17.7	13.9	9.4
511500	221500	35.9	23.5	15.0	10.1
512500	221500	27.8	19.0	14.0	9.5
513500	221500	23.9	16.7	13.7	9.3
510500	220500	29.1	20.0	14.5	10.0
511500	220500	28.2	19.3	14.1	9.6
512500	220500	24.8	17.3	13.3	9.1

Table 6-16: Comparison between Defra and monitored background NO₂ (µg/m³)

Monitoring site	OS Grid Square		Defra mapped	Monitored	Difference (%)
	X	Y	NO ₂	NO ₂	
LN22	511341	221864	23.5	23.0	-2%
LN24	511902	222144	16.4	22.0	34%
LN26	512109	222234	15.4	20.0	30%
LN71	509549	221623	22.4	31.0	39%

⁶⁹ Defra (2017) Background Maps. Available at: <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html> [Accessed: March 2019]

Monitoring site	OS Grid Square		Defra mapped	Monitored	Difference (%)
	X	Y	NO ₂	NO ₂	
LN72	508937	221745	24.0	30.0	25%
LN76	507574	222948	20.3	32.0	58%

6.5 Assessment methodology

Baseline survey methodology

- 6.5.1 A baseline monitoring survey to supplement the existing monitoring data is currently ongoing. Passive diffusion tubes at five locations are monitoring volatile organic compounds (VOCs). Passive diffusion tubes at 10 locations are monitoring NO₂. The details of the monitoring locations are given in Table 6-17 and shown in Figure 6.8 (Volume 2).
- 6.5.2 Monitoring has been set up at locations where there are gaps in the local authority monitoring around the airport, and at locations which could be used to support model verification.
- 6.5.3 The monitoring records monthly NO₂ and VOC concentrations from which annual mean data can be calculated.

Table 6-17: Location details of the NO₂ diffusion tube monitors

ID	Name	Type	Easting	Northing
L1	Dunstable Road East (A505), co-located with LN60	Roadside	508708	221352
L2	Crawley Green Rd	Roadside	511155	222445
L3	Wigmore Lane	Roadside	511782	222762
L4	Eaton Green Road/Darley Road	Roadside	513223	222397
L5	Breachwood Green	Roadside	515048	221904
L6	Winch Hill	Roadside	513773	221750
L7	Vauxhall Way	Roadside	511057	221386
L8	Kimpton Rd	Roadside	510543	220706
L9	Luton Parkway Station	Urban background	510531	220611
L10	Caddington	Roadside	506548	219856

Table 6-18: Location details for the VOC diffusion tube monitors

ID	Name	Type	Easting	Northing
V1	Crawley Green Rd (co-located with L2)	Roadside	511155	222445
V2	Wigmore Park	Urban background	512471	222199
V3	Breachwood Green (co-located with L5)	Roadside	515048	221904

ID	Name	Type	Easting	Northing
V4	Copt Hall Road	Rural background	512495	220012
V5	Luton Parkway Station (co-located with L9)	Urban background	510524	220604

Air quality impact assessment methodology

- 6.5.4 Air quality impacts due to the Proposed Development are likely to result from increased volumes of road traffic associated with the Proposed Development (Do Something (DS) scenario) and increased aircraft movements by comparison to the 2017 Baseline Year and Do Minimum (DM) scenario (without the Proposed Development).
- 6.5.5 The effects of increased aircraft and road traffic will be assessed using the ADMS-Airport (Version 4.1) atmospheric dispersion model. This software is widely used for air quality assessments in the UK and was, for example, the software used for the assessments to inform the recommendations made by the Airports Commission on the short-listed options for expanded airport capacity at both Heathrow and Gatwick.
- 6.5.6 The overall approach to the air quality assessment will comprise:
- a review of the existing (2017) local air quality conditions at and near the airport;
 - an assessment of the potential changes in air quality arising from the demolition and construction works;
 - an assessment of the potential changes in air quality arising from future operations of the airport both without the development (DM) and with the development (DS); and
 - the formulation of mitigation measures, where necessary, to ensure any potential adverse effects on air quality are minimised.
- 6.5.7 The air quality assessment will be undertaken in accordance with relevant guidance from the industry, such as the Defra, IAQM and ICAO. The steps in the assessment methodology are described in the following sections.

Baseline

- 6.5.8 The baseline survey described in Section 6.5.1, and the desk-based study described in Section 6.4, will be used to define the baseline ambient air quality conditions and to help verify the model.
- 6.5.9 Spatial data (location and geometry), time-varying information, activity and emissions data from all relevant emission sources will be gathered to be included in the air quality model for the

following scenarios in line with the assessment scenarios described in **Chapter 5 Approach to Assessment** of this Scoping Report:

- 2017 baseline;
- 2020 DM and DS;
- 2024 DM and DS;
- 2029 DM and DS; and
- 2038 DM and DS.

6.5.10 The future assessment years are based on current forecast passenger demand and proposed capacity phasing. Should demand forecasts change, the years at which the assessment scenarios described in **Chapter 7 Traffic and Transport** of this report are achieved are also subject to change.

6.5.11 For each assessment scenario, information for a typical diurnal schedule and annual air traffic movement (ATM) data by airframe/engine type and maximum take-off weight will be used. Information on airport operations policies, such as use of Fixed Electrical Group Power (FEGP), and times-in-mode will be requested. Traffic data for each assessment scenario will be provided by the transport consultants in the form of annual average daily traffic (AADT) flows, percent of Heavy Goods Vehicles (HGVs) and average daily speeds.

Emissions inventory

6.5.12 An emissions inventory is a database holding the spatial, and temporal emissions data for each source of the air pollutants to be included in the modelling, for each scenario assessed. A detailed emissions inventory will be built using the data sources described below:

- Defra's Emission Factor Toolkit⁷⁰;
- aircraft fleet and airside operational data from the Applicant;
- the ICAO aircraft engine emissions databank⁷¹;
- the Swedish Defence Research Agency (FOI) confidential database for turboprop engine emissions⁷²;

⁷⁰ Defra, Emissions Factor Toolkit. Available at: <https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html> [Accessed March 2019]

⁷¹ ICAO (2017) ICAO Aircraft Engine Emissions Databank. Available at: <https://www.easa.europa.eu/document-library/icao-aircraft-engine-emissions-databank> [Accessed: March 2019]

⁷² FOI. FOI's Confidential database for Turboprop Engine Emissions. Available at: <https://www.foi.se/en/our-knowledge/aeronautics-and-air-combat-simulation/fois-confidential-database-for-turboprop-engine-emissions.html> [Accessed: March 2019]

- the Swiss Federal Office of Civil Aviation (FOCA) guidance on the determination of helicopter emissions⁷³;
- the UK Air Pollution Information System (APIS) website⁷⁴;
- the European Environment Agency EMEP/EEA air pollutant emission inventory guidebook⁷⁵;
- the US Federal Aviation Administration (FAA) Aviation Environmental Design Tool (AEDT)⁷⁶; and
- the National Atmospheric Emissions Inventory (NAEI)⁷⁷.

6.5.13 An inventory of annual emissions will be built for the following pollution sources:

- aircraft main engines in the landing and take-off (LTO) phase, both at ground level and at height;
- Aircraft Auxiliary Power Units (APUs);
- Ground Support Equipment (GSE), namely vehicles operating airside (airside of the terminal) which are associated with the aircraft turn-around and the runway maintenance;
- other airport sources, such as ground power units (GPUs), energy and heating plant, fire training ground, engine testing ground;
- landside (landside of the terminal building) road vehicles on the local highway network; and
- all background sources that are non-airport related, included in the NAEI (e.g. domestic heating).

6.5.14 The pollutants calculated will be NO_x, NO₂, PM₁₀ and PM_{2.5}. Emissions will be calculated using the data sources described above for all sources.

Background concentrations

6.5.15 The desk study in Section 6.4 compared the Defra background maps⁶⁹ with the monitoring results from urban background sites.

⁷³ FOCA. Aircraft Engine Emissions. Available at: <https://www.bazl.admin.ch/bazl/en/home/specialists/regulations-and-guidelines/environment/pollutant-emissions/triebwerkemissionen.html> [Accessed: March 2019]

⁷⁴ APIS. Air Pollution Information System. Available at: <http://www.apis.ac.uk/> [Accessed: March 2019]

⁷⁵ EMEP/EEA (2016) Air Pollutant Emission Inventory Guidebook 2016

⁷⁶ FAA (2017) Aviation Environmental Design Tool (AEDT). Available at: https://www.faa.gov/about/office_org/headquarters_offices/apl/research/models/edms_model/ [Accessed: March 2019]

⁷⁷ Defra (2017) National Atmospheric Emissions Inventory. Available at: <http://naei.defra.gov.uk/> [Accessed: March 2019]

It found that the Defra background NO₂ concentrations were underpredicting for 2017.

- 6.5.16 A more detailed approach will be taken to generate background concentrations from modelling. This will involve the 1km by 1km gridded background emissions from the NAEI for NO_x, PM₁₀ and PM_{2.5}. Dispersion of these emissions will be modelled to predicted annual average concentrations at the human and ecological receptors included in the analysis. The concentrations recorded at rural background monitoring stations in Defra's Automatic Urban and Rural Network⁷⁸ (AURN) will also be used to generate hourly varying background concentrations for the Study Area, which will be an input into the modelling.
- 6.5.17 The background concentration modelling for 2017 will be compared with the 2017 urban background monitoring results to determine whether the modelled concentrations are appropriate.

Air quality assessment

- 6.5.18 A construction impact assessment will be carried out in accordance with the IAQM guidance⁵⁷ and appropriate mitigation proposed.
- 6.5.19 The ADMS-Airport dispersion model will be used for assessment of operational emissions. The model takes into account all the relevant emissions sources on and off the airport and can allow for variations of each of the emission sources with time. Annual mean concentrations of NO_x, NO₂, PM₁₀ and PM_{2.5} will be estimated for comparison with the relevant air quality standards.
- 6.5.20 The initial air quality modelling will be a verification of model-predicted concentrations against monitored values to determine whether the model output for future scenarios requires any adjustment to take into account systematic over- or under-predictions. Any required adjustment would then be undertaken in accordance with Defra guidance⁵⁶.
- 6.5.21 Pollutant concentrations will be predicted at a grid of receptors covering the 15km x 15km Study Area, and at discrete sensitive human and ecological receptors in the Study Area.
- 6.5.22 For the assessment of impacts and significance at sensitive ecological receptors, the methodologies outlined in Defra's and the Environment Agency's guidance⁶² and DMRB HA 207/0727⁶⁰ will be used.

⁷⁸ Defra. Automatic Urban and Rural Network (AURN). Available at: <https://uk-air.defra.gov.uk/networks/network-info?view=aurun> , [Accessed: March 2019]

Odour impact assessment methodology

- 6.5.23 Construction site emissions and VOCs from aircraft will be considered as potential sources of odour.
- 6.5.24 During the proposed construction and earthworks, potentially contaminated soils and waste material may be exposed. This may temporarily generate potentially dust and odours affecting human receptors off-site. The potential odours from construction will be considered in the Soils and Geology assessment (**Chapter 11 Soils and Geology**).
- 6.5.25 Odour is typically due to a mixture of substances and the odour impact of different substances cannot simply be summed. Dispersion modelling of the VOCs would therefore not enable an evaluation of significant effects associated with any increased emissions. Therefore, in accordance with IAQM guidance⁵⁹, a semi-quantitative approach to the assessment of odour under operational scenarios will be undertaken.

Health impact assessment methodology

- 6.5.26 The air quality assessment will determine the population affected by significant concentrations. This will be considered in the Health and Community Assessment (**Chapter 15 Health and Community**).

Significance criteria

Assessment of long-term impacts at human receptors

- 6.5.27 For the assessment of long-term impacts and significance at sensitive human receptors, the approach described in the IAQM/EPUK guidance⁵⁸ will be used. This is best practice for undertaking air quality assessments.
- 6.5.28 Impact descriptors are determined based on the magnitude of incremental change in pollutant concentrations as a proportion of the relevant assessment level; in this instance the air quality standards. The change is then examined in relation to the predicted total pollutant concentrations in the assessment year and its relationship with the relevant air quality standard (Table 6-19).

Table 6-19: EPUK/IAQM impact descriptors

% Change in concentrations relative to air quality standard		Predicted concentration relative to air quality standard				
		Very High	High	Medium	Low	Very low
		>110%	103-109%	95-102%	76-94%	<75%
High	>10%	Major	Major	Major	Moderate	Moderate
Medium	6-10%	Major	Major	Moderate	Moderate	Minor
Low	2-5%	Major	Moderate	Moderate	Minor	Negligible
Very low	1%	Moderate	Moderate	Minor	Negligible	Negligible

6.5.29 Slight and substantial impacts from the IAQM/EPUK guidance have been called ‘minor’ and ‘major’ respectively for this assessment. The resulting impact descriptors at each of the assessed receptors are then used in combination with other considerations, to make a professional judgement on the overall significance of effects from the Proposed Development. In the assessment, ‘major’ or ‘moderate’ impacts are usually judged to result in significant effects in the absence of additional factors, and ‘minor’ or ‘negligible’ impacts usually result in effects which are not significant.

Assessment of short-term impacts at human receptors

6.5.30 Short-term impacts are not expected to be significant as they usually arise from major industrial sources (i.e. Part A processes). There are no major industrial sources in the Study Area. The IAQM/EPUK guidance also describes the approach to assessing the significance of short-term impacts.

Assessment of impacts at ecological receptors

6.5.31 For the assessment of impacts and significance at the local sensitive ecological receptors identified within 2km of the Main Application Site, the methodologies outlined in the Defra and Environment Agency Guidance⁶² will be used. Nitrogen and sulphur deposition rates and information on sensitive habitats for the designated sites will be taken from the APIS website⁷⁴.

6.5.32 The DMRB guidance⁶⁰ states that where annual mean NO_x concentrations are predicted to be below the environmental standards for protected conservation areas (i.e. 30µg/m³), or where the change in predicted concentrations is less than 0.4µg/m³, then no significant effects would be anticipated for the assessed ecological site. Where the annual mean NO_x concentrations are predicted to exceed the environmental standard and the change in concentrations due to the Proposed Development is predicted to be larger than 0.4µg/m³, then an assessment of nitrogen and acid deposition needs to be undertaken.

- 6.5.33 The Defra and Environment Agency guidance⁶² states that air quality impacts can be considered to be insignificant if the annual mean process contribution (i.e. the predicted change in concentrations of nitrogen deposition due to the Proposed Development) is less than 1% of the long-term environmental standard (i.e. the critical load in the case of assessing nitrogen and acid deposition for ecological sites).
- 6.5.34 The critical load is defined as a quantitative estimate of exposure to pollutants below which significant harmful effects do not occur (i.e. it relates to the rate at which the pollutant is deposited from air to the ground).
- 6.5.35 For those sites that require an assessment of nitrogen and acid deposition, a conversion of NO₂ is required. The modelled NO_x will be converted to NO₂ (using the Clapp and Jenkin approach) in order to calculate the nitrogen deposition rate, as follows:
- the NO₂ concentrations (µg/m³) will be multiplied by the relevant deposition velocity (0.0015m/s for grassland and 0.003m/s for forest habitats); and
 - the resulting value (µg NO₂/m²/s) will be converted to kg NO₂/ha/yr using a factor of 315.26 and then to kg N/ha/yr using a factor of 14/46 (i.e. converting from NO₂ to nitrogen using the molecular mass).
- 6.5.36 The calculations will be carried out for the baseline and future year assessment scenarios at the designated sites in the Study Area. When predicting future deposition rates, total nitrogen deposition rates will be reduced by 1% per year. This is following a response from Natural England to the Stansted Airport planning application. This is a more precautionary approach to the DMRB guidance which suggests a reduction of 2% per year. This is because of predicted improvements in vehicle technologies (cleaner fuels and electrification) and abatement equipment. The resulting change in nitrogen deposition due to the Proposed Development will be compared against the upper and lower critical levels for each site.

6.6 Potential significant effects

- 6.6.1 Based on the baseline data gathered to date, an understanding of the Proposed Development, and experience of other major projects, it is proposed that the following matters, that could potentially result in significant air quality effects, be included in the scope of the assessment. The receptors that may experience these effects will be further described in the ES.

Construction

6.6.2 Impacts that could potentially result from construction works include:

- The generation of dust, odour and elevated levels of particulate matter (PM₁₀, PM_{2.5}) arising from demolition and construction works;
- Increased journeys (construction related) to and from the Proposed Development on the road network; and
- Increased exhaust emissions from vehicles operating at the Airport, airside and landside.

Operation

6.6.3 Potential operational impacts of the Proposed Development include:

- Increased staff and passenger journeys to and from the Airport on the road network;
- Increased emissions from aircraft engines;
- Increased exhaust emissions from vehicles operating at the Airport, airside and landside;
- Increased emissions from energy and heating plant (i.e. boilers);
- Miscellaneous emissions from other airport activities, such as aircraft fire training and engine testing; and
- Odour emissions from airside sources, for which a semi-quantitative approach to the assessment will be taken.

Cumulative effects

6.6.4 The assessment will also consider cumulative effects with respect to air quality, either beneficial or adverse, of the Proposed Development and 'other development' projects in the ZOI which have the potential to impact air quality. For example, emissions from the increase in traffic caused by other foreseeable developments will be captured by the traffic data used in the dispersion modelling. See **Chapter 21 In-Combination and Cumulative Effects** of this Scoping Report for further details regarding methodology.

6.7 Matters scoped out

6.7.1 The impacts from alleged jettisoning of fuel from aircraft will not be considered. The jettisoning of fuel from aircraft is only undertaken in emergency scenarios, when an aircraft is required to undertake an emergency landing. Jettisoning of fuel will

usually occur over water and at high altitude in order to vaporise the fuel and facilitate dispersion. Due to the infrequency of these events, it is considered that there is no potential significant effect from these activities.

- 6.7.2 The potential odours from construction will also not be considered in the air quality assessment. However, it will be considered in the Soils and Geology assessment and mitigation will be specified in the Draft CoCP.

6.8 Mitigation

- 6.8.1 This section outlines the likely approach to air quality mitigation and some examples of measures that are likely to be employed, based on the baseline data gathered to date, an understanding of the Proposed Development, and experience of other aviation projects.

Embedded mitigation

- 6.8.2 Embedded mitigation for construction includes phased working to reduce the magnitude and extent of air quality impacts in comparison to undertaking all works at the same time.

- 6.8.3 Embedded mitigation for operation includes:

- use of the new access road to provide routes for road traffic, away from sensitive receptors; and
- cleaner aircraft operations due to the design and location of terminals and the use of proposed FEGP, allowing more efficient operations and aircraft movements.

Good practice mitigation

- 6.8.4 Good practice mitigation for construction includes those listed in the IAQM guidance⁷⁹. The recommended level of mitigation will be based on the results of the assessment. This mitigation can then be included in the Draft CoCP.

- 6.8.5 The Draft CoCP will also include mitigation measures for odours. This will be included in a remediation strategy, if the Soils and Geology Assessments identifies a requirement for remediation.

- 6.8.6 Good practice mitigation for operation includes:

- cleaner aircraft technology in the future due to aircraft emissions compliance to the Committee on Aviation Environmental Protection (CAEP) standards⁷⁹; and

⁷⁹ ICAO. Committee on Aviation Environmental Protection (CAEP). Available at: <https://www.icao.int/ENVIRONMENTAL-PROTECTION/Pages/CAEP.aspx> [Accessed: March 2018]

- cleaner airside vehicles through the uptake of electric vehicles and low emission vehicles, and the future improvements through Euro and Stage emission standards compliance.

7 TRAFFIC AND TRANSPORT

7.1 Introduction

7.1.1 This chapter presents the proposed approach to the assessment of the likely significant environmental effects of the Proposed Development on traffic and transportation.

7.1.2 The assessment will consider potential impacts on road and transport users, including:

- drivers of vehicles;
- passengers in vehicles;
- cyclists;
- pedestrians; and
- public transport users.

7.1.3 The application for the Proposed Development will be accompanied by a Transport Assessment (TA) and a Travel Plan. The TA will assess the impact of the Proposed Development upon the operation of the surface access network and will consider both the construction and operational aspects taking into account the Surface Access Strategy. Predictions of the distribution future year trips on the transport networks are provided by an updated version of the Central Bedfordshire and Luton Traffic Model (CBLTM) which has been amended to provide more detail of the networks around LTN and to extend the area over which the performance of the highway network can be assessed.

7.1.4 The TA and the associated traffic modelling which supports the assessment will form the basis of the Traffic and Transport chapter included within the ES. Where other assessments rely on traffic modelling data they refer to its use in the relevant topic chapters of this Scoping Report. The principal purpose of the TA is to consider the implications of the Proposed Development on the operation of the transport networks. For example the assessment of whether there is sufficient spare capacity in the junctions to cater for the additional vehicles and if not, what are the likely consequences in terms of queueing and delay. This includes identifying suitable mitigation measures.

7.1.5 The Traffic and Transport assessment in the ES will assess effects of the increase in trips on the transport networks on the users by considering the following impacts:

- severance;
- pedestrian delay;
- pedestrian amenity;

- driver stress and delay;
- accidents and safety; and
- hazardous loads.

7.1.6 Whereas the TA concentrates on peak periods the assessment reported in the ES generally considers daily traffic flows which are generally the trigger for the environmental impacts listed in the previous paragraph.

7.1.7 The highway model that will identify the changes in traffic volumes covers an area that is bounded to the east and west by the A1/A1(M) and A41 corridors respectively and to the south and north by the M25 and the A421 corridors.

7.1.8 The changes in traffic flows on the highway network that will result from the greater throughput of passengers at LTN have the potential for there to be changes to air quality and noise. These changes are covered in **Chapter 6** and **Chapter 10** respectively.

7.2 Legislation, policy and guidance

7.2.1 The transport elements of the Proposed Development are required to comply with various transport policies at national, regional and local levels. A summary of the various policy documents which are relevant to the Traffic and Transport assessment is provided below.

National planning and aviation policy

Airports National Policy Statement – June 2018

7.2.2 While specific to Heathrow Airport, the requirements for an airport surface access strategy set out in paragraph 5.9 of the ANPS¹¹ are similar for all airports in the south east. The strategy must “*reflect the needs of the scheme contained in the application for development consent, including any phasing over its development, implementation and operational stages, reflecting the changing number of passengers, freight operators and airport workers attributable to the number of air traffic movements*” (paragraph 5.9).

7.2.3 Paragraphs 5.10, 5.13 and 5.14 state respectively:

“The applicant should assess the implications of airport expansion on surface access network capacity using the WebTAG methodology stipulated in the Department for Transport guidance, or any successor to such methodology. The applicant should consult Highways England, Network Rail and highway and transport authorities, as appropriate, on the assessment and proposed mitigation measures. The assessment should distinguish between the construction and

operational project stages for the development comprised in the application.”

“For schemes and related surface access proposals or other works impacting on the strategic road network, the applicant should have regard to DfT Circular 02/2013, The Strategic Road Network and the delivery of sustainable development (or prevailing policy), and the National Networks NPS. This sets out the way in which the highway authority for the strategic road network will engage with communities and the development industry to deliver sustainable development and economic growth, whilst safeguarding the primary function and purpose of the network.”

“The surface access systems and proposed airport infrastructure may have the potential to result in severance in some locations. Where appropriate, the applicant should seek to deliver improvements or mitigation measures that reduce community severance and improve accessibility.”

- 7.2.4 The guidance for Heathrow that is set out above has been adopted for the assessment of the surface access impacts associated with the Proposed Development.

Aviation Strategy

- 7.2.5 The emerging Aviation Strategy was published for consultation in December 2018²¹. Paragraph 3.67 is concerned with Surface Access and states:

“It is important to have good surface access links with airports. All proposed airport developments need to be accompanied by clear surface access proposals which demonstrate how the airport will ensure easy and reliable access for passengers, increase the use of public transport and minimise congestion, emissions and other local impacts.”

- 7.2.6 Paragraph 4.39 recognises the work that is being undertaken at LTN where as part of the terminal development project a ‘travel hub’ is being developed as part of the arrivals area where passengers can easily be assisted by surface access providers to make the best choices for their onward journeys.

National Planning Policy Framework (NPPF) – February 2019

- 7.2.7 Chapter 9 of the NPPF is concerned with “*promoting sustainable transport*”. Paragraph 102 states that “*transport issues should be considered from the earliest stages of development proposals, so that:*

- a) *the potential impacts of development on transport networks can be addressed;*

- b) *opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised - for example in relation to the scale, location or density of development that can be accommodated;*
- c) *opportunities to promote walking, cycling and public transport use are identified and pursued;*
- d) *the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account - including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and*
- e) *patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places.”*

7.2.8 Paragraph 108 is concerned with the transport issues when considering development proposals and states:

“In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

- a) *appropriate opportunities to promote sustainable transport modes can be - or have been - taken up, given the type of development and its location;*
- b) *safe and suitable access to the site can be achieved for all users; and*
- c) *any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.”*

7.2.9 Paragraph 109 states that *“development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe”*

7.2.10 Paragraph 110 continues by stating that *“within this context, applications for development should:*

- a) *give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second - so far as possible - to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;*
- b) *address the needs of people with disabilities and reduced mobility in relation to all modes of transport;*

- c) *create places that are safe, secure and attractive - which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;*
- d) *allow for the efficient delivery of goods, and access by service and emergency vehicles; and*
- e) *be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations.”*

7.2.11 Paragraph 111 states that “*all developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a statement or transport assessment so that the likely impacts of the proposal can be assessed.*”

Planning Practice Guidance (PPG)

7.2.12 The PPG⁸⁰ was launched in March 2014 and is an on-line guidance resource to use alongside the NPPF. This includes ‘Travel plans, transport assessments and statements in decision-taking’, which provides advice on when Transport Assessments and Transport Statements are required, and what they should contain. It covers:

- Overarching principles on Travel Plans, Transport Assessments and Statements;
- Travel Plans; and
- Transport Assessments and Statements.

County policy

Hertfordshire Local Transport Plan (2018-2031)

7.2.13 The Hertfordshire Local Transport Plan 2018-2031 (HLTP) was adopted in May 2018. There is recognition that the Airport generates traffic movements on the County’s roads and also that HCC will work with others to seek to improve public transport connections to LTN.

7.2.14 The HLTP considers areas around Hertfordshire that have their own growth strategies which will provide employment and business opportunities for Hertfordshire and drive travel demand. One of these is LTN which it notes has planning permission to expand to 18mmpa that it expects to be reached within five years.

7.2.15 HCC notes that passenger flows for LTN are particularly heavy on the M1 and Midland Mainline railway. Other key routes that lie

⁸⁰ DCLG, (2014); Planning Policy Guidance 2014

within the county are identified as the A1081, A505, A602, and B653.

- 7.2.16 Survey data published by the Civil Aviation Authority⁸¹ shows the mode of transport by passenger type for a range of airports. HCC notes that in terms of modal share for passengers, Stansted is already successful in attracting trips by sustainable modes with 51% using alternatives to the car, in contrast LTN has around 30% using non-car modes and increasing this level is a key priority for them. Increasing passenger trips by non-car modes will be vital for both airports as more passengers use them in the coming years, and both airports have strategies to help achieve this. In recognition of the expansion of the airports around London, the HLTP includes the following policy.

“Policy 11: Airports

The county council, working in partnership with neighbouring local authorities and airport operators, will seek improvements to surface access to Luton and Stansted Airports, and promote and where possible facilitate a modal shift of both airport passengers and employees towards sustainable modes of transport.

The county council is opposed to new runway development at Luton and Stansted Airports”.

- 7.2.17 To achieve the delivery of sustainable airport growth at LTN with negative impacts on the local road network minimised, HCC will work with other stakeholders to improve non-car modes of access. HCC foresees that this will include working with local authority partners, bus operators and the airport operators to look for opportunities to maximise the levels of passenger transport (bus and coach), especially from areas without direct rail access to LTN.
- 7.2.18 It will also work with relevant stakeholders as part of the Thameslink programme. This is a key element of plans to increase rail travel to LTN from Hertfordshire and beyond. This includes lobbying for longer trains on the Midland Main Line and more frequent, faster services to Luton Airport Parkway railway station.
- 7.2.19 LTN lies within identified strategic transport corridors, as summarised below:

[Corridor 2: London-Watford-Luton-Milton Keynes](#)

“Luton Airport generates significant travel demand...we will work with Luton Borough Council and airport operators on improving

⁸¹ Civil Aviation Authority (2015); Passenger Survey Report

surface access to Luton Airport, and work with Highways England to ensure effective operation of the M1.

Features of our strategic approach within this corridor include supporting the development of major economic growth locations at... Luton Airport Enterprise Zone via working in cooperation with Luton Borough Council”

Corridor 6: Luton – Stevenage

“The primary connections within this strategic movement corridor are the A505 and A602. These routes provide the strategic link between Luton, Luton Airport, the A1(M) and Stevenage, as well as serving the towns of Hitchin, Letchworth and Baldock. In addition to these towns, Luton Airport generates a significant amount of traffic on the corridor. Traffic flows are generally localised between the towns along the corridor, although there are some longer distance movements between the A10/A602 in the east and A6 in the west. A number of lower category parallel routes also serve the corridor with some traffic using these to avoid congestion at Luton or Hitchin. Notable travel flows in this corridor are between Luton/Dunstable and Hitchin and Stevenage, as well as Letchworth Garden City to Stevenage.

The main scheme priorities in the corridor are to improve interurban passenger transport connectivity from Luton to Stevenage, and improve sustainable travel links between the towns of Hitchin, Letchworth and Baldock. We will work in partnership with local and neighbouring planning authorities and Highways England on long term growth plans and transport improvements, to understand the need for more significant highway improvements along the corridor.”

Local policy

Luton Local Plan 2011-2031 – November 2017

- 7.2.20 The Luton Local Plan 2011-31 is a strategic document setting out the vision, objectives and spatial planning strategy for the whole of LBC area for the period up to 2031. The Local Plan includes eleven Strategic Objectives of which the one most relevant to transport considerations is,

“Strategic Objective 8: Improve accessibility, connectivity, sustainability and ease of movement to, from and within the borough”.

- 7.2.21 There are two policies that need to be considered when assessing the surface access effects of the Proposed Development. These are Policy LLP6 – London Luton Airport Strategic Allocation that includes a requirement to seek to encourage the use of sustainable transport measures and Policy

LLP31 – Sustainable Transport Strategy which is based on the vision for the Local Transport Plan 2011-2026⁸².

7.2.22 Policy LLP6 requires that proposals for expansion of the airport and its operation, together with any associated surface access improvements, will be assessed against the Local Plan policies as a whole taking account of the wider sub-regional impact of the airport. The policy towards surface access is set out in Section B of the policy in the following two subsections:

“viii. Incorporate sustainable transportation and surface access measures in particular which minimise use of the private car, maximise the use of sustainable transport modes and seek to meet modal shift targets, all in accordance with the London Luton Airport Surface Access Strategy;

ix. incorporate suitable road access for vehicles including any necessary improvements required as a result of the development”.

7.2.23 The surface access strategy referred to in the policy was a document⁸³ published by LLAOL. The strategy had an objective *“to improve access to London Luton Airport, particularly by public transport”*. The strategy included a number of commitments to achieve the objective which include:

- further improve public transport in the area;
- set challenging targets for reducing dependence on the private car; and
- identify specific actions to encourage greater use of public transport and more sustainable travel behaviour.

7.2.24 Since the publication of the Local Plan, a new Surface Access Strategy has been produced to cover the period 2018-2022⁸⁴. The new strategy has the following two objectives:

- *“to promote and encourage sustainable transport options for employees and passengers; and*
- *to reduce the impact of surface access to the airport on the local community.”*

7.2.25 The strategy includes the following targets to support the objectives:

- reducing single occupancy vehicle and private car journeys to and from LTN;
- increasing sustainable travel to and from LTN; and

⁸² Luton Borough Council (2011): Local Transport Plan 2011-2026

⁸³ London Luton Airport (no date); Airport Surface Access Strategy 2012-2017

⁸⁴ London Luton Airport (no date); Airport Surface Access Strategy 2018-2022

- promoting and monitoring sustainable travel at LTN.

7.2.26 Policy LLP31 includes a section that is specific to LTN,

“D. Support for the continued economic success of London Luton Airport as a transport hub (policy LP6), will be delivered through:

- *Measures to ensure there is capacity at strategically important junctions;*
- *Continued enhancement of sustainable modes of transport via the Airport Surface Access Strategy”.*

Luton Local Transport Plan 2011-2026

7.2.27 The Local Transport Plan (LTP) does not consider any increase in passenger throughput at the airport beyond 20mppa which it considered could be achieved by 2026, the horizon year of that document.

7.2.28 The LTP includes the following vision for the long-term transport strategy, that is to 2026,

“To make Luton a safer and healthier place in which to live, work, learn and have fun, we will provide an integrated, safe, accessible and more sustainable transport system which supports the economic regeneration and prosperity of the conurbation and the planned growth of the area whilst reducing unnecessary car use and CO₂ emissions, enhances the environment and generally improves the health and quality of life of the community”.

Guidance

7.2.29 The ‘Guidelines for the Environmental Assessment of Road Traffic’⁸⁵ were produced by the Institute of Environmental Assessment (IEA) in 1993 (now the Institute of Environmental Management (IEMA)) and referred to as the ‘IEMA Guidelines’. This document provides descriptions of environmental effects that may be considered important when considering traffic from an individual development and indicators of levels of change that might determine the level of severity of any effect. In addition, reference will be made to the advice in Volume 11 of the Design Manual for Roads and Bridges⁸⁶ (referred to as the ‘DMRB’) (Section 2, Part 8) published by the Department for Transport when considering the effects on pedestrians and cyclists.

⁸⁵ Institute of Environmental Assessment (IEA, now Institute of Environmental Management and Assessment, IEMA), (1994); Guidelines for the Environmental Assessment of Road Traffic

⁸⁶ Department for Transport (DfT), (1993); Design Manual for Roads and Bridges, Volume 11 Section 3 Part 8, Pedestrians, Cyclists, Equestrians and Community Effects

7.3 Stakeholder engagement and consultation

- 7.3.1 Meetings have been held with LBC, Highways England, HCC and CBC to provide an overview of the Proposed Development and to discuss the methodology proposed to produce the future year trips by mode to cover both passenger related activity and airport employees. Also discussed was the extent of the area over which there is the potential for there to be effects that would be investigated and reported in the TA, and the Traffic and Transport chapter included within the ES. The methodology for testing the local transport networks was also discussed.
- 7.3.2 The TA Scoping Report was issued to those four highway authorities on 31 October 2018 and a continuing programme of collaboration is ongoing.
- 7.3.3 Further consultation will be held with train, coach, and bus operators in order to establish appropriate measures that would provide alternative means of access that reduce the high level of reliance on the use of the private car to LTN and forms an important part of the surface access strategy.

7.4 Baseline conditions

Study Area

- 7.4.1 The Study Area will be defined by the major transport routes serving the catchment area for air travellers and the location of the residences of the workforce. From initial analysis the transport routes relating to the air travellers will include the M1 corridor to the north and south of Junction 10 and the A505/A602 corridor providing a link across to the A1(M). In addition, roads within the town, particularly to the north of the Airport will experience changes in traffic flows as a result of the increase in employment at LTN.
- 7.4.2 The geographic extent of the Study Area will be agreed with the four highway authorities identified in paragraph 7.3.1 as part of the TA Scoping discussions. By the nature of the assessment methodologies and sensitivities, the area over which the transport and traffic effects of the Proposed Development will be smaller than the area that will be covered by the TA.
- 7.4.3 Figure 7.1 (Volume 2) shows the airport in relation to the strategic transport network in the area, which includes the M1, M25 and A1(M) motorways, the A505/A602 corridor, and the East Midlands Mainline railway line. Figure 7.2 (Volume 2) shows the local transport network and also includes the alignment of CPAR and the Luton DART link from Luton Airport Parkway railway station to the existing terminal building.

Data gathering and survey

- 7.4.4 An extensive data collection exercise was undertaken in November 2017 to update and enhance the existing CBLTM. This was completed to establish the baseline for both the TA and the ES assessments. The surveys included:
- classified junction turning counts (43 locations);
 - automatic traffic counts (45 locations);
 - car park entry/exit surveys (five locations);
 - car park occupancy (one location); and
 - journey time surveys (three routes).
- 7.4.5 The surveys that collected data for the junction turning counts were conducted using video cameras. To capture data for a typical weekday, the survey specification required that the cameras recorded activity at the junctions on a Tuesday, Wednesday, or Thursday for the period 05:00 to 20:00. Data for the periods 05:30 to 10:30 and 16:00 to 19:00 was extracted from the recordings. The surveys also observed pedestrian movements at the junctions and queue lengths that were recorded every five minutes.
- 7.4.6 The automatic traffic counts recorded traffic flows over a period of two weeks. The data is fully classified, with average speeds recorded at 15 minute intervals. Data for the M1 will be obtained from the WebTRIS⁸⁷ database.
- 7.4.7 Surveys were undertaken at the following six car parks,
- short stay;
 - mid-stay;
 - long stay;
 - multi-storey;
 - drop off zone; and
 - car hire.
- 7.4.8 With the exception of the car hire car park, vehicles entering and leaving were counted over the 24-hour period on a Tuesday, Wednesday, or Thursday. In addition, the start and end occupancy of the car park or drop-off zone was also recorded. At the car hire car park only the start and end occupancy was

⁸⁷ Highways England. WebTRIS (Online) Available from: <http://webtris.highwaysengland.co.uk/> [Accessed March 2019]

recorded as the vehicle movements were captured as part of the junction turning count surveys.

- 7.4.9** Further traffic counts and journey time surveys were undertaken in Autumn 2018 to assist the expansion of the CBLTM.
- 7.4.10** Personal Injury Collision (PIC) data will be obtained from LBC to cover the most recently available five-year period. This may extend to CBC and HCC to cover roads for which they are the highway authority. This will help assist the mitigation process as appropriate.
- 7.4.11** Bus company and rail operator websites will be reviewed in order to establish baseline public transport provision, to include routes and frequencies.
- 7.4.12** Information on passenger loadings on trains will be requested from Govia Thameslink Trains and East Midlands Trains.

7.5 Existing conditions

- 7.5.1** The CAA departing passenger survey undertaken in 2017⁸⁸ shows that of the five major airports serving London and the surrounding area, LTN has the lowest proportion of passengers who use public transport to travel to the airport. The figures obtained in a 2017 survey are shown in Table 7-1.

Table 7-1: Mode of Travel to Airport

Mode	Gatwick	Heathrow	London City	Luton	Stansted
Public	42.5%	38.5%	42.8%	30.6%	49.2%
Private	57.4%	61.3%	54.8%	69.1%	40.6%
Other	0.2%	0.3%	2.5%	0.3%	0.2%
Terminating Passengers (mppa)	41.2	48.0	4.4	15.6	24.27

- 7.5.2** Generally, the airport is somewhat constrained in highway/ traffic terms and capacity problems exist at certain locations near the LTN at peak times of the day and this can be exacerbated by the heavy reliance on the private mode of access. This mode includes taxis/minicabs which account for 17.6% of access journeys.
- 7.5.3** Improvements to Junction 10 and Junction 10A of the M1 are in place and these improvements were carried out taking into

⁸⁸ Civil Aviation Authority (2017); Passenger Survey Report

account the 18mppa expansion programme of works granted planning permission in 2014.

7.5.4 Unlike the other London airports, LTN is not served directly by a rail line. The nearest station is Luton Airport Parkway railway station which is served by Thameslink and East Midlands Trains. During the day the former provides the bulk of the rail capacity with 6 trains per hour in each direction. Four of these are trains that run between Bedford and areas to the south of London and also serve Gatwick Airport. The typical journey times between Luton Airport Parkway railway station and St Pancras International on these trains is between 32 and 34 minutes. The fastest connection between the station and St Pancras International is the service operated by East Midlands Trains. The journey time is around 25 minutes, with the trains running non-stop to London. These trains run between St Pancras International and Nottingham.

7.5.5 Currently, shuttle buses transport passengers between Parkway station and the airport. The reliability and journey time of the bus service can be affected by traffic congestion, which is difficult to predict in advance. These issues can lead to stressful and delayed journeys to the airport.

7.5.6 It is recognised that public transport improvements are required and that a significant shift to public transport is a key component of any future transport strategy together with the introduction of traffic management measures. Accordingly, in order to enhance the attractiveness of rail as a means of travelling to the airport, LLAL and LBC are investing the Luton DART driverless rail system which will transport passengers between Luton Airport Parkway railway station and the airport. The Luton DART is being developed to improve passenger journey time and connectivity to and from the airport using a modern, sustainable and efficient system. Construction of the link commenced in April 2018 and its services are scheduled to commence operations in 2021.

7.6 Assessment methodology

7.6.1 National, regional and local planning policy and best practice guidance as well as local policies relating to transport will be used to inform the assessment.

7.6.2 The methodology to be utilised in the assessment will reflect the guidance for preparing traffic and transportation ES chapters contained within:

- The Guidelines for the Environmental Assessment of Road Traffic published by The Institute of Environmental Assessment in 1993 (now IEMA);

- Volume 11 of the Design Manual for Roads and Bridges (DMRB) (Highways Agency) – Environmental Assessment; and
- The Department for Communities and Local Government (DCLG) Planning Practice Guidance on Environmental Impact Assessment and Travel Plans, Transport Assessments and Statements in Decision-Taking (Ref. 40).

7.6.3 The magnitude of change, based on the net change in journeys, when compared against the sensitivity of receptors will establish the significance of any beneficial or adverse traffic and transport effects of the Proposed Development.

7.6.4 The environmental issues that will be assessed to determine the traffic and transport effects of the Proposed Development (during the construction phase and once complete and fully operational) are as follows:

- Severance - this is described in the IEMA guidance as the perceived division that can occur within a community when it becomes separated by a major traffic artery. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself. It can also relate to quite minor traffic flows if they impede pedestrian access to essential facilities. The guidance recognises that the measurement and prediction of severance is extremely difficult.
- Pedestrian delay – this is defined in the IEMA Guidelines as an issue, which is affected by changes in the volume, composition and / or speed of traffic may affect the ability of people to cross roads. Typically, increases in traffic levels result in increased pedestrian delay, although increased pedestrian activity itself also contributes.
- Pedestrian amenity – this is defined in the IEMA Guidelines as the relative pleasantness of a journey and can include fear and intimidation if they are relevant. As with pedestrian delay, amenity is affected by traffic volumes and composition along with pavement width and pedestrian activity.
- Driver stress and delay – this is identified in the IEMA Guidelines as an issue that can occur at several points on the network, although the effects are only likely to be significant when the traffic on the highway network is predicted to be at or close to the capacity of the system. The DMRB Guidelines identify three main components of driver stress:
 - frustration;
 - fear of potential accidents; and

- uncertainty relating to the route to be followed.
- Accidents and safety – these are not defined in the IEMA Guidelines, which suggests that professional judgement will be required to assess the implications of local circumstance, or factors which may increase or decrease the risk of accidents. The full results of the accident analysis will be reported in the TA and drawn on in the Traffic and Transportation chapter as appropriate.
- Hazardous Loads - During construction, the Proposed Development may generate hazardous loads. The consideration of hazardous loads will be reviewed during design development and considered if required.

7.6.5 The proposed geographical scope of the assessment will be determined based on the results of the TA Scoping and will include an agreed schedule of committed schemes and developments and the distribution of Proposed Development trips onto the local transport network.

7.6.6 The assessment will cover a number of years to reflect the phased build-up of passenger throughput identifying key infrastructure requirements for each phase. The future year growth will be based on provisional passenger demand forecasts. If the projected forecast demand changes, the year in which airport capacity is achieved may also change. The current expected assessment scenarios are:

- 2017 – 15.9 million passengers per annum (mppa) – base year;
- 2020 – 18 million mppa;
- 2024 – 21 mppa;
- 2029 – 25 mppa; and
- 2039 – 32 mppa.

7.6.7 Assessments of the effects at key critical stages during the construction programme when the potential effects of the construction related traffic will be greatest will be provided, based on a construction programme and anticipated vehicular traffic mainly being HGVs. Detailed information on the phasing of the Proposed Development is not currently available, therefore the assessment years at which the impact of construction related movements on the transport network are to be examined will be agreed with the relevant authorities at a later date.

7.6.8 The TA will be based on a surface access strategy that will be developed to support the increased passenger throughput making use of the different forms of transport that are or will be available to minimise the impact on the local transport networks;

that is both highway and public transport. Public transport uptake will play a key role as part of this new transport strategy.

- 7.6.9 The TA will assess the impact of the Proposed Development on the local highway network concentrating on changes in terms of operational and capacity performance. It will consider link and junction capacities, journey times and safety, with an emphasis on AM and PM peak periods on the network. It will also consider the potential impact on the public transport network based on the surface access strategy.
- 7.6.10 As part of the TA a VISSIM micro-simulation traffic model has been developed to investigate the impacts on the highway network in the vicinity of the Proposed Development. To review changes to traffic flows over a wider area, the existing strategic CBLTM has been updated and modified. The latter will provide predicted traffic flows for a number of assessments that will be reported in the ES.
- 7.6.11 There are no further notable assumptions or limitations to this assessment.

Significance criteria

- 7.6.12 The IEMA guidelines suggest following two broad rules-of-thumb that can be used as a screening process to delimit the scale and extent of the assessment,
- Rule 1 – include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%).
 - Rule 2 – include any other specifically sensitive areas where traffic flows have increased by 10% or more.
- 7.6.13 Where the predicted increase in traffic flows is lower than these thresholds, the IEMA guidelines suggest the significance of the effects can be stated to be negligible and further detailed assessments are not warranted. Given that daily variations in background traffic flow may vary by + or -10%, it should be assumed that projected changes of less than 10% create no discernible environmental impact.
- 7.6.14 These broad rules will remain subject to professional judgement and are specifically relevant to the assessment of the traffic-related environmental effects considered in this chapter. Smaller traffic changes than those set out above may, in some circumstances, be relevant in the consideration of congestion or congestion related effects. Similarly, there will be occasions where there may be in percentage terms a high increase in traffic flow but this is a result of a low baseline and a low projected increase. As an extreme example, if there were an increase of 20 vehicles on a base flow of 10 vehicles that would give a 200%

increase; however, in terms of those environmental effects that will be examined in the Transport and Traffic chapter it would be highly unlikely that there would be any adverse environmental effect.

Magnitude of impact

7.6.15 The methodology for determining magnitude of impact will broadly follow DMRB 11.2.5⁸⁹. Table 7-2 below sets out typical descriptors and criteria, adapted from DMRB to provide consistent reporting in this report and the ES, that will be used to define the magnitude of an impact of a project.

Table 7-2: Magnitude of Impact and Typical Descriptors

Magnitude of impact (Adverse or Beneficial)	Descriptor
High	Substantial change to attribute, service or baseline conditions.
Medium	Notable change to attribute, service or baseline conditions, but not posing a threat to integral use.
Low	Some noticeable change to attribute, service but does not represent a substantial change to baseline conditions.
Very Low	Very small change to attribute, service or baseline conditions which would be barely perceivable to users.
No Change	No change to baseline conditions.

Sensitivity of receptors

7.6.16 The sensitivity of a road reflects the vulnerability of the road user groups who may use it. These can be pedestrians, cyclists, and vehicle drivers and passengers. Paragraph 2.5 of the IEMA Guidelines identifies the affected groups and special interests as follows:

- people at home;
- people in work places;
- sensitive groups including children, elderly and disabled;
- sensitive locations, e.g. hospitals, churches, schools, historic buildings;
- people walking;
- people cycling;
- open spaces, recreational sites, shopping areas;

⁸⁹ Department for Transport (DfT), (2008); Design Manual for Roads and Bridges, Volume 11 Section 2 Part 5, Assessment and Management of Environmental Effects

- sites of ecological/nature conservation value; and
- sites of tourist/visitor attraction.

7.6.17 This list covers those groups or locations that could be affected by a range of environmental effects, some of which such as noise and air quality are considered in other chapters. The nature of the environmental effects that are considered in this chapter are described in Section 7.6 and the receptors are likely to be those groups/locations identified in the third, fourth, fifth, and sixth bullet point in addition to travellers in motorised vehicles who are not included in the IEMA Guidelines list. For some receptors the physical layout of the highway may affect the sensitivity. For example, pedestrians walking along a road that has no footway will be more sensitive to increases in traffic than pedestrians walking along a wide footway adjacent to a carriageway.

7.6.18 Table 7-3 provides typical descriptors, adapted from DMRB, that will be used to define the sensitivity of receptors.

Table 7-3: Sensitivity of traffic and transport receptors

Sensitivity	Typical Descriptor
Very High	Very high importance, very limited potential for substitution, no or low capacity to absorb change.
High	High importance, some ability to absorb change.
Medium	Medium importance, and able to adapt to change.
Low	Low importance, able to adapt to or resist change.
Very Low	Very low importance, resistant to change.

Significance

7.6.19 The significance of effects will be determined based on the combination of the magnitude and sensitivity using the matrix in Table 7-4 below, adapted from DMRB.

Table 7-4: Significance of Traffic and Transport Effects

		Magnitude of Impact				
		No Change	Very Low	Low	Medium	High
Sensitivity	Very High	No effect	Negligible	Minor or Moderate	Moderate or Major	Major
	High	No effect	Negligible	Negligible or Minor	Moderate or Major	Moderate or Major
	Medium	No effect	No effect or Negligible	Negligible or Minor	Minor or moderate	Moderate or Major
	Low	No effect	No effect or negligible	No effect or negligible	Minor	Negligible or Minor
	Very Low	No effect	No effect	No effect or negligible	No effect or negligible	Negligible

- 7.6.20 Significance ratings of 'Major' and 'Moderate' and above will be considered as significant, whereas those classified as 'Minor' or 'Negligible' will be considered not significant.

7.7 Potential significant effects

Construction

- 7.7.1 The principal transport issues, which may arise as a result of the Proposed Development and create significant environmental effects during the construction phase are:

- Traffic generation (for both the construction traffic and traffic associated with the normal operation of the airport);
- Construction vehicle routing; and
- Impacts on the highway network and junctions.

Operation

- 7.7.2 The principal transport issues, which may arise as a result of the Proposed Development and create significant environmental effects when it is complete and operational are:

- Traffic generation;
- Vehicle routing;
- Highway network and junction impact;
- Increase pedestrian and cycle movement; and
- Public transport capacity.

- 7.7.3 See **Chapters 6 Air Quality and 10 Noise and Vibration** of this Scoping Report for further details regarding air quality and noise and vibration impacts.

Cumulative effects

- 7.7.4 There may be cumulative impacts during construction of the Proposed Development with 'other development' projects generating construction traffic at that the same. Having estimated combined volume of construction traffic the increase in flow will be subjected to the two rules set out in the IEMA Guidelines to identify and areas where there is the potential for cumulative effects. The cumulative effects are most likely to relate to those effects that are directly related to junction capacities.

- 7.7.5 The predicted traffic flows for the future assessment years are provided by an update of the CBLTM. The primary purpose of this model is to provide predicted traffic flows for use in the transport assessment. As is standard practice in transport assessments, base traffic flows for future years in the model include both the predicted flows and agreed mitigation measures

for committed developments. As such, assessment of the effects on traffic and transport using this data is inherently cumulative and further assessment is not required. See **Chapter 21 In-Combination and Cumulative Effects** of this Scoping Report for further details regarding methodology.

7.8 Matters scoped out

7.8.1 It is not proposed that any of the topics set out in paragraph 7.6.4 are scoped out.

7.9 Mitigation

Embedded mitigation

7.9.1 Where possible, the Proposed Development will be designed to avoid or reduce adverse effects on other road and public transport users through measures that are targeted at encouraging greater use of those mode of travel that have less environmental impact. Table 3-1 sets out potential indicative Off-site Highway Interventions that are currently considered to be part of the Proposed Development. The list of interventions presented in Table 3-1 only identifies currently proposed measures and will be subject to change following detailed modelling, assessment and engagement with the relevant stakeholders.

7.9.2 Reference has already been made to the Luton DART scheme that will link Luton Airport Parkway railway station with the existing terminal building. In order to maintain and positively increase the level of attractiveness of travel by rail it will be necessary to extend the Luton DART to serve the new terminal building.

Good practice mitigation

7.9.3 In addition to the Draft CoCP, construction traffic movements would be managed by a Construction Logistics Plan (CLP) and a Construction Traffic Management Plan (CTMP). The CLP would have the following structure,

- Introduction
- Context, considerations and challenges
- Construction programme and methodology
- Vehicle routing and site access
- Strategies to reduce impacts
- Estimated vehicle movements
- Implementing, monitoring and updating

- 7.9.4 Within the CLP there would be a commitment to:
- safety and environmental standards and programmes;
 - adherence to designated routes; and
 - implementation of a construction staff travel plan.
- 7.9.5 The following planned measures would then be set out as matters to be investigated in detail when the nature of the construction tasks and programme are clearer:
- delivery scheduling;
 - timing for out of peak deliveries;
 - timing for out of hours deliveries;
 - use of holding and vehicle call off areas;
 - use of logistics and consolidation centres; and
 - smart procurement.
- 7.9.6 A CTMP will provide information on the way in the which the following would be managed in order to lessen the impact of the construction works,
- highway safety;
 - management deliveries to the Site;
 - abnormal loads;
 - Demolition/Construction Workers Travel plan; and
 - protection of the public highway.

Additional mitigation

- 7.9.7 Any additional highway mitigation identified as required during the TA and/or ES will be incorporated into the design as appropriate.

8 CLIMATE CHANGE

8.1 Introduction

8.1.1 This chapter presents the proposed scope and approach for the assessment of climate change impacts on the Proposed Development (Climate Change Resilience (CCR)) and the combined impacts of climate change and the Proposed Development on receptors in the surrounding environment (In-combination Climate Change Impacts (ICCI)).

8.2 Legislation, policy and guidance

8.2.1 This section outlines legislation, policy and guidance that have been taken into consideration in this Scoping Report and will be considered in the assessment.

Legislation

National

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

8.2.2 The EIA Regulations require the consideration of climate change in the following provisions:

- Regulation 5(2)(c);
- Schedule 4, Regulation 4: and
- Schedule 4, Regulation 5(f).

Climate Change Act 2008

8.2.3 Under the Climate Change Act, the Adaptation Reporting Power (ARP)⁹⁰ gives the Secretary of State the power to direct organisations with public functions to produce reports detailing:

- current and future projected effects of climate change on their organisation;
- proposals for adapting to climate change; and
- assessment of progress towards implementing the plans and actions set out in their previous ARP reports.

8.2.4 LLAOL published a Climate Change Adaption Report in May 2011⁹¹. A revised Climate Change Adaption Report is due to be

⁹⁰ Department of Energy and Climate Change, Department for Environment, Food and Rural Affairs, and Department for Transport. The Climate Change Act 2008. London. 2008

⁹¹ London Luton Airport, 2011, Climate Change Adaption Report

published in 2021 as part of the third round of adaptation reporting.

National planning and aviation policy

Airports National Policy Statement - June 2018

- 8.2.5 The ANPS¹¹ states that pursuant to the EIA Regulations, the applicant should undertake an assessment as part of the Environmental Statement regarding any likely significant climate impacts. The following considerations will need to be taken into account during the assessment of climate change impacts on the Proposed Development.
- 8.2.6 In relation to climate change adaptation Paragraph 4.45 states *“New airports infrastructure will typically be a long-term investment which will need to remain operational over many decades, in the face of a changing climate. Consequently, the applicant must consider the impacts of climate change when planning design, build and operation.”*
- 8.2.7 Paragraph 4.46 states that *“Detailed consideration must be given to the range of potential impacts of climate change using the latest UK Climate Projections available at the time, and to ensuring any environmental statement that is prepared identifies appropriate mitigation or adaptation measures. This should cover the estimated lifetime of the new infrastructure”.*
- 8.2.8 Paragraph 4.47 sets out *“Where transport infrastructure has safety-critical elements, and the design life of the asset is 60 years or greater, the applicant should apply the latest available UK Climate Projections, considering at least a scenario that reflects a high level of greenhouse gas emissions at the 10%, 50% and 90% probability levels, to assess the impacts of climate change over the lifetime of the development”.*
- 8.2.9 Paragraph 4.48 requires that applicants *“should demonstrate that there are no critical features of infrastructure design which may be seriously affected by more radical changes to the climate beyond those projected in the latest set of UK Climate Projections. Any potential critical features should be assessed, taking account of the latest credible scientific evidence on, for example, sea level rise, and on the basis that necessary action can be taken to ensure the operation of the infrastructure over its estimated lifetime through potential further mitigation or adaptation”.*

National Planning Policy Framework (NPPF) – February 2019

- 8.2.10 The NPPF sets out a number of requirements that will need to be assessed in relation to CCR and ICCI for the Proposed

Development. Paragraph 150 states *“New development should be planned for in ways that avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which is vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure”*.

- 8.2.11 The NPPF outlines that development should consider *“taking into account the current and future impacts of climate change” within the flood risk assessments in order to avoid flood to people or property.*

A Green Future: Our 25 Year Plan to Improve the Environment

- 8.2.12 The 25 Year Environment Plan⁹² published in January 2018, sets out the actions the UK Government will take to help the natural world regain and retain good health. The goals include clean air, minimising waste and mitigation against climate change.

- 8.2.13 The Plan states that we will adapt to reduce the impact of climate change by:

- *“Making sure that all policies, programmes and investment decisions take into account the possible extent of climate change this century.*
- *Implementing a sustainable and effective second National Adaptation Programme.”*

Keeping Country Running: Natural Hazards and Infrastructure

- 8.2.14 Keeping Country Running: Natural Hazards and Infrastructure⁹³ published by the Cabinet Office in 2011 provides a guide to improving the resilience of critical infrastructure and essential services. It states that *“building resilience will need to consider the impacts of climate change over the lifetime of the infrastructure and make allowances for the magnitude of future hazards in investment decisions to secure the necessary adaptation over time”*.

Local policy

Luton Local Plan 2011-2031 – November 2017

- 8.2.15 With regards to Airport Expansion, Policy LLP6 London Luton Airport Strategic Allocation states proposals for development will only be supported where the following criteria are met:

⁹² HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment

⁹³ Cabinet Office (2011) Keeping Country Running: Natural Hazards and Infrastructure

“iv. they fully assess the impacts of any increase in Air Transport Movements on surrounding occupiers and/or local environment (in terms of noise, disturbance, air quality and climate change impacts), and identify appropriate forms of mitigation in the event significant adverse effects are identified;”

- 8.2.16 Chapter 11 of the Luton Local Plan outlines the threats faced as a result of climate change and various mitigation strategies that need to be considered during the design of the Proposed Development.
- 8.2.17 Policy LLP36 outlines the measures that must be taken to minimise the risk and impact of flooding as a result of climate change. These measures include:
- *“directing new development to areas with the lowest probability of flooding;*
 - *ensuring that all new development addresses flood resilience, the effective management of flood risk including opportunities for appropriate dry access for emergency vehicles;*
 - *ensuring that development does not increase the risk of flooding elsewhere including cumulative impact on adjoining and surrounding land and in the wider catchment;*
 - *ensuring wider environmental benefits of development in relation to flood risk and contribute towards delivering “good ecological status”. ”*
- 8.2.18 In relation to climate change adaptation, Policy LLP37 states *“The Council will support development proposals which contribute towards mitigation, and adaptation to climate change through energy use reduction and efficiency and renewable and decentralised energy.”* Additionally, *“All new non-residential developments over 1,000 square metres will be required to achieve the 2013 BREEAM “Good” standard or equivalent”*.

Luton Borough Council Climate Change Adaptation Action Plan

- 8.2.19 The LBC Adaption Action Plan identifies potential climate change risks in Luton Borough and provides an action plan to adapt Luton’s built environment to a changing climate. This Plan sets out a number of measures that will need to be considered during the design and operation of the Proposed Development including:
- *“Reviewing construction material specifications to reflect changing temperature and conditions;*
 - *Considering workforce health and safety when working outside in differing weather conditions;*

- *Reviewing road safety measures to address the varying seasonal use of public highways;*
- *Mitigating against extreme weather impacts on programmed works;*
- *Promoting sustainable design principles including climate change adaptation;*
- *Ensuring adequate levels of drainage maintenance;”*
- Further actions are also provided for minimising flood risk in Luton, enhancing green infrastructure, increasing reliance of service delivery and workforce capability.

North Hertfordshire District Council Proposed Submission Local Plan 2011-2031

- 8.2.20 The NHDC Local plan requires consideration to be given to address climate change impacts by “...*improving opportunities for travelling by public transport, walking and cycling, using natural resources more efficiently, reducing the demand for water, securing high quality sustainable design and managing the risk of flooding.*”
- 8.2.21 Strategy ENV4 involves mitigating climate change effects through sustainable construction techniques, use of renewable energy technologies and reducing flood risk.
- 8.2.22 Policy SP6: ‘Sustainable transport’ requires applicants to “...*provide assessments, plans and supporting documents to demonstrate the safety and sustainability of their proposals...*”

Central Bedfordshire Council Local Plan 2035: Pre-Submission (January 2018)

- 8.2.23 Paragraphs 16.2.7 to 16.2.15 outline the need for climate change adaptation and resilience planning due to climate change projections indicating more extreme weather events such as drought and flooding. The design of new developments will be expected to reflect the increased likelihood of such weather events. For example:
- “...*all new development will be expected to achieve the higher water efficiency standard of 110 litres per person per day...*”
 - “...*new developments are required to use simple rainwater harvesting...*” and,
 - “...*where appropriate, buildings [should be] designed to be resistant or resilient to flooding and the impacts of flooding both now and in the future.*”
- 8.2.24 Policy CC1: ‘Climate Change and Sustainability’ requires proposals to “...*demonstrate how they support the mitigation of,*

and adaptation to, the impacts of climate change” through the preparation and submission of an adaptation strategy which details the measures taken to minimise the development’s vulnerability to climate change effects.

Guidance

- 8.2.25 Consideration of the following guidance will be given when undertaking the CCR and ICCL assessments:
- 8.2.26 Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (IEMA)⁹⁴ provides a framework for the effective assessment of CCR and adaptation throughout the EIA process. This guidance is currently being updated by IEMA and is expected to be published later in 2019.
- 8.2.27 European Commissions’ Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment⁹⁵ provides guidance on the way in which climate change and biodiversity are integrated in EIAs carried out across the EU.
- 8.2.28 Intergovernmental Panel on Climate Change’s (IPCC) Fifth Assessment Report⁹⁶ provides evidence that human influence on climate change is clear and growing. Climate change is the largest inter-related cumulative environmental effect which has the potential to lead to significant environmental effects on a wide range of areas. This report outlines potential impacts of climate change in various geographical areas.
- 8.2.29 The International Civil Aviation Organisation’s (ICAO) Environmental Report 2010 Chapter 6: Adaptation⁹⁷ provides further context of climate change mitigation and adaptation within the aviation industry.
- 8.2.30 The Civil Aviation Authority (CAA)⁹⁸ Climate Change Adaptation Report, 2015, highlights the direct impacts of climate change on the aviation sector, reviews performance of adaptation across the UK’s regulated airports and provides a set of actions to mitigate future climate change.

⁹⁴ IEMA; 2015; Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation

⁹⁵ European Commission (2013) Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment.

⁹⁶ Intergovernmental Panel on Climate Change (IPCC) (2014) Climate Change 2014: Fifth Assessment Report Synthesis Report

⁹⁷ International Civil Aviation Organisation (ICAO) (2010) Environmental Report Chapter 6: Adaptation

⁹⁸ Civil Aviation Authority (CAA), 2015, Climate Change Adaptation Report

8.2.31 The Committee on Climate Change's (CCC) UK Climate Change Risk Assessment Evidence Report⁹⁹ provides further context of climate change mitigation and adaptation within the aviation industry.

8.2.32 The Airport Cooperatives Research Programme's (ACRP) Climate Change Adaptation Planning: Risk Assessment for Airports¹⁰⁰ provides further context for climate change projections and impacts for airports.

8.3 Stakeholder engagement and consultation

8.3.1 Key consultees have been identified, and engagement will be undertaken and recorded throughout the pre-application stages of the project. Proposed consultees include:

- Committee on Climate Change (CCC) (adaption Subcommittee);
- Department for Transport (DfT).
- Civil Aviation Authority (CAA);
- NHDC;
- CBC;
- HCC; and
- LBC.

8.3.2 Other consultees will be engaged with through other ES technical disciplines, such as the Environment Agency and Lead Local Flood Authorities on flood risk.

8.4 Baseline conditions

Study Area

8.4.1 This section presents a description of the area of assessment and existing conditions based on an initial desk-based exercise.

In-combination Climate Change Impacts

8.4.2 The Study Area for the ICCI will be the ZOIs and environmental receptors defined in each of the environmental assessments in the ES.

⁹⁹ Committee on Climate Change, 2017, UK Climate Change Risk Assessment Evidence Report

¹⁰⁰ Airports Cooperative Research Programme (2010) Climate Change Adaptation Planning: Risk Assessments for Airports

- 8.4.3 The most relevant grid squares in the United Kingdom Climate Change Projections 2018 (UKCP18¹⁰¹) will be used for the assessment.

Climate Change Resilience

- 8.4.4 The Study Area for the CCR assessment will be the Proposed Development.
- 8.4.5 The most relevant grid squares in the UKCP18 will be used for the assessment data gathering.
- 8.4.6 Baseline data gathered for the ICCI and CCR assessments will focus on assembling information on projected climatic conditions for location of the Proposed Development.
- 8.4.7 Data will be sourced from:
- UKCP18 (UKCP09 data will be used only if needed to supplement gaps where UKCP18 data is not fully available);
 - The Met Office Observational data for the station nearest to LTN; and,
 - London Luton Airport Climate Change Adaptation Report (May 2011¹⁰²).

Existing conditions

- 8.4.8 The baseline for both the ICCI and CCR assessments includes the existing and future climate conditions. The following subsections summarise the two components of the baseline conditions.

Existing baseline

- 8.4.9 Historic climate data obtained from the Met Office website¹⁰³ recorded by the meteorological station closest to the Proposed Development (Rothamsted No.2) for the period 1981-2010 indicates the following:
- Average annual maximum daily temperature was 13.7 °C.
 - Warmest month on average was July (mean maximum daily temperature of 21.8 °C).
 - Coldest month on average was February (mean minimum daily temperature of 1 °C).
 - Average total annual rainfall levels were 712.3 mm.

¹⁰¹ United Kingdom MET Office (2018), United Kingdom Climate Change Projections 2018 (UKCP18)

¹⁰² London Luton Airport (2011), Climate Change Adaption Report

¹⁰³ Met Office. Available at: <https://www.metoffice.gov.uk/>

- Wettest month on average was November (75.0 mm of rainfall on average for the month).
- Driest month on average was February (47.7 mm of rainfall on average for the month).

8.4.10 Additional data for other climate variables will be collated as part of the assessment. In addition, data from the UKCP18 gridded observational dataset will be collated to complement the existing baseline.

Future baseline

8.4.11 UKCP18 provides probabilistic climate change projections for pre-defined 20-year periods for annual, seasonal and monthly changes to mean climatic conditions over land areas. For the purpose of the assessment, UKCP18 probabilistic projections for the following average climate variables have been obtained and will be further analysed:

- mean annual temperature;
- mean summer temperature;
- mean winter temperature;
- maximum summer temperature;
- minimum winter temperature;
- mean annual precipitation
- mean summer precipitation; and
- mean winter precipitation.
- Further data will also be obtained, where available, for other climate variables and extreme weather events, namely:
 - heavy rainfall events;
 - droughts (extended periods of low precipitation);
 - heat waves (high temperatures);
 - frosts/freezes (low temperatures);
 - average and strong winds;
 - humidity
 - lightning; and
 - fog.

8.4.12 Projected temperature and precipitation variables are presented in Table 8-1 and Table 8-2 respectively. UKCP18 probabilistic projections have been analysed for the 25km grid square where the Proposed Development is located. These figures are

expressed as temperature/precipitation anomalies in relation to the 1981-2000 baseline.

- 8.4.13** As the design life of the Proposed Development is at least 60 years, in line with the ANPS, the CCR assessment will consider a high emissions scenario at the 10%, 50% and 90% probability levels to assess the impact of climate change over the lifetime of the Proposed Development.
- 8.4.14** The climate projections have been presented to include the 60-year project design life (the temporal scope for the assessment) from the start of construction through to maximum operating capacity.

Table 8-1: Projected changes to temperature variables¹⁰⁴ (RCP 8.5)¹⁰⁵

Climate variable	Time period		
	2020-2039	2040-2059	2060-2079
Mean annual air temperature anomaly at 1.5m (°C)	+1.0 (+0.3 to +1.8)	+1.9 (+0.9 to +2.9)	+2.9 (+1.3 to +4.6)
Mean summer air temperature anomaly at 1.5m (°C)	+1.3 (+0.4 to +2.3)	+2.5 (+1.0 to +4.0)	+3.7 (+1.3 to +6.4)
Mean winter air temperature anomaly at 1.5m (°C)	+0.9 (+0.0 to +1.9)	+1.6 (+0.4 to +2.9)	+2.5 (+0.7 to +4.2)
Maximum summer air temperature anomaly at 1.5m (°C)	+1.5 (+0.3 to +2.8)	+2.8 (+0.9 to +4.9)	+4.3 (+1.3 to 7.5)
Minimum winter air temperature anomaly at 1.5m (°C)	+0.9 (-0.1 to +1.9)	+1.6 (+0.3 to +3.1)	+2.4 (+0.7 to +4.4)

¹⁰⁴ The main central number for each variable at each time period represents the 50 per cent probability level, indicating that the particular change is 'as likely as not' to occur. The figures in brackets show the wider range of probability and potential change (10 per and 90 per cent probability levels).

¹⁰⁵ UKCP18 uses a range of possible scenarios, classified as Representative Concentration Pathways (RCPs), to inform differing future emission trends. These RCPs "... specify the concentrations of greenhouse gases that will result in total radiative forcing increasing by a target amount by 2100, relative to preindustrial levels." In accordance with UKCP18 guidance, RCP8.5 has been used as it is the closest equivalent to the high emissions scenario within the UKCP09 data, the use of which was best practise prior to the release of UKCP18 data.

Table 8-2: Projected changes to precipitation variables (%)

Climate variable	Time period		
	2020-2039	2040-2059	2060-2079
Annual precipitation rate anomaly (%)	+1 (-4 to +7)	-1 (-8 to +6)	-1 (-7 to +6)
Summer precipitation rate anomaly (%)	-7 (-30 to +16)	-20 (-45 to +6)	-28 (-59 to +4)
Winter precipitation rate anomaly (%)	+7 (-4 to +20)	+12 (-4 to +29)	+19 (-1 to +41)

8.4.15 As noted by the UK Climate Change Risk Assessment (CCRA 2017)¹⁰⁶, England is already impacted by extreme weather events. The report identifies key risks and implications from a changing climate, which include:

- changes in extreme weather conditions, which will impact on infrastructure, in particular through storm damage, flooding and high temperatures; and
- flooding of transport, including roads and rail is likely to increase, affecting both urban and rural access routes.

8.5 Assessment methodology

8.5.1 Consideration of climate change impacts within EIAs is an area of emerging practice. The approach outlined below is aligned with existing guidance such as IEMA and good practice from similar studies.

8.5.2 The following key terms and definitions relating to the CCR and ICCI assessment are used:

- Climate hazard – a weather or climate related event which has potential to do harm to environmental or community receptors or assets, for example increased winter precipitation.
- Climate change impact – an impact from a climate hazard which affects the ability of the receptor or asset to maintain its function or purpose.
- Consequence – any effect on the receptor or asset as a result of the climate hazard having an impact.

In-combination Climate Change Impacts

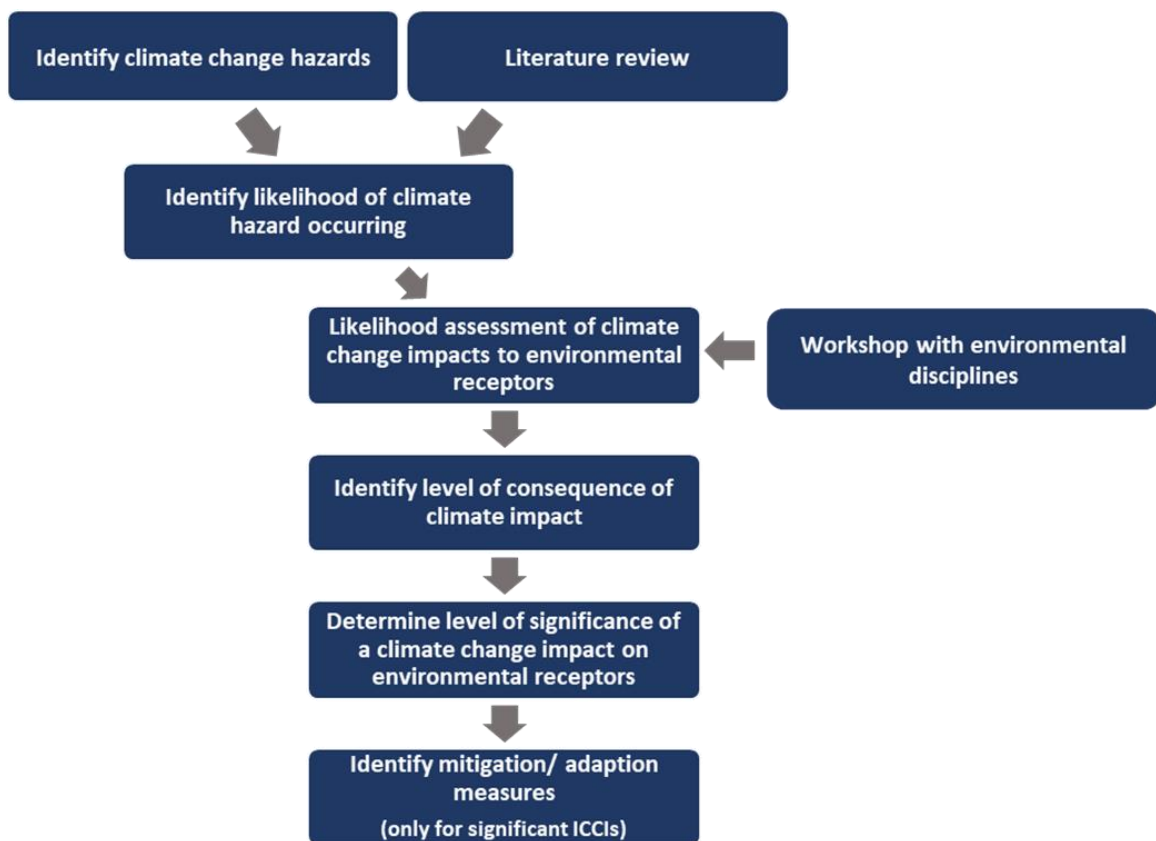
8.5.3 The ICCI assessment will entail qualitatively assessing how the effects identified by other environmental disciplines are affected

¹⁰⁶ Committee on Climate Change (2017), UK Climate Change Risk Assessment Evidence Report

by future climate change within the design life of the Proposed Development.

- 8.5.4 The exception to the largely qualitative assessment is flood risk, where a Flood Risk Assessment (FRA) will be provided as a separate report as part of the ES. This will incorporate quantitative climate change allowances for increases in peak river flow and peak rainfall.
- 8.5.5 Figure 8.1 below outlines the methodology for the ICCI assessment.

Figure 8.1: ICCI assessment methodology flow diagram



- 8.5.6 The sections below outline the method shown in the diagram in more detail and provide details on assessment criteria.

Identifying climate change hazards

- 8.5.7 Existing literature providing observations on climate change such as the UK Climate Change Risk Assessment (CCRA 2017) along with UKCP18 data outputs for the location of the Proposed Development will be used to identify potential climate hazards that may affect the geographical location of the Proposed Development.

Likelihood of climate change hazard occurring

- 8.5.8 Once climate change hazards have been identified the likelihood of the climate change hazard occurring will be assessed. The likelihood of a climate change hazard occurring, is defined as the probability of some well-defined outcome occurring in the future. Likelihood is categorised into five levels depending on the probability of the hazard occurring, in line with the definitions of likelihood in the IPCC 5th Assessment Report¹⁰⁷.

Table 8-3: Level of likelihood of the climate hazard occurring

Level of likelihood	Definition of likelihood¹⁰⁸
Very likely	90-100% probability that the hazard will occur
Likely	66-100% probability that the hazard will occur
Possible, about as likely as not	33-66% probability that the hazard will occur
Unlikely	0-33% probability that the hazard will occur
Very Unlikely	0-10% probability that the hazard will occur

In-combination change impact workshop

- 8.5.9 Climate change specialists will lead a workshop with the environmental disciplines. The assessment of the UKCP18 climate change projections for the location of the Proposed Development, the identified climate hazards and their likelihood of occurring will be presented.
- 8.5.10 The environmental disciplines will consider whether these climate hazards could result in a changed effect on identified environmental receptors considering both likelihood and consequence in accordance with the criteria below.

Likelihood of a climate change impact occurring

- 8.5.11 In defining likelihood of an impact occurring, embedded mitigation measures will be accounted for. Definitions of likelihood are set out in
- 8.5.12
- 8.5.13 Table 8-4 below.
- 8.5.14 The likelihood of an impact occurring will be based on the likelihood of the climate hazard occurring combined with the sensitivity of the receptors as defined in relevant environmental disciplines, using professional judgement.

¹⁰⁷ Intergovernmental Panel on Climate Change (IPCC) (2014), Fifth Assessment Report

¹⁰⁸ The likelihood levels have been taken from the IPCC Fifth climate report. There is a certain amount of overlap in the criteria provided to allow for uncertainty and the qualitative approach of the assessment.

Table 8-4: Level of Likelihood of the climate impact occurring¹⁰⁷

Level of likelihood	Definition of likelihood
Very likely	90-100% probability that the impact will occur during the life of the project
Likely	66-100% probability that the impact will occur during the life of the project
Possible, about as likely as not	33-66% probability that the impact will occur during the life of the project
Unlikely	0-33% probability that the impact will occur during the life of the project
Very Unlikely	0-10% probability that the impact will occur during the life of the project

Consequence

8.5.15 The ICCI Consequence criteria are defined in Table 8-5 below and are based on the change to the significance of the effect already identified by the environmental discipline. To assess the consequence of an ICCI impact each discipline with input from the climate change specialists will assign a level of consequence to an impact based on the criteria description provided and their discipline assessment methodology. Disciplines will use this approach to identify the significance of effects.

Table 8-5: Consequence criteria for in-combination climate change impact assessment

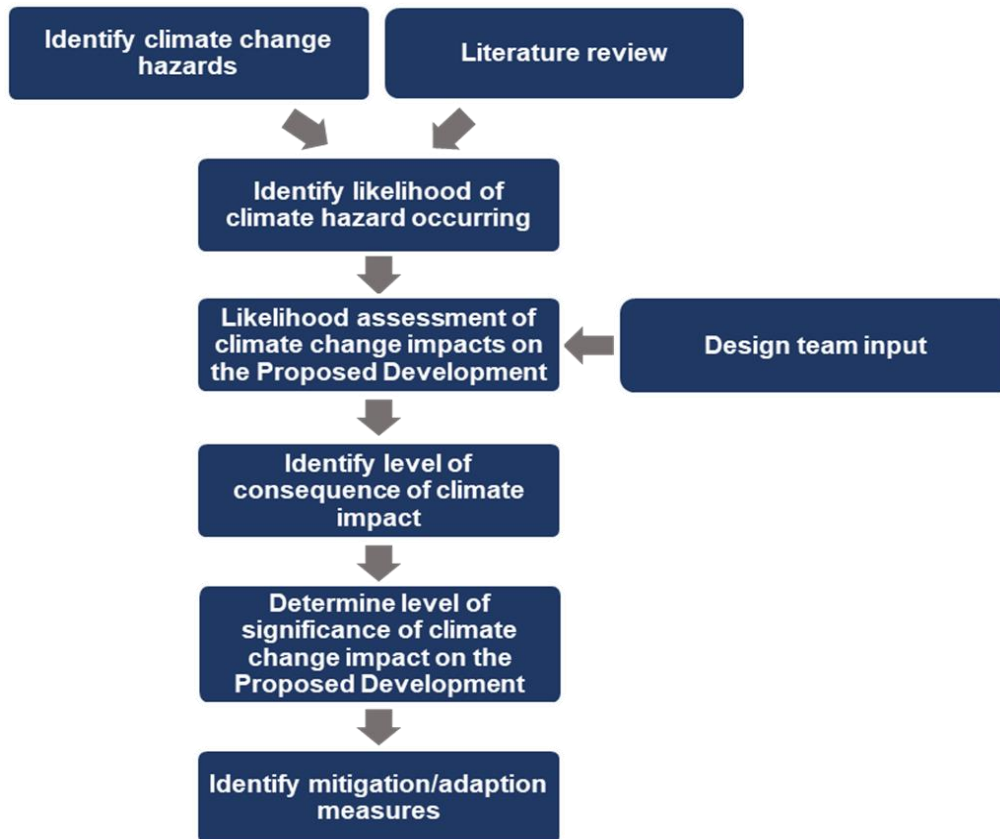
Consequence	Consequence criteria
High	The climate change parameter in-combination with the effect of the Proposed Development, causes the effect defined by the topic to increase from negligible, low, or moderate, to major.
Medium	The climate change parameter in-combination with the effect of the Proposed Development, causes the effect defined by the topic, to increase from negligible or low, to moderate.
Low	The climate change parameter in-combination with the effect of the Proposed Development, causes the significance of effect defined by the topic, to increase from negligible to low.
Very low	The climate change parameter in-combination with the effect of the Proposed Development does not alter the significance of the effect defined by the topic.

8.5.16 The outputs of the assessment will be presented in the relevant discipline chapter in the ES along with mitigation measures for identified impacts. A summary of the assessment and mitigation measures will be provided in the Climate Change chapter of the ES.

Climate Change Resilience

8.5.17 Figure 8.2 outlines the methodology for the CCR assessment.

Figure 8.2: CCR assessment methodology flow diagram



Identifying climate change hazards

8.5.18 The process used to identify hazards for the ICCI assessment will be followed to identify hazards for the CCR assessment.

Likelihood of climate hazard

8.5.19 The likelihood of a climate hazard occurring will be based on the approach outlined above for the ICCI assessment. This will be assigned a likelihood rating as described in Table 8-6.

Likelihood of climate impact occurring

8.5.20 The likelihood of a climate impact occurring will be assessed based on likelihood of the hazard occurring combined with the vulnerability of the Proposed Development, using professional judgement and in discussion with the design team. This will be assigned a likelihood rating described in Table 8-4.

Consequence of climate impact

8.5.21 Criteria for assessing consequence for CCR are defined in Table 8-6 and are based on the on the criteria used in the LLAOL Climate Adaptation Report. Using this previously defined criteria provides a consistent approach for climate risk assessment at LTN. This classification will be reviewed during the assessment to ensure it matches the latest definitions used to assess climate change risks at LTN. Term significance has been used by LLAOL to describe the consequence of a climate change risk to the operation of the airport.

Table 8-6: Consequence criteria for Climate Change risk / opportunity assessment

Consequence	Consequence criteria
Catastrophic Adverse	Total service loss for significant period (>1 day); adverse international publicity; Loss / litigation potential of £10m
Major Adverse	Sustained service disruption (>2 hrs); public enquiry; litigation potential of £1m - £10m
Considerable Adverse	Service disruption for 1-2 hrs; national adverse publicity; litigation potential of £500k-£1m
Moderate Adverse	Minor impact on London Luton Airport services; local adverse publicity; litigation
Minor Adverse	Annoyance but does not disrupt London Luton Airport services; isolated customer complaints; litigation potential of <£50k
Insignificant Adverse	Cost negligible; low financial loss
No change	No foreseen impact or benefit
Slight Beneficial	Negligible reduction in expenditure or litigation potential; negligible improvement in service delivery
Minor Beneficial	Small reduction in expenditure or litigation potential of <50k; positive customer feedback; small improvements in service delivery potential
Moderate Beneficial	Temporary reduction in expenditure or litigation potential of 50k-£500k; beneficial local publicity; temporary improvements in service delivery
Considerable Beneficial	Considerable reduction in expenditure/ or litigation potential of £500k-£1m; beneficial national publicity; considerable improvements in service deliver
Major Beneficial	Long-term large-scale reduction in expenditure and litigation potential of >£1m-£10m; sustainable beneficial national publicity; sustained improvements in service delivery
Substantial Beneficial	Large & permanent reduction in expenditure/ litigation potential of >£10m; permanent improvement in corporate reputation; beneficial international publicity; large and permanent improvements in service delivery
Note: These criteria reflect those used in the LLAOL Climate Change Adaption Report, 2011. The use of the term 'significant' in the Consequence rating has been changed to	

'considerable' to avoid confusion with 'significant' when used to assess effects in line with the EIA Regulations.

8.5.22 The CCR assessment will assume that the Proposed Development will be designed to be resilient to impacts arising from current weather events and climatic conditions, and designed in accordance with current planning, design and engineering practice and codes. The assessment will also identify and take into account the existing resilience mitigation measures for each risk either already in place or in development for infrastructure and assets.

8.5.23 Workshops will be held with the Proposed Development's design team to discuss the CCR risk assessment and identify mitigation measures.

8.5.24 In line with the ANPS, the CCR assessment will seek to demonstrate that there are no critical features of infrastructure design which may be seriously affected by more radical changes to the climate beyond those projected in the latest set of UK Climate Projections (UKCP18). If any potential critical features are identified these will be assessed and the mitigation measures will be identified.

Significance criteria

8.5.25 The ICCI and CCR assessments will not follow the significance assessment framework outlined in Section 5 as the approach of comparing the sensitivity of the identified receptors and the impact magnitude is not applicable for these assessments.

In-combination Climate Change Impacts

8.5.26 The significance of ICCI impacts will be determined by individual environmental disciplines based on the application of the consequence criteria of an ICCI impact defined in Table 8-6 and their discipline assessment methodology.

Climate Change Resilience

8.5.27 While there are no specific significance criteria for the assessment of CCR, a framework will be developed to identify and prioritise risks according to the perceived level of likelihood and severity of operational/economic disruption.

8.5.28 Significance is derived through combining outcomes from the likelihood impact with the consequence to determine the level of effect, as shown in Table 8-7. Where an adverse impact is determined as High or Very high this will be deemed significant. The significance of CCR impacts is based on the approach from the Luton Climate Change Adaptation report and varies from typical EIA methodology.

Table 8-7: Level of effect criteria for climate change resilience impacts

		Likelihood of a climate impact occurring				
		Very unlikely	Unlikely	Possible, about as likely as not	Likely	Very likely
Consequence	Catastrophic Adverse/Substantial Beneficial	L	M	VH	VH	VH
	Major	L	M	H	H	VH
	Considerable	L	M	H	H	H
	Moderate	L	M	M	M	H
	Minor	L	L	L	M	M
	Insignificant	L	L	L	L	L
	No change	L	L	L	L	L

VH = Very high

H = High

M = Moderate

L = Low

8.6 Potential significant effects

Construction

In-combination Climate Change Impacts

8.6.2 In-combination climate change impacts arising during construction will be assessed. This will consider how any climate change impact, especially those related to extreme weather events, might exacerbate the impacts of the Proposed Development on the surrounding natural environment and communities during the construction phase. Examples of potential ICCI impacts during construction are provide in Table 8-8.

Table 8-8: Key climate parameters for potentially significant construction ICCI effects

Parameter	Potential effects
Extreme weather events (e.g. severe storms)	Disruption to the construction programme due to adverse weather impacting transportation of materials and workers to site
Sea level rise	The Proposed Development is not located in an area that is susceptible to sea level rise and is therefore scoped out of the assessment.
Drier/drought conditions	Hotter and drier / drought conditions -increase concentrations of certain air pollutants such as ozone and PM _{2.5/10} . soil erosion.

Parameter	Potential effects
Temperature/humidity	Humidity and hotter temperatures may result in a greater number of people sleeping with windows open. This may exacerbate any increase in noise levels in the local area during construction works
Precipitation	Fluctuating levels of precipitation may lead to an increase in likelihood and severity of local flooding during construction
Increase in wind speed	Exposure of soils during construction may lead to increased erosion from due to higher winds.

Climate Change Resilience

8.6.3 The resilience of the construction activities to climate change impacts will be assessed during the assessment. This will consider how any climate change impacts may influence construction activities and affect the construction schedule for the project.

8.6.4 Climate change effects may impact the construction of the Proposed Developed. Potential impacts may include;

- Extreme weather events such as heatwaves, heavy precipitation and increased snowfall/freezing disrupting construction timescales;
- Health risk to construction workers from heatwaves and other extreme weather; and
- The impact on materials and their use during construction

Operation

In-combination Climate Change Impacts

8.6.5 The key climate parameters that may result in significant ICCI effects during operation are described in Table 8-9.

Table 8-9: Key Climate Parameters for potentially significant operation ICCI effects

Parameter	Potential effects
Extreme weather events (e.g. severe storms)	An increase in the likelihood and severity of extreme weather events could lead to damage to ecosystem stability (biodiversity).
Sea level rise	The Proposed Development is not located in an area that is susceptible to sea level rise and is therefore scoped out of the assessment.
Drier/drought conditions	Water demands from the expanding airport may lead to an exacerbation of water shortage in the surrounding area.
Temperature/humidity	Fluctuating levels of temperature may lead to: <ul style="list-style-type: none"> - Increase in likelihood and severity of heat waves which might have a negative impact on biodiversity and health; and

Parameter	Potential effects
	<ul style="list-style-type: none"> - Increase in likelihood and severity of freezes which might have a negative impact on biodiversity and health.
Precipitation	Fluctuating levels of precipitation may lead to: <ul style="list-style-type: none"> - Increase in likelihood and severity of local flooding which might have adverse impact on assets, infrastructure and landscaping; and, - Increased strain on drainage infrastructure.
Increase in wind speed	May lead to a wider distribution of noise/air pollution from the Proposed Development

Climate Change Resilience

8.6.6 The Climate Change Adaptation Report published in 2011 on the airport was undertaken up to the years 2020 and 2050¹⁰⁹. Risks and opportunities to make the airport more resilient to climate change were identified and prioritised. An adaptation programme was developed to ensure adaptation was integrated into the airports existing processes. It was identified that the 20-year master planning timescales that were in place at that time were not long enough to prepare for long-term climate changes.

8.6.7 The top five prioritised risks to airport operations as a result of climate change identified in the Climate Change Adaptation Report included:

- increased in flight disruption;
- increased impact of flooding on surface drainage provision;
- flood risk at key site access points;
- increased risk of surfaces freezing; and
- impact on the integrity of materials for essential airfield services.

8.6.8 Further potential significant CCR effects may be identified during the design and assessment stages and will be addressed in the ES.

Cumulative effects

8.6.9 The assessment will consider cumulative effects with respect to ICCI impacts, either beneficial or adverse, of the Proposed Development and 'other development' projects in the ZOI.

8.6.10 It is not relevant to assess the cumulative effects with regard to CCR as the focus of this assessment is only the Proposed Development itself.

¹⁰⁹ London Luton Airport, 2011, Climate Change Adaption Report

8.7 Matters scoped out

- 8.7.1 Impacts of sea level rise have been scoped out of the in-combination and climate resilience assessments as the development is not within the geographical proximity of the coast.
- 8.7.2 Due to the length of the lifetime of the project, decommissioning of the airport will not be considered within the scope of the assessment. Any future decommissioning of the airport is likely to require planning consent and a separate assessment.

8.8 Mitigation

- 8.8.1 Mitigation measures or mechanisms to reduce the potential significant effects arising from ICCI impacts or CCR risks will be developed in discussion with environmental specialists and the design engineering teams, and those adopted will be incorporated into the design or proposed in the ES. Therefore, specific measures cannot be described in this Scoping Report.
- 8.8.2 LLAOL are due to shortly update the Climate Change Adaption Plan. Opportunities to combine the CCR assessment and revised plan will be sought.
- 8.8.3 The ES will explain which mitigation measures are embedded within the design and which are additional mitigation. Additional mitigation measures are those that are required to mitigate residual effects identified in the impact assessment. These additional measure will be described in the ES and associated Climate Change Management Plan.

9 GREENHOUSE GASES

9.1 Introduction

9.1.1 This chapter presents the proposed approach to the assessment of the likely significant environmental effects of the Proposed Development on Greenhouse Gas (GHG) emissions over its lifetime.

9.1.2 Assessment of the impacts of climate change on the Proposed Development (Climate Change Resilience) and the combined impacts of the Proposed Development and climate change on the surrounding environment is described in **Chapter 8 Climate Change** of this Scoping Report.

9.2 Legislation, policy and guidance

9.2.1 This section outlines legislation, policy and guidance that have been taken into consideration when undertaking this scoping exercise and will be considered in the ES.

Legislation

International

EU Emission Trading Scheme (ETS)

9.2.2 The EU ETS is a cap-and-trade scheme, whereby a total amount of allowable annual carbon emissions from electricity generation and large energy-intensive industries has been agreed at the EU level.

9.2.3 Since 2012, the coverage of EU ETS has included aviation carbon emissions from flights to and from EU countries. Following legal challenge to its application to non-EU carriers, it has been temporarily amended to only include flights within EU countries.

9.2.4 According to the UK's Aviation Strategy²¹, the UK government is "...considering continuing to participate in the EU ETS after 2020 or a UK approach which is at least as ambitious".

9.2.5 This UK position on EU ETS and aviation beyond 2020 is still to be confirmed.

9.2.6 The assessment will consider the implications of existing EU ETS policy on traded and non-traded GHG emissions from the Proposed Development, assuming the emissions meet the threshold for inclusion within the EU ETS. This aligns with the reporting requirements set out in the ANPS (paragraph 9.2.17).

National

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

9.2.7 The EIA Regulations require the consideration of climate change and greenhouse gases in the following provisions:

- Regulation 5(2)(c);
- Schedule 4, Regulation 4: and
- Schedule 4, Regulation 5(f).

Climate Change Act 2008

9.2.8 The Climate Change Act 2008 (the 'Act')¹¹⁰ establishes a legally binding target to reduce the UK's GHG emissions by at least 80% by 2050 from 1990 levels. To drive progress and set the UK on a pathway towards this target, the Act introduced a system of five-year carbon budgets.

9.2.9 Five-year carbon budgets are currently agreed to 2032. The UK is currently in the third carbon budget period (2018 – 2022). Table 9-1 sets out the current carbon budgets.

Table 9-1: UK Carbon Budgets

Carbon Budget	Year of coverage	Cumulative emissions (MtCO ₂ e)
3 rd	2018 to 2022	2544
4 th	2023 to 2027	1950
5 th	2028 to 2032	1725
	2033 - 2050	TBC
	2050 target	167

9.2.10 The Committee on Climate Change (CCC) is an independent, UK statutory body established under the Act to monitor progress towards meeting the carbon reduction targets.

9.2.11 Emissions from domestic aviation are included within the carbon budgets 1-5 set out to 2032, however international aviation emissions are not.

9.2.12 Emissions from international aviation are currently excluded from the legally-binding 2050 target due to a lack of international agreement on how and where such emissions should be allocated. However, the CCC recommends that international aviation should be included by 2050. The UK government therefore proposes to continue using the CCC advice and leave

¹¹⁰ Department of Energy and Climate Change, Department for Environment, Food and Rural Affairs, and Department for Transport. The Climate Change Act 2008.

‘headroom’ for international aviation when setting carbon budgets so that the economy as a whole is on a trajectory that could be consistent with the 2050 target.

Policy

International

Intergovernmental Panel on Climate Change

- 9.2.13 In 2014 the Intergovernmental Panel on Climate Change (IPCC) published its Fifth Assessment Report (AR5) Synthesis Report¹¹¹, further reinforcing its statement that human influence on climate change is clear and growing. The report surmises that Climate change is the largest inter-related cumulative environmental effect which has the potential to lead to significant environmental effects on a wide range of areas.
- 9.2.14 The AR5 Synthesis Report provides robust evidence that climate change poses a global risk and underpins the international response in terms of setting ‘carbon budgets’.
- 9.2.15 The importance and urgency of carbon budget setting was reinforced by the IPCC’s recent ‘The Special Report on Global Warming of 1.5 °C’ (SR15)¹¹². The SR15 sets out the impacts of global warming of 1.5°C above pre-industrial levels and related global GHG emission pathways, as contained in the Decision of the 21st Conference of Parties (‘COP21’) of the United Nations Framework Convention on Climate Change (UNFCCC) to adopt the Paris Agreement¹¹³.

United Nations Framework Convention on Climate Change (UNFCCC)¹¹⁴

- 9.2.16 The UNFCCC was formed in 1992 with the aim of tackling climate change through international policy and cooperation. Countries that sign the UNFCCC are referred to as ‘Parties’ and meet annually at the Conference of Parties (COP).
- 9.2.17 The Kyoto Protocol is an international treaty which extends the 1992 UNFCCC to commit state Parties to reduce GHG emissions. The protocol was adopted in December 1997 and entered into force in February 2005.
- 9.2.18 There are now 197 Parties to the UNFCCC and 192 Parties to the Kyoto Protocol; the UK is party to both.

¹¹¹ Intergovernmental Panel on Climate Change (IPCC), Climate Change 2014: Fifth Assessment Report Synthesis Report

¹¹² Intergovernmental Panel on Climate Change (IPCC), ‘The Special Report on Global Warming of 1.5 °C’ (SR15) (* October 2018).

¹¹³ UNFCCC, Conference of Parties (2015) Paris Agreement.

¹¹⁴ United Nations, 1994, United Nations Convention on Climate Change

9.2.19 Negotiated during COP 21, the Paris Agreement came into force in November 2016 and commits to keep the global temperature rise to well below 2°C this century and to pursue efforts to limit the temperature increase to 1.5°C. Efforts to meet the Paris target, or any successor agreement, are expected to include continued efforts to reduce aviation's share of global GHG emissions.

International Civil Aviation Organisation (ICAO) Carbon Offsetting Reduction Scheme for International Aviation (CORSA¹¹⁵)

9.2.20 The ICAO is the body responsible for environmental standards relating to aviation activity globally, including policy relating to aviation's global carbon emissions.

9.2.21 In October 2016, the ICAO adopted CORSIA as a global scheme to address carbon emissions from the international aviation, by financing a reduction in emissions elsewhere. CORSIA aims to stabilise net carbon emissions from international civil aviation at 2020 levels and help the aviation sector achieve its climate targets in the short and medium term by complementing its emissions reduction initiatives.

9.2.22 CORSIA is one element of a series of measures to achieve ICAO's global aspirational goal of carbon neutral growth from 2020. It will be implemented through two phases:

- Pilot phase (from 2021 through 2023) and first phase (from 2024 through 2026) would apply to international flights between States that have volunteered to participate in the scheme; and
- Second phase (from 2027 through 2035) will cover all international flights (including those travelling to or from states that had not volunteered for the early phases), except Least Developed Countries (LDCs), Small Island Developing States (SIDS), Landlocked Developing Countries (LLDCs) and states that have a very small share of international traffic (below 0.5% of global revenue tonne kilometres (RTK)) unless they volunteer to participate in this phase.

9.2.23 CORSIA is supported by the UK government, as an ICAO member¹¹⁶. The assessment will consider the potential implications of non-domestic airlines participating in CORSIA to offset carbon emissions. While LLAOL/LLAL cannot directly

¹¹⁵ ICAO (2019) Carbon Offsetting Reduction Scheme for International Aviation Available at <https://www.icao.int/environmental-protection/CORSIA/Pages/default.aspx> [Accessed March 2019]

¹¹⁶ HM Government (2018), Aviation 2050 -The future of UK aviation: a consultation.

influence how CORSIA is implemented, CORSIA may have an impact on future ATM cruise emissions.

National planning and airport policy

Airports National Policy Statement – June 2018

- 9.2.24 The ANPS¹¹ provides a series of tests against which the carbon impact of a development should be considered against including temporal range, scope of assessment and various scenarios.
- 9.2.25 The ANPS states that pursuant to the EIA regulations, the applicant should undertake an assessment as part of the Environmental Statement regarding any likely significant climate impacts.
- 9.2.26 Section 5.74 recognises that the carbon impact of airport development falls into four areas namely:
- *“Air transport movements (both international and domestic) as a result of increased demand;*
 - *Emissions from airport buildings and ground operations;*
 - *Emissions from surface transport accessing the expanded airport; and*
 - *Emissions caused by construction.”*
- 9.2.27 Section 5.76 requires that:
- “The applicant should provide evidence of the carbon impact of the project (including embodied carbon), both from construction and operation, such that it can be assessed against the Government’s carbon obligations, including but not limited to carbon budgets. The applicant should quantify the greenhouse gas impacts before and after mitigation to show the impacts of the proposed mitigation. This will require emissions to be split into traded sector and non-traded sector emissions, and for a distinction to be made between international and domestic aviation emissions.”*
- 9.2.28 Sections 5.76 – 5.77 set out the considerations that will need to be taken into account for an assessment of GHG emissions, including the quantification of impacts in relation to:
- *“Emissions from surface access due to airport and construction staff;*
 - *Emissions from surface access due to freight and retail operations and construction site traffic;*
 - *Emissions from surface access due to airport passengers / visitors; and*

- *Emissions from airport operations including energy and fuel use.”*

9.2.29 Furthermore, *“This should be undertaken in both a ‘do minimum’ and also in the ‘do something’ scenario for the opening, peak operation, and worst case scenarios”.*

9.2.30 Paragraphs 5.82 and 5.83 set out the decision-making framework in regard to carbon emissions and state that: *“...evidence of appropriate mitigation measures in both design and construction should be presented as part of any application for development consent.”.* Paragraphs 5.78 to 5.79 describe some of the climate change mitigation measures that could be incorporated into an airport development during construction or operation.

9.2.31 Appendix A of the Appraisal of Sustainability (AoS) 2018¹¹⁷, informing the ANPS provides significance methodology for assessing GHG emissions. The scope of the GHG assessment will align with the requirements of the ANPS and associated AoS.

National Planning Policy Framework – February 2019

9.2.32 Chapter 14 of the NPPF describes the importance of effective planning in ensuring significant reductions in GHG emissions and increasing resilience to adverse effects associated with climate change.

9.2.33 With regard to reducing life cycle GHG emissions, Paragraph 153 highlights the importance of minimising energy consumption by accounting for landform, layout, building orientation, massing and landscaping within the planning process.

9.2.34 It also outlines that *“significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health”.*

National Policy Statement for National Networks

9.2.35 The NPS NN¹¹⁸ sets out government policies for nationally significant rail and road infrastructure projects for England and recognises the integral role of the transport sector in meeting the UK’s legally binding carbon reduction targets.

9.2.36 The NPS NN states that *“...any increase in carbon emissions is not a reason to refuse development consent, unless the increase in carbon emissions resulting from the proposed scheme are so*

¹¹⁷ DfT (2018) Appraisal of sustainability: Airports National Policy Statement

¹¹⁸ DfT (2014) National Policy Statement for National Networks

significant that it would have a material impact on the ability of Government to meet its carbon reduction targets”.

- 9.2.37 It also sets out the requirement to present appropriate mitigation measures for both design and construction, ensuring the carbon footprint of a project is not “*unnecessarily high*”. The adequacy of such measures will be a material factor in planning related decision making.
- 9.2.38 The impact of GHG emissions from the Proposed Development over its lifetime will be assessed based on its potential influence on the Government’s ability to meet the UK carbon budgets. The assessment will report on GHG emissions associated with surface access transport (unmitigated and mitigated) and assess how these emissions align with the UK carbon budgets.

Aviation Strategy

- 9.2.39 On 17 December 2018, the UK government published a consultation document ‘Aviation 2050: the future of UK aviation’²¹, to gather opinion on specific policy proposals for inclusion in the final aviation strategy.
- 9.2.40 The consultation period runs until 11 April 2019, with the final aviation strategy published mid-2019.
- 9.2.41 The document recognises that sector growth must be balanced with action to address potential environmental impacts (including carbon emissions).
- 9.2.42 Government policy proposals include setting the requirement for capacity growth planning applications “*...to provide a full assessment of emissions, drawing on all feasible, cost-effective measures to limit their climate impact, and demonstrating that their project will not have a material impact on the government’s ability to meet its carbon reduction targets*”.
- 9.2.43 The impact of the Proposed Development on GHG emissions over its lifetime will be considered in the context of the requirements of the Aviation strategy.

A Green Future: Our 25 Year Plan to Improve the Environment

- 9.2.44 The 25 Year Environment Plan¹¹⁹ published in January 2018, sets out the actions the UK Government will take to help the natural world regain and retain good health. The goals include clean air, minimising waste and mitigation against climate change.

¹¹⁹ HM Government; 2018; A Green Future: Our 25 Year Plan to Improve the Environment

- 9.2.45 The Plan states that the UK will take all possible action to mitigate climate change by:

“Continuing to cut greenhouse gas emissions including from land use, land use change, the agriculture and waste sectors and the use of fluorinated gases. The UK Climate Change Act 2008 commits us to reducing total greenhouse gas emissions by at least 80 per cent by 2050 when compared to 1990 levels.”

[Heathrow Expansion EIA Scoping Report – Chapter 7: Carbon and other greenhouse gases and Scoping Opinion: Proposed Expansion of Heathrow Airport \(Third Runway\)](#)

- 9.2.46 A similar approach to the greenhouse gas assessment adopted in the Heathrow Expansion Scoping report¹²⁰ has been taken for the Proposed Development. The approach proposed by Heathrow is in line with the ANPS. Consideration has also been given to the Heathrow expansion Scoping Opinion¹²¹.

Local policy

[Luton Local Plan 2011-2031 – November 2017](#)

- 9.2.47 With regards to Airport Expansion, Policy LLP6 London Luton Airport Strategic Allocation states proposals for development will only be supported where the following criteria are met:

“iv. they fully assess the impacts of any increase in Air Transport Movements on surrounding occupiers and/or local environment (in terms of noise, disturbance, air quality and climate change impacts), and identify appropriate forms of mitigation in the event significant adverse effects are identified;”

- 9.2.48 Chapter 11 of the Luton Local Plan outlines the threats faced as a result of climate change and various mitigation strategies.

- 9.2.49 In relation to GHG emissions reduction, Policy LLP37 states *“The Council will support development proposals which contribute towards mitigation, and adaptation to climate change through energy use reduction and efficiency and renewable and decentralised energy.”*

[North Hertfordshire District Council Proposed Submission Local Plan 2011-2031 - October 2016](#)

- 9.2.50 The District plans to address climate change by *“...improving opportunities for travelling by public transport, walking and cycling, using natural resources more efficiently, reducing the demand for water, [and] securing high quality sustainable design....”*

¹²⁰ Heathrow 2018, Heathrow Expansion Scoping Report, 2018

¹²¹ PINS 2018, Scoping Opinion Proposed Expansion of Heathrow Airport (Third Runway)

9.2.51 Strategy ENV4 involves mitigating climate change effects through sustainable construction techniques, and use of renewable energy technologies.

9.2.52 Policy SP6: ‘Sustainable transport’ requires applicants to “...provide assessments, plans and supporting documents to demonstrate the safety and sustainability of their proposals...”.

[Central Bedfordshire Council Local Plan 2035: Pre-Submission \(January 2018\)](#)

9.2.53 Paragraph 16.2.4 states that the Council will require all major developments to “...submit a Sustainability Statement that clearly demonstrates the steps that will be taken to minimise the lifetime carbon emissions resulting from the development.” A reduced impact of at least 10% is the aim of this requirement.¹²²

9.2.54 Policy CC1 also states: “New development will be required to incorporate measures that minimise and mitigate its impacts on the environment and climate change by:

- Reducing carbon dioxide emissions;
- Maximising energy efficiency and conservation through orientation, layout and design of buildings, landscaping and planting;
- Making use of natural lighting and beneficial solar gain; and
- Taking advantage of opportunities to use renewable and low carbon energy sources”.

Guidance

9.2.55 The GHG impact assessment will be informed by the following guidance:

- The ‘Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance’¹²³ provides guidance on the identification, assessment and subsequent mitigation of life cycle impacts of GHG emissions throughout the EIA process.
- The ‘Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard’¹²⁴ provides a guide for companies to use in quantifying their GHG emissions.

¹²² Central Bedfordshire; 2018; Central Bedfordshire Local Plan 2035 Pre-Submission

¹²³ IEMA; 2017; Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance

¹²⁴ World Business Council for Sustainable Development (WBCSD) and World Resources Institute (WRI); Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard

- ‘PAS 2080 Carbon Management in Infrastructure’¹²⁵ provides guidance on how to incorporate effective carbon management in infrastructure.
- ‘BS EN 15978 Sustainability of construction works – assessment of environmental performance of buildings – calculation method’¹²⁶ focusses on the calculation method to assess the environmental performance of a building based on life cycle assessment for both new and existing buildings.
- The RICS’ ‘Methodology to calculate embodied carbon’¹²⁷ and ‘Embodied Carbon Database’¹²⁸ provides practical guidance to help built environment professionals to identify where carbon reductions can be made throughout the construction process of buildings.
- The ‘EMEP/EEA Air Pollution Inventory Guidebook: 2016’¹²⁹ (formerly known as ‘Corinair’) provides guidance on calculating GHG emissions from aircraft and will be used to calculate emissions over the cruise and LTO phases.
- The ICAO’s Aircraft Engine Emissions Databank (AEED)¹³⁰ provides guidance on calculating GHG emissions from specific engine types during the LTO cycle.

9.3 Stakeholder engagement and consultation

9.3.1 Potential consultees have been identified, and engagement will be undertaken and recorded throughout the pre-application stages of the project subject to project requirements:

- Committee on Climate Change (CCC);
- Department for Transport (DfT);
- Civil Aviation Authority (CAA);
- CBC;
- NHDC;
- LBC; and
- HCC.

¹²⁵ Publicly Available Standard 2080: Carbon Management In Infrastructure, BSI 2017

¹²⁶ BSI Standards Publication. (2011). BS EN 15978: 2011 Sustainability of Construction Works. Assessment of Environmental Performance of Buildings. Calculation Method

¹²⁷ Royal Institute of Chartered Surveyors (RICS); 2014; Professional Guidance, Methodology to calculate embodied carbon, 1st edition

¹²⁸ RICS; 2018; <https://wcarbon.rics.org/Default.aspx> [Accessed March 2019]

¹²⁹ European Environment Agency, ‘EMEP/EEA Air Pollution Inventory Guidebook: 2016’ (2016).

¹³⁰ ICAO, 2017, Aircraft Engine Emissions Databank

9.4 Baseline conditions

Study Area

Spatial

9.4.1 The Study Area for the GHG emissions impact assessment comprises direct GHG emissions arising from activities undertaken during construction and operation of the Proposed Development.

9.4.2 The Study Area also considers a number of indirect GHG emissions arising outside the Proposed Development boundary as a result of construction and operational activity including ATMs, surface access journeys and extraction and processing of construction materials.

Existing conditions

9.4.3 The baseline for this assessment has not yet been established. The methodology for how this will be established is set out in paragraph 9.5.13.

9.5 Assessment methodology

Scope

9.5.1 The proposed scope of the assessment is GHG emissions arising from the construction and operation of the Proposed Development. To identify the key contributing GHG emission sources and/or activities associated with the Proposed Development, a project stage approach has been taken in this scoping assessment.

9.5.2 This approach is consistent with the principles set out in BS EN 15804 and PAS 2080, and IEMA guidance. The key anticipated GHG emission sources to be scoped into the assessment for the construction and operation phases are set out in Table 9-2 and Table 9-3 respectively.

Table 9-2: GHG emissions sources during construction

Activity	Primary emission sources
Land clearance	Loss of carbon sink from soil organic carbon and above-/below-ground vegetation
Embodied carbon emissions in materials	GHG emissions from raw material extraction and manufacturing of construction materials
On-site construction activity	GHG emissions from energy (electricity, fuel, etc.) consumption related to construction activities
Transport of construction materials	GHG emissions from fuel consumption from transport of materials to site (where these are not included in embodied GHG emissions)

Activity	Primary emission sources
Waste	GHG emissions from transportation and disposal of construction waste

Table 9-3: GHG emissions sources during operation

Activity	Primary emission sources
Operation of the airport buildings, assets and vehicles	GHG emissions from energy (grid electricity/fuel e.g. natural gas), provision of potable water, treatment of waste water, waste treatment. GHG emissions from fuel consumption for airside/ landside vehicles GHG emissions from other operational activities e.g. auxiliary power units, firefighting activities, engine testing.
Surface access journeys from employees, passengers, and freight	GHG emissions from the transportation of passengers, staff, and freight to and from the airport
Operation of aircraft	GHG emissions from landing and take-off (LTO) cycles and cruise emissions of aircraft
Note: Cruise emissions are defined as all activities that take place at altitudes above 3000 feet (1000 m). There is no upper limit of altitude. Cruise includes climb to cruise altitude, cruise, and descent from cruise altitudes. Cruise emissions are only calculated for flights departing from an airport to avoid double counting with other airport inventories. Emissions will be calculated for the length of the journey i.e. tCO ₂ per km from the departure airport to the destination airport (single flight only, no onward journeys).	

Data gathering

9.5.3 The data required for key GHG emissions sources to undertake the GHG assessment in line with ANPS requirements and published guidance, are also presented in Table 9.2 and Table 9.3. This will consist of a combination of primary data for example data formally reported such as metered energy from existing operations, where this available, and estimated data based on the future operational requirements, forecasts and airport design.

Temporal scope

9.5.4 The temporal scope for the assessment of the Proposed Development will cover commencement of construction of the Proposed Development through to 2050 consistent with the UK Government's carbon reduction forecasts.

9.5.5 In line with the requirements of the ANPS the GHG emissions assessment will quantify GHG emissions for the following years:

- The current consented capacity (18mppa) (2020);
- Year of capacity for the first phase of the new terminal (2029);
- Year of peak operation (2039);
- Year of peak construction (to be defined in the ES); and,

- Worst case scenario – Year of predicted maximum environmental impact (interpreted as the year with the highest estimated GHG emissions – to be confirmed in the ES assessment).
- 9.5.6 Emissions will also be presented cumulatively from the baseline year to 2050.
- 9.5.7 To meet the requirements within the ANPS the GHG emissions assessment will consider a ‘do-minimum’ and ‘do-something’ scenario for each year being reported.
- 9.5.8 The ‘do-minimum’ scenario will assume that the Proposed Development proceeds and that standard mitigation measures will be embedded i.e. measures that are certain to happen such as meeting minimum planning requirements for energy efficiency and energy generation.
- 9.5.9 The ‘do-something’ scenario will assume that the Proposed Development proceeds and that Best Practice mitigation has been implemented i.e. additional mitigation measures that are over and above those required to achieve standard planning regulations or where reasonable assumptions regarding implementation by the Proposed Development can be made such as the use of renewable energy sources.

Baseline

- 9.5.10 The baseline for the assessment will be from 2017 to 2050. The baseline, will consider LTN without the Proposed Development. It will include estimated operational emissions through to 2020, when the airport is expected to meet its maximum currently consented capacity of 18mppa and then to 2050 in line with UK carbon budgets.
- 9.5.11 The future baseline scenario will therefore include estimated emissions arising from airport operations at the maximum consented capacity. It will assume best practice mitigation measures have been implemented. The future baseline will also account for decarbonisation of the national grid and other technological improvements such as lower emission vehicles.
- 9.5.12 The baseline will cover GHG emissions from existing sources including airport operations, aircraft (landing and take-off and cruise), surface access journeys and any permitted construction that has already been consented.

Greenhouse gas quantification

- 9.5.13 In line with IEMA guidance which advocates World Business Council for Sustainable Development (WBCSD)/ World Resources Institute (WRI) Greenhouse Gas (GHG) Protocol

guidelines¹³¹, the GHG emissions assessment will be reported as tonnes of carbon dioxide equivalent (tCO₂e) and consider the seven Kyoto Protocol gases:

- Carbon dioxide (CO₂);
- Methane (CH₄);
- Nitrous oxide (N₂O);
- Sulphur hexafluoride (SF₆);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Nitrogen trifluoride (NF₃).

9.5.14 The only exception to this is emissions from aviation (ATM) which will be presented as CO₂ in line with the UK aviation forecasts published in 2017.

9.5.15 GHG emissions for both the construction and operation phases will be assessed using a calculation-based methodology as per the below equation:

$$\text{Activity data} \times \text{GHG emissions factor} = \text{GHG emissions value}$$

9.5.16 Table 9-4 sets out the sources of greenhouse gas emission factors to be used for the GHG assessment.

Table 9-4: Example GHG emissions source factors by scope of emissions

Emissions scope	Emissions factor
Scope 1: direct emissions from the operation of the airport i.e. from combustion of fuels such as natural gas, petrol, diesel	DEFRA & DBEIS UK Government GHG Conversion Factors for Company Reporting;
Scope 2: Indirect emissions under control of the airport i.e. grid electricity, purchased heating and cooling	DEFRA & DBEIS UK Government GHG Conversion Factors for Company Reporting;
Scope 3: Indirect emissions that result from airport operation and that can be influenced but not directly controlled by the airport i.e. embedded carbon in materials for construction/maintenance, emissions from fuel combustion in aircraft, and third party service providers.	DEFRA & DBEIS UK Government GHG Conversion Factors for Company Reporting; Inventory of Carbon and Energy Inventory for embodied carbon factors for construction materials; ICAO's Aircraft Engine Emissions Databank (AEED)

¹³¹ World Resources Institute/World Business Council for Sustainable Development, 2015, Greenhouse Gas Protocol

Emissions scope	Emissions factor
	EMEP/EEA Air Pollution Inventory Guidebook: 2016

9.5.17 The future baseline, ‘do-minimum’ and ‘do-something’ scenarios for each of the years (outlined in paragraph 9.5.7) will be presented as a total for all sources and separately for the GHG sources outlined within Table 9-2 and Table 9-3.

9.5.18 Comparison will be made between the future baseline and the ‘do-something’ scenario to determine the potential emissions impact of the Proposed Development.

Significance of effect

9.5.19 There is no defined quantitative threshold for determining if GHG emissions are significant. Significance will be determined based on a qualitative approach in line with the Appraisal of Sustainability¹³² for the ANPS, adapted to take into account the requirements of the EIA Regulations.

9.5.20 The GHG emission of the Proposed Development will be estimated. The emissions will be described using the definitions provided in the EIA Regulations: ‘*direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects*’.

9.5.21 Significant effects will be described in the ES and are likely to be those that are identified as being direct, permanent in nature and have a greater negative impact.

Implications on UK carbon obligations

9.5.22 The Appraisal of Sustainability for the ANPS requires that the impact of the Proposed Development on the UK meeting its carbon reduction obligations by 2050 is assessed. This assessment is separate and additional to the assessment of significant effects required by the EIA Regulations.

9.5.23 To determine whether the Proposed Development’s GHG emissions materially impact the UK’s ability to meet its carbon reduction targets the difference between the future baseline, the ‘do-minimum’ and ‘do-something’ scenario will be compared against relevant UK carbon budgets (third, fourth, fifth and 2050 target).

¹³² DfT (2018) Appraisal of Sustainability for Airports NPS Available at: <https://www.gov.uk/government/publications/appraisal-of-sustainability-for-the-proposed-airports-national-policy-statement> [Accessed March 2019]

- 9.5.24 The output of this assessment will consider both the total net GHG emissions for the Proposed Development and the impacts associated with the four main sources of emissions outlined in Table 9-2 and Table 9-3, i.e. construction, airport operations, surface access journeys and aircraft. When assessing the separate GHG emission sources for implications on the UK carbon obligations, policy measures within various industries (power, industry, transport, buildings, agriculture and land use change) will be considered.

9.6 Potential significant effects

- 9.6.1 GHG emissions sources are stated in Table 9-3 and Table 9-4. Given the scale of the Proposed Development, they are all potentially significant and will be assessed.

Cumulative effects

- 9.6.2 The receptor for all GHG emissions is the global atmosphere. As GHG emissions are approaching a scientifically defined limit, emissions from all projects should be considered to have an impact on climate change, and any GHG emissions or reductions from a project might therefore be considered significant.
- 9.6.3 It is unlikely that any single UK project in isolation (even if the ZOI was extended to a national boundary; i.e. the UK national emissions), would have a clear measurable impact on global warming, however cumulatively there could be a significant impact on the UK's ability to meet its carbon budgets.
- 9.6.4 The requirement to present the impact of the Proposed Development in the context of the UK Carbon budgets is a cumulative assessment and as such it is concluded that further cumulative GHG emissions is scoped out.

Transboundary effects

- 9.6.5 GHG emissions impact on the global atmosphere which in turn can give rise to a range of climate change effects that are experienced globally. It is not considered possible however to apportion any GHG impact to any other country or to assess whether any impact is significant.

9.7 Matters scoped out

- 9.7.1 Due to the length of the lifetime of the project decommissioning of the airport will not be considered within the scope of the assessment.
- 9.7.2 As described above, due to the nature of GHG emissions and their assessment being inherently cumulative, a cumulative

assessment of greenhouse gasses is scoped out of further assessment.

9.8 Mitigation

9.8.1 Mitigation measures or mechanisms to avoid or reduce any GHG emissions arising from construction, and operation of the Proposed Development will be proposed in the ES, including, where relevant, those outlined within paragraphs 5.77, 5.78 and 5.79 of the ANPS.

9.8.2 Embedded measures are expected to be realised through project engineering and architectural requirements (including masterplan, asset utilisation, material and resource productivity, construction programming), and surface access. The 'do-minimum' scenario for each year modelled will assume embedded mitigation measures for example all new buildings meeting minimum building regulation requirements for energy efficiency and carbon emissions and vehicles used for surface access road journeys such a private cars and busses meeting required minimum standards for emissions.

9.8.3 Embedded and good practice mitigation measures at the construction stage may include:

- a code of construction practice;
- development of a construction traffic management plan;
- transport of material to site by alternative modes to road;
- increased efficiency in use of construction plant;
- use of energy efficient site accommodation;
- reduction of waste, and transport of waste;
- construction site connection to grid electricity to avoid use of mobile generation;
- selection of construction materials to utilise low carbon options; and/or
- selection of construction materials to minimise distance of transport.

9.8.4 Embedded carbon and good practice emission reduction measures during operation may include:

- zero or low-emissions hybrid or electric vehicle use, charging and fuel facilities;
- changes to the layout of surface access arrangements;
- a surface access strategy;
- use of LED lighting and lighting controls;

- specification of energy efficient heating, ventilation, and air conditioning systems;
- consideration of renewable energy;
- staff training on energy efficiency good practice; and
- monitoring and reporting of energy use.

Additional mitigation measures

- 9.8.5 Additional mitigation measures at the construction stage should draw on best practice, including measures, such as, opportunities to sequester and store carbon such as through additional tree planting will also be considered.
- 9.8.6 Additional mitigation measures to limit carbon impact of the Proposed Development may include but are not limited to:
- single engine taxiing;
 - reducing emission from aircraft at the gate;
 - encouraging increased use of public transport by staff and passengers.

10 NOISE AND VIBRATION

10.1 Introduction

10.1.1 This chapter presents the proposed scope and methodology for the assessment of the likely significant environmental noise and vibration effects due the Proposed Development. The assessment will consider the impact of the following principal sources of noise at key sensitive receptors:

- 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; and
- changes in road traffic noise, including from the new road infrastructure.

10.1.2 Where possible, the Proposed Development will be designed to reduce/offset adverse noise and vibration effects in accordance with policy and best practice. The assessment will also consider the potential cumulative noise effects from other foreseeable developments within the ZOI.

10.2 Legislation, policy and guidance

10.2.1 This section sets out details on the policy and guidance that will be covered in the noise and vibration assessment.

Legislation

10.2.2 The relevant legislation which could influence the scope, method and mitigation elements of the noise and vibration assessment is listed as follows:

- Control of Pollution Act 1974¹³³;
- Environmental Protection Act 1990¹³⁴;
- The Civil Aviation Act 2006¹³⁵;
- The Infrastructure Planning (EIA) Regulations 2017

¹³³ Her Majesty's Stationery Office (1974), *Control of Pollution Act*. Available at: <https://www.legislation.gov.uk/ukpga/1974/40> [Accessed March 2019]

¹³⁴ Her Majesty's Stationery Office (1990); *Environmental Protection Act*. Available at: <http://www.legislation.gov.uk/ukpga/1990/43/contents> [Accessed March 2019]

¹³⁵ Her Majesty's Stationery Office (2006), *Civil Aviation Act*. Available at: http://www.legislation.gov.uk/ukpga/2006/34/pdfs/ukpga_20060034_en.pdf [Accessed March 2019]

- The Airports (Noise-related Operating Restrictions) (England and Wales) Regulations 2018¹³⁶;
- The Environmental Noise (England) Regulations 2006¹³⁷;
- The Aerodrome (Noise Restrictions) Rules and Procedures Regulation, 2003¹³⁸;
- The Noise Insulation Regulations (1975), as amended 1988¹³⁹; and
- The Land Compensation Act (1973)¹⁴⁰.

National planning and aviation policy

Airports National Policy Statement – June 2018

10.2.3 The Proposed Development must be undertaken in accordance with the relevant policies on noise management. For this proposal, the contents of the ANPS¹¹ are regarded as important and relevant considerations. In addition, the ANPS states that due regard must be given to national policy on aviation noise, the relevant sections of the Noise Policy Statement for England¹⁴¹ (NPSE), the NPPF, and the Government’s associated planning guidance on noise¹⁴².

10.2.4 The ANPS sets out the scope of a noise assessment for airport development at paragraphs 5.52-5.53. Paragraph 5.52 states that:

“The noise assessment should include the following:

- *A description of the noise sources;*
- *An assessment of the likely significant effect of predicted changes in the noise environment on any noise sensitive*

¹³⁶ European Parliament and Council of the European Union (2014), *Regulation (EU) No 598/2014*. Available at:

http://www.legislation.gov.uk/ukxi/2018/785/made?_sm_au_au=iVVJ3J3PHrjF10Z5
[Accessed March 2019]

¹³⁷ Her Majesty’s Stationery Office (2006), *The Environmental Noise (England) Regulations*. Available at: <https://www.legislation.gov.uk/ukxi/2006/2238/contents/made>
[Accessed March 2019]

¹³⁸ Her Majesty’s Stationery Office (2003), *Aerodrome (Noise Restrictions) Rules and Procedures Regulation*. Available at: <http://www.legislation.gov.uk/ukxi/2003/1742/made>
[Accessed March 2019]

¹³⁹ Her Majesty’s Stationery Office (1975), *Noise Insulation Regulations*. Available at: <http://www.legislation.gov.uk/ukxi/1975/1763/contents/made> [Accessed March 2019]

¹⁴⁰ Her Majesty’s Stationery Office (1973), *Land Compensation Act*. Available at: <https://www.legislation.gov.uk/ukpga/1973/26/contents> [Accessed March 2019]

¹⁴¹ Department for Environment Food and Rural Affairs (2010), *Noise Policy Statement for England*. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69533/pb13750-noise-policy.pdf [Accessed March 2019]

¹⁴² Department for Communities and Local Government (2014), *Planning Practice Guidance: Noise*. Available at: <https://www.gov.uk/guidance/noise--2> [Accessed March 2019]

premises (including schools and hospitals) and noise sensitive areas (including National Parks and Areas of Outstanding Natural Beauty);

- *The characteristics of the existing noise environment, including noise from aircraft, using noise exposure maps, and from surface transport and ground operations associated with the project, the latter during both the construction and operational phases of the project;*
- *A prediction on how the noise environment will change with the proposed project; and*
- *Measures to be employed in mitigating the effects of noise.”*

10.2.5 Paragraph 5.68 of the ANPS is concerned with the decision making process and states:

“Development consent should not be granted unless the Secretary of State is satisfied that the proposals will meet the following aims for the effective management and control of noise, within the context of Government policy on sustainable development:

- *Avoid significant adverse impacts on health and quality of life from noise;*
- *Mitigate and minimise adverse impacts on health and quality of life from noise; and*
- *Where possible, contribute to improvements to health and quality of life.”*

10.2.6 These requirements are virtually identical to the three aims of the Government’s overarching noise policy as set out in the NPSE.

10.2.7 Paragraphs 5.54 to 5.66 of the ANPS provides details of the type of mitigation measures that could be incorporated into an airport development during construction or operation. Although primarily concerned with a new runway at Heathrow, some of these measures could be relevant to LTN.

General Aviation Policy

10.2.8 There is policy on noise within the government’s emerging Aviation Strategy²¹ (December 2018), currently the subject of consultation. One of the parameters in this document is an objective for modernising airspace to deliver quieter and cleaner journeys to:

“progressively reduce the noise of individual flights, through quieter operating procedures and, in situations where planning decisions have enabled growth which may adversely affect

noise, require that noise impacts are considered through the airspace design process and clearly communicated.”¹⁴³

10.2.9 Paragraphs 3.102 to 3.122 of the Consultation Aviation Strategy²¹ are concerned with “Managing Noise”. In this section there is policy concerned with moving towards a stronger noise policy framework which states that *“the government intends to put in place a stronger and clearer framework which addresses the weaknesses in current policy and ensures industry is sufficiently incentivised to reduce noise, or to put mitigation measures in place where reductions are not possible.”* (paragraph 3.114). It also describes new measures for this Framework, including:

- *“setting a new objective to limit, and where possible, reduce total adverse effects on health and quality of life from aviation noise;*
- *developing a new national indicator to track the long term performance of the sector in reducing noise;*
- *routinely setting noise caps as part of planning approvals (for increase in passengers or flights); and*
- *requiring all major airports to set out a plan which commits to future noise reduction, and to review this periodically”.* (paragraph 3.115)

10.2.10 Until the Government’s aviation strategy is finalised, current UK aviation noise policy is spread over four documents. These are:

- The Aviation Policy Framework (2013)²⁰;
- UK Airspace Policy: A framework for balanced decisions on the design and use of airspace (February 2017)¹⁴⁴;
- Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace (October 2017)¹⁴⁵; and
- Air Navigation Guidance (October 2017)¹⁴⁶.

¹⁴³ Paragraph 3.14 - HM Government (December 2018) Aviation 2050 the Future of UK Aviation

¹⁴⁴ Department for Transport (2017), UK Airspace Policy: A framework for balanced decisions on the design and use of airspace. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/588187/uk-airspace-policy-a-framework-for-balanced-decisions-on-the-design-and-use-of-airspace-print-version.pdf [Accessed March 2019]

¹⁴⁵ Department for Transport (2017), *Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace*. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/653801/consultation-response-on-uk-airspace-policy-web-version.pdf [Accessed March 2019]

¹⁴⁶ Department for Transport (2017), *Air Navigation Guidance*. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/653978/air-navigation-guidance-2017.pdf [Accessed March 2019]

10.2.11 At paragraph 2.69 of the UK Airspace Policy, it states

“The government’s overall policy on aviation noise is to limit and, where possible, reduce the number of people in the UK significantly affected by aircraft noise as part of a policy of sharing benefits of noise reduction with industry in support of sustainable development. Consistent with the Noise Policy Statement for England, our objectives in implementing this policy are to:

- limit and, where possible, reduce the number of people in the UK significantly affected by the adverse impacts from aircraft noise”.

Noise Policy Statement for England

10.2.12 The NPSE seeks to clarify the underlying principles and aims in existing policy documents, legislation and guidance that relate to noise. The statement applies to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise.

10.2.13 The NPSE sets out the long-term vision of the government’s noise policy, which is to *“promote good health and a good quality of life through the effective management of noise within the context of policy on sustainable development”*.

10.2.14 This long-term vision is supported by three aims:

- *“Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life; and*
- *Where possible, contribute to the improvements of health and quality of life.”*

10.2.15 The ‘Explanatory Note’ within the NPSE provides further guidance on defining ‘significant adverse effects’ and ‘adverse effects’ using the concepts:

- No Observed Effect Level (NOEL) - the level below which no effect can be detected. Below this level no detectable effect on health and quality of life due to noise can be established;
- Lowest Observable Adverse Effect Level (LOAEL) - the level above which adverse effects on health and quality of life can be detected; and
- Significant Observed Adverse Effect Level (SOAEL) - the level above which significant adverse effects on health and quality of life occur.

10.2.16 With reference to the SOAEL, the NPSE states:

“It is recognised that it is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.”

- 10.2.17 For situations where noise levels are between the LOAEL and SOAEL, all reasonable steps should be taken to mitigate and minimise the effects. However, this does not mean that such adverse effects cannot occur.

National Planning Policy Framework (NPPF) – February 2019

- 10.2.18 The aim of the NPPF in terms of noise and vibration is to prevent both *“new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of...noise pollution...”* (paragraph 170).
- 10.2.19 Section 15 of the NPPF is concerned with conserving and enhancing the natural environment, including the matters that should be considered for planning decisions in relation to ground conditions and pollution. This includes ensuring *“that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
- *Mitigate and reduce to a minimum other adverse impacts resulting from noise from new development and avoid noise giving rise to significant adverse impacts on health and quality of life; and*
 - *Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”* (Paragraph 180).
- 10.2.20 These policies must be applied in the context of Government policy on sustainable development

Planning Practice Guidance (March 2014)

- 10.2.21 The PPG concerned with noise “*advises on how planning can manage potential noise impacts in new development*”¹⁴⁷ and provides guidelines that are designed to assist with the implementation of the NPPF.
- 10.2.22 The PPG states that local planning authorities should take account of the acoustic environment and in doing so consider:
- “*whether or not a significant adverse effect is occurring or likely to occur;*
 - *whether or not an adverse effect is occurring or likely to occur; and*
 - *whether or not a good standard of amenity can be achieved.*”
- 10.2.23 Factors to be considered in determining whether noise is a concern are identified including the absolute noise level of the source, the existing ambient noise climate, time of day, frequency of occurrence, duration, character of the noise and cumulative effects.

County policy

Hertfordshire Local Transport Plan (2018-2031)

- 10.2.24 Policy 21 of the Hertfordshire Local Transport Plan¹⁴⁸ is related to the environment. The Policy states that:
- “The county council will seek to: [...]*
- Minimise noise issues arising from transport where practical to do so”*
- 10.2.25 The supporting text sets out how the county council will seek to minimise noise impacts in relation to transport infrastructure including LTN:
- “Traffic, air travel and passenger transport can all cause noise disturbances, which can impact upon quality of life and tranquillity. The council will seek to minimise the impacts of traffic and transport noise in Hertfordshire, both when maintaining the existing transport infrastructure and when new infrastructure is installed. This will be achieved by working with key partners and stakeholders and through use of appropriate materials. The*

¹⁴⁷ Ministry of Housing, Communities & Local Government (2014) Guidance: Noise. Available at: <https://www.gov.uk/guidance/noise--2> [accessed March 2019]

¹⁴⁸ Hertfordshire County Council (2018), *Local Transport Plan*. Available at: <https://www.hertfordshire.gov.uk/media-library/documents/about-the-council/consultations/lt4-local-transport-plan-4-complete.pdf>

county council will also work with the local airports to seek to reduce disturbances from aircraft noise in Hertfordshire.”

Local policy

Luton Local Plan 2011-2031 – November 2017

- 10.2.26 The Luton Local Plan 2011-2031 November 2017, states that proposals for expansion of LTN should:

“...achieve further noise reduction or no material increase in day or night time noise or otherwise cause excessive noise including ground noise at any time of the day or night and in accordance with the airport's most recent Airport Noise Action Plan”

- 10.2.27 Policy LLP38 - Pollution and Contamination Pollution concerns the protection of both new and existing developments from being adversely affected by pollution. The policy states that:

“Evidence on the impacts of development will need to demonstrate whether the scheme (individually or cumulatively with other proposals) will result in any significantly adverse effects with regard to air, land or water on neighbouring development, adjoining land or the wider environment. Where adverse impacts are identified, appropriate mitigation will be required. This policy covers chemical, biological and radiological contamination and the effects of noise, vibration, light, heat, fluid leakage, dust, fumes, smoke, gaseous emissions, odour, explosion, litter and pests.”

Central Bedfordshire Local Plan 2035: Pre-Submission – January 2018

- 10.2.28 The Central Bedfordshire Local Plan 2035: Pre-Submission references noise in the following policies:

- Policy EE6 - Tranquillity

“Require planning applications for both major residential and commercial developments to demonstrate how they have assessed the potential impact of their proposals on areas of high tranquillity, including visual intrusion, impact on biodiversity, lighting and noise. Such applications will be required to demonstrate how negative impacts have been avoided and any harmful impacts are adequately mitigated.”

- Policy CC8: Pollution and Land Instability

“All proposals for new development must demonstrate compliance with the current national guidance as well as the Council's adopted standards and supplementary planning guidance in terms of pollution and land instability. Pollution includes matters in relation to noise, waste management,

vibration, odour, surface and ground waters, light, contaminated land and airborne pollution.”

North Hertfordshire District Council Proposed Submission Local Plan 2011-2031 - October 2016

- 10.2.29 NHDC are in the process of replacing the current Local Plan (adopted 1996) with a new Local Plan to cover the period 2011 to 2031.
- 10.2.30 Policy NE3: The Chilterns Area of Outstanding Natural Beauty (AONB) of the NHDC Proposed Submission Local Plan 2011-2031 aims to protect The Chilterns from noise impacts through the following statement:

“Planning permission for any proposal within the AONB, or affecting the setting of the AONB, will only be granted when it:

f. Avoids adverse impacts from individual proposals (including their cumulative effects), unless these can be satisfactorily mitigated.”

Guidance

World Health Organisation Guidelines for Community Noise, 1999

- 10.2.31 The World Health Organisation (WHO) ‘Guidelines for Community Noise’¹⁴⁹ provides guidelines based on scientific knowledge about the health impacts of community noise.
- 10.2.32 It is understood that these guidelines are in the process of being updated and may be published prior to the completion of the assessment of the Proposed Development. If that is the case, account will be taken of the new guidelines, as appropriate.

World Health Organisation Night Noise Guidelines for Europe, 2009

- 10.2.33 The WHO ‘Night Noise Guidelines for Europe’¹⁵⁰ (NNG) provides guidance on the effects that noise levels at night can have on sleep.

¹⁴⁹ World Health Organisation (1999), *Guidelines for Community Noise*. Available at: <https://infrastructure.planninginspectorate.gov.uk/document/2322958> [Accessed March 2019]

¹⁵⁰ World Health Organisation (2009), *Night Noise Guidelines for Europe*. Available at: http://www.euro.who.int/_data/assets/pdf_file/0017/43316/E92845.pdf [Accessed March 2019]

World Health Organisation Environmental Noise Guidelines for the European Region, 2018

- 10.2.34 The WHO's 'Environmental Noise Guidelines for the European Region'¹⁵¹ has recently been published and provides updated guidelines based on research about the health impacts of community noise. The updated guidelines identify noise exposure levels, which are recommended that noise should be reduced below. The noise exposure levels are based on global research; however, the guidelines state that:

"...data and exposure–response curves derived in a local context should be applied whenever possible to assess the specific relationship between noise and annoyance in a given situation."

- 10.2.35 Paragraph 3.106 of The Aviation Strategy makes reference to the updated WHO Guidelines and states agreement with the ambition to reduce noise¹⁵². However, in line with WHO Guidelines statement to apply local data, the Aviation Strategy states that UK policy will be underpinned with recent UK specific evidence in the Civil Aviation Authorities Survey of Noise Attitudes (SoNA)¹⁵³. Consequently, the new WHO Guidelines are currently not considered directly applicable to the assessment; however, this may be amended in future should the status of the new WHO Noise Guidelines be revised.

British Standard 4142:2014

- 10.2.36 BS 4142 'Method for Rating Industrial and Commercial Sound'¹⁵⁴ can be used for assessing the impact of noise from mechanical services plant. The method effectively compares the difference between the level of the new source, with the existing level at the receptor position.

¹⁵¹ World Health Organisation (2018), *Environmental Noise Guidelines for the European Region*. Available at: http://www.euro.who.int/_data/assets/pdf_file/0008/383921/noise-guidelines-eng.pdf [Accessed March 2019]

¹⁵² Q4 of Appendix A – Department for Transport (2018), *Airspace Modernisation Supporting Document*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/763085/nats-cao-feasibility-airspace-modernisation.pdf [Accessed March 2019]

¹⁵³ Civil Aviation Authority (2017), *Survey of Noise Attitudes 2014, CAP 1506*. Available at: <https://publicapps.caa.co.uk/docs/33/CAP%201506%20FEB17.pdf> [Accessed March 2019]

¹⁵⁴ British Standards Institute (2014), *BS 4142 – Methods for rating and assessing industrial and commercial sound*. BSi, London.

British Standard 7445-1:2003

- 10.2.37 BS 7445 'Description and Measurement of Environmental Noise'¹⁵⁵ defines parameters, procedures and instrumentation associated with noise measurement and analysis.

British Standard 5228:2009+A1:2014

- 10.2.38 BS 5228-1 'Code of practice for noise and vibration control on construction and open sites Noise'¹⁵⁶ is the formally adopted Code of Practice under Section 71 of the Control of Pollution Act 1974. It provides information regarding the control of noise from construction operations. It also includes a method for predicting noise from construction activities. BS 5228-2 'Code of practice for noise and vibration control on construction and open sites. Vibration'¹⁵⁷ provides comparable information for vibration control, including guidance on the human response to vibration.

Calculation of Road Traffic Noise, 1988

- 10.2.39 Department of Transport/Welsh Office Memorandum 'Calculation of Road Traffic Noise'¹⁵⁸ (CRTN) describes procedures for the calculation of road traffic noise based on relevant input data such as traffic flow, composition, speed etc. It is suitable for environmental assessments of schemes where road traffic noise may have an impact.

Design Manual for Roads and Bridges, 2011

- 10.2.40 The Highways Agency's DMRB Volume 11 Section 3 Part 7 Traffic Noise and Vibration'¹⁵⁹ provides guidance on the appropriate level of assessment to be used when assessing the noise and vibration effects arising from road projects, including construction of new roads, road improvements and maintenance.

10.3 Stakeholder engagement and consultation

- 10.3.1 A Noise Working Group has been set up to facilitate ongoing consultation with relevant local authorities. The Noise Working Group currently includes representation from the following boroughs and districts:

¹⁵⁵ British Standards Institute (2003), BS 7445-1 – *Description and Measurement of Environmental Noise*. BSi, London.

¹⁵⁶ British Standards Institute (2014), BS 5228-1:2009+A1:2014 – *Code of practice for noise and vibration control on construction and open sites. Part 1: Noise*. BSi, London.

¹⁵⁷ British Standards Institute (2014), BS 5228-2 – *Code of practice for Noise and Vibration control on construction and open sites. Vibration*, BSi, London.

¹⁵⁸ Department of Transport/Welsh Office (1988), *Calculation of Road Traffic Noise*. Her Majesty's Stationery Office, London.

¹⁵⁹ Highways Agency (2011); *Design Manual for Road and Bridges Volume 11 Section 3 Part 7-Traffic Noise and Vibration*.

- LBC;
- NHDC;
- Stevenage Borough Council;
- CBC;
- Dacorum Council;
- Welwyn Hatfield Borough Council;
- East Herts District Council;
- St Albans City & District Council; and
- Aylesbury Vale District Council.

10.3.2 To date, the Noise Working Group has been consulted on the noise monitoring methodology and the contents of this EIA Scoping Report chapter. The group intends to meet quarterly to ensure that the ZOI for the noise and vibration assessment is agreed, and that the group is kept well informed about the progress of the noise and vibration assessment and the emerging findings.

10.3.3 In addition to the Noise Working Group, a Noise Envelope Design Group (NEDG) will be set up to assist in defining a noise envelope for LTN, as defined in the Civil Aviation Authority's (CAA) CAP1129 document¹⁶⁰. The NEDG will consist of representatives from local communities and relevant stakeholders. There is also a requirement to take account of any independent guidance. Reference is made in the ANPS to the Independent Commission on Civil Aviation Noise (ICCAN), who will be consulted throughout the noise envelope process.

10.4 Baseline conditions

Study Area

10.4.1 As the extent of the potential adverse impact cannot be determined without some noise modelling, the final extent of the Study Area cannot be determined at the scoping stage. Details on how the Study Area will be determined are set out in section 10.5.

Data gathering and survey

10.4.2 The following sources of data have been referenced when preparing this noise and vibration scope:

- digital mapping and aerial imagery;

¹⁶⁰ Civil Aviation Authority (2013), CAP 1129 *Noise Envelopes*. Available at: <http://publicapps.caa.co.uk/docs/33/CAP%201129%20Noise%20Envelopes.pdf> [Accessed March 2019]

- London Luton Airport Noise Action Plan 2019 - 2023¹⁶¹; and
- London Luton Airport Annual Monitoring Report 2017¹⁶².

10.4.3 This source data listed above has been referenced to determine the likely communities that may be affected by the Proposed Development and where baseline noise monitoring should take place.

10.4.4 Noise monitoring associated with an impact assessment has several functions. Primarily, a noise survey is designed to provide information regarding the existing noise environment and, in particular, the noise exposure experienced by those living and working at the various locations that may be affected by noise from the Proposed Development. However, such monitoring also assists in understanding the nature and character of the existing noise environment so that the impact of the Proposed Development may be better understood. Measured noise data is also used in calibrating the computer-based noise models that are used to predict the future noise environment with the Proposed Development. Noise monitoring proposed in connection with the Proposed Development is designed to address all these issues as required.

10.4.5 Receptors in close proximity to the Proposed Development may be affected by noise arising from activities such as construction works and airport operational ground activities, most prominently, ground running, taxiing and holding prior to take-off. Receptors close to the existing road transport network in the vicinity of the airport may be affected by changes in road traffic noise as a result of the Proposed Development. Receptors that are further away from the Proposed Development but are near to the current arrival and departure flight paths are likely to be affected by changes in aircraft noise associated with the Proposed Development. Finally, there are locations that are not notably affected by aircraft noise at the moment but may be so in the future following expansion of the airport.

10.4.6 Consequently, the noise monitoring undertaken at these various receptors will be used to assist in:

- determining the current noise exposure that they experience;
- identifying the nature and character of the existing noise; and where appropriate;

¹⁶¹ London Luton Airport (2019), Noise Action Plan 2019-2023. Available at:

[Redacted] [\[Redacted\]](#) [Accessed March 2019]

¹⁶² London Luton Airport (2017), *Annual monitoring Report*. Available at:

[Redacted] [Accessed March 2019]

- calibrating the noise models that will be used to determine the potential future noise impact.
- 10.4.7 The geographical extent of noise monitoring has been based on the possible extent of potential adverse noise impacts arising from the Proposed Development. However, undertaking noise monitoring at a particular location does not mean that there will be an adverse noise impact at that location as a result of the development.
- 10.4.8 The monitoring locations have been agreed through consultation with the Noise Working Group. The noise monitoring locations are shown in Figure 10.1 (Volume 2). As baseline noise monitoring is ongoing at the time of submission of this document, some of the final noise monitoring locations presented in the ES may be marginally different to those presented in Figure 10.1 (Volume 2). The baseline noise survey has been undertaken following the principles contained in BS 7445-1:2003.

Assumptions and limitations

Study area

- 10.4.9 The Study Area for air noise is defined by the extents of the LOAEL. Due to the requirement for noise modelling to be undertaken before the LOAEL can be identified, the Study Area for the noise and vibration assessment has still to be defined. Once the Study Area for the noise and vibration assessment has been defined, it will be submitted to the Noise Working Group for discussion.

Construction

- 10.4.10 The construction noise assessment will be based on an outline programme of works. Noise predictions will be undertaken for periods that are considered representative of reasonable worst-case activities. Conservative assumptions on aspects of the construction process based on experience of similar construction projects that represent a reasonable worst-case in terms of construction noise effects.

Airspace Design

- 10.4.11 The process for the redesign of UK airspace is currently taking place and outside the scope of the DCO process for the Proposed Development and is scheduled to be delivered by 2024. Consequently, the assessment of air noise will be undertaken based on existing flight paths. However, NATS states that LTN may be a significant beneficiary of airspace redesign through the suggestion that the 55 dB noise contour may reduce

by 28%¹⁶³, which is a potential outcome of airspace redesign base on one optimised scenario.

- 10.4.12 The use of developing airspace design in the assessment of air noise is covered in paragraph 5.52 of the ANPS, which states:

“The applicant’s assessment of aircraft noise should be undertaken in accordance with the developing indicative airspace design. This may involve the use of appropriate design parameters and scenarios based on indicative flightpaths.”

- 10.4.13 Consequently, available information on the developing indicative design of LTN airspace will be applied in the assessment of air noise where practicable.

Future aircraft

- 10.4.14 The most direct way of reducing aircraft noise is at source so assumptions on the implementation of new aircraft technology by airport fleet operators will be a key determining factor in how potential impacts are reduced. In 2017, International Civil Aviation Organisation Chapter 14 standard of aircraft was introduced which included noise criteria that all new civil aircraft should achieve. Consequently, future aircraft fleets in future assessment years are likely to generate lower levels of noise than current aircraft fleets.

- 10.4.15 It is forecast that a future generation of aircraft could be introduced into service between 2025 and 2040 and are likely to result in reductions in noise from the forecast assessment fleets. Sensitivity testing will be undertaken on the potential for reduction in aircraft noise emissions based on the best available evidence. Any assumptions made on potential reductions in noise due to future generation aircraft will be described in the ES.

10.5 Assessment methodology

Introduction

- 10.5.1 This section sets out the methodology that will be adopted for the assessment of noise and vibration. The assessment will consider the likely significant effects during construction and operation of the Proposed Development.

- 10.5.2 Whereas the construction assessment will be based on an assessment of absolute noise or vibration levels in terms of LOAEL and SOAEL, the operational noise uses the LOAEL to screen receptors for assessment and the SOAEL to define where receptors may be more sensitive to small changes in noise. As the LOAEL and SOAEL cannot be universally defined for all

¹⁶³ Paragraph 3.106 – HM Government (December 2018) Aviation 2050 the Future of UK Aviation

sources of noise, the methodology includes definitions of LOAELs and SOAELs for different noise sources based on available evidence or statements from the government.

Study Area

- 10.5.3 The Study Area for the noise and vibration assessment will be based on the area within which adverse effects (exceedances of the LOAEL) may occur. Whereas, any construction adverse effects will be localised around the site, any road and air traffic adverse effects may be more widespread around the region. Sensitive receptors within the defined Study Area will be considered in the noise and vibration assessment.

Assessment scenarios

Construction

- 10.5.4 The assessment of construction noise will be undertaken based on the outline construction programme. Representative periods of high intensity construction activities will be identified to determine the likely level of noise or vibration that nearby receptors may be exposed to.

Operation

- 10.5.5 Data for the following assessment scenarios, as described in the Section 10.6 of this Scoping Report, will be used to determine the potential magnitude of impact throughout the phased increase in capacity of the Proposed Development until it reaches full capacity:

- Baseline 2017;
- Future Baseline 2020 – consented capacity of 18mppa;
- 2024 – expansion of the present terminal to reach 21mppa;
- 2029 – partial opening of the new terminal to reach 25mppa; and
- 2039 – New terminal completed and airport at full capacity of 32mppa.

- 10.5.6 The years in which these assessment scenarios occur are dependent on the forecast passenger demand. Should the passenger demand forecast change, the year in which the scenarios occur are also subject to change.

Construction

Introduction

- 10.5.7 Due to the proximity of sensitive receptors to the Main Application Site, temporary significant effects may occur at sensitive

receptors during the earthworks and construction programme. The assessment of noise and vibration considers the following:

- Construction noise emissions from on-site activities;
- Construction vibration emissions from on-site activities; and
- Changes in road traffic noise due to construction traffic on the local road network.

Construction noise

10.5.8 A construction noise assessment will be undertaken based on expected construction activity and plant use during representative periods of activity throughout the construction programme. Noise levels at receptors will be calculated using BS 5228-1:2009 (and update A1 2014 Part 1 Noise) data and procedures.

10.5.9 Criteria for assessing construction noise effects have been defined with reference to 'example method 1 – the ABC method' as defined in BS 5228 1:2009+A1:2014. Category A criteria in the ABC method are interpreted as LOAEL and Category C criteria are considered equivalent to SOAEL, as presented in Table 10-1.

Table 10-1: Thresholds of potential effects of construction noise at residential buildings

Effect	Time Period	Threshold Value ($L_{Aeq,T}$ dB) ^a
LOAEL	Day (07:00 – 19:00)	65
	Evening (19.00 – 23.00)	55
	Night (23.00 – 07.00)	45
SOAEL	Day (07:00 – 19:00)	75
	Evening (19.00 – 23.00)	65
	Night (23.00 – 07.00)	55

a) These effects are expected to occur if the programme of works indicates that the relevant threshold values are likely to be exceeded over a period of at least one month. The values apply to a location one metre from a residential building façade containing a window, ignoring the effect of the acoustic reflection from that façade.

Construction vibration

10.5.10 As well as noise which travels through the air, construction equipment can also generate ground-borne vibration. Due to the extent of construction and earthworks proposed, vibration generated by plant activities on-site may create adverse levels of vibration at sensitive receptors.

10.5.11 The local ground conditions can have a material influence on the propagation of vibration through the ground and therefore the same activity at different locations may produce different levels

of vibration. This makes the prediction of vibration challenging, with a resulting lower level of accuracy when compared to the prediction of noise.

- 10.5.12 BS 5228-2:2009+A1:2014 provides specific methods for predicting vibration from construction activities and sample Peak Particle Velocity (PPV) data for different ground conditions at different distances. PPV data will be referenced to estimate the likely PPV that sensitive receptors may experience during construction activities.
- 10.5.13 When defining assessment criteria, reference has been made to BS 5228-2:2009+A1:2014, which provides descriptions of the impact of vibration in terms PPV on human receptors. For residential receptors and equivalent, the LOAEL has been defined as a vibration dose value of 0.3 mm/s (millimetres per second), this being the point at which construction vibration is likely to become perceptible. The SOAEL has been defined as a vibration dose value of 1.0 mm/s, this being the level at which construction vibration can be tolerated with prior warning.

Construction traffic

- 10.5.14 The Proposed Development has the potential to influence traffic flows on existing roads in the area surrounding the construction sites. Construction traffic noise will be assessed by considering the increase in traffic flows during works through calculation of the Basic Noise Level (BNL), as defined in CRTN.
- 10.5.15 The LOAEL and SOAEL for road traffic noise are defined in Table 10-2. Where exceedance of the LOAEL are identified, the magnitude of potential construction traffic impacts will be defined from magnitude of impact criteria presented in Table 10-3 and Table 10-4 (see paragraph 10.5.20).

Table 10-2: Road Traffic Noise LOAEL and SOAEL

Effect Level	Time Period	Threshold Level dB $L_{Aeq,T}$
LOAEL	07:00 to 23:00	50
	23:00 to 07:00	40
SOAEL	07:00 to 23:00	63
	23:00 to 07:00	55

- 10.5.16 The LOAEL and SOAEL have been defined based on WHO Guidelines for Community Noise and WHO Night Noise Guidelines. The daytime LOAEL is based on the onset of moderate community annoyance and the daytime SOAEL is based on the onset of cardiovascular health effects. The night time LOAEL is defined using the WHO Night Noise Guidelines, and the night time SOAEL is equivalent to the levels above which

WHO Guidelines for Community Noise suggests that the increased risk of health effects starts to become clearer.

Operation

Introduction

10.5.17 Potential noise effects due to the operation of the Proposed Development may be experienced at sensitive receptors due to:

- Air Noise – noise from aircraft during the landing and take-off cycle, including noise from start-of-roll for take-off until end-of-roll at landing, and while in flight;
- Airside Ground Noise – noise from on-site ground activities such as aircraft on the ground prior to take-off and after landing i.e. taxiing, holding and aircraft activity at stand. Additionally, on-site road traffic, fire testing areas and noise generated at areas designated for engine testing will be included; and
- Surface Noise – noise from changes in road traffic flows on the existing road network and new road infrastructure serving the Proposed Development.

10.5.18 In addition to the sources listed above, the Proposed Development may require increases in train movements to provide adequate means of access to the airport. The need to assess increased train movements relating to the Proposed Development will be reviewed once a detailed transport assessment has been undertaken.

10.5.19 Noise emissions from fixed plant may also need to be considered; however, it is likely that airside ground noise will dominate on-site noise emissions and an assessment of these sources can potentially be scoped out. However, as there remains uncertainty over this aspect, the need for a fixed plant noise assessment will be kept under review.

Magnitude of impact for changes in operational noise

10.5.20 Whereas the construction assessment considers significance of the absolute level of a temporary noise or vibration source, changes in existing noise sources will be assessed based on the predicted change in noise. The criteria that will be used to describe the magnitude of impact, in terms of the change in noise arising from the operational phase of the Proposed Development, are presented in Table 10-3. The criteria that will be used for night-time noise are presented in Table 10-4.

10.5.21 The magnitude of impact criteria are based on the current understanding of the impact of noise and have been drawn from a range of sources, including DMRB.

Table 10-3: Magnitude of impact criteria for changes in daytime operational noise

Magnitude of Impact	Change in Noise Level	
	Resulting Exposure between the LOAEL and the SOAEL	Resulting Exposure Exceeding the SOAEL
High	10.0 dB(A) or more	5.0 dB(A) or more
Medium	5.0 – 9.9 dB(A)	3.0 dB(A) – 4.9 dB(A)
Low	3.0 – 4.9 dB(A)	1.0 – 2.9 dB(A)
Very Low	0.1 – 2.9 dB(A)	0.1 – 0.9 dB(A)
No change	0.0 dB(A)	0.0 dB(A)

Table 10-4: Magnitude of impact criteria for changes in night-time operational noise

Magnitude of Impact	Change in Noise Level	
	Resulting Exposure between the LOAEL and the SOAEL	Resulting Exposure Exceeding the SOAEL
High	5.0 dB(A) or more	5.0 dB(A) or more
Medium	3.0 – 4.9 dB(A)	3.0 – 4.9 dB(A)
Low	1.0 – 2.9 dB(A)	1.0 – 2.9 dB(A)
Very Low	0.1 – 0.9 dB(A)	0.1 – 0.9 dB(A)
No change	0.0 dB(A)	0.0 dB(A)

10.5.22 The magnitude of a noise impact due to changes in operational noise levels will be assessed at receptors exposed to operational noise levels exceeding the LOAEL will be assessed. Receptors exposed to noise levels exceeding the SOAEL are considered more sensitive to smaller changes in noise than those where the existing noise levels are lower. Consequently, receptors that are exposed to noise exceeding the SOAEL are considered to be of High sensitivity to noise. Consequently, the terminology used to define the magnitude of impact from particular changes in noise level is different for exposure above SOAEL compared with exposure below SOAEL.

Air noise assessment methodology

10.5.23 The number of annual passengers currently at LTN is approximately 16 mppa. The airport has consent to operate up to 18 mppa, which it expects to reach by approximately 2020. When considering the proposed increase in passengers of up to 32 mppa, there is potential for significant noise effects to occur due to the subsequent increases in air traffic. Significant noise effects will be identified in line with national policy, which considers noise over the day and night periods.

10.5.24 Air noise predictions will be undertaken using the Aviation Environmental Design Tool (AEDT), which is the current

internationally recognised noise modelling software package, produced by the Federal Aviation Administration. AEDT replaced the Integrated Noise Model (INM), which is no longer supported by the Federal Aviation Authority, in 2015.

10.5.25 The results of air noise predictions will be produced in terms of the average mode summer day and night contours, expressed in terms of the $L_{Aeq,16h}$ and $L_{Aeq,8h}$ noise indicators. Other measures of the impact are likely to be used in order to help describe as clearly as possible the effects that might be expected. This will include the following operational scenarios:

- average operating modal split;
- easterly single mode of operation; and
- westerly single mode of operation.

10.5.26 In the Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace (October 2017)¹⁶⁴, the Department for Transport (DfT) stated that:

“...we will set a LOAEL at 51 dB $L_{Aeq,16hr}$ for daytime, and based on feedback and further discussion with CAA we are making one minor change to the LOAEL night metric to be 45dB $L_{Aeq,8hr}$ rather than L_{night} to be consistent with the daytime metric.”

10.5.27 These indicators refer to the summer average day and night respectively.

10.5.28 To account for this definition of the LOAEL, impacts will be identified within the 51 dB $L_{Aeq,16h}$ noise contour and the 45 dB $L_{Aeq,8h}$ noise contour. Consequently, the range of average mode noise contours that will be considered in the assessment are as follows:

- $L_{Aeq,16h}$ – average summer’s day: 51 dB and above in 3 dB increments; and
- $L_{Aeq,8h}$ – average summer’s night: 45 dB and above in 3 dB increments.

10.5.29 For the purposes of this assessment, SOAEL will be regarded as 63 dB $L_{Aeq,16h}$. This exposure roughly equates to the value at which the evidence presented in WHO Guidelines for Community Noise suggests that the increased risk of health effects starts to become clearer. This value has also been used in the assessment of aircraft noise impact at other airports.

¹⁶⁴ Department for Transport (2017), *Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace*. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/653801/consultation-response-on-uk-airspace-policy-web-version.pdf [Accessed March 2019]

- 10.5.30 The equivalent night-time SOAEL is considered to be 55 dB, which is in line with guidance within WHO Night Noise Guidelines for Europe.
- 10.5.31 A summary of the defined LOAEL and SOAEL for air noise during day and night periods are presented in Table 10-5.

Table 10-5: Air Noise LOAEL and SOAEL

Effect Level	Time Period	Threshold Level dB $L_{Aeq,T}$
LOAEL	07:00 to 23:00	51
	23:00 to 07:00	45
SOAEL	07:00 to 23:00	63
	23:00 to 07:00	55

- 10.5.32 The terminology that will be used to describe the magnitude of impact of changes in daytime noise arising from the operational phase of the Proposed Development are presented in Table 10.3. The terminology that will be used for night-time noise are presented in Table 10-4. The results will be evaluated in the context of current Government policy and research findings, including SoNA14¹⁶⁵.

Additional air noise metrics

- 10.5.33 Significant noise effects may be identified through the discussion of additional noise metrics, which will provide context to noise that is identified as exceeding the LOAEL. The intention of the additional noise metrics is to supplement the main assessment and provide greater clarity on noise impacts for the non-technical specialist. The additional metrics that will be presented are defined in the Air Noise Guidance document as follows:
- Number Above: The N65 (for daytime) and the N60 (for night-time) describe the number of aircraft generating noise above 65 dB L_{ASmax} and 60 dB L_{ASmax} . Noise contours for the N60 and N65 based on the average summer day will be presented;
 - Overflights: Overflights are formally defined in the Civil Aviation Authorities' (CAP 1498) document¹⁶⁶. The overflight metric provides greater clarity on the number of aircraft movements that may affect specific communities. The document does not explicitly define a method to determine the number of overflights; however, based on the information

¹⁶⁵ Civil Aviation Authority (2017), *Survey of Noise Attitudes 2014, CAP 1506*. Available at: <https://publicapps.caa.co.uk/docs/33/CAP%201506%20FEB17.pdf> [Accessed March 2019]

¹⁶⁶ Civil Aviation Authority (2017); *Definition of Overflight, Cap 1498*. Available at: http://publicapps.caa.co.uk/docs/33/CAP_1498_V2_APR17.pdf [Accessed March 2019]

provided in CAP 1498, it is considered that an overflight is defined as an aircraft in flight passing an observer at an elevation angle that is greater than 48.5° below 4,000 feet and below 60° at an altitude of 4,000 to 7,000 feet; and

- Consideration will be given to providing $L_{Aeq,T}$ noise contours for periods outside those defined in UK policy. For example, although aircraft noise is assessed over the night-time period from 23:00 to 07:00, aircraft movements tend to be limited over the Night Quota Period from 23:30 to 06:00. Providing additional noise contours for this period will provide further clarity on how aircraft noise varies at night during constrained and unconstrained periods, which are included in the $L_{Aeq,8h}$ noise contours. Any additional $L_{Aeq,T}$ noise contours produced will be dependent on the level of detail provided in aircraft noise forecasts and whether noise contours over additional periods provide any greater clarity on how aircraft noise emissions vary throughout the course of the average day over the contours produced for periods identified in UK policy.

10.5.34 In addition to the noise metrics defined in the Air Navigation Guidance document, further context on aircraft noise impacts will be provided through a study of aircraft noise effects on sleep. Research will be referenced that provides a dose-response relationship for the L_{ASmax} and the probability of awakening due to aircraft movements¹⁶⁷. The assessment of sleep disturbance will be based on the number of aircraft movements that would be expected to result in one awakening.

Airside ground noise

10.5.35 The Proposed Development will result in an intensification of ground activities at the airport. Noise modelling of ground sources will be undertaken using the prediction methodology set out in ISO 9613-2¹⁶⁸. This methodology is referenced in Annex II of the Environmental Noise Directive¹⁶⁹ for the calculation of transport infrastructure noise, which includes aircraft ground noise.

10.5.36 As ground noise is considered a transport infrastructure source, the LOAEL and SOAEL presented in Table 10-2 are considered applicable. The change in airside ground noise at nearby

¹⁶⁷ Basner, Samel, Isermann (2006), Aircraft noise effects on sleep: Application of the results of a large polysomnographic field study, The Journal of the Acoustical Society of America.

¹⁶⁸ International Standards Organisation (1996), ISO 9613-2 Acoustics – Attenuation of sound during propagation outdoors: Part 2: General method of calculation.

¹⁶⁹ Commission Directive (EU) 2015/996 of 19 May 2015 establishing common noise assessment methods according to Directive 2002/49/EC of the European Parliament and of the Council. Available at: [REDACTED]

[REDACTED] [Accessed March 2019]

sensitive receptors will be assessed in line with the magnitude of impact criteria presented in Table 10-3 and Table 10-4.

Surface access noise

- 10.5.37 The increase in passenger numbers is likely to result in significant increases in road traffic. The road traffic noise assessment will consider the likely noise impact on all transport routes covered in the transport assessment.
- 10.5.38 A road traffic noise model will be developed to predict levels of road traffic noise at sensitive receptors. The software applies the CRTN calculation methodology, which utilises road traffic data in terms of the 18-hour AAWT (Average Annual Weekday Traffic) flow from 06:00 to 24:00. The change in road traffic noise at nearby sensitive receptors will be assessed in line with criteria presented in Table 10-3 and Table 10-4. The LOAEL and SOAEL for road traffic noise are identified in Table 10-2.

Sensitivity of receptors

- 10.5.39 Sensitive receptors will be classified depending on their use and consequent sensitivity to noise and vibration. The categories used for defining the sensitivity of receptors to noise and vibration are presented in Table 10-6.
- 10.5.40 Where the assessment considers the magnitude of impact due to the change in noise from an existing source, the SOAEL has been used to determine where receptors may experience increased sensitivity to changes in noise

Table 10-6: Criteria to define sensitivity of receptors

Sensitivity	Description	Examples of Receptor Usage
High	Receptors where noise or vibration will significantly affect the function of a receptor	Residential receptors in areas where permanent noise exposure levels exceed the SOAEL; Auditoria/studios; and Specialist medical/teaching centres.
Medium	Receptors where people or operations are particularly susceptible to noise or vibration	Residential; Places of worship; Conference facilities; Libraries Schools in daytime; and Hospitals/residential care homes.
Low	Receptors of low sensitivity to noise or vibration, where it may cause some distraction or disturbance	Offices; Restaurants; and Sports grounds when spectator noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf).

Sensitivity	Description	Examples of Receptor Usage
Very Low	Receptors where distraction or disturbance from noise or vibration is minimal	Residences and other buildings not occupied during working hours; Factories and working environments with existing high noise levels; and Sports grounds when spectator noise is a normal part of the event.

Significance criteria

Construction

10.5.41 Although a significant effect due to construction activities may be determined through an assessment based on exceedances of the defined SOAELs for construction noise and vibration, additional consideration of the significance of the effect for temporary construction activities will be provided through qualitative discussion of the following:

- duration of activities;
- frequency of events; and
- sensitivity of receptor.

Operation

10.5.42 Determination of significant effects due to changes in operational noise will be undertaken using the criteria detailed in Section 5.3 of this report. The significance of effects matrix presented in Table 10-5 applies the magnitude of impact and sensitivity of receptor to determine the significance of effect.

10.5.43 In addition to the magnitude of impact, information will be provided on the area coverage and population exposed to noise within the various noise contour bands. Population will be considered in the assessment of operational noise given that a significant effect may still be identified through qualitative discussion if an area of high population density is exposed to a noise level that approaches the SOAEL and a magnitude of impact that approaches Medium, as defined in Table 10-3 and Table 10-4.

10.6 Potential significant effects

10.6.1 The EIA Regulations require:

“...the identification of likely significant effects, both positive and negative, and the envisaged mitigation to avoid or reduce the significant effects”.

10.6.2 Likely significant effects that are identified in accordance with EIA Regulations are separate to exceedances of the SOAEL that are identified in accordance with national noise policy. The potential

for significant effects cannot be fully determined until a detailed assessment has been undertaken; however, this section attempts to identify where significant noise and vibration effects may occur based on an understanding of baseline conditions and likely changes to the noise and vibration environment relating to the Proposed Development.

10.6.3 The likely significant effects will be considered for the following noise sources that have been scoped into the noise and vibration assessment:

- construction noise;
- construction vibration;
- changes in road traffic noise due to construction traffic;
- changes in air noise;
- changes in ground noise; and
- changes in surface access noise.

10.6.4 Final determination of whether effects are likely to be significant is made following the classification of effects and using professional judgement. These include consideration of the duration, frequency and likelihood of effects and whether they are temporary or permanent and the area and number of receptors affected.

Combined effects

10.6.5 The combined effect that a receptor experiences due to the combined influence of different noise and vibration sources will be considered. Receptors where exceedances of the LOAEL have been identified for more than one source of noise and/or vibration, will be considered in this assessment. The combined effects assessment will be a qualitative discussion on the likely effect due to the interaction of different noise and/or vibration sources.

Cumulative effects

10.6.6 Cumulative noise effects due to a combination of noise generated by the Proposed Development and due to the noise from the Proposed Development combined with that from other committed developments will be assessed. Committed developments will be identified from the ZOI for the Proposed Development.

10.6.7 In addition to the identified committed developments, changes to other airports and their associated flight paths may influence cumulative effects. Given that consultation on the strategy for redesign of airspace is likely to extend beyond the submission of

the ES, any assessment of cumulative effects due to aircraft will be based on available information at the time of writing the ES.

- 10.6.8 See **Chapter 21 In-Combination and Cumulative Effects** of this Scoping Report for further details regarding methodology.

10.7 Matters scoped out

- 10.7.1 Road traffic vibration can potentially affect buildings and disturb occupiers. DMRB states that imperfections in roads are the main source of vibration and a well-maintained road surface is sufficient that road traffic vibration is not appreciable. DMRB goes on to report that extensive research on a wide range of buildings has found no evidence of traffic induced ground-borne vibration being a source of significant damage to buildings and no evidence that exposure to airborne vibration has caused even minor damage. Given that the condition of road surfaces on the majority of the highway network is outside the scope of the Proposed Development, with only localised junction improvements proposed, an assessment of road traffic vibration has been scoped out.

- 10.7.2 Although vibration may be generated by on-site sources such as road and air traffic activity that are associated with the operation of the Proposed Development, these sources are not expected to generate appreciable vibration on well-maintained surfaces. Additionally, the distance from vibration sources to the Main Application Site boundary is likely to be sufficient that vibration will be ground attenuated to a level that is not perceptible at the Main Application Site boundary. Consequently, the Proposed Development is not considered to generate significant levels of vibration and operational vibration will be scoped out of the assessment.

10.8 Mitigation

Introduction

- 10.8.1 Mitigation measures will be agreed through consultation with the Noise Working Group and will be described in the ES. The aim of mitigation is to reduce temporary construction effects and permanent operational effects as far as reasonably practicable. When considering practicable mitigation for air noise, paragraph 5.47 of the ANPS states the need to strike a balance between negative impacts of noise and the positive benefits of flight.

Construction

- 10.8.2 Mitigation measures will be employed to ensure that potential noise impacts at nearby sensitive receptors due to earthworks and construction activities are minimised. The preferred approach for controlling construction noise is to reduce source

levels where possible, but with due regard to practicality. The simplest and most effective method of reducing noise at nearby receptors is to ensure that noisy plant is located as far from receptors as practicable and screened using temporary barriers. Noise can also be reduced by limiting the daily time that noisy equipment is operated; however, it is acknowledged that sometimes a greater noise level may be acceptable if the duration of the construction activity, and therefore length of disruption, is reduced.

- 10.8.3 Good industry standards, guidance and practice procedures (i.e. construction contractors to sign-up to the Considerate Contractors Scheme) will be followed in order to minimise noise and vibration effects during construction. Noise and vibration will also be minimised through the adoption of best practicable means (as defined in Section 72 of the Control of Pollution Act 1974) as standard working practices across the site to ensure that noise and vibration is reduced as far as reasonably practicable. Mitigation measures will be documented within a Draft CoCP, which will take into account the relevant key guidance documents.

Operation

Air noise

- 10.8.4 Aircraft noise management is subject to the concept of a 'Balanced Approach' (resolution A33/7¹⁷⁰). This is given legal effect in the UK through EU Regulation 598/2014. Mitigation measures in line with the ICAO Balanced Approach to Aircraft Noise Management would be adopted to reduce aircraft noise as far as reasonably practicable. The balanced approach is taken into consideration when defining noise improvement methods in the London Luton Airport Noise Action Plan 2019-2023. The four principles of the ICAO Balanced Approach are:

- reduction of noise at source;
- land-use planning and management;
- noise abatement operational procedures; and
- operating restrictions.

- 10.8.5 Depending on the nature and extent of the impact, a number of mitigation measures that are not covered in LTN's Noise Action Plan may be adopted. The level of mitigation recommended will be dependent on the effects identified. Once the Proposed Development is operational, noise envelope principles will be

¹⁷⁰ International Civil Aviation Organization (2001), *Assembly Resolutions in Force*. Available at: <https://www.icao.int/environmental-protection/Documents/STATEMENTS/A33-7.pdf> [Accessed March 2019]

adopted so that the benefits from any further reductions in noise from new aircraft technology can be shared between the airport and the local community.

10.8.6 The noise envelope will be bespoke to LTN and it will be developed to provide a mechanism to manage the noise impact. Once the NEDG has been set up, it is anticipated that the group will meet to define the following aspects of the noise envelope:

- to review relevant available information regarding:
 - the expected purpose of a noise envelope;
 - the possible elements of a noise envelope;
 - how the noise envelope would be implemented and enforced; and
 - other details such as review periods, duration etc.
- to agree, in general terms, on the purpose and content of the London Luton Airport Noise Envelope;
- to define the detailed content of the London Luton Airport Noise Envelope; and
- to suggest how the terms of noise envelope would be enforced.

10.8.7 The UK is undergoing a redesign of airspace, which is being undertaken simultaneously with the DCO project. In line with advice presented in paragraph 5.52 of the ANPS, sensitivity testing on potential reductions in noise that may be provided through airspace design will be undertaken based on the best available information within the programme for the DCO application submission.

10.8.8 Additional sensitivity testing will be undertaken that considers the potential for reductions in aircraft noise due to improvements in aircraft technology within the lifespan of the Proposed Development. Any assumptions made on reductions in noise for future generations of aircraft will be based on best available information and described in the ES.

Ground noise

10.8.9 The design of the masterplan provides screening of ground activities for sensitive receptors to the north of the airport that do not currently benefit from screening. Use of barriers, bunding or landscaping will be applied where practicable to reduce ground noise emissions from the airport.

Surface access noise

10.8.10 Where significant noise effects are predicted, mitigation measures will be considered to reduce road traffic noise effects. This may be achieved, where practicable, through:

- Environmental barriers – can be either earth bunding or noise fencing. The use of these is dependent on space available;
- Low noise road surfaces – reduces noise created by the interaction between tyre and road. Reductions in road traffic noise range from approximately 1 dB at mean speeds of 10 km/h to approximately 3 dB at mean speeds of 50 km/h; and/or
- Speed restrictions – above 40 km/h, noise levels increase with vehicle speed.

11 SOILS AND GEOLOGY

11.1 Introduction

11.1.1 This chapter presents the proposed approach to the assessment of the likely significant environmental effects of the Proposed Development on soils and geology.

11.1.2 The assessment will consider potential impacts on:

- land quality with respect to soils contamination including soil gases;
- geomorphological and geological features of scientific interest and importance; and
- mineral extraction.

11.1.3 Supporting considerations related to the assessment of soils and geology are addressed separately in **Chapter 13 Waste and Resources** and **Chapter 16 Agricultural Land Quality and Farming Circumstances** of this Scoping Report with regards to waste resources and agricultural land quality. National and local planning policies which are relevant to groundwater and the proposed approach to the assessment of contamination impacts on groundwater are covered in **Chapter 12 Water Resources** of this Scoping Report.

11.2 Legislation, policy and guidance

11.2.1 This section outlines the applicable legislation, policy and guidance which have influenced the proposed soils and geology scope and method of assessment.

Legislation

Environmental Protection Act

11.2.2 The UK Legislation on contaminated land is principally contained in Part 2A of the Environmental Protection Act 1990 as amended by the Environment Act 1995¹⁷¹. The legislation endorses the principle of a “*suitable for use*” approach to contaminated land, where remedial action is only required if there are unacceptable risks to health or the environment, taking into account the use of the land and its environmental setting. The assessment of the impacts arising from potentially contaminated land is based upon consideration of pollution linkages between contamination sources and sensitive receptors. The methodology of risk assessment is normally set out in terms of “*significant pollutants*” and “*significant pollutant linkages*” (referred to as contaminant

¹⁷¹ Environmental Protection Act 1990, as amended by the Environment Act 1995, Part IIA Contaminated Land

linkages in the latest version of the Part 2A statutory guidance) within a source-pathway-receptor model of the site. The model comprises:

- the principal pollutant hazards associated within the site (the sources);
- the principal receptor at risk from the identified hazards; and
- the existence, or absence, of plausible pathways which may exist between the identified hazards and receptors.

11.2.3 For land to be determined statutorily ‘contaminated’ and require remediation or a change to less sensitive use, all three elements (source-pathway-receptor) of a significant pollutant linkage must be present. A possibility of significant harm to one or all of a number of identified receptors should be demonstrated.

Contaminated Land Regulations

11.2.4 The Contaminated Land Regulations (Amendment) 2012¹⁷² clarify the process for the designation of contaminated land and promote a risk-based approach to identify contaminated land. The identification of contaminated land is based upon establishing a pollution linkage from a contaminant, through a pathway to a receptor. The regime identifies the “*appropriate*” persons to bear responsibility for remediation as those “*who caused or knowingly permitted the substances to be in, on or under that land*” based on the “*polluter pays*” principle.

Waste Regulations

11.2.5 The waste hierarchy has been transposed into UK law through the Waste (England and Wales) Regulations 2011¹⁷³. The prevention of waste offers the best outcomes for the environment, is at the top of the priority order, followed by preparing for re-use, recycling, other recovery and disposal, in descending order of environmental preference.

Environmental Permitting Regulations

11.2.6 The Environmental Permitting Regulations (2010)¹⁷⁴ apply to persons operating certain facilities which could harm the environment or human health unless they are controlled. The operators are required to obtain a permit or apply for an exemption for their operations, which would be regulated by the Environment Agency.

¹⁷² Contaminated Land (England) (Amendment) Regulations 2012

¹⁷³ The Waste (England and Wales) Regulations 2011. Statutory Instrument 2011 No. 988 Environmental Protection, England and Wales

¹⁷⁴ The Environmental Permitting (England and Wales) Regulations 2010 No. 675

National planning and aviation policy

Airports National Policy Statement – June 2018

- 11.2.7 Land stability policy is set out at paragraphs 5.226-5.229 of the ANPS¹¹. Paragraph 5.228 states that:

“A preliminary assessment of ground instability should be carried out at the earliest possible stage before a detailed application for development consent is prepared. The applicant should ensure that any necessary investigations are undertaken to confirm that their sites are and will remain stable or can be made so as part of the development. The site needs to be assessed in the context of surrounding areas where subsidence, landslides and land compression could threaten the development during its anticipated life or damage neighbouring land or property. This could be in the form of a land stability or slope stability risk assessment report”.

- 11.2.8 Policies concerned with land contamination are set out in the Land Use section of the ANPS (paragraphs 5.106 – 5.127). Paragraph 5.110 states that:

“Construction and operation of airport facilities is a potential source of contaminative substance (for example, through de-icing or leaks and spills of fuel). Where pre-existing land contamination is being considered through development, the objective is to ensure that the site is suitable for its intended use. Risks would require consideration in accordance with the contaminated land statutory guidance as a minimum”.

- 11.2.9 Paragraph 5.116 states that *“For developments where land may be affected by contamination, or existing mitigation is in place in respect of historic contamination, the applicant should have regard to the statutory regime contained in Part IIA of the Environmental Protection Act 1990 and relevant Government guidance relating to or dealing with contaminated land”.*

National Planning Policy Framework (NPPF) – February 2019

- 11.2.10 The NPPF sets out the objectives for sustainable development, including an environmental objective *“to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.”*
- 11.2.11 Paragraph 170 is concerned with enhancing the natural and local environment, including:

(a) *“by protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan)”*

(e) *“preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability”.*

(f) *“remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.”*

11.2.12 Paragraph 178 is concerned with ground conditions and states that planning *“decisions should ensure that:*

(a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation)

(b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990

(c) adequate site investigation information, prepared by a competent person, is available to inform these assessments”.

Local policy

Luton Local Plan 2011-2031 – November 2017

11.2.13 The Luton Local Plan 2011-2031 was recently adopted on 7 November 2017 and covers the whole of LBC’s administrative area. The Luton Local Plan, together with the Joint Minerals & Waste Local Plan, provide the statutory development plan for Luton Borough for the plan period 2011 and 2031. This local plan guides the spatial distribution of development including housing and employment, retail and leisure between 2011 and 2031. It also set sets out policies, development allocations and actions to meet the environmental, social and economic challenges facing the area over the 20-year plan period.

11.2.14 Policy LP 1 listed in the local plans states that:

“Planning permission will be granted where applications contribute positively to economic, social and environmental objectives of the local plan and which accord with local plan policies (and, where relevant, with policies in neighbourhood

plans) when taken as a whole, unless other material considerations indicate otherwise”.

11.2.15 Policy LP 1 also states that

“To enable the delivery of sustainable development and sustainable communities, all development proposals will: use land and resources (such as water, energy, soils, minerals and waste) in an efficient and effective way (including contributing towards attainment of 'water neutrality') and by ensuring that the best and most versatile soils are safeguarded in preference for lower quality land;”

11.2.16 Policy LP 38 Contaminated Land specifies that

“For proposals on or affecting contaminated land a site assessment must be carried out to establish the full nature and extent of the contamination. Where contamination is identified, this should be remediated under a remediation strategy that is agreed with LBC with reference to the Contaminated Land Statutory Guidance and should favour on-site treatment of materials where possible. It also states that planning permission will not be granted to scheme that could:

- expose the occupiers and neighbours of the development to unacceptable risk;*
- threaten the structural integrity of any existing or proposed building on, or adjoining, the site;*
- lead to the contamination of any watercourse, water body or aquifer; or*
- cause the contamination of adjoining land or allow the contamination of the development site to continue.”*

Luton’s Sustainable Community Strategy

11.2.17 Luton’s Sustainability Community Strategy (2008-2026) main aim is to inform people about Luton; the challenges, opportunities and priorities, and to provide clear direction to develop policy with all partner organisations and challenge all Luton Forum partners to deliver the vision. A key priority listed in this strategy is to reduce consumption of water, energy, material and minimising waste, including support for renewable energy generation.

Minerals and Waste Local Plan

11.2.18 The Minerals and Waste Local Plan: Strategic Site and Policies (January 2014) by the Full Council of all three councils – Bedford Borough Council, LBC and CBC. It sets out the strategic allocations for mineral extraction and for waste management development in the Plan area together with strategic policies which will guide the ongoing supply of minerals and development

of waste management facilities. In particular, the Waste Strategy of the Plan aims to manage waste following recovery so that a very low proportion is landfilled. This is to be achieved by maximising the reuse and recycling of wastes and minimising the need for disposal.

Guidance

11.2.19 The assessment will be carried out in accordance with the following relevant guidance documents:

- British Standard, Investigation of Potentially Contaminated Sites – Code of Practice BS10175¹⁷⁵;
- Environment Agency, Model Procedures for the Management of Land Contamination (CLR11) report¹⁷⁶;
- Environment Agency, Guiding Principles for Land Contamination (GPLC2)¹⁷⁷;
- Environment Agency, The Environment Agency’s approach to groundwater protection¹⁷⁸;
- CIRIA C733 Asbestos in soil and made ground: a guide to understanding and managing risks¹⁷⁹, and;
- Ministry of Housing, Communities and Local Government, Planning Practice Guidance¹⁸⁰.

British Standard, Investigation of Potentially Contaminated Sites

11.2.20 The British Standard (BS) sets out best practice for guidance on conducting site investigations on potentially contaminated sites. It advocates the use of a Conceptual Site Model (CSM) to inform the required investigation at a site. BS10175¹⁸¹ has been used for site investigations undertaken to date within the Main Application Site.

¹⁷⁵ British Standards (2013) *Investigation of Potentially Contaminated Sites – Code of Practice BS10175:2011+A2:2017*

¹⁷⁶ Environment Agency (2004) *Model Procedures for the Management of Land Contamination, Contaminated Land Report 11 CLR 11*

¹⁷⁷ Environment Agency (2010) *GPLC2 Guiding Principles for Land Contamination: FAQs, technical information, detailed advice and references. Updated 2016.*

¹⁷⁸ Environment Agency (2018) *The Environment Agency’s approach to groundwater protection. Version 1.2.*

¹⁷⁹ CIRIA C733 (2014) *Asbestos in soil and made ground: a guide to understanding and managing risks.*

¹⁸⁰ Ministry of Housing, Communities & Local Government (March 2014) *Planning Practice Guidance. Land affected by contamination.*

Model Procedures for the Management of Land Contamination

11.2.21 Environment Agency and Defra guidance; Model Procedures for the Management of Land Contamination: Contaminated Land Report 11 (CLR11)¹⁸² advocates the use of a CSM. The basis of this approach comprises three elements, namely a source, a pathway and a receptor. Without all three of these there can be no contamination risk. Therefore, the presence of measurable concentrations of contaminants within the ground and subsurface environment does not automatically imply that a contamination problem exists, since the contamination must be defined in terms of pollutant linkages and unacceptable risk of harm. The nature and importance of both pathways and receptors, which are relevant to a particular site, will vary according to the intended use of the site, its characteristics and its surroundings. The potential for harm to occur requires three conditions to be satisfied:

- the presence of substances (potential contaminants/pollutants) that may cause harm (the 'Source' of pollution);
- the presence of a receptor which may be harmed, (e.g. the water environment or humans, buildings, fauna and flora) (the 'Receptor'); and
- the existence of a linkage between the source and the receptor (the 'Pathway').

11.2.22 CLR11 has been followed to provide a technical framework to assist in understanding how contamination issues that may arise on the site could be managed.

Guiding Principles for Land Contamination (GPLC)

11.2.23 The GPLC consists of a series of best practice documents. GPLC 2 is directed to 'problem holders' and their advisors, promoted CLR11 approach and provided a translation of CLR11 requirements and role of the Environment Agency. Details key elements expected by the Environment Agency on requirements for land contamination reports including:

- Risk assessment – to determine whether contamination is a problem at a site (sometimes requiring site investigation), comprising a Phase 1 Preliminary Risk Assessment (PRA), Phase 2 Generic Quantitative Risk Assessment (GQRA), and Detailed Quantitative Risk Assessment (DQRA).
- Options appraisal – if a risk assessment demonstrates there are unacceptable risks to be managed at the site (Phase 3)

which identifies feasible remediation options, a detailed evaluation of options, and developing remediation strategy.

- Implementation of remediation – how to implement the chosen remediation from the options appraisal (Phase 3) which includes preparation of an implementation plan, the design, implementation and verification of the remediation, and long-term monitoring and maintenance.

Environment Agency’s approach to groundwater protection.

- 11.2.24 This document updates the previous Groundwater protection: Principles and practice (GP3) now withdrawn. It provides position statements in relation to Environment Agency’s approach to groundwater protection, including land contamination and landfills.

Asbestos in soil and made ground: a guide to understanding and managing risks

- 11.2.25 This document promotes good practice and advises on the safe investigation, assessment and remediation of asbestos contaminated soils (ACS). The guidance aims to assist landowners, site investigation companies and consultants to comply with current Control of Asbestos Regulations and related waste and health and safety regulations.

Planning Practice Guidance

- 11.2.26 The Part 2A regime does not take into account future uses which could need a specific grant of planning permission. Therefore, the requirements of PPG also have been considered. The PPG states that responsibility for securing a safe development, in relation to land contamination, rests with the developer and/or landowner. Where there is a reason to believe contamination could be an issue, developers should provide proportionate but sufficient site investigation information (a risk assessment) to determine the existence or otherwise of contamination. Unless initial assessments clearly demonstrate that the risk from contamination can be reduced to an acceptable level, further site investigations and risk assessment will be needed before the application can be determined.
- 11.2.27 To ensure a site is suitable for its new use and to prevent unacceptable risk from pollution, the implications of contamination for a new development would be considered by the local planning authority to the extent that it is not addressed by other regimes.

11.3 Stakeholder engagement and consultation

11.3.1 Key consultees have been identified and focussed engagement through non-statutory consultation has been undertaken and recorded. Consultees include:

- Environment Agency;
- LBC;
- NHDC; and
- CBC.

11.3.2 An introduction to the Proposed Development was presented to key Local Authority stakeholders and the Environment Agency on 26 February 2018. The Environment Agency commented at this meeting the importance of protecting groundwater from pollution.

11.3.3 A further meeting was held with Environmental Health Officers (EHOs) on 12 April 2018. Representatives from NHDC and CBC attended. LBC were also invited to this meeting but were unable to attend. The meeting discussed EIA scoping relating to air quality, noise and contaminated land. Further and ongoing consultation was welcomed by the LPAs and it was suggested that discipline specific meetings would be preferable.

11.3.4 The following meetings have been held with the Environment Agency to date:

- 26 March 2018 - Meeting to discuss content of EIA scoping and ground investigation (GI)– the Environment Agency were in agreement with proposed approach to EIA scoping and that the GI will meet expectations with regard to data requirements.
- 16 August 2018 - Meeting to discuss landside drainage strategy and provide the Environment Agency with an update on GI.
- 10 October 2018 - Meeting was held to discuss initial strategy with regards to re-engineering the landfill waste. Strategy was presented to Environment Agency and the regulatory mechanisms discussed. Environment Agency advised that a Waste Recovery Permit would be required for the works.

11.3.5 Consultation will continue throughout the pre-application stages of the project.

11.4 Baseline conditions

11.4.1 This section presents a description of the existing site conditions based on desk-based data gathering and previous site investigations undertaken.

Study Area

- 11.4.2 The Main Application Site predominately comprises of an area of the existing airport infrastructure, agricultural land and Wigmore Valley Park. The northern part of Wigmore Valley Park includes public open space with public facilities, a playground, skate park, community centre, and conference facility.
- 11.4.3 Two off-site car parking locations near to Luton Airport Parkway railway station are included as part of the Proposed Development. One of the areas is occupied in part by a vehicle showroom and storage for heavy goods vehicles (HGVs) trailers. The other area is currently a vacant plot.
- 11.4.4 As part of the Proposed Development there is also Off-site Highway Interventions proposed such as junction improvements. These improvements principally comprise of shallow road works in already developed areas of road. It is not anticipated that these activities will encounter significant sources of contamination or present a significant risk to receptors. The potential risks associated with the works can be managed through standard Draft CoCP measures and as such are not included in the assessment of the likely significant environmental effects.
- 11.4.5 Potential impacts to the groundwater are considered in **Chapter 12 Water Resources** of this Scoping Report. Also, the potential effects on waste infrastructure capacity from generation of waste materials from the Proposed Development are discussed as part of **Chapter 13 Waste and Resources** of this Scoping Report.

Zone of Influence

- 11.4.6 The soils and geology assessment, will include the contaminated land assessment, and will consider the potential impacts on and off-site, within 250m of the Main Application Site and the Off-site Car Parks, with the exception of landfills which will be considered within 1km of the Proposed Development. Guidance contained within R&D Publication 66¹⁸³ states that off-site features typically within an area up to 250m from the indicative development boundary should be considered within the hazard identification stage of site assessment. However, features of greater distances should be considered if they have the potential to affect a greater distance i.e. landfills.

Data gathering and survey

- 11.4.7 A number of sources have been used to inform the baseline assessment within this report:

¹⁸³ EA/NHBC (2008) Guidance for the Safe Development of Housing on Land Affected by Contamination. R&D Publication 66.

- Groundsure records – comprising historical and geological mapping;
- British Geological Survey online viewer website¹⁸⁴;
- Natural England MAGIC website¹⁸⁵ ;
- Available existing reports and site investigation data^{186,187,188,189,190,191,192}; and
- Information from relevant local authorities and councils on available records of historic and current contaminated land activity.

Existing conditions

Geology

- 11.4.8 The solid geology in the Study Area comprises Cretaceous Upper Chalk. Superficial deposits of Clay-with-Flints overlie the Chalk in several areas. The interface between the Clay with Flints and the Chalk is a solution ‘front’. Solution features in this surface formed creating local depressions infilled with Clay. There is evidence of solution features in the local area and there may be features beneath areas of the Main Application Site.
- 11.4.9 During the last glacial period, the Anglian Ice sheet advanced from the north towards the site. The site lies close to the limit of glaciation and may have been affected by glacial advances. However, the landscape and geology has predominately been affected by periglacial processes, where frozen ground was subject to seasonal melting, creating ephemeral rivers which cut down valley sides in the area. This has led to the area being characterised by a series of dry chalk river valleys.
- 11.4.10 The published geology is summarised in Table 11-1.

¹⁸⁴ British Geological Survey (BGS) (2018) Geology Viewer. Available at:

[REDACTED]

¹⁸⁵ Natural England (2019) MAGIC. Available at:

<https://magic.defra.gov.uk/MagicMap.aspx> [accessed March 2019]

¹⁸⁶ Arup (2018) London Luton Airport Limited. Proposed Airport Potential Parking Sites. Review of Ground and Constructions Issues.

¹⁸⁷ AECOM (2018) Luton Airport Landfill Main Ground Investigation – Factual Report (Draft)

¹⁸⁸ Structural Soils (July 2017) Landfill. Factual Report on Ground Investigation. Project no:562415

¹⁸⁹ Structural Soils (June 2017) Century Park. Factual Report on Ground Investigation. Project no: 562415

¹⁹⁰ Structural Soils (June 2017) Century Park Access Road. Factual Report on Ground Investigation. Project no: 562291.

¹⁹¹ Soil Engineering (2012) Factual Report on a ground investigation for Luton Airport FBO

¹⁹² Delta Simons (2012) Preliminary Site Investigation. Proposed Taxiway Foxtrot, London Luton Airport. Project Number 12-0319.01

Table 11-1: Published Geology

Strata Type	Reason for Designation
Made Ground	Identified as Made Ground on BGS geological map ¹⁹³
Superficial	Head deposits. Clay with flints.
Bedrock	Lewes Nodular and Seaford Chalk formation. There are isolated bands of the Holywell Nodular and New Pit Chalk formation underlying the Lewes Nodular and Seaford Chalk formation.

11.4.11 There are no designated Sites of Special Scientific Interest (SSSI) in relation to geological or geomorphological features or Regionally Important Geological Site (RIGS) in the Study Area that are considered of national, regional or local importance.

11.4.12 Information provided on MAGIC.gov.uk for agricultural soil classifications supplied by Defra (published 2002) is Grade 3a and 3b in the greenfield land to the east of the landfill, which is moderate to good. The soils in the area are slightly acid loamy clayey soils with impeded drainage. Scoping for assessment of impacts to agricultural land quality and operation is discussed within **Chapter 16 Agricultural Land Quality and Farming Circumstances** of this Scoping Report.

11.4.13 Historically there has been small scale local mineral extraction of the chalk in the area. According to Bedfordshire and Luton Minerals and Waste Local Plan the Main Application Site is not considered to be a Mineral Safeguarding Area (MSA).

Hydrogeology and hydrology

11.4.14 The hydrogeology beneath the Main Application Site is dictated by the underlying geology and is designated by the Environment Agency as follows:

- Superficial Clay-with-Flints- Unproductive aquifer; and
- Chalk Groups (Lewes Nodular, Seaford, Holywell Nodular and New Pit Chalk formations) – Principal Aquifer.

11.4.15 Principal Aquifers are defined as “*layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale*”¹⁹⁴.

¹⁹³ British Geological Survey, (1995). Hitchin. England and Wales Sheet 221. Solid and Drift Geology. 1:50,000 (Keyworth, Nottingham: British Geological Survey)

¹⁹⁴ Environment Agency (2019) Aquifer Designation Maps. Available at: <https://magic.defra.gov.uk/MagicMap.aspx> [accessed March 2019]

- 11.4.16 The Principal Chalk Aquifer is overlain with soils of intermediate permeability. The Clay-with-Flints, where present, are of low permeability.
- 11.4.17 North and eastern parts of the Main Application Site are located over the Total Catchment zones of Groundwater Source Protection Zones (SPZ). Some of the proposed Off-site Highway Interventions are also located the inner zone of these SPZ, as shown in Figure 12.2 (Volume 2).
- 11.4.18 The SPZ to the east of the Main Application Site is associated with a Thames Water abstraction, located approximately 615m north west.
- 11.4.19 The SPZs to the west of the Main Application Site are associated with a number of groundwater abstractions in the area. Therefore, any activities at the site will require detailed consideration when assessing impacts to the groundwater in this area. The potential for changes to groundwater regime and quality to impact on these abstractions are considered in **Chapter 12 Water Resources** of this Scoping Report.
- 11.4.20 The nearest surface water feature located within the Study Area is the River Lee (sometimes spelt Lea). The River Lee is a designated main river, located approximately 300m to the south west of the Main Application Site. The River Mimram is identifiable on OS mapping as a surface water feature approximately 3km to the south east of the existing airport, to the north west of Whitwell.

Contaminated land

- 11.4.21 Within the Main Application Site there have been a variety of historical uses of the land. Those with a potential to have caused contamination of the land are outlined below.
- 11.4.22 The former Eaton Green Landfill, occupies an area of 53 hectares of the Main Application Site (see Figure 11.1, in Volume 2 of this Scoping Report). Some of the existing LTN infrastructure has been built on the former landfill, including the long stay car park and hangars on the eastern boundary of LTN. A Preliminary Risk Assessment (PRA) of the former landfill site was undertaken by Arup¹⁹⁵. The landfill was filled from approximately late 1930's up until 1980's. Records regarding the nature of the waste in the landfill are limited and therefore information on the pollution potential is limited. The landfill is "*dilute and disperse*", which means any pollutants from the landfill go directly into the underlying strata and are diluted in the groundwater. This was considered the best practice at the time the landfill was formed.

¹⁹⁵ Arup (2016) London Luton Airport Limited. Former Eaton Green Landfill. Assessment of Potential Ground Risks.

- 11.4.23 The eastern part of the Main Application Site has predominately been used as agricultural land. Aerial images and historical maps indicate there may have been some small-scale chalk excavation pits within the area. These pits are no longer present and the material used to infill these features is of unknown chemical quality.
- 11.4.24 A substantial part of the Proposed Development is within the boundary of the existing LTN. There is the potential for spillages of various chemicals/fuels associated with the airport to have occurred and caused localised contamination.
- 11.4.25 A preliminary review of the ground conditions at the proposed off-site car parking areas has been undertaken¹⁹⁶. The historical land uses are shown on Figure 11.2, in Volume 2 of this Scoping Report. The key potential historic contaminative land uses to the north of the Midland Mainline railway prior to 1950s include rifle range and motor works. In 1955 a significant earthwork platform was constructed, which aerial photographs suggest was chalky in nature. This was then expanding in 1961 and subsequently reducing in size and re-profiled in 2002 to its current profile. The historical use of the proposed off-site car parking area to the south of the Midland Mainline railway is unclear. The 1941 mapping and aerial photography indicates that three earthwork mounds were present on site. These platforms are still present on site and decrease in height from east to west; the approximate levels area 114m AOD, 110m AOD and 107m AOD.
- 11.4.26 There has historically been a number of industrial activities in the vicinity of the airport including Percival Works which was present approximately 300m north west of the landfill site. Percival Works was established in Luton in 1933 and principally were designers and constructors of light aircraft. During World War II Percival Works manufactured Mosquitos, Oxfords and the Proctor (military version of the Vega Gull). It is known that aircraft dials have historically been painted with radium to make them luminous and this may have been undertaken at Percival Works.
- 11.4.27 Vauxhall Motor Works was also present off Kimpton Road and manufactured motor vehicles from 1905 until present. The current footprint of the Motor Works is significantly less than in the past.
- 11.4.28 Groundwater quality in the vicinity of Luton has been known to be poor due to a “*low level halo*” of solvent contamination related to the surrounding area’s industrial heritage. Published information indicates no single source of the pollution has been

¹⁹⁶ Arup (2018) London Luton Airport Limited. Proposed Airport Potential Parking Sites. Review of Ground Conditions and Construction Issues

identified and it was attributed to widespread diffuse pollution with some “hotspots” of high concentrations¹⁹⁷.

- 11.4.29 Exploratory GIs have been undertaken at the Main Application Site, which covered the landfill and the agricultural land to the east^{198,199}. No known previous GI has been undertaken at the proposed off-site car parking sites. However, a number of investigations have been undertaken nearby, principally within a former area of the Vauxhall Motor Works.
- 11.4.30 A preliminary GI was undertaken in 2016/2017 which provided some reassurance that the landfill did not present a significant pollution risk to controlled waters or human health²⁰⁰. However, this was based on limited data and it was recognised that further data was required in order to provide a robust assessment and understand the potential risk to environment and health from development on the landfill.
- 11.4.31 Additional GI of the landfill has been completed in 2018. Detailed assessment of the GI results is currently being undertaken. However initial observations during the site works indicate that a large proportion of the material is daily cover materials and soil. The waste material was generally moderately degraded with undegraded waste in more recent domestic deposits comprising predominately plastic. The wastes are generally dry with small volumes of leachate recorded.
- 11.4.32 The GI of the agricultural land to the east indicated this area was predominately natural soils, with little or no Made Ground present. The soils in this area did not indicate a significant pollution risk to human health. The pollution risk to groundwater was considered within the risk assessment undertaken for the landfill, as this presents a potential pollution source to groundwater in this area. No further GI is proposed within the area of agricultural land but there is an ongoing long-term monitoring programme in place to measure ground gases and groundwater quality in this area to assess the potential off-site migration of contaminants/gases from the former landfill.
- 11.4.33 LTN operated as a base for Royal Air Force fighters during World War II and therefore there is the potential for Unexploded Ordnance (UXO) in the area. A detailed UXO Threat and Risk

¹⁹⁷ Longstaff, S.L (*et al*) (1992) Contamination of the Chalk Aquifer by Chlorinated Solvents: A Case Study of the Luton and Dunstable Area.

¹⁹⁸ Structural Soils (2017) Century Park. Factual Report on Ground Investigation. London Luton Airport Limited

¹⁹⁹ Structural Soils (2017) Landfill. Factual Report on Ground Investigation. London Luton Airport Limited.

²⁰⁰ Arup (2017) London Luton Airport Limited (LLAL) Century Park Development, Airport Way- Landfill Area. Contamination Quantitative Risk Assessment

Assessment has been undertaken²⁰¹ which details the mitigation measures required for GI and construction related works. These include operational UXO Emergency Response Plan and UXO Safety and Awareness briefings for groundworks contractors.

11.5 Assessment methodology

11.5.1 This assessment will be undertaken in general accordance with the guidance identified in Section 3.2 and in addition the following:

- DMRB Volume 11, Section 2, Part 5 Assessment and Management of Environmental Effects; and
- DMRB Volume 11, Section 3, Part 11 Geology and Soils.

11.5.2 There is no specific methodology for determining the significance of effects to soils and geology. The assessment will therefore be based on the general EIA assessment methodology as detailed in **Chapter 5 Approach to Assessment**, the criteria defined below (paragraph 11.5.9 to 11.5.12), and professional judgement.

Land contamination

11.5.3 The existing baseline assessment of the landfill area will be supplemented to consider the wider geo-environmental setting and ground conditions within the area of the Proposed Development. In particular, an emphasis on the value of the geology present, the presence of any historical land uses, any history of ground instability and any significant aquifer resources.

11.5.4 The baseline assessment will be carried out in accordance with relevant guidance documents such as the Environment Agency's CLR 11 Report²⁰², BS 10175²⁰³, CIRIA C733²⁰⁴ and Guiding Principles for Land Contamination (GPLC2²⁰⁵).

11.5.5 The baseline assessment will involve a Phase 1 or 'Desk Study' Investigation. The desk study will entail a review of available and relevant previous reports relating to the Main Application Site. This will include the review of available records including

²⁰¹ Landmark and Alpha Associates (2018) Detailed Unexploded Ordnance (UXO) Threat & Risk Assessment Project Number P6329.

²⁰² Environment Agency and Defra (2004) Model Procedures for the Management of Land Contamination. Contaminated Land Report 11 (CLR11).

²⁰³ British Standard (2011) Investigation of Potentially Contaminated Sites- Code of Practice BS10175.

²⁰⁴ CIRIA C733 (2014) Asbestos in soils and made ground: a guide to understanding and managing risks.

²⁰⁵ Environment Agency (2010) Guiding Principles for Land Contamination. GPLC2.Updated 2016.

historical mapping, and a review and interpretation of relevant geological maps as well as any mineral and borehole records.

- 11.5.6 Further geotechnical and geo-environmental GI within the former landfill area, including soil and groundwater testing was undertaken in 2018, in accordance with best practice guidance BS10175. This area may present a significant potential source of contamination. A Phase 2 detailed assessment of the potential contamination risks to both human health and controlled waters from Proposed Development on the landfill area is currently being undertaken. The approach to potential contamination risk to groundwater is described in **Chapter 12 Water Resources** of this Scoping Report.
- 11.5.7 The assessment work described above will inform the Proposed Development's design and the preparation of a remediation strategy, in order to ensure appropriate management of contamination where present, during construction of the Proposed Development. The remediation strategy will inform the mitigation measures required and will be presented in the ES.

Materials management

- 11.5.8 There is the potential for significant quantities of excess material excavated from the former landfill to be generated as part of the development works. The material will be assessed to identify appropriate options for the treatment, re-use or possible disposal of materials. The assessment will be undertaken in accordance with the guidance detailed above in Section 17.5.1, relevant waste management guidance²⁰⁶ and environmental permitting guidance²⁰⁷. This will form part of the remediation strategy and will be presented in the ES. Off-site disposal of materials is proposed to be limited as far as possible. The assessment of the impact of off-site material disposal on waste management infrastructure is described in **Chapter 13 Waste and Resources** of this Scoping Report.

Significance criteria

- 11.5.9 The significance of potential environmental effects with respect to soils and geology, will be assessed by consideration of the magnitude of an identified impact and the value/sensitivity of the impacted resource/receptor. Consideration must also be given to the potential for any post-construction environmental effects, caused by remobilisation of contamination within the ground following disturbance during the construction process.

²⁰⁶ Environment Agency (2015) Guidance on the classification and assessment of waste. Technical Guidance WM3.

²⁰⁷ DEFRA (2013) Environmental Permitting Guidance. Core Guidance for the Environmental Permitting (England and Wales) Regulations 2010.

11.5.10 The assessment method for identifying significant effects from land contamination will be undertaken in line with CLR11. The CSM will be reviewed to establish the presence of any 'contaminant linkages', put simply, in order for a potential risk to be identified, a source of risk, a receptor and a pathway between the two need to be identified. In order to assess the potential impact of each of the identified potential contaminant linkages, they will be 'ranked' according to both the probability and severity of any likely impact. This approach is based on guidance presented in CIRIA Document C552²⁰⁸. Table 11-2 describes the proposed criteria for the magnitude of impact.

Table 11-2: Impact Magnitude Criteria for Soils and Geology

Magnitude of Impact	Criteria Definition
High	<p>Short term acute effect on human health affecting both Site users and users of sites in the vicinity, arising from contamination on the Main Application Site, or Chronic damage to human health affecting users of both the site and other sites in the vicinity arising from contamination on the Main Application Site.</p> <p>Long-term, reversible detrimental effect impact on animal or plant populations from contaminated soils.</p> <p>Irreversible detrimental impact on a nationally important geological feature.</p> <p>Irreversible impact to proven economically extractable mineral resource.</p> <p>Severe irreversible damage to buildings or property on or in the vicinity of the Main Application Site arising from contamination on the Main Application Site.</p>
Medium	<p>Chronic damage to human health of users of the Main Application Site.</p> <p>Medium-term, reversible detrimental effect impact on animal or plant populations from contaminated soils.</p> <p>Medium-term, reversible detrimental impact on a nationally important geological feature.</p> <p>Medium-term, reversible detrimental impact to a proven economically extractable mineral resource.</p> <p>Detrimental impact to building structure requiring remedial engineering works arising from contamination on the Main Application Site.</p>
Low	<p>Non-permanent effects to human health e.g. short term intermittent nuisance such as odours not hazardous to human health.</p> <p>Short-term, reversible detrimental impact on animal or plant populations from contaminated soils.</p> <p>Short-term, reversible detrimental impact to nationally important geological feature.</p> <p>Short-term, reversible detrimental impact to a proven economically extractable mineral resource.</p> <p>Detrimental impact to building structures not requiring remedial engineering works arising from contamination on the Main Application Site.</p>

²⁰⁸ CIRIA (2001) *Contaminated Land Risk Assessment. A guide to good practice*. CIRIA C552.

Magnitude of Impact	Criteria Definition
Very low	No appreciable impact on human, animal or plant health, property or geological feature of importance.

Determining the value and sensitivity of resources/receptors

- 11.5.11 Receptors likely to be affected by construction and operation of the Proposed Development will be identified in the ES. The values and/or sensitivities of receptors identified will be classified using the criteria defined in Table 11-3.

Table 11-3: Value and Sensitivity of Resources and Receptors for Soils and Geology

Sensitivity/Value	Resources and Receptors
High	Residential areas, schools and playing fields within 50m of the Proposed Development. Sites designated at a national level e.g. SSSI. Major strategic mineral resource areas.
Moderate	Residential areas, schools and playing fields within 250m of the Proposed Development. Sites designated at a regional level e.g. Local Nature Reserves (LNRs) or Regionally Important Geological Sites (RIGS). Regionally or locally important mineral resource areas.
Low	Adjacent commercial or industrial development. Forestry areas, or ornamental plant nurseries.
Very Low	Minimal economic or social uses of land

- 11.5.12 The effects will be determined by considering the magnitude of the impact and value/sensitivity of receptor in line with the matrix described in Table 5-4.

11.6 Potential significant effects

- 11.6.1 Informed by the results of the previous and recent site investigations and other desk-based assessment, a number of potential receptors have been identified as having the potential to be significantly affected by the Proposed Development as detailed below.

Construction

- 11.6.2 Impacts and effects that will result from construction works will be divided into two sub types (i) temporary and (ii) permanent, as described below.

Temporary construction impacts

11.6.3 The potential significant temporary construction effects comprise:

- During the proposed earthworks potentially contaminated soils and waste material may be exposed. This may generate potentially contaminated dust and odours affecting human receptors off-site.
- Impact on human health via inhalation, ingestion or dermal contact with hazardous material as a result of exposure of ground conditions within the area of the Proposed Development.
- Excavation and earthworks in the area of the former landfill is likely to result in excess waste material. The approach to the assessment of the impact of excess waste material is discussed in **Chapter 13 Waste and Resources**.
- Disturbance of the former landfill may release gases/leachates which could potentially affect off-site receptors.
- The presence of solution features (see Section 17.4.8) on-site mean ground stability works may be required.
- Health of construction workers arising from contact with potential contaminants within the Made Ground and historical landfill or inappropriate procedures and working methods.

Permanent construction impacts

11.6.4 The potential significant permanent construction effects comprise:

- Alteration in ground gas regime during construction may require appropriate gas protection measures to be incorporated into the design of the buildings consistent with the British Standard (BS8485)²⁰⁹.
- Potential off-site impacts to human health due to alteration to the ground gas regime may require installation of boundary control systems e.g. gas curtain.

Operation

11.6.5 Operational impacts of the Proposed Development are likely to be limited to the introduction of potential contaminating materials, e.g. inappropriate storage and use of fuels, which may impact

²⁰⁹ British Standards Institution (2015) *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*. BS8485:2015 [Withdrawn]

soil or water resources and exposure of human receptors to contaminated soils in landscaped areas and public open space.

Cumulative effects

- 11.6.6 The Soils and Geology chapter of the ES will also assess whether there are any cumulative effects with respect to ground conditions, either beneficial or adverse, from the Proposed Development, and any reasonably foreseeable 'other developments'.
- 11.6.7 See **Chapter 21 In-Combination and Cumulative Effects** of this Scoping Report for further details regarding methodology.

11.7 Matters scoped out

- 11.7.1 There are no geological or geomorphological features of scientific interest and importance within (or immediately adjacent to) the Proposed Development, therefore this has been scoped out of further assessment.
- 11.7.2 A detailed groundwater assessment will be required to assess the effect of altering groundwater flow and pathways and impacts on quality on the nearby groundwater receptors. The approach to undertaking this assessment is described in **Chapter 12 Water Resources** of this Scoping Report. Therefore, this has been scoped out of further consideration in this subject assessment.
- 11.7.3 The proposed Off-site Highway Interventions have been scoped out of further assessment as these works principally comprise of shallow road works in already developed areas of road, which can be managed through standard Draft CoCP measures.
- 11.7.4 The assessment of the impacts of off-site disposal of material on waste management infrastructure is described in **Chapter 13 Waste and Resources** of this Scoping Report. Therefore, this has been scoped out of further consideration in this subject assessment.

11.8 Mitigation

- 11.8.1 The Soils and Geology chapter of the ES will identify appropriate mitigation measures to reduce/avoid potential impacts associated with the construction of the Proposed Development. Potential mitigation measures which may be required include:

Embedded mitigation ('Primary', Inherent)

- 11.8.2 Where embedded mitigation is not practicable, and a Phase 2 detailed assessment indicates that existing contamination presents a potential risk to human health or the environment based on the future use of the land required for the Proposed Development, secondary mitigation will be proposed such as a

remediation strategy to be developed to break the contaminant linkage and mitigate/manage the risk.

Additional 'Secondary' mitigation

- 11.8.3 Measures such as preparing and implementing an appropriate remediation method, if required, where unacceptable levels of contamination are identified.
- 11.8.4 Where remediation is identified as required, the initial step in developing the strategy will be to undertake a Remediation Options Appraisal (ROA) consistent with CLR 11. The ROA will identify possible remediation options and assess them in depth. This will take into account relevant factors including sustainability, timescales, cost and permissions. The ROA will identify the chosen remediation solutions for inclusion in the remediation strategy. The remediation solution adopted will need to ensure that the resulting land is suitable for the future use of the land required for the Proposed Development.
- 11.8.5 Following development of the ROA a remediation implementation plan will be developed and agreed with regulators. This will set out the remediation strategy, proposals for verification reporting and long-term monitoring requirements.
- 11.8.6 Where issues such as unstable/unsuitable ground conditions are identified mitigation will be developed as part of the construction design to mitigate/manage the risks i.e. improvement techniques or excavation and replacement of poor material.

Good practice 'Tertiary' mitigation

- 11.8.7 The following good practice mitigation measures will be assumed to be in place:
- appropriate measures and plans in the Draft CoCP, in order to reduce any impact on ground conditions associated with the Proposed Development;
 - ensuring any spills will be rapidly and effectively dealt with;
 - identifying appropriate Personal Protection Equipment (PPE) to protect construction workers from exposure to ground contamination risks; and
 - obtaining a Bespoke Waste Recovery Permit for the reuse of excavated materials, where appropriate.

12 WATER RESOURCES

12.1 Introduction

12.1.1 This chapter presents the proposed approach to the assessment of the likely significant environmental effects of the Proposed Development on water resources.

12.1.2 The assessment will consider potential impacts on the local water environment, including:

- Flood risk;
- Surface water features;
- Groundwater features;
- Water Framework Directive (WFD) bodies; and
- Abstractions and Source Protection Zones.

12.1.3 Where possible, the Proposed Development will be designed to avoid or reduce adverse effects on water resources and flood risk in accordance with policy and best practice.

12.1.4 A separate Flood Risk Assessment (FRA) will be prepared and appended to the final ES.

12.2 Legislation, policy and guidance

12.2.1 This section sets out the legislation, policy and guidance that have influenced the proposed water resources and flood risk scope and methodology for the assessment.

Legislation

Water Framework Directive (2000/60/EC)²¹⁰

12.2.2 The underlying principles of the directive are to protect, and where possible enhance the sustainable use of water resources by consideration of a water body's chemical status (surface and groundwater quality), the physical bounds of a water body (geomorphology) and its ecological status (resource quantity and the related biodiversity). The directive also sets out a need to mitigate against floods and droughts. Compliance with the directive requires demonstration that new developments will not result in the deterioration of the water body WFD status or affect their objective to achieve good status.

²¹⁰ Official Journal of the European Union (2000). Directive 2000/60/EC. *Establishing a framework for the Community action in the field of water policy* [online] Available at: [\[REDACTED\]](#). [Accessed March 2018]

Groundwater Directive (2006/118/EC)²¹¹

12.2.3 This directive establishes a regime which sets quality standards for underground water and introduces measures to prevent or limit inputs of pollutants into groundwater. The directive identifies the chemical and quantitative status of groundwater bodies to establish their baseline quality and identify objectives to be achieved in the future. Compliance with the directive requires demonstration that new developments will not result in the deterioration of the chemical or quantitative status of the groundwater body.

Floods Directive (2007/EC/60)²¹²

12.2.4 This Directive requires member states to assess the flood risk posed by all watercourses, and coastlines and to map the areas at risk. In addition, the directive requires member states to take adequate and coordinated measures to reduce this flood risk. Those proposing development within a member state have to present an understanding of the existing flood risk characteristics affecting the Proposed Development site, design the Proposed Development in a manner that is safe from flooding and does not increase flood risk to adjacent land owners. This information has to be presented to the competent authority for approval

UK domestic legislation and regulations

12.2.5 In addition to the European Directives, the water environment is also regulated under the following domestic legislation:

- The Flood Risk Regulations (2009)²¹³;
- Water Resources Act (1991)²¹⁴;
- Environment Act (1995)²¹⁵;
- The Water Act (2003)²¹⁶;

²¹¹ Official Journal of the European Union (2006). *Directive 2006/118/EC. On the protection of groundwater against pollution and deterioration* [online]. Available at: [redacted] [Accessed March 2019]

²¹² Official Journal of the European Union (2007). *Directive 2007/60/EC. On the assessment and management of flood risks.* [online] Available at: [redacted] [Accessed March 2019]

²¹³ The Flood Risk Regulations 2009 No. 3042 *Environmental Protection.* [online]. Available at: <http://www.legislation.gov.uk/uksi/2009/3042/introduction/made>. [Accessed March 2019]

²¹⁴ *Water Resources Act 1991.* [online] Available at: <http://www.legislation.gov.uk/ukpga/1991/57/contents> [Accessed March 2019]

²¹⁵ *The Environment Act 1995* [online] Available at: <http://www.legislation.gov.uk/ukpga/1995/25/contents> [Accessed March 2019]

²¹⁶ *Water Act 2003* [online] Available at: https://www.legislation.gov.uk/ukpga/2003/37/pdfs/ukpga_20030037_en.pdf [Accessed March 2019]

- The Water Act (2014)²¹⁷ amending the Water Industry Act 1991;
- The Water Industry Act (1991)²¹⁸;
- The Land Drainage Act (1991)²¹⁹;
- The Flood and Water Management Act (2010)²²⁰;
- Groundwater Regulations (2009)²²¹;
- Environmental Protection Act 1990 as amended by the Environmental Act 1995²²²; and
- The Contaminated Land (England) Regulations (Amendment) 2012²²³.

National planning and aviation policy

Airports National Policy Statement – June 2018

Flood risk

12.2.6 Paragraphs 5.152-5.157 of the ANPS¹¹ set out the approach to flood risk assessment that are relevant for airport development. Paragraph 5.154 states:

“In preparing a flood risk assessment the applicant should:

- *Consider the risk of all forms of flooding arising from the development comprised in the preferred scheme, in addition to the risk of flooding to the project, and demonstrate how these risks will be managed and, where relevant, mitigated, so that the development remains safe throughout its lifetime;*
- *Take into account the impacts of climate change, clearly stating the development lifetime over which the assessment has been made;*
- *Consider the need for safe access and exit arrangements;*
- *Include the assessment of residual risk after risk reduction measures have been taken into account, and demonstrate that this is acceptable for the development;*

²¹⁷ *The Water Act 2014* [online]. Available at:

<http://www.legislation.gov.uk/ukpga/2014/21/contents/enacted> [Accessed March 2019]

²¹⁸ *Water Industry Act 1991* [online]. Available at:

<http://www.legislation.gov.uk/ukpga/1991/56/contents> [Accessed March 2019]

²¹⁹ *Land Drainage Act 1991* [online]. Available at:

<http://www.legislation.gov.uk/ukpga/1991/59/contents> [Accessed March 2019]

²²⁰ *Flood and Water Management Act 2010* [online] Available at:

<http://www.legislation.gov.uk/ukpga/2010/29/contents> [Accessed March 2019]

²²¹ The Groundwater (England and Wales) Regulations 2009 No. 2902

²²² Environmental Protection Act 1990, as amended by the Environment Act 1995, Part IIA Contaminated Land

²²³ Contaminated Land (England) (Amendment) Regulations 2012

- *Consider if there is a need to remain operational during a worst case flood event over the preferred scheme's lifetime; and*
- *Provide evidence for the Secretary of State to apply the Sequential Test and Exception Test,²²⁴ as appropriate."*

12.2.7 Paragraphs 5.158 to 5.165 describe some of the flood mitigation measures that could be incorporated into an airport development during construction or operation. Although aimed at Heathrow some of these measures could be relevant to LTN. Paragraph 5.160 emphasises that mitigation "...may include the use of sustainable drainage systems but could also include vegetation to help to slow runoff, hold back peak flows, and make landscapes more able to absorb the impact of severe weather events."

Water quality and resources

12.2.8 Paragraph 5.172 – 5.174 set out the assessment considerations for water quality and resources and 5.175 states that where the development:

"Where the proposed development is subject to an Environmental Impact Assessment and the development is likely to have significant adverse effects on the water environment, the applicant should ascertain the existing status of, and carry out an assessment of, the impacts of the proposed project on water quality, water resources and physical characteristics as part of the environmental statement."

12.2.9 Paragraph 5.176 provides further details on the matters to be assessed, including:

- *"The existing quality of water affected by the proposed project;*
- *Existing water resources affected by the proposed project and the impacts of the proposed project on water resources;*
- *Existing physical characteristics of the water environment (including quantity and dynamics of flow) affected by the proposed project, and any impact of physical modifications to these characteristics;*
- *Any impacts of the proposed project on water bodies or protected areas under the Water Framework Directive and source protection zones around potable groundwater abstractions; and*
- *Any cumulative effects."*

²²⁴ National Planning Policy Framework, March 2012, paragraphs 100-104

- 12.2.10 Paragraph 5.177 also states the applicant “*should assess the effects on surrounding water and wastewater treatment network in cooperation with local water and sewerage undertaker(s)*”, and future water infrastructure.
- 12.2.11 Paragraphs 5.178 to 5.181 describe some of the water resource mitigation measures that could be incorporated into an airport development during construction or operation. Although aimed at Heathrow some of these measures could be relevant to LTN.

National Planning Policy Framework (NPPF) – February 2019

- 12.2.12 Section 14 of the NPPF sets out the challenges of climate change, flooding and coastal change and how these should be addressed within the planning system. Section 15 of NPPF describes how the natural environment should be protected through the development process and accounts for the control of water pollution.
- 12.2.13 Paragraph 170 states that planning decisions should contribute to and enhance the natural and local environment, including by “*preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.*”

Local policy

Luton Local Plan 2011-2031 – November 2017

- 12.2.14 The Luton Local Plan 2011-2031 was adopted in November 2017. It contains the following strategic objective and policy relevant to flood risk and water resources.
- 12.2.15 Strategic Objective 11 seeks to “*avoid inappropriate development in areas at risk of flooding, secure improvements in air and water quality and ensure effective waste management*”.
- 12.2.16 Policy LLP36 – Flood risk - which states that the risk and impact of flooding will be minimised through ensuring that new developments are located in areas with the lowest probability of flooding and address issues associated with cumulative impacts, flood resilience and apply the use of the Sequential Test. It also outlines requirements for site specific flood risk assessments (FRA) and consultation with the Environment Agency.

Central Bedfordshire Council Local Plan 2035: Pre-Submission (January 2018)

- 12.2.17 CBC submitted the Pre-Submission version of the Local Plan in January 2018, and the final version of the plan was submitted to the Secretary of State April 2018. It has the following policies relevant to water resources and flood risk.
- 12.2.18 Policy CC3: Flood Risk Management which states that development will be supported where it is located in areas of low risk from flooding, demonstrates resilience to climate change and where the Sequential and Exception tests have been applied. It also provides guidance on requirements site specific assessment of flood risk, mitigation measures and advocates the use of SuDs.
- 12.2.19 Policy CC4: Development close to watercourses which states that development should maximise opportunities for watercourse restoration and enhancement. It also outlines requirements for new developments related to existing flood defence structures, natural flood defence measures and navigation facilities.
- 12.2.20 Policy CC5: Sustainable Drainage which states that all developments are expected to use SuDs as normal practices and that outlines requirements for all developments that result in an increase in hardstanding area or impacts on surface water flow paths.

North Hertfordshire District Council Proposed Submission Local Plan 2011-2031 – October 2016

- 12.2.21 The NHDC Local Plan 2011-2031 received full Council approval on the 11 April 2017 for submission of the plan for examination. It contains the following policies that are relevant to water resources and flood risk.
- 12.2.22 Policy SP11: Natural resources and sustainability which states that the NHDC will:
- *“Take a risk-based approach to development and flood risk, directing development to areas at lowest risk in accordance with the NPPF and ensuring the provision of Sustainable Drainage Systems (SuDS) and other appropriate measures; and*
 - *Support the principles of the Water Framework Directive and seek to protect, enhance and manage the water environment.”*
- 12.2.23 Policy NE7: Reducing flood risk which outlines requirements that development proposals must fulfil in relation to NPPF guidance, the Strategic Flood Risk Assessment (SFRA) and Environment Agency guidance to gain planning permission.

- 12.2.24 Policy NE8: Sustainable drainage systems which states requirements for sustainable drainage solutions that must be complied with to gain planning permission.
- 12.2.25 Policy NE9: Water quality and environment which identifies buffers and guidance on river restoration and resilience improvements that should be considered for developments located close to nearby watercourses to gain planning permission.
- 12.2.26 Policy NE10: WFD and wastewater infrastructure which states requirements against the WFD which must be fulfilled to gain planning permission.
- 12.2.27 Policy NE11: Contaminated Land policy aims to protect the natural environment including groundwater and help meet the objectives of the WFD, i.e. development must ensure water quality is not compromised and improvements to water quality secured as appropriate.

Guidance

***The Sustainable Drainage Systems Manual*²²⁵**

- 12.2.28 The Sustainable Drainage Systems Manual provides guidance for cost-effective planning, design, construction and maintenance of SuDS in existing and new developments. It aims to provide useful tools in improving flood risk and water quality.

Design Manual for Roads and Bridges

- 12.2.29 Highways England's Design Manual for Roads and Bridges (DMRB)²²⁶ is a suite of guidance describing how to design, assess and maintain highway assets. Volume 11, Section 3, Part 10, HD 45/09 provides guidance on how road drainage and the water environment should be assessed. The assessment methods and approaches described in this document can be successfully transferred to other non-highway related schemes.

***Climate Change Allowance Guidance*²²⁷**

- 12.2.30 The Environment Agency provides guidance on climate change allowances to be used within assessment. This outlines the

²²⁵ CIRIA (2015). *C753 The SuDs Manual* [online]. Available from:

[h](#)
[Accessed March 2019]

²²⁶ Highways England (2019). *Design Manual for Road and Bridges Volume 11, Section 3, Part 10, HD 45/09 Road Drainage and Water Environment*. [online]. Available from:

[Accessed March 2019]

²²⁷ Environment Agency (2016). *Flood Risk Assessments: Climate Change Allowances*. [online] Available from: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances> [Accessed March 2019]

percentage increase in rainfall intensities that should be examined when designing surface water drainage systems, the increase in river flows that should be applied when examining the behaviour of river systems in close proximity to the Proposed Development and sea level rise at coastal settings.

Luton Level 1 Strategic Flood Risk Assessment (SFRA) Update²²⁸

- 12.2.31 The Luton Level 1 SFRA provides information to aid understanding of flood risk across the Luton area. It identifies risks from all sources of flooding, includes site specific flood risk assessments and takes into account the possible impacts of development and changes in land usage. It also outlines how flood risk should be assessed and designed to satisfy Luton Borough planning requirements.

Central Bedfordshire Council Local Plan Strategic Flood Risk Assessment (SFRA) Final Report²²⁹

- 12.2.32 The CBC SFRA includes a Level 1 and Level 2 assessment, it provides; a tool for assessing risk from all sources of flooding current and future, identify potential climate change effects, informing decisions on the emerging Local Plan, assist in identifying new development sites through application of Sequential and Exception Tests, guidance is also provided on site-specific flood risk assessments, highlighting measures or objectives 'required to manage flood risk to the appropriate standard'.

Environment Agency Approach to Groundwater Protection²³⁰

- 12.2.33 This document updates the previous Groundwater protection: Principles and practice (GP3) now withdrawn. It provides position statements in relation to Environment Agency's approach to groundwater protection, including land contamination and landfills.

²²⁸ Luton Borough Council (2013) *Luton Level 1 SFRA update* [online] Available at: <https://www.luton.gov.uk/Environment/Lists/LutonDocuments/PDF/Luton%20Level%20%20Strategic%20Flood%20Risk%20Assessment%20Update.pdf> [Accessed March 2019]

²²⁹ CBC Local Plan (2015-2035) SFRA August 2018 Available at: <http://www.centralbedfordshire.gov.uk/planning/flooding/downloads.aspx> [Accessed March 2019]

²³⁰ Environment Agency (2018) The Environment Agency's approach to groundwater protection. Version 1.2

Guidance

- 12.2.34 Web based PPG²³¹ specific to planning and flood risk is available that outlines how flood risk assessment should be undertaken in accordance with NPPF.
- 12.2.35 The general principles highlight that flood risk should be considered at all stages of the planning process and at the earliest opportunity. In addition, land being considered for development should be taken through the development process in a way that ensures the land is safe from flooding and that the development process will not affect the flood risk status of land elsewhere.
- 12.2.36 In addition to the guidance relating to contamination detailed in **Chapter 11 Soils and Geology**, the Environment Agency, Approach to Groundwater Protection²³² will also be applied to the assessment.

12.3 Stakeholder engagement and consultation

- 12.3.1 Early engagement has been undertaken with the Environment Agency and Lead Local Flood Authorities (LLFA). The relevant LLFAs to the project are LBC, CBC and HCC. This included introducing the scheme and discussion and agreement on the scope and methodology of the assessment.
- 12.3.2 Meetings held to date include:
- 26 March 2018 – Introduction to the scheme and discussion of ground investigation with Environment Agency, LBC, CBC and HCC;
 - 16 August 2018 – Presentation and discussion of landside drainage strategy and assessment methodology with Environment Agency; and
 - 18 October 2018 – Presentation and discuss of landside drainage strategy with LBC, CBC, HCC and Thames Water.
- 12.3.3 Engagement and consultation will continue throughout the pre-application stage and be recorded appropriately.

²³¹ Ministry of Housing, Communities and Local Government (2012) *Planning Practice Guidance* [online]. Available at: <https://www.gov.uk/government/collections/planning-practice-guidance> [Accessed March 2019]

²³² Environment Agency (2017) The Environment Agency's approach to groundwater protection. Version 1.1.

12.4 Baseline conditions

Study Area

12.4.1 A Study Area of 1km from Main Application Site boundary has been used for the purpose of this Scoping Report and all surface and groundwater receptors within this Study Area are considered. In addition, the assessment will include consideration of the Off-site Highway Interventions shown on Figure 2.1 (Volume 2).

Data gathering and survey

12.4.2 The sources used to compile this scoping exercise: LBC Preliminary Flood Risk Assessment (PFRA)²³³, Strategic Flood Risk Assessment (SFRA)²²⁸, Surface Water Management Plan (SWMP)²³⁴, Water Cycle Strategy²³⁵ and Local Flood Risk Management Strategy (LFRMS)²³⁶;

- CBC PFRA²³⁷, SFRA²⁹ and LFRMS²³⁸;
- NHDC SFRA²³⁹;

²³³ Luton Borough Council (2011) *Luton Preliminary Flood Risk Assessment* [online]. Available at:

https://www.luton.gov.uk/Transport_and_streets/Lists/LutonDocuments/PDF/Engineering%20and%20Transportation/Climate%20change/Luton-PFRA-20110608-V1pt0.pdf [Accessed March 2019]

²³⁴ Luton Borough Council (2012) *Surface Water Management Plan* [online] Available at: <https://www.luton.gov.uk/Environment/Lists/LutonDocuments/PDF/Luton%20SWMP%20-%20Final%20Draft%20-%20V1%207.pdf> [Accessed March 2019]

²³⁵ Luton Borough Council (2015) *Luton Water Cycle Strategy* [online] Available at: <https://www.luton.gov.uk/Environment/Lists/LutonDocuments/PDF/Local%20Plan/Climate%20change/CC%20005.pdf> [Accessed March 2019]

²³⁶ Luton Borough Council (2015) *Luton Borough Council Local Flood Risk Management Strategy* [online] Available at: <https://www.luton.gov.uk/Environment/Lists/LutonDocuments/PDF/Local%20flood%20risk%20management%20strategy.pdf> [Accessed March 2019]

²³⁷ IDB Bedford Group (2011) *Tri Lead Local Flood Authority: PFRA for Bedford Borough Council, Central Bedfordshire Council and Milton Keynes Council* [online]. Available at: http://www.centralbedfordshire.gov.uk/Images/preliminary-flood-risk-assessment_tcm3-7812.pdf [Accessed March 2019]

²³⁸ Central Bedfordshire Council (2014) *Local Flood Risk Management Strategy for Central Bedfordshire* [online]. Available at: <http://www.centralbedfordshire.gov.uk/planning/flooding/management.aspx> [Accessed March 2019]

²³⁹ North Hertfordshire District Council (2008) *North Hertfordshire District Council Strategic Flood Risk Assessment* [online]. Available at: [REDACTED]

[Accessed March 2019]

- HCC SFRA addendum²⁴⁰, LFRMS²⁴¹ and PFRA²⁴²;
- Environment Agency long-term flood risk map²⁴³ and flood map for planning²⁴⁴;
- Environment Agency Catchment Data Explorer²⁴⁵;
- Environment Agency Water Abstraction Licences database²⁴⁶;
- British Geological Society (BGS) mapping²⁴⁷;
- Vale of St Alban's Groundwater Model, Phase 1: Data collection and formulation of initial conceptual model final report²⁴⁸; and
- Available existing site investigation data^{249,250,251,252,253,254}.

²⁴⁰ Hertfordshire County Council (2017) Addendum to the Level 1 Strategic Flood Risk Assessment (SFRA) [online] Available at: <https://www.hertfordshire.gov.uk/media-library/documents/about-the-council/consultations/draft-minerals-local-plan/6.-strategic-flood-risk-assessment-addendum-for-draft-mlp.pdf> [Accessed March 2019]

²⁴¹ Hertfordshire County Council (2017) *Local Flood Risk Management Strategy for Hertfordshire 2013-2016* [online] Available at: <https://www.hertfordshire.gov.uk/media-library/documents/environment-and-planning/water/flood-risk-management/lfrms-for-hertfordshire-full-report.pdf> [Accessed March 2019]

²⁴² Hertfordshire County Council (2011) *PFRA* [online]. Available at: <https://www.hertfordshire.gov.uk/media-library/documents/environment-and-planning/water/flood-investigations/archive-consultations/hcc-preliminary-flood-risk-assessment.pdf>. [Accessed March 2019]

²⁴³ Environment Agency (2019) *Long term flood risk map* [online] Available at: <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map> [Accessed March 2019]

²⁴⁴ Environment Agency (2019) *Flood map for planning* [online] Available at: <https://flood-map-for-planning.service.gov.uk/> [Accessed March 2019]

²⁴⁵ Environment Agency (2019) *Catchment Data Explorer* [online] Available at: <http://environment.data.gov.uk/catchment-planning/> [Accessed March 2019]

²⁴⁶ Environment Agency (2017) Water abstraction data sets [online] Available at: <https://data.gov.uk/dataset/7619198a-1bbf-4cbc-8014-f6a46edb230e/water-abstraction-data-sets> [Accessed March 2019]

²⁴⁷ British Geological Survey (2019) *Geology of Britain viewer* [online] Available at: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> [Accessed March 2019]

²⁴⁸ Atkins (2007) *Environment Agency Vale of St Alban's model, Phase 1: Data collection and formulation of initial conceptual model final report*.

²⁴⁹ AECOM (2018) Luton Airport Landfill Main Ground Investigation – Factual Report (Draft)

²⁵⁰ Structural Soils (July 2017) Landfill. Factual Report on Ground Investigation. Project no:562415

²⁵¹ Structural Soils (June 2017) Century Park. Factual Report on Ground Investigation. Project no: 562415

²⁵² Structural Soils (June 2017) Century Park Access Road. Factual Report on Ground Investigation. Project no: 562291.

²⁵³ Soil Engineering (2012) Factual Report on a ground investigation for Luton Airport FBO

²⁵⁴ Delta Simons (2012) Preliminary Site Investigation. Proposed Taxiway Foxtrot, London Luton Airport. Project Number 12-0319.01

Existing conditions

Topography

- 12.4.3 The Main Application Site spans two river valleys, the River Lee and the River Mimram. The existing airport sits on a plateau between these two river valleys at an elevation of approximately 160m Above Ordnance Datum (AOD). The east of the Main Application Site is located within the head of the River Mimram valley. The land here dips to the south east with elevations ranging between approximately 160- 115m AOD.

Surface water features

- 12.4.4 The surface water features discussed in this section are identified in Figure 12.1 (see Volume 2 of this Scoping Report).
- 12.4.5 The River Lee (or Lea) is a designated main river, located approximately 300m to the south west of the Main Application Site. It is a major tributary of the River Thames and generally flows within an open channel in a south easterly direction. The proposed Off-site Highway Interventions at the A1081/B653 Junction and the Windmill Road/St Mary's Road/ Crawley Green Road Gyratory are located on culverted sections of the river.
- 12.4.6 The River Lee is a designated waterbody under the WFD (WFD water body name Luton to Luton Hoo Lakes, ID: GB106038033391). It is designated a heavily modified waterbody. During the 2016 WFD classification, Cycle 2, the River Lee was classified as achieving a Bad WFD status with the target to achieve Good by 2027²⁴⁵.
- 12.4.7 The River Mimram is approximately 4km to the east of the Main Application Site. It is designated under the WFD and the water body name and ID are Mimram (Whitwell to Codicote Bottom), GB106038033460 respectively. During the 2016 WFD classification, Cycle 2, the River Mimram was classified as achieving a Moderate WFD status with the target to achieve Moderate by 2015²⁴⁵.
- 12.4.8 The Mimram is a chalk stream, a watercourse type with a very specific ecological and habitat response that is in decline across Southern England. It is fed by the local groundwater catchment underlying the Main Application Site. The springs at the headwaters of the Mimram are approximately 4km from the Main Application Site.
- 12.4.9 The Ippollitts Brook flows in a north easterly direction and is crossed by the Off-site Highway Intervention works at A602 Park Way/Stevenage Road in Hitchin. It is not a designated main river but is a designated WFD watercourse, the water body name and ID are Purwell, GB105033037690. In the 2016 WFD

classification, Cycle 2, the Purwell was classified as achieving a Poor status with the target to achieve Good by 2015²⁴⁵.

- 12.4.10 There are two attenuation basins located on Eaton Green Road, within the Main Application Site. One is a Thames Water asset, the function of the other has yet to be established.
- 12.4.11 The majority of the Proposed Development is located within Flood Zone 1 and as such is at low risk of flooding from rivers. There is one exception to this on A602 Park Way/Stevenage Road where there is a small area of Flood Zone 3 that extends across the road, associated with the Ippollitts Brook.
- 12.4.12 The Environment Agency long-term flood risk mapping²⁴³ shows numerous areas of surface water flood risk across the Main Application Site, particularly in proximity to the new terminal building, and at all of the Off-site Highway Intervention locations, as shown in Figure 12.1 in Volume 2 of this Scoping Report. These areas are likely to be associated with the impermeable surfaces of the existing infrastructure. There are also a number of surface water flow paths, located in the east of the Main Application Site, flowing in a south-easterly direction down Winch Hill towards the River Mimram at Kingswalden Park, representing the upper catchment of the River Mimram.
- 12.4.13 No records of surface water abstractions have been identified within 1km of the Main Application Site.

Groundwater features

- 12.4.14 There are two groundwater bodies located beneath the Main Application Site, an extensive Chalk bedrock aquifer and a smaller superficial aquifer associated with head deposits in the upper reaches of the River Mimram catchment. In addition, A1081/B653 Junction proposed Off-site Highway Interventions are located above two superficial aquifers associated with alluvium and glaciofluvial deposits along the River Lee.
- 12.4.15 The British Geological Society map²⁴⁷ indicates that the bedrock underlying the Main Application Site is Lewes Nodular Chalk Formation and Seaford Chalk Formation (Undifferentiated) – Chalk. This is underlain by isolated bands of the Holywell Nodular Chalk Formation and New Pit Chalk Formation (Undifferentiated) – Chalk. According to a report on the Vale of St. Albans Groundwater model²⁴⁸ these formations fall under the subgroup White Chalk (105-174m thick). Additionally, the Hitchin Road proposed Off-site Highway Interventions to the north east of the Main Application Site cross the West Melbury Marly Chalk Formation and Gault Formation.
- 12.4.16 The Chalk is designated by the Environment Agency as a Principal Aquifer, which are defined as “*layers of rock or drift*”

*deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale*²⁵⁵.

- 12.4.17 Groundwater Vulnerability mapping²⁵⁶ indicates that this aquifer has High and Intermediate vulnerability across the Study Area.
- 12.4.18 The Principal Aquifer is also a designated WFD Groundwater body, the Upper Lee Chalk. For groundwater bodies, there are two separate classifications – chemical status and quantitative status which in combination provide an overall water body status.
- 12.4.19 The chemical status for the Upper Lee Chalk is designated as poor. This is related to issues associated with elevated levels of nitrate, pesticides, solvents and other contaminants. The quantitative status is also designated as poor, this related to over abstraction of groundwater from this body²⁵⁷. On the basis of the chemical and quantitative status, in 2016 it was designated as having a Poor overall status and an objective to achieve a Poor overall status for 2027²⁴⁵.
- 12.4.20 The Chalk is a soft white carbonate rock traversed by flint and marl layers. It consists of minute calcareous shells which impart a high porosity to the matrix so that the water contained in pore spaces is virtually immobile, being held in by capillary forces. Consequently, most storage and transport of water in the Chalk is via a network of fractures (dual porosity) and exhibit variations in hydraulic conductivity with depth. There is also evidence of the presence of solution features in the local area and therefore it is possible that there are solutions features beneath the Main Application Site²⁴⁸.
- 12.4.21 The specific fracture characteristics associated with each bedrock type²⁴⁸ identified within the Main Application Site is given below:
- Lewes Nodular Chalk – Nodular chalk fracturing and widely spaced conjugate joints;
 - Seaford Chalk – Medium spaces regular joints;
 - Holywell Nodular Chalk – Medium spaced conjugate joints; and

²⁵⁵ Environment Agency (2019) Aquifer Designation. Available at:

<http://apps.environment-agency.gov.uk/wiyby/117020.aspx> [Accessed March 2019]

²⁵⁶ Environment Agency (2019) Groundwater Vulnerability Maps. Available at:

<https://magic.defra.gov.uk/MagicMap.aspx> [Accessed March 2019]

²⁵⁷ River Lea Catchment Partnership (n.d.) *Upper Lea catchment description* [online]

Available at: <http://www.riverleacatchment.org.uk/index.php/river-mimram-about-us/river-mimram-catchment-description> [Accessed March 2019]

- New Pit Chalk – Intense steeply inclined fractures dissipating along marls seams.
- 12.4.22 The superficial deposits overlying the bedrock beneath the majority of the Main Application Site are Clay-with-Flints Formation consisting of Clay, Silt, Sand and Gravel. In the east of the site, in the upper reaches of the River Mimram catchment, the superficial deposits are formed of Head – Clay, Silt, Sand and Gravel. Glaciofluvial Deposits – Sand and Gravel as well as Alluvium – Clay, Silt, Sand and Gravel superficial deposits are found along the River Lee and River Mimram within the Study Area. There is also a small area of Lowestoft Formation – Diamicton located within the eastern portion of the Study Area.
- 12.4.23 The Alluvium – Clay, Silt, Sand and Gravel (underlying the River Lee at the proposed Off-site Highway Intervention on the A1081/B653 Junction and the Windmill Road/St Mary's Road/Crawley Green Road Gyratory) and Glaciofluvial Deposits – Sand and Gravel deposits (underlying the upper reaches of the Mimram catchment in the east of the Main Application Site) are classified as Secondary A aquifers.
- 12.4.24 The Head - Clay, Silt, Sand and Gravel (underlying the surface water flow paths that form the upper reaches of the River Mimram catchment in the east of the Main Application Site) and the Lowestoft Formation superficial deposits (located within the Study Area to the north east of the Main Application Site) are designated as Secondary Undifferentiated aquifers.
- 12.4.25 The Clay-with-Flints Formation (underlying the majority of the Main Application Site) is classed as unproductive stratum by the Environment Agency
- 12.4.26 Groundwater quality in the vicinity of Luton has been known to be poor due to a 'low level halo' of solvent contamination related to the surrounding area's industrial heritage. Although published information indicates no single source of the pollution has been identified and it was attributed to widespread diffuse pollution with some 'hotspots' of high concentrations²⁵⁸. The Chalk aquifer also has elevated levels of nitrate, pesticides and other contaminants.
- 12.4.27 As detailed in **Chapter 11 Soils and Geology** there are a number of current and historical land uses which may have led to contamination of the groundwater, including:
- Former Eaton Green Landfill, within the Main Application Site, which occupies an area of 53 hectares. The landfill was in use from around the late 1930's to the 1980's. Records regarding

²⁵⁸ Longstaff, S.L. et al (1992) *Contamination of the chalk aquifer by chlorinated solvents: A case study of the Luton and Dustable area.*

the nature of the waste in the landfill are limited. The landfill is 'dilute and disperse', which means any pollutants from the landfill go directly into the underlying strata and are diluted in the groundwater. This was considered the best practice at the time the landfill was formed;

- The eastern part of the Main Application Site has predominately been used as agricultural land, there may have been some small scale chalk excavation pits within the area, which are infilled with material of unknown chemical quality;
- LTN - potential for spillages of various chemicals/fuels associated with the airport to have occurred and caused localised contamination; and
- Historically been a number of industries in the vicinity of the airport, within the Study Area, including Vauxhall motor works and aircraft manufacturing works.

12.4.28 A preliminary GI undertaken in 2016/2017 provided some reassurance that the landfill did not present a significant pollution risk to groundwater^{259,260,261}. However, this was based on limited data and it is recognised that further data is required in order to provide a robust assessment and understand the potential risk to environment from development on the landfill. Additional GI of the landfill has been completed in 2018²⁶², and data will be available to inform the ES.

12.4.29 Ground investigations of the agricultural land to the east indicated this area was predominately natural soils, with little or no Made Ground present. No further GI is proposed within this area however an ongoing long-term monitoring programme is in place to monitor groundwater quality and assess the potential off-site migration of contaminants from the former landfill.

12.4.30 Ground investigation indicates that the groundwater levels within the Main Application Site are typically 15-35m below ground level²⁶³. Figure 12.3 (Volume 2) shows the groundwater monitoring location within, and close to, the Main Application Site.

12.4.31 The regional groundwater flow direction within the Chalk is to the south east in the dip direction of the Chalk²⁶³. However, the river catchments described above influence groundwater flow. In the

²⁵⁹ Structural Soils (June 2017) Century Park. Factual Report on Ground Investigation. Project no: 562415

²⁶⁰ Structural Soils (July 2017) Landfill. Factual Report on Ground Investigation. Project no:562415.

²⁶¹ Arup (2017) London Luton Airport Limited (LLAL) Century Park Development, Airport Way- Landfill Area. Contamination Quantitative Risk Assessment

²⁶² AECOM (2018) Luton Airport Landfill Main Ground Investigation – Factual Report (Draft)

²⁶³ Arup (2018) *London Luton Airport Expansion: Groundwater Level Assessment*.

River Lee catchment, the groundwater flow direction is influenced by local abstraction and flows in a westerly direction. Similarly, the Mimram catchment is also affected by the potable abstraction near Kings Walden which results in an easterly flow direction.

- 12.4.32 A groundwater divide is located underneath the existing airport and as such the local groundwater flow beneath the Main Application Site is predominantly to the east, with west side flowing west towards the River Lee.
- 12.4.33 The LBC PFRA shows the majority of the Main Application Site as having very low susceptibility to groundwater flooding and does not report any historical groundwater flooding incidents in the Study Area. Some areas of low to moderate susceptibility are reported that follow the direction of the surface water flow paths that form the upper catchment of the River Mimram.
- 12.4.34 The LBC PFRA also identifies an area of high to very high susceptibility to groundwater flooding that follows the path of the River Lee floodplain along the A1081/B653 Junction proposed Off-site Highway Intervention.
- 12.4.35 The CBC PFRA, NHDC SFRA and HCC PFRA do not report any areas of susceptibility to groundwater flooding or historical incidents within the Study Area.
- 12.4.36 A number of groundwater abstractions used for industrial use and public water supply, including a Thames Water abstraction, are adjacent to the Main Application Site, as shown in Figure 12.2 (Volume 2).
- 12.4.37 The Main Application Site and proposed Off-site Highway Interventions encompass two Groundwater SPZ. The north east of the Main Application Site is within the Total Catchment zone of a SPZ, associated with a Thames Water groundwater abstraction point located approximately 1km north east of the Main Application Site.
- 12.4.38 The Windmill Road/St Mary's Road/Crawley Green Road Gyratory is within the Inner Protection zone of a SPZ likely to be associated with Affinity Water and Thames Water groundwater abstraction points, located approximately 250m south west and 615m north west respectively.

Water related infrastructure

Existing sewerage

- 12.4.39 Two existing drains have been identified within the Main Application Site that have been identified as part of the existing airport drainage system. One located to the south west of the

existing runway and the other located to the north east of the existing taxiways and aprons.

- 12.4.40 A CCTV survey was completed in January 2018 which has identified that the manhole covers in the north of Wigmore Valley Park provide access to a Thames Water storm relief sewer. This is an overflow to the Thames Water balancing pond located in the north west corner of Wigmore Valley Park. This feature is aligned north west to south east across the landfill area.²⁶⁴
- 12.4.41 Details of existing sewerage infrastructure owned and operated by Thames Water and HCC acting as the LLFA or the Local Highway Authority will be reported in the final Environmental Statement.
- 12.4.42 Neither the LBC PFRA the HCC PFRA, the NHDC SFRA or the CBC PFRA contain any records of sewer flooding events within the Study Area.

12.5 Assessment methodology

Value criteria

- 12.5.1 To assess the impact and effect of the Proposed Development on the water environment it has been necessary to characterise the baseline conditions. This has been undertaken by identifying all surface and groundwater features located within 1km of the indicative Proposed Development boundary and at the Off-site Highway Intervention locations that are located outside of this 1km boundary.
- 12.5.2 The baseline understanding of the existing surface and ground water regimes will be refined over the course of the project. This more detailed understanding will be developed as a result of information obtained from stakeholders and third-party consultees and site surveys including ground investigation and analytical work.
- 12.5.3 This will include using the existing groundwater model of the Vale of St Albans to improve the understanding of existing groundwater levels and flow paths. This model will be refined using the site specific data gathered as part of the ground investigation. The details of this model such as the software used to construct the model are not currently available.
- 12.5.4 The existing surface water drainage characteristics of the Main Application Site will be determined using Flood Estimation Handbook²⁶⁵ and associated hydrological calculation methods such as the Interim Code of Practice for Sustainable Drainage

²⁶⁴ Hydro Cleansing Ltd CCTV Report 09.01.18 Ref: 38451

²⁶⁵ Institute of Hydrology (1999). Flood Estimation Handbook

Systems²⁶⁶. To understand the performance of existing drainage infrastructure across the Main Application Site, a model of the existing drainage system has been completed. This information will be presented in a separate FRA and supporting drainage strategy documentation that will accompany the ES.

- 12.5.5** To understand the potential risks to groundwater from former contaminative users in and around the Main Application Site a Phase 1 or 'Desk Study' report will be undertaken. The desk study will include a review of available and relevant previous reports relating to the Main Application Site based on a review of available records including historical mapping, and a review and interpretation of relevant geological maps as well as any mineral and borehole records within the Main Application Site.
- 12.5.6** Further geotechnical and geo-environmental GI, including soil and groundwater testing has been undertaken within the former landfill area, as this may present a significant source of contamination. The GI was undertaken in accordance with best practice guidance BS10175. Additional information relating to the GI is provided in **Chapter 11 Soils and Geology**.

Receptor importance value

- 12.5.7** Each receptor identified in the baseline section will be assigned an importance value. The importance values are an adaptation of those provided in Table A4.3 of Annex IV of DMRB HD 45/09²⁶⁷. The values are shown in Table 12-1.

Table 12-1: Importance values for water receptors

Importance value	Description	Example
High	Feature with high quality and rarity on a regional or national scale	Principal aquifer providing a regionally important resource or supporting a site protected under UK or EC habitat legislation. Source Protection Zone (SPZ) 1 Identifiable unlicensed potable abstractions (less than 20 m ³ /day) WFD class 'High' water body Watercourse supporting a UK or EC protected site (SAC, SPA or SSSI) or other habitat recognised to be under threat
Medium	Feature with high quality and rarity on a local	Principal aquifer providing a locally important resource or supporting river ecosystem (could apply to Secondary A if importance in

²⁶⁶ Defra (2004) Interim Code of Practice for Sustainable Drainage Systems. Available at: [\[Redacted\]](#) [Accessed March 2019]

²⁶⁷ Highways England (2009): Design Manual of Roads and Bridges Volume 11, Section 3, Part 10 HD 45/09.

Importance value	Description	Example
		terms of a resources recognised in RBMP or other published reports). SPZ total catchment. WFD class 'Good or moderate' water body Major cyprinid fishery Supports a species protected under EC or UK habitat legislation Ordinary watercourse with natural channel morphology and indications of good water quality
Low	Feature with medium quality and rarity on a local	Secondary B or undifferentiated aquifer Licensed or identifiable unlicensed abstractions for non-potable uses. WFD class waterbodies of Poor or below or ordinary watercourse Ordinary watercourse affected by agriculture or development or compromised water quality
Very Low	Feature with low quality and rarity on a local scale	Unproductive strata Minor ditch

Magnitude of impact

12.5.8 Each impact will be assigned a magnitude based on criteria adapted from Table A4.4 of Annex IV of DMRB HD 45/09 and is shown in Table 12-2.

Table 12-2: Magnitude of Impact

Magnitude of impact	Criteria
High adverse	Results in a loss of a feature and or quality and integrity of the feature
Medium adverse	Results in a loss of a part of the feature or an effect on the quality and integrity of the feature
Low adverse	Results in some measurable change in the features quality
Very Low	Results in an effect but insufficient to affect use or integrity
Low beneficial	Results in a measurable beneficial effect or reduces the risk of negative effect from occurring
Medium beneficial	Results in an improvement in the features quality that will increase its viability as a habitat.
High beneficial	Results in an improvement in the features quality that will lead to an improvement in status

12.5.9 The magnitude of impact will be determined based on:

- calculations such as mass balance equations, determinations using professional judgement to determine a likely scale of change;
- Micro-Drainage (or similar) hydraulic model will be used to determine impact on surface water hydrological characteristics;
- Environment Agency Vale of St Alban's groundwater model used to refine the baseline understanding of the groundwater regime (changes to flows and level); and
- Use of a conceptual site model and geo-environmental Ground Investigations to inform the assessment of potential impacts on groundwater contamination (See **Chapter 11 Soils and Geology** for further information).

Groundwater

- 12.5.10 To determine the magnitude of impact a detailed quantitative risk assessment of the potential contamination risks to controlled waters from the Main Application Site and adjacent areas will be undertaken. A hydrogeological assessment will be required to assess the effect of altering groundwater flow and pathways on the nearby groundwater receptors, this will be undertaken. The output of this hydrogeological assessment will also be used to inform the contamination assessment described above.
- 12.5.11 The assessment work described above will inform the Proposed Development's design and the preparation of a remediation strategy, to ensure appropriate management of contamination, where present, during construction of the Proposed Development. The remediation strategy will inform the mitigation measures required and will be presented in the Environmental Statement.

Surface water

- 12.5.12 The assessment of impact and effects on surface water receptors at the construction stage will involve identifying the location of construction activities and assessing the potential risk of these activities from releasing pollutants and/or changing hydraulic conditions based on proximity. Although calculations to determine the volume of potential pollutants and changes to surface water flood level will be undertaken where necessary. These calculations will be hand based mass balance calculations
- 12.5.13 To determine the magnitude of impact at the operational stage an assessment of the performance of the proposed water management system will be undertaken. This will determine the changes to the existing regime in terms of water quality, volume and level and will be based on outputs from Micro-drainage

models of the proposed drainage systems and performance criteria of proposed water quality treatment solutions.

12.5.14 A routine highway runoff screening assessment will be completed in line with DMRB guidance to identify potential impacts on water quality in the River Lee as a result of the proposed Off-site Highway Interventions at A1081 Junction and the Windmill Road/St Mary’s Road/ Crawley Green Road Gyratory. If this screening shows that further assessment is required then this assessment will be completed using HAWRAT methodology and reported in the ES.

12.5.15 An assessment of the impact on the Proposed Scheme on the WFD status and future objectives of the WFD surface- and ground-water bodies located within the Study Area will be completed as part of the ES. This will include the identification of any additional mitigation measures required to ensure no deterioration in status or failure to meet the future objectives as a result of the Proposed Scheme.

Significance criteria

12.5.16 The significance of effect will be determined using Table 12-3. This combines the importance value as described in Table 12-1 and the magnitude of an impact as described in Table 12-2.

Table 12-3: Significance of Effects

Magnitude of Impact	Importance value 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

12.5.17 The significance of the effects will be assessed at the construction and operational stages. The assessment will also determine if an effect will be temporary or permanent. ‘Major’ or ‘Moderate’ effects are usually considered significant, and ‘minor’ or ‘negligible’ effect not significant, however, professional judgment me be applied.

12.6 Potential significant effects

12.6.1 Based on the baseline data gathered to date, an understanding of the Proposed Development, and experience of other major projects, it is considered that the following matters could potentially result in significant effects on water resource, and will be included in the scope of the assessment.

Construction

12.6.2 During the construction phase of the Proposed Development it is considered that there will be potential for significant effects relating to groundwater quality and the integrity of the groundwater abstractions and the SPZs. Therefore, these aspects will be considered further in the EIA.

12.6.3 The likely key impacts to the water environment during construction are outlined below:

- Disruption of existing groundwater flow paths due to activities such as excavation or piling.
- Disruption of existing surface-groundwater interactions such as springs.
- Dewatering of underlying strata to facilitate excavation leading to reduced groundwater levels, affect groundwater flows and a need to dispose of abstracted water. It could also mobilise groundwater contaminants remaining from historical land uses.
- Creation of pollution pathways to the underlying Principal aquifer during excavation and the digging of foundations, particularly during excavation and/or piling of the historic landfill.
- Compaction of ground leading to reduced infiltration and groundwater recharge which may impact on the Principal aquifer.
- Release of sediments and silt from stock piled material and excavations into the water environment, e.g. Impact on surface water and groundwater quality from site runoff.
- Release of construction related polluting matter and materials into the local water environment, including fuels and oils during routine use of vehicles, spillage and concrete.
- At the time of scoping, proposed Off-site Highway Interventions are assumed to be constrained to surface works. However, it is noted that there are potential temporary impacts on fluvial flood risk and damage to banks if at a later stage it is confirmed that the proposed Off-site Highway Interventions at A1081/B653 Junction, Windmill Road/St Mary's Road/ Crawley Green Road Gyratory and A602 Park Way/Stevenage Road require construction works within the River Lee and Ippolitts Brook floodplains.
- Compaction of the ground leading to accelerated surface water runoff and an increase in and extent of surface water flood risk.

- Damage to existing water infrastructure during construction which could lead to increased flood risk from local sewage infrastructure.

Operation

12.6.4 In the operational phase of the Proposed Development it is considered that there will be potential for significant effects relating to groundwater quality and the integrity of the groundwater abstractions and the SPZs. Therefore, these aspects should be considered further in the EIA.

12.6.5 The likely key impacts to the water environment during operation are outlined below:

- Release of airport related pollutants (such as de-icing and fuel oils) to surface water receptors and underlying Principal aquifer from the airport drainage management system.
- Release of highway related pollutants (such as hydrocarbons related to fuel oils) to the River Lee and Ippollitts Brook as a result of the proposed Off-site Highway Interventions at A1081/B653 Junction, Windmill Road/St Mary's Road/Crawley Green Road Gyratory and A602 Park Way/Stevenage Road.
- At the time of Scoping, proposed Off-site Highway Interventions are assumed to be constrained to surface works. However, it is noted that there is potential for permanent impingement into the fluvial flood zone if at a later stage it is confirmed that the proposed Off-site Highway Interventions at A1081/B653 Junction, Windmill Road/St Mary's Road/ Crawley Green Road Gyratory and A602 Park Way/Stevenage Road require build out into the River Lee and Ippollitts Brook floodplains.
- Reduced infiltration and increased surface water runoff due to increased impermeable surfaces anticipated in the eastern portion of the site and change to the surface water management system.
- Changes to groundwater flows and levels (potential indirect impact on groundwater abstractions and SPZs) and susceptibility to groundwater flooding as a result of earthworks required for the Proposed Development.

Cumulative effects

12.6.6 The assessment will also consider cumulative effects with respect to water quality and flood risk, either beneficial or adverse, of the Proposed Development and 'other developments' within the Study Area. This will include consideration of impacts from climate change identified in **Chapter 8 Climate Change**

and consideration of impacts on groundwater from contamination identified in **Chapter 11 Soils and Geology**.

12.6.7 See **Chapter 21 In-Combination and Cumulative Effects** of this Scoping Report for further details regarding methodology.

12.7 Matters scoped out

12.7.1 A full detailed FRA is to accompany the ES. A desk study of the existing conditions completed for this Scoping Report has identified that the Main Application Site is located in an area of Flood Zone 1 and is not located in an area susceptible to groundwater flooding. Therefore, flooding associated with rivers and groundwater will not be examined in detail for the Main Application Site as agreed with the LLFAs and Environment Agency.

12.8 Mitigation

12.8.1 Appropriate mitigation measures or mechanisms to reduce any likely significant adverse effects arising from construction impacts of the Proposed Development will be proposed in the ES.

12.8.2 The likely key primary and tertiary mitigation measures are anticipated to be in the form of a range of management measures including the implementation of sustainable drainage measures into the design, drainage and surface water management strategies, a Draft CoCP and sediment control measures.

12.8.3 Detailed groundwater modelling will be employed to inform recommendations for any specific secondary and primary mitigation measures that may need to be implemented to avoid adverse impacts on groundwater receptors. For example, monitoring during construction and operation and the discharge of uncontaminated groundwater generated during construction back into the aquifer to mitigate potential impacts of dewatering.

12.8.4 The project team will explore opportunities for the Proposed Development to contribute to sustainable water consumption and achieving enhanced water quality. Therefore, sustainable drainage systems, greywater and rainwater harvesting will be considered and discussed in the final ES.

12.8.5 A FRA will be completed in line with NPPF guidance which will provide an overview of local flood risk, an assessment of the impact of the Proposed Development on flood risk, a detailed description of the drainage design and identification of any additional primary and secondary mitigation required to ensure no significant adverse effect on flood risk.

13 WASTE AND RESOURCES

13.1 Introduction

13.1.1 This chapter presents the proposed scope and methodology for assessing the potential environmental impacts associated with waste management and resource use during the construction and operation of the Proposed Development. It is informed by an outline description of existing baseline conditions, and identifies the potential significant environmental effects associated with the Proposed Development.

13.1.2 For the purposes of this EIA Scoping Report and the assessment, waste is defined by the European Waste Framework Directive (Waste FD) (2008/98/EC) as “any substance or object which the holder discards or intends or is required to discard”. Resources are considered to include bulk materials, such as aggregates and fill materials, and manufactured construction products, such as steel, required for the construction of the Proposed Development.

13.1.3 The assessment will consider the following issues under the waste and resources theme:

- The estimated volume, type and classification of waste generated during the construction and operational phases of the Proposed Development;
- How this waste will be managed by the local and regional waste management infrastructure in line with current legislation and planning policy; and,
- Opportunities to prevent, minimise, reuse and recycle waste to meet some of the resource requirements associated with the construction and maintenance of the Proposed Development.

13.2 Legislation, policy and guidance

Legislation

13.2.1 The European Waste FD (2008/98/EC)²⁶⁸ establishes the wider regulatory context for waste management across Europe. In addition to defining waste, it also introduces the concept of the waste hierarchy and establishes landfill diversion targets for member states. The requirements of the Waste FD are transposed into applicable national law through the Waste

²⁶⁸ European Union (2008). Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0098&from=EN> [Accessed March 2019]

(England and Wales) Regulations 2011 as amended²⁶⁹ and other national waste legislation and policies including but not limited to:

- The Environmental Permitting (England and Wales) Regulations 2016;
- Environmental Protection Act 1990 (as amended);
- Hazardous Waste (England and Wales) Regulations 2005 (as amended).

National planning and aviation policy

Airports National Policy Statement - June 2018

13.2.2 Paragraph 5.141 of the ANPS¹¹ sets out the approach to the management of waste and states:

“The applicant should set out the arrangements that are proposed for managing any waste produced in the application for development consent. The arrangements described should include information on the proposed waste recovery and disposal system for all waste generated by the development. The applicant should seek to minimise the volume of waste sent for disposal unless it can be demonstrated that the alternative is the best overall environmental, social and economic outcome when considered over the whole lifetime of the project.”

13.2.3 Paragraph 5.143 is concerned with mitigation measures and states:

“The applicant should set out a comprehensive suite of mitigations to eliminate or significantly reduce the risk of adverse impacts associated with resource and waste management.”

National Planning Policy Framework (NPPF) – February 2019

13.2.4 The NPPF does not contain specific waste policies as these are detailed within the Waste Management Plan for England²⁷⁰ and the National Planning Policy for Waste²⁷¹.

²⁶⁹ Waste (England and Wales) Regulations 2011 as amended, SI 1889. Available at: http://www.legislation.gov.uk/ukxi/2011/988/pdfs/ukxi_20110988_en.pdf [Accessed March 2019]

²⁷⁰ Department for Environment, Food and Rural Affairs (2013). *Waste Management Plan for England*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/265810/pb14100-waste-management-plan-20131213.pdf [Accessed March 2019]

²⁷¹ Department for Communities and Local Government (October 2014). *National Planning Policy for Waste*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/364759/141015_National_Planning_Policy_for_Waste.pdf [Accessed March 2019]

13.2.5 The environmental objective set out at paragraph 8 of the NPPF is *“to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.”*

13.2.6 The environmental objective set out in paragraph 204 of the NPPF is *“so far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously.”*

Aviation Strategy

13.2.7 The emerging Aviation Strategy²¹ was published for consultation in December 2018. Paragraphs 3.73 - 3.76 are concerned with “reducing waste” as part of the operation of the airport. They include examples of good practice such as the incorporation of disposal points for liquids for passengers and biomass treatment plants to treat waste from aircraft.

National Planning Policy for Waste

13.2.8 The National Planning Policy for Waste²⁷⁰ sets out detailed waste planning policies to be applied in conjunction with the NPPF. It states:

“when determining planning applications for non-waste development, local planning authorities should, to the extent appropriate to their responsibilities, ensure that:

1. the likely impact of proposed, non-waste related development on existing waste management facilities, and on sites and areas allocated for waste management, is acceptable and does not prejudice the implementation of the waste hierarchy and/or the efficient operation of such facilities;

2. new, non-waste development makes sufficient provision for waste management and promotes good design to secure the integration of waste management facilities with the rest of the development, and;

3. the handling of waste arising from the construction and operation of development maximises reuse/recovery opportunities, and minimises off-site disposal”.

Waste Management Plan for England

13.2.9 The Waste Management Plan for England²⁷⁰ provides an overview of waste management in England and reiterates the

requirement for all waste producers and waste management providers to implement the waste hierarchy. It also highlights the need for waste to be managed using the proximity principle and confirms England's commitment to recovering at least 70% by weight of non-hazardous construction and demolition waste by 2020 (excluding soils and stones). Recovery is assumed in the context of this policy to include reuse, recycling and incineration with energy recovery.

25 Year Environment Plan

- 13.2.10 The UK Government's Environment Plan: 'A Green Future: Our 25 Year Plan to Improve the Environment'²⁷² published in 2018, "*sets out goals for improving the environment within a generation and leaving it in a better state than we found it. It details how the government will work with communities and businesses to do this*".

Resources and Waste Strategy for England

- 13.2.11 In the 25 Year Environment Plan, the government pledged to leave the environment in a better condition for the next generation. The strategy²⁷³ published in 2018 will help the government to meet that commitment and "*sets out how we will preserve our stock of material resources by minimising waste, promoting resource efficiency and moving towards a circular economy. At the same time we will minimise the damage caused to our natural environment by reducing and managing waste safely and carefully, and by tackling waste crime.*" The strategy combines actions to be taken now and commitments for the coming years. Key targets and milestones and targets, which could be relevant to the Proposed Development, include:

- roll out of a deposit return scheme (subject to consultation) – 2023;
- legislation for mandatory separate food waste collections (subject to consultation) – 2023;
- 75% recycling rate for packaging (subject to consultation) – 2023;
- 65% recycling rate for municipal solid waste – 2035; and
- municipal waste to landfill 10% or less – 2035.

²⁷² HM Government, 2018. A Green Future: Our 25 Year Plan to Improve the Environment. Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf. [Accessed March 2019].

²⁷³ HM Government, 2018. Our Waste, Our Resources: A Strategy for England. Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf. [Accessed March 2019].

- 13.2.12 For the purposes of this assessment municipal waste is considered to include Commercial and Industrial (C&I) and institutional waste from the activities associated with the operation of an airport (e.g. retail, aircraft and terminal cleansing etc.).

Local policy

- 13.2.13 The Luton Local Plan 2011-2031 Policy LLP37 encourages “...an overall reduction in the amount of waste generated, treated and disposed of to reduce the need for land of waste management. Proposals that are likely to generate significant volumes of waste through development or operational phases will be required to include a waste audit as part of the application”.
- 13.2.14 The Bedford Borough, CBC and LBC’s Minerals and Waste Local Plan: Strategic Sites and Policies adopted January 2014²⁷⁴ sets out the strategic locations for mineral extraction and for waste management development in the Plan area together with strategic polices which will guide the ongoing supply of minerals and development of waste management facilities. Waste Strategic Policy WSP 5 outlines that “all new developments should include sufficient and appropriate waste storage and recovery facilities in their design and layout”.
- 13.2.15 The Hertfordshire Waste Development Framework Waste Core Strategy & Development Management Policies Development Plan Document 2011-2026²⁷⁵ sets out HCC’s policies for waste management. Policy 2 outlines how the authority will work with business and residents to reduce waste in line with the Waste FD. Policy 12 sets out requirements for sustainable construction and demolition practices, which include increased recycling and reductions in the use of primary materials.
- 13.2.16 NHDC’s Proposed Submission Local Plan 2011-2031, submitted to Government on 9 June 2017 includes policies on sustainable design. Policy D1 Sustainable Design states that “planning permission will be granted where development proposals... take all reasonable opportunities, consistent with the nature and scale of the scheme, to, iii. reduce energy consumption and waste...”. It encourages the efficient use of local or sustainably sourced new materials together with the reuse and recycling of materials to reduce the waste created in developments.

²⁷⁴ Bedford Borough Council, Central Bedfordshire Council and Luton Borough Council (2014). Minerals and Waste Local Plan: Strategic Sites and Policies.

²⁷⁵ Hertfordshire County Council (2012). Hertfordshire Waste Development Framework: Waste Core Strategy & Development Management Policies Development Plan Document 2011-2026. Available at: <https://www.hertfordshire.gov.uk/media-library/documents/environment-and-planning/planning/planning-in-hertfordshire/waste-local-plan/waste-core-strategy-and-development-management-policies-document.pdf>

Guidance

13.2.17 There is an abundance of documents to guide and support sustainable construction, including the effective management of waste during construction. Relevant guidance includes, but is not limited to:

- The Definition of Waste: Development Industry Code of Practice, Contaminated Land: Applications in Real Environments (CL:AIRE)²⁷⁶. This Code of Practice (CoP) establishes best practice for assessing if materials are classified as waste, or not, and determining when waste, once treated, can cease to be classified as waste for a defined use.
- Designing Out Waste: A Design Team Guide for Civil Engineering, WRAP²⁷⁷ provides guidance to help design teams minimise waste and identify opportunities to reuse waste early in the design process.

13.3 Stakeholder engagement and consultation

13.3.1 An initial introductory project stakeholder consultation event was held on 26 February 2018. Initial consultation with LBC, CBC and HCC was carried out at a meeting held on 18 January 2019. Consultation with the Environment Agency has also been carried out as part of the Geology and Soils assessment; please see **Chapter 11 Soils and Geology** for further details. Further consultation with relevant stakeholders will be conducted as required as part of the assessment.

13.4 Baseline conditions

Study Area

13.4.1 The final extent of the overall Study Area will be agreed in consultation with the applicable statutory consultees and subsequently confirmed as the assessment is undertaken and refined. The Study Area implemented to inform the assessment will be presented within the ES.

13.4.2 The Study Area for operational waste generation is defined by the Main Application Site, within which waste would be generated. The Study Area for construction waste is the

²⁷⁶ Contaminated Land: Applications in Real Environments (CL:AIRE) (2011). *The Definition of Waste: Development Industry Code of Practice*. Version 2. Available at: <http://www.360environmental.co.uk/documents/Definition%20of%20Waste.%20Development%20Industry%20Code%20of%20Practice.pdf> [Accessed March 2019]

²⁷⁷ Waste and Resources Action Programme (WRAP) (2011). *Designing Out Waste: A Design Team Guide for Civil Engineering*. Available at: [http://www.wrap.org.uk/sites/files/wrap/Designing%20out%20Waste%20-%20a%20design%20team%20guide%20for%20civil%20engineering%20-%20Part%201%20\(interactive\)1.pdf](http://www.wrap.org.uk/sites/files/wrap/Designing%20out%20Waste%20-%20a%20design%20team%20guide%20for%20civil%20engineering%20-%20Part%201%20(interactive)1.pdf) [Accessed March 2019]

Proposed Development. This Study Area is deemed to include the footprint of the Proposed Development, including temporary land requirements during construction: this may include temporary offices, compounds and storage areas.

- 13.4.3 At present it is anticipated the Study Area for non-hazardous waste management comprises the counties of Bedfordshire (including LBC and CBC), Buckinghamshire and Hertfordshire as defined in the Environment Agency's Waste Management Information 2017²⁷⁸. This represents the most likely area in which the waste would be managed. It is assumed, due to the lack of landfill capacity, that waste from the Proposed Development would not be managed within the Greater London area.
- 13.4.4 The Study Area for the use of material resources in the construction of the development is the Proposed Development.
- 13.4.5 Key construction bulk materials, such as aggregates, are likely to be sourced regionally. Other manufactured construction products, such as steel, may be manufactured globally. The Study Area for resources considers supply of material resources at a national level.

Data gathering and survey

- 13.4.6 A quantitative baseline for the assessment of Construction Demolition and Excavation (CDE) and operational waste generated during the construction and operation of the Proposed Development has been established using the most recently available published data from the Environment Agency, Bedford Borough, CBC and LBC's and other industry reports.
- 13.4.7 Operational waste is currently generated from the activities and maintenance associated with the current airport infrastructure. It is considered to be classified as Commercial and Industrial (C&I) waste for the purposes of this assessment, as it arises from a business and is managed through a commercial waste agreement rather than through the Local Authority. It is therefore assumed that operational waste will not compete with local household waste processing capacity.
- 13.4.8 Operational waste data has been provided by the current airport operator.

Existing conditions

- 13.4.9 Table 13-1 summarises the volume of CDE and C&I waste arising and requiring management in Central Bedfordshire

²⁷⁸ Environment Agency (2018). Waste management data for England. Waste Data Interrogator 2017. 2017 Waste Summary Tables.zip. Published: 11 September 2018. Available at: [redacted] [Accessed March 2019].

(including Luton Borough and Bedford Borough) in 2013/14 with projections for 2028/29:

Table 13-1: Selected waste arisings in Central Bedfordshire in 2013/14 and projected in 2028/29²⁷⁹

	Waste Arisings (Tonnes)		
	Construction, Demolition and Excavation	Commercial and Industrial Waste	Total
2013/2014	1,140,000	510,000	1,650,000
2028/29 Projected	1,323,000	544,000	1,867,000

13.4.10 Table 13-2 and Table 13-3 present Environment Agency figures for 2017 for landfill inputs and capacity for the non-hazardous waste Study Area and the South East and East of England regions.

Table 13-2: Landfill inputs and capacity in the South East and East of England^{280, 281}

Landfill Type	Input/Capacity ('000 tonnes)			
	South East		East of England	
	Input	Capacity	Input	Capacity
Hazardous Merchant	14	550	-	-
Hazardous Restricted	21	10	-	-
Non Hazardous with SNRHW cell*	2,692	29,386	600	6,528
Non Hazardous	2,517	17,237	4,998	28,620
Non Hazardous Restricted	-	-	-	484
Inert	2,792	29,795	4,409	35,952
Total	8,036	76,979	10,007	71,584

* SNRHW: stable non-reactive hazardous waste

Table 13-3: Landfill inputs and capacity in Bedfordshire, Buckinghamshire and Hertfordshire (2017)^{278,277}

Landfill Type	Bedfordshire		Buckinghamshire		Hertfordshire	
	Input ('000 tonnes)	Capacity (m ³)	Input ('000 tonnes)	Capacity (m ³)	Input ('000 tonnes)	Capacity (m ³)
Hazardous Merchant	-	-	-	-	-	-

²⁷⁹ Bedford Borough Council, Central Bedfordshire Council and Luton Borough Council (2014). Minerals and Waste Local Plan: Strategic Sites and Policies. Available at: http://www.centralbedfordshire.gov.uk/Images/minerals-waste_tcm3-2120.pdf. [Accessed March 2019].

Landfill Type	Bedfordshire		Buckinghamshire		Hertfordshire	
Hazardous Restricted	-	-	-	-	-	-
Non Hazardous with SNRHW cell*	-	-	1,480	21,212	-	-
Non Hazardous	609	-	698	10,099	502	733
Non Hazardous Restricted	-	-	-	-	-	-
Inert	765	619	474	2,095	838	9,689
Total	1,374	619	2,652	33,406	1,341	10,422

* SNRHW: stable non-reactive hazardous waste

13.4.11 In 2017, 63% of airport operational waste was diverted from landfill²⁸².

13.4.12 UK data has been used to establish a quantitative national baseline of demand for material resources, as regional information is not available for the Study Area. Table 13-4 summarises UK demand in 2015 and 2016 for key construction materials expected to be used during the construction of the Proposed Development.

Table 13-4: UK demand for key construction materials^{283, 284}

Material	2015 Demand ('000 tonnes)
Aggregates	226,000
Ready Mixed Concrete	54,000
Concrete Products	27,000
Asphalt	24,000
	2016 Demand ('000 tonnes)
Steel	10,990

13.5 Assessment methodology

Identification of environmental sensitive receptors

13.5.1 Assessment of waste and resources impacts does not follow the approach of identifying receptors and determining their sensitivity that is typically used for other topics. Attempting to identify receptors is problematic since:

²⁸² Data obtained from LLAOL (2019)

²⁸³ Mineral Products Association (2016). The Mineral Products Industry at a Glance [online] Available at:

[Accessed March 2019]

²⁸⁴ International Steel Statistics Bureau (2017). UK Steel Demand. Available at: [redacted] 2019]

- Waste producers have a legal duty of care to manage their waste in accordance with regulations and to ensure that any waste leaving the site of generation is transferred to a suitably licensed facility for further treatment or disposal.
- Facilities transferring, treating or disposing of waste must be either licensed or apply for an exemption from a license. Impacts arising from the operation of waste management facilities are considered as part of the planning and permitting process for such facilities.

13.5.2 As part of their planning function, the Waste Disposal Authorities (WDA) are required to ensure that sufficient land is available to accommodate facilities for the treatment of all waste arising in the area, either within the WDA area, or by export to suitable facilities in other areas.

Methodology including significance criteria

13.5.3 There are no widely accepted significance criteria for assessing effects for waste and resources and, as described in Section 13.5.1, it is therefore not possible to use the standard methodology as described in Section 5.3. In the absence of specific guidance on assigning significance, professional judgement, national and local policy, and recognised best practice will be used to objectively assess the impact of the Proposed Development against the baseline.

13.5.4 The magnitude of impacts and significance of waste and resources effects will be assessed by:

- Establishing the baseline waste infrastructure capacity for the waste management Study Area (specifically landfill).
- Estimating the likely types and quantities of waste that will be generated by the Proposed Development.
- For each category of waste, comparing the likely waste arisings from the Proposed Development to the baseline waste infrastructure capacity for the Study Area and calculating the likely percentage of the baseline waste infrastructure capacity that would be used (specifically landfill).
- Establishing the baseline for resources for the Study Area (national demand).
- Estimating the likely resources and quantities of resources that will be used in construction.
- For each category of resource, comparing the likely resources to be used in construction to the baseline resources demand for the Study Area and calculating the likely percentage of the baseline resource demand that would be used.

13.5.5 The effects and significance criteria are set out in Table 5-5 of this Scoping Report.

Table 13-5: Waste and Resources Significance criteria

Effect	Criteria for Effects of Waste Generated and Resources Used	Significance
Major	Large decrease in landfill capacity and resource availability greater than 5% of current baseline; potentially causing significant burden to the local and regional waste infrastructure and material resource markets.	Significant
Moderate	Moderate decrease in landfill capacity and resource availability between 2% and 5% of current baseline; potentially causing moderate burden to the local and regional waste management infrastructure and material resource markets.	
Minor	Minor decrease in landfill capacity and resource availability between 0.1% and 2% of current baseline; causing a minor burden to the local and regional waste management infrastructure and material resource markets.	Not significant
Negligible	Negligible decrease in landfill capacity and resource availability less than 0.1% of current baseline; causing insignificant burden to the local and regional waste management infrastructure and material resource markets.	

13.5.6 For the purposes of this assessment, only moderate and major effects are considered to be significant.

13.6 Potential significant effects

13.6.1 Table 13-6 summarises the types of resources that are likely to be used and wastes that may be generated during construction and operation of the Proposed Development.

Table 13-6: Types of resources that would be used and wastes that may be generated

Project Activity	Material resources required for the project	Waste arisings from the project
Site remediation/ preparation/ earthworks	Fill material for construction purposes. Primary and secondary/recycled aggregates for ground stabilisation. Stripped topsoil and subsoil.	Surplus excavated materials or material that does not have the required engineering properties. Stripped topsoil and subsoil. Contaminated soils. Site clearance, green waste arisings.
Demolition	Materials are not required for demolition works.	Waste arisings from the demolition of any existing buildings or structures.
Site construction	Construction materials including: Concrete; Asphalt and bituminous material; Bricks; Plasterboard;	Packaging from materials delivered to site. Offcuts, excess and broken/ damaged/ out of specification construction materials.

Project Activity	Material resources required for the project	Waste arisings from the project
	Cement bound granular material; Plastics; Tiles and ceramics; Floor coverings; Well graded granular material; Precast concrete kerb; Timber; Plywood; Cementitious grout; Reinforcing steel; Reinforcing fabric; Geotextile; Geo-composite drainage system; Pipe bedding aggregate.	Waste oils, lubricants and other liquids from construction vehicles and plant. Construction worker waste (excluding sewage).
Operation	Resources required during operation and routine maintenance of the airport.	Waste arisings during operation and routine maintenance of the airport.

13.6.2 Potential significant effects could arise from the generation of large volumes of waste during the construction and operational phases, particularly if this waste is disposed of using methods at the bottom of the waste hierarchy and there is insufficient appropriate landfill capacity. Significant effects for resources could arise from the use of large quantities of nationally scarce materials.

13.6.3 Given the potential for the reuse of excavated material on site and recovery of construction and demolition waste to build the extended airport landform, it is considered unlikely that the Proposed Development would result in a significant reduction in the available landfill capacity in the Study Area.

Construction

13.6.4 Large volumes of construction waste are likely to be generated during the construction of the Proposed Development. Some of this waste may be potentially hazardous or difficult to manage. Significant effects could arise if this waste is consigned directly to landfill, or to local/regional waste management sites with limited capacity.

13.6.5 Significant effects on material resources could also arise where large volumes of scarce materials are used in preference to reused or recycled materials sourced from within the Proposed Development or the surrounding region.

Operation

13.6.6 With the forecast capacity increase in both passenger numbers and aeroplanes using the airport, operational waste arisings are

likely to rise as a consequence of increased retail activity, aeroplane cleaning and maintenance, and from the upkeep of the Proposed Development. Where this waste is not managed in line with the waste hierarchy, or there is limited waste processing capacity, there could be increased reliance on landfill as a disposal option.

Cumulative effects

- 13.6.7 Cumulative effects on waste management receptors could occur where one or more large construction projects are simultaneously consigning large volumes of waste to the same waste management sites or to landfill, resulting in a reduction in the available capacity at those sites.
- 13.6.8 A cumulative assessment for waste and materials will be carried out for identified projects in the Study Area where the predicted waste volumes have been identified and disclosed.
- 13.6.9 See **Chapter 21 In-Combination and Cumulative Effects** of this Scoping Report for further details regarding methodology.

13.7 Matters scoped out

- 13.7.1 Waste arising from extraction, processing and manufacture of construction components and products has been scoped out of this assessment on the assumption that these products and materials are being developed in a manufacturing environment with their own waste management plans, facilities, and supply chain, which are potentially in different regions of the UK or the world and therefore outside of the geographical scope of this study.
- 13.7.2 Environmental impacts associated with the management of waste for the Proposed Development e.g. on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of waste are addressed separately in the relevant topic chapters of this Scoping Report.

13.8 Mitigation

- 13.8.1 A number of mitigation measures will be adopted to avoid or reduce significant adverse effects. These measures are outlined below:
- Primary mitigation measures include activities that would be undertaken during the design stage to minimise waste. These include the use of designing out waste workshops to identify mitigation, design of adequate provision for internal and external waste storage to allow waste segregation during

operation, and identifying opportunities to achieve a cut/fill balance during construction of the Proposed Development.

- Good practice mitigation, in the form of specific guidance on managing waste in accordance with the relevant regulations would be outlined in the Draft CoCP. This document would cross refer to a Site Waste Management Plan, which would include targets for diversion of waste from landfill.
- With the availability of further ground investigation data during the design phase, further opportunities to use waste and materials beneficially both within the Proposed Development and on other nearby projects would be explored. This would typically involve the use of the CL:AIRE Code of Practice²⁷⁶ to reclassify waste as a resource and move material between construction sites using a defined process and methodology.

14 ECONOMICS AND EMPLOYMENT

14.1 Introduction

14.1.1 This section outlines the proposed scope and methodology for the economic and employment assessment of the Proposed Development. This has been informed by an outline description of existing baseline conditions, and will identify potentially significant effects associated with the Proposed Development.

14.1.2 The issues to be covered under this assessment will include:

- Direct, indirect and induced impacts on employment and Gross Value Added (GVA) in the UK and locally through the construction and operational phases and taking into account the net effects from any demolition and/or displacement of existing businesses and employment. Any potential displacement of activity from other UK airports will also be considered in so far as it is relevant to the Study Area;
- Wider economic impacts arising from improved connectivity offered by the expanded operation of the airport;
- Effects on existing businesses and employment from in combination environmental factors from construction such as noise, vibration and traffic as well as interrupted access.

14.1.3 Consideration will also be given to the skills and employment profile generated by the Proposed Development.

14.2 Legislation, policy and guidance

14.2.1 The economic impact of the Proposed Development will be considered within the context of the following policy documents.

National planning and aviation policy

National Planning Policy Framework (NPPF) - February 2019

14.2.2 The NPPF replaces the 2012 Framework and provides minor clarifications to the 2018 version, it is the relevant national planning policy.

14.2.3 The Framework does not contain specific policies for nationally significantly infrastructure projects, however, some of the policies are likely to be important and relevant for determining a DCO application, as confirmed at paragraph 5 of the NPPF.

14.2.4 At the heart of the NPPF is a presumption in favour of sustainable development. Paragraph 8 identifies the three key dimensions of sustainable development, namely:

- ***“an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;***
- ***a social objective – supporting strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible local services and open spaces that reflect current and future needs and support community’s health, social and cultural well-being;”***
- ***an environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.***

14.2.5 The last of these dimensions is considered fully in other topic chapters of this Scoping Report.

14.2.6 Part 9 of the NPPF promotes sustainable transport. In relation to large scale facilities and airports specifically, the NPPF states planning policies should (para 104):

e) provide for any large scale transport facilities that need to be located in the area, and the infrastructure and wider development required to support their operation, expansion and contribution to the wider economy. In doing so they should take into account whether such development is likely to be a nationally significant infrastructure project and any relevant national policy statements; and

f) recognise the importance of maintaining a national network of general aviation airfields, and their need to adapt and change over time – taking into account their economic value in serving business, leisure, training and emergency service needs, and the Government’s General Aviation Strategy.

Aviation Policy Framework – March 2013

14.2.7 The APF²⁰ sets out the Government’s current policy on aviation. This Framework replaced the 2003 Air Transport White Paper as Government policy on aviation and sets out the Government’s overall objectives for aviation and the policies needed to achieve them, alongside any future decisions the Government may make following the recommendations of the independent Airports

Commission, which are now being taken forward through the ANPS.

- 14.2.8 The APF²⁰ puts economic growth and the environment at the heart of the Government's vision for aviation and this is made clear in the Secretary of State's Foreword:

"The Government believes that aviation needs to grow, delivering the benefits essential to our economic wellbeing, whilst respecting the environment and protecting quality of life."

- 14.2.9 Chapter 1 of the Framework concerns the support for growth and the benefits of aviation. The introductory paragraphs reaffirm the importance of aviation to economic growth:

"We believe that aviation infrastructure plays an important role in contributing to economic growth through the connectivity it helps deliver. For example, it provides better access to markets, enhances communications and business interactions, facilitates trade and investment and improves business efficiency through time savings, reduced costs and improved reliability for business travellers and air freight operations."

"There is broad agreement that aviation benefits the UK economy, both at a national and a regional level. While views differ on the exact value of this benefit, depending on the assumptions and definitions used, responses to both the scoping document and the consultation demonstrated that the economic benefits are significant, particularly those benefits resulting from the connectivity provided by aviation. In addition we believe there to be social and cultural benefits from aviation."

- 14.2.10 The Framework goes on to note the specific benefits the industry brings through its contribution to Gross Domestic Product (GDP) and jobs, imports and exports, manufacturing and technology, greater productivity and growth, tourism, and wider societal benefits. These are summarised in the Executive Summary:

"Aviation benefits the UK economy through its direct contribution to gross domestic product (GDP) and employment, and by facilitating trade and investment, manufacturing supply chains, skills development and tourism. The whole UK aviation sector's turnover in 2011 was around £53 billion and it generated around £18 billion of economic output. The sector employs around 220,000 workers directly and supports many more indirectly. The UK has the second largest aircraft manufacturing industry in the world after the USA and will benefit economically from growth in employment and exports from future aviation growth. Aviation also brings many wider benefits to society and individuals, including travel for leisure and visiting family and friends."

- 14.2.11 In overall terms, the policy position is summarised at paragraph 5 of the APF²⁰ as:

“The Government’s primary objective is to achieve long-term economic growth. The aviation sector is a major contributor to the economy and we support its growth within a framework which maintains a balance between the benefits of aviation and its costs, particularly its contribution to climate change and noise. It is equally important that the aviation industry has confidence that the framework is sufficiently stable to underpin long-term planning and investment in aircraft and infrastructure.”

- 14.2.12 The Government is consulting on an update to the APF, due to be published during 2019. An initial consultation document ‘Beyond the Horizon – The Future of UK Aviation, Call for Evidence’ was published in July 2017. At the outset, this consultation document makes clear the context for emerging policy:

“Aviation has a key role to play in helping to build a global Britain that is outward-looking and embraces the world, with a strong economy that supports a fairer society and benefits the whole of a united nation.

The UK’s aviation sector is a global success story. It creates jobs, encourages economic growth and connects us with the world.”
(Executive Summary).

- 14.2.13 In June 2018, accompanying the ANPS (referred to below), the Government made an initial policy statement - Beyond the Horizon The future of UK Aviation: Making best use of existing runways encouraging all airports to make best use of their existing runways¹²:

“Therefore the government is supportive of airports beyond Heathrow making best use of their existing runways. However, we recognise that the development of airports can have negative as well as positive local impacts, including on noise levels. We therefore consider that any proposals should be judged by the relevant planning authority, taking careful account of all relevant considerations, particularly economic and environmental impacts and proposed mitigations.” (paragraph 1.29)

- 14.2.14 Subsequently, this policy has been re-confirmed in a Green Paper - published by the Department for Transport in December 2018, namely ‘Aviation 2050 the Future of UK Aviation: A consultation’.

- 14.2.15 This document also reaffirms the economic importance of aviation, repeating the language from the earlier call for evidence and stressing that:

“Aviation has an important role to play in the future of our country. It is key to helping to build a global Britain that reaches out to the world. It underpins the competitiveness and global reach of our national and our regional economies.”²⁸⁵

14.2.16 It goes on to set out a number of strategic objectives, namely:

- build a global and connected Britain;
- ensure that aviation can grow sustainably;
- support regional growth and connectivity;
- enhance the passenger experience;
- ensure a safe and secure way to travel;
- support General Aviation (GA); and
- encourage innovation and new technology²⁸⁶

14.2.17 Aviation is seen as being of particular importance as the UK leaves the European Union.

14.2.18 Following this consultation, a new Strategy for Aviation will be published and this will replace the APF. It is expected that the new Aviation Strategy will be in place during 2019.

Airports National Policy Statement – June 2018

14.2.19 The ANPS was designated in June 2018 relating specifically to the development of a new northwest runway at Heathrow and associated terminal infrastructure.

14.2.20 The ANPS only “has effect” in relation to this development at Heathrow. However, the general provisions in the ANPS will be “*an important and relevant consideration in respect of applications for [...] airport infrastructure in London and the South East of England*”²⁸⁷ and, hence, will be relevant to the DCO application for LTN²⁸⁸.

14.2.21 The ANPS starts from the position of the economic importance of aviation:

“1.1 The UK aviation sector plays an important role in the modern economy, contributing around £20 billion per year and directly supporting approximately 230,000 jobs. The positive impacts of the aviation sector extend beyond its direct contribution to the economy by also enabling activity in other important sectors like business services, financial services, and the creative industries. The UK has the third largest aviation network in the world, and

²⁸⁵ Ibid, Section 1.

²⁸⁶ Ibid, paragraph 1.35.

²⁸⁷ Paragraph 1.12, ANPS

²⁸⁸ Paragraph 1.12 and 1.41, ANPS

London's airports serve more routes than the airports of any other European city.

1.2 However, London and the South East are now facing longer term capacity problems. Heathrow Airport is operating at capacity today, Gatwick Airport is operating at capacity at peak times, and the whole London airports system is forecast to be full by the mid-2030s. There is still spare capacity elsewhere in the South East for point to point and especially low cost flights. However, with very limited capability at London's major airports, London is beginning to find that new routes to important long haul destinations are being set up elsewhere in Europe. This is having an adverse impact on the UK economy, and affecting the country's global competitiveness."

- 14.2.22 In the light of the economic importance of having sufficient airport capacity to support economic growth, the ANPS reconfirms that the Government is minded to support all airports who wish to make best use of their runways at paragraph 1.39.
- 14.2.23 The support for growth of existing airports in the south east is set out in paragraphs 1.38, 1.39 and 1.42 of the ANPS, noting that any developer is expected to submit an application for planning permission or development consent. It accepts that existing airports may be able to demonstrate sufficient need for their proposals, additional to (or different from) the need which is met by the provision of a north west Runway at Heathrow.
- 14.2.24 Paragraph 4.4 states that *"in considering any proposed development, and in particular when weighing its adverse impacts against its benefits, the Examining Authority and the Secretary of State will take into account:*
- *Its potential benefits, including the facilitation of economic development (including job creation) and environmental improvement, and any long term or wider benefits; and*
 - *Its potential adverse impacts (including any longer term and cumulative adverse impacts) as well as any measures to avoid, reduce or compensate for any adverse impacts."*

Regional policy

South East Midlands Local Enterprise Partnership (SEMLEP)

- 14.2.25 SEMLEP, which includes LBC, published a revised Strategic Economic Plan (SEP) for the South East Midlands²⁸⁹. The SEP

²⁸⁹ South East Midlands (November 2017), Strategic Economic Plan, Available at: [\[REDACTED\]](#) & [Accessed March 2019]

sets the ambition and strategic economic direction for the south east Midlands to 2050, focusing particularly on the next 10 years.

- 14.2.26 It details priority areas where SEMLEP and partners will target investments and actions to create and support the right conditions for successful growth, doubling the size by area's economy by 2050. The SEP provides detailed economic evidence that underpins long-term strategic priorities.
- 14.2.27 Luton Airport Enterprise Zone is one of the key drivers across the Local Enterprise Partnership (LEP). The area focuses in particular on aerospace businesses and advanced engineering sectors.
- 14.2.28 The identified sectors of growth across the LEP include:
- *“High Performance Technology, Manufacturing & Advanced Technology;*
 - *Logistics; and*
 - *Creative & Cultural sector.”*
- 14.2.29 The SEMLEP's investment programme has secured £265m of Local Growth Fund from Government to support a portfolio of projects. For LTN these include the following:
- *“£1.2million has been allocated for Luton Highway Access: As passenger numbers increase at Luton Airport to 28 Million a year a number of junction improvements are required to increase the road capacity around the south of the town. These will commence in Winter 17/18 with the help of the Airport as part funder;*
 - *£20million has been allocated for Luton Surface Access: This is a major £100M project to open up employment land and improve airport access. The project is expected to open in 2021. This investment will open up employment land and improve airport access at London Luton airport. This will support growth of around 5,000 jobs in and around the airport and the neighbouring business parks.”*
- 14.2.30 In addition, there are further transport schemes supported in principle by the LEP. This includes improving highway access to LTN, to improve passenger access and facilitate airport growth. This will complement investment by LLAL and LBC into improved rail access to the airport. This has included the Direct Air to Rail Transit (DART) system which is under construction and will transport passengers between Luton Airport Parkway railway station and LTN.

Local policy

Luton Local Plan 2011-2031 – November 2017

- 14.2.31 The adopted Luton Local Plan (2011-31) is a strategic document setting out the vision, objectives and spatial planning strategy for the whole of LBC's area for the period up to 2031.
- 14.2.32 There are three strategic objectives relating to the Economic Strategy for the Borough. These include:
- *“Strategic Objective 1: Retain and enhance Luton’s important sub-regional role as a place for economic growth and opportunity including the safeguarding of London Luton Airport’s existing operations and to support the airport’s sustainable growth over the Plan period based on its strategic importance.*
 - *Strategic Objective 2: To utilise Luton’s economic, social and environmental resources efficiently and sustainably including appropriate mitigation within the limited physical land capacity of the borough whilst ensuring the permanence of the Green Belt.*
 - *Strategic Objective 6: Reduce social, economic and environmental deprivation, particularly where it is spatially concentrated, by taking priority measures to reduce unemployment, improve skills and education and renew housing, community and environmental conditions.”*
- 14.2.33 The key issues that the borough faces in terms of planning for growth and prosperity over the plan period include the need to plan for growth of around 18,000 jobs (8,000 B class jobs and 10,000 non-B class jobs), the Luton economy is capable of generating those jobs as evidenced by the Employment Land Review²⁹⁰.
- 14.2.34 The development of, and improved access to, the London Luton Airport Strategic Allocation, which includes Century Park, are needed to serve aviation engineering, business and logistics related growth and some small scale B2 accommodation for local businesses.
- 14.2.35 Through LLP6 London Luton Airport Strategic Allocation the Local Plan aims to serve the strategic role of LTN and associated growth of business and industry, including aviation engineering, distribution and service sectors which are important for Luton, the sub-regional economy, and for regenerating the wider conurbation. In particular, the London Luton Airport Strategic

²⁹⁰ Nathaniel Lichfield & Partners (2013) Luton Employment Land Review. Available at <https://www.luton.gov.uk/Environment/Lists/LutonDocuments/PDF/Local%20Plan/Growin g%20Lutons%20economy/ECON%20003a.pdf> [Accessed March 2019]

Allocation of approximately 325 hectares includes land within the airport boundary, Century Park and Wigmore Valley Park. LLP6 Policy provides a detailed framework for any activity related to the airport. In particular LLP6B refers to the airport expansion. Airport Safeguarding, Car Parking, Design, Drainage together with the developments in Century Park and Wigmore Valley Park are provided in detail.

14.2.36 Policy LLP13 Economic Strategy sets out a positive and flexible economic strategy for delivering jobs and strategic allocations. LLP3ii refers to Century Park development as a mixed aviation related B1b-c, B2 and B8, small scale ancillary service uses and hotel use.

14.2.37 LLP14 Employment Areas - LP14 will regulate the process by which land will be protected and delivered in accordance with the Employment evidence support the Local Plan.

Guidance

14.2.38 Guidance from the Homes and Communities Agency (HCA)²⁹¹ will be used to undertake the assessment of economic impacts arising from the Proposed Development.

14.3 Stakeholder engagement and consultation

14.3.1 Stakeholder engagement and consultation is ongoing. On 19 March 2019 discussions regarding the approach to economic and employment assessment were held with invitees being:

- Local authorities of Central Bedfordshire, North Hertfordshire, Luton, Aylesbury Vale;
- HCC;
- South East Midlands LEP; Hertfordshire LEP; and
- Hertfordshire Chamber of Commerce

14.3.2 This meeting included discussion on:

- overall scope and approach;
- the Study Area;
- issues considered;
- anticipated effects; and
- wider appropriate consultation.

14.3.3 Further engagement sessions are planned with consultees which will continue to progress discussion topics and expect to expand the invitee list to a broader group of local authorities within the

²⁹¹ HCA (2014) Additionality Guide (4th Edition)

‘Three Counties’ of Hertfordshire, Bedfordshire and Buckinghamshire.

14.4 Baseline conditions

Study Area

- 14.4.1 The area immediate to and comprising direct airport operations is described as general Airport Area. This will consider employment growth from the airport as well as losses and displacements. In some instances businesses are considered outside of this area where they are known to be airport related, and similarly those excluded within the line where they are non-airport related and otherwise unaffected.
- 14.4.2 The wider principal Study Area will comprise the ‘Three Counties’ of Bedfordshire, Hertfordshire and Buckinghamshire. Outputs will be broken down by local authority area within this zone, including the local area of LBC.
- 14.4.3 In addition, the economic impact of LTN will be presented at a national level, by region (East of England, London, South East) and in relation to the Thameslink corridor and Oxfordshire and Cambridgeshire.

Data gathering and survey

- 14.4.4 The existing baseline for airport employment is based on work undertaken in 2018 by Oxford Economics, which will be published in 2019. This updates previous work by Oxford Economics in 2017. Previous economic impact assessments undertaken by Oxford Economics were based on employment data from 2011, taken from the Office for National Statistics (ONS) Business Register and Employment Survey (BRES) and Experian data projected forward in line with LLAOL’s Annual Monitoring Report. These employment estimates related to all employment within the general Airport Area regardless of whether the activity was related to the operation of the airport or not.
- 14.4.5 For the assessment of the Proposed Development, an updated data collection exercise during 2018 has been undertaken by Oxford Economics. This has comprised a telephone survey of businesses on and adjacent to the airport, supplemented by the Inter Departmental Business Register (IDBR) database for Luton Borough for 2017. These new data sources have enabled employment directly related to the operation of the airport in the base year 2017 to be distinguished from other employment located in the vicinity of the airport.
- 14.4.6 In addition, the following data sources will be used to inform the forecast economic assessment:

- CAA Passenger Survey data on passenger surface origins, ultimate air destinations, purpose of travel, residency, surface access mode and air fares by airport;
- OAG data²⁹² on airline schedules for different airports;
- UK input-output tables produced by the ONS for information on expenditure patterns in the UK economy;
- Tourism spend information from VisitBritain;
- Secondary data on employment levels and concentrations from the Business Register and Employment Survey undertaken by the ONS;
- The Annual Survey of Hours and Earnings to provide information on wages and salaries;
- ONS estimates of regional GVA.

14.4.7 Economic data for the local and wider economy draws on the Business Register and Employment Survey, Census 2011 and Annual Population Survey.

Existing conditions

14.4.8 Existing conditions are considered across the ‘Three Counties’ (Bedfordshire, Hertfordshire and Buckinghamshire) and Luton covering:

- airport employment; and
- Study Area economic profile including employment, wages, unemployment and qualifications and skills;

Airport employment

14.4.9 LTN plays an important (and growing) role in the local and sub-regional economies, which in turn delivers a number of contributions to local communities, not just through the direct and indirect jobs created by the airport’s activities, but also from the further effect of companies choosing to locate in the region due to the access to the airport and the connectivity it offers.

14.4.10 Based on new research by Oxford Economics which will be published in 2019, in 2017, the economic activity supported by LTN contributed around £1.8 billion to UK GDP. Almost half of this came directly from the activities at LTN itself. The rest was supported through the supply chain and through secondary rounds of spending by employees of airport based companies and their supply chains spending their wages and supporting jobs elsewhere in the economy (induced impacts). The direct

²⁹² OAG – Official Airline Guide is an air travel intelligence company. It provides digital flight information, intelligence and analytics for airports, airlines and travel tech companies and is based in the UK.

employment effects were largely contained in the ‘Three Counties’, with 31% of gross wages accruing to employees resident in Bedfordshire and 23% to employees resident in Hertfordshire.

- 14.4.11 In 2017, Oxford Economics estimate that LTN supported a total of 26,900 jobs across the UK, including: 9,800 direct jobs at the airport; 8,200 indirect jobs within the supply chains of airport based companies; and 8,900 induced jobs supported by employees of the airport based companies and their supply chains. Of the wider supply chain and induced impacts, 35% of jobs and 34% of GDP benefits were also realised in the ‘Three Counties’.

Study Area economic profile

- 14.4.12 Employment by sector is reported for the Study Area (‘Three Counties’) and for Luton as well as benchmarked against England (see Table 14-1).
- 14.4.13 Luton has notably higher than average employment in the sectors of Business Administration and Support Services, Manufacturing, and Transport and Storage compared with the ‘Three Counties’ and England. LTN is a key driver of business administration sector employment. The strength of this sector in Luton affects the corresponding ‘Three Counties’ employment rate. Employment within the Professional, Scientific and Technical services sector in Luton is lower than the national average whereas the ‘Three Counties’ employment in this sector is higher than the national average.
- 14.4.14 The 2013 LBC Employment Land Review²⁹⁰ reports that, over the last decade, there have been large job losses in manufacturing in Luton which have off-set gains in other sectors including health, accommodation, businesses services and transport.

Table 14-1: Employment by broad industrial sector (BRES 2016)

Sector	Luton		Three Counties	England
	Jobs	%	%	%
Agriculture, forestry & fishing	30	0.0%	0.1%	1.3%
Mining, quarrying & utilities	150	0.2%	1.1%	1.1%
Manufacturing	10,000	10.2%	9.3%	7.9%
Construction	4,000	4.1%	7.5%	4.6%
Motor trades	3,000	3.1%	3.5%	1.8%
Wholesale	4,000	4.1%	7.3%	4.0%
Retail	7,000	7.1%	12.5%	9.4%

Sector	Luton		Three Counties	England
Transport & storage (inc. postal)	8,000	8.2%	6.1%	4.9%
Accommodation & food services	4,500	4.6%	7.9%	7.4%
Information & communication	2,000	2.0%	6.7%	4.3%
Financial & insurance	1,250	1.3%	2.5%	3.6%
Property	1,250	1.3%	2.2%	1.8%
Professional, scientific & technical	7,000	7.1%	14.4%	9.1%
Business administration & support services	21,000	21.4%	17.7%	9.0%
Public administration & defence	3,000	3.1%	3.8%	3.9%
Education	9,000	9.2%	11.8%	8.7%
Health	11,000	11.2%	12.7%	12.5%
Arts, entertainment, recreation & other services	3,000	3.1%	6.3%	4.6%
Total (no)	98,000	100%	100.0%	100%

Wages

14.4.15 Resident based analysis indicates that Luton has the lowest median wages in the 'Three Counties' area, £532 gross a week compared with £562 in Bedford and £651 in Hertfordshire. However workplace analysis reports that Luton has amongst the highest paid jobs in the area, £593 a week compared with £542 in Bedford and £600 in Hertfordshire. This suggests that whilst Luton provides high quality and well paid jobs, there is commuting of residents to lower paid work outside of Luton (Annual Survey of Hours and Earnings, 2017).

Qualifications and skills

14.4.16 The qualifications and skills profile in the 'Three Counties' is higher than the national average whilst Luton is lower. In the 2011 census, across Luton 22% of 16-64 year olds held a National Vocation Qualification of Level 4 or above; compared with the 'Three Counties' average of 31% and a national average of 27%. In addition, Luton has a higher than national average percentage of adults with no qualifications, at 24% compared to 19% across the 'Three Counties' and 22% in England.

Unemployment

14.4.17 The 'Three Counties' have a lower percentage (3.4%) of the Economically Active population unemployed in comparison to Luton (5.7%) and the national average (4.6%) (ONS 2017²⁹³).

14.5 Assessment methodology

14.5.1 The assessment will use both the terms 'impact' and 'effect' as considered in the EIA Regulations. An impact will be generally considered to be a physical change caused by the Proposed Development (and in this context changes in employment numbers will be impacts). The consequences of impacts on resources and receptors will be generally termed effects.

14.5.2 For the economic assessment, resources are those assets and facilities which are impacted. Receptors are the operators, users or beneficiaries of those resources. Resources and receptors will vary for each type of impact and effect. For example, increased construction traffic may have a range of impacts, such as congestion on the roads. The effects of this congestion could be disturbance and disruption for local businesses.

14.5.3 Effects will be considered in terms of:

- Construction – effects associated with the demolition or construction activities of the Proposed Development.
- Operation – effects associated with the operation of the Proposed Development.
- Cumulative – arising during either construction or operation of the Proposed Development with consideration of other relevant developments.

14.5.4 The construction of the Proposed Development is intended to commence in 2021, and will be delivered in a phased approach up to a capacity of 32 mppa.

14.5.5 The economic effects associated with the Proposed Development will be determined against the current position (2017) and against a baseline of the airport operating at its current consented capacity of 18 mppa.

Impacts and effects

14.5.6 Impacts relevant to economic assessment fall broadly within the following categories:

- demolition and direct land possession as a result of the construction process;

²⁹³ ONS Annual Population Survey 2017. Available [redacted] [Accessed March 2019]

- intrusion/disturbance to businesses caused by other environmental impacts including access;
- direct (on site and off site), indirect and induced employment and GVA effects through the construction phase and the operation phase of the Proposed Development; and
- the wider economic consequences for the economy including through Transport Economic Efficiency (TEE) effects (operational).

14.5.7 Impacts will generate the following broadly defined effects on receptors and resources:

- loss or gain: a loss or gain to a resource or receptor. For example, a decrease or increase in employment opportunities as a result of construction or operation;
- displacement: displacement means the re-location of receptors from one location to another location within the Study Area, for example businesses moving from their premises. The assessment recognises that in some cases businesses may cease to trade if they are forced to relocate, and some businesses may relocate outside of the Study Area (referred to as leakage). To the extent that there is displacement of activity from other airports which impacts on businesses or employment within the Study Area, this will also be taken into account;
- change in the combined environmental effects on business: The benefits or otherwise that receptors gain from a resource in line with its intended function. The combination of factors such as: noise and vibration; heavy goods vehicle (HGV) construction traffic; air quality; and visual impacts can affect the level of wellbeing experienced by receptors. The economic assessment will consider when changes of this nature could potentially result in a loss of trade for affected businesses; and
- isolation: In the context of this assessment, isolation will be measured by potential isolation and islanding of businesses by interrupted access. This includes physical islanding (i.e. non-economic) and the effects of this on businesses. The economic assessment considers when isolation of a business or group of businesses might potentially result in a loss of trade for those affected businesses.

Construction impacts assessment methodology

Existing businesses

14.5.8 Assessment of adverse effects on businesses and employees during the construction phase due to land lost as required for

construction/operation will be identified through the development of detailed location and phasing plans. This will differentiate where displacement rather than loss is taking place where existing businesses may be re-provided for either within the construction phase or at the operational phase.

- 14.5.9 Changes in the effects and combined environmental effects on businesses through noise, vibration, traffic etc will be determined by the findings of other technical chapters and reported.
- 14.5.10 Isolation effects will be identified through construction and phasing plans where effects on business access will be determined, including road closures, diversions or delays. This will consider access effects on businesses as well as the ability of employees to reach their employment location.

Construction employment

- 14.5.11 The methodology for assessing construction employment generation and GVA effects is based on HM Treasury Guidance²⁹⁴ and the HCA Additionality Guide²⁹⁵. It draws on the following data:
- the estimated construction costs of the proposed development programme over the life of the project;
 - Annual Business Survey data on construction industry output and GVA per employee; and
 - full-time equivalents (FTE) calculated in line with HM Treasury convention that 10 construction job years equals one FTE job.
- 14.5.12 Appropriate multipliers for the Study Area will be used to assess the indirect (supply chain) and induced (employee expenditure) multiplier for capital projects.
- 14.5.13 The employment calculation will be based on the estimated capital cost of the construction of the Proposed Development over the construction period, taking into account the phasing of development, divided by the output per employee in the industry as defined in the Annual Business Survey. The GVA calculation will be based on GVA per construction job multiplied by the number of employees expected to be working on the development each year. GVA per construction job will be calculated by dividing the GVA for the construction sector in the UK by the total employment in the sector.
- 14.5.14 Dividing the capital cost by the GVA per construction worker provides the number of 'construction job years'. Based on the HM

²⁹⁴ HM Treasury (2018) The Green Book: Central Government Guidance on Appraisal and Evaluation

²⁹⁵ HCA (2014) Additionality Guide (4th Edition)

Treasury's standard approach, ten construction job years is assumed to equate to one FTE job.

- 14.5.15 A skills profile of construction employment will be developed using the Construction Industry Training Board Labour Forecast Toolkit.
- 14.5.16 The framework for the assessment of construction impacts will be as set out in Table 14-2 below.

Table 14-2: Economic construction assessment framework

Impact category	Definition
Direct – existing Businesses lost	Business / employment losses due to land required for construction.
Direct – existing Businesses displaced	Business / employment permanently or temporarily displaced due to land required for construction.
Environmental / in combination – existing Businesses	Disturbance due to other environmental (noise, vibration, air quality, visual impacts, access interruption / isolation including employee access) resulting in business displacement, closure or employment loss.
Direct construction employment	Construction employment related to the construction of the airport.
Indirect	Employment generated in the chain of suppliers of goods and services related to the construction of the airport.
Induced	Employment and income generated by the spending of construction incomes earned.
GVA	Gross Value Added through construction employment.

Operational impacts assessment methodology

- 14.5.17 The economic assessment will consider the current direct, indirect and induced employment and GVA effects at the airport, including an assessment of the number and type of jobs taken up by residents in the Study Area and more widely. This assessment will be undertaken using the most up to date information available from the airport and its on-site employers as set out above.
- 14.5.18 For each of the relevant future assessment years, the impacts will be assessed in terms of the direct, indirect and induced employment and GVA at the airport and the likely impact on the local jobs market in the neighbouring areas compared against the current position (2017) and against a baseline of the airport operating at its current consented capacity of 18 mppa.
- 14.5.19 The framework for the assessment of operational impacts will be as set out in Table 14-3 below.

Table 14-3: Economic operational assessment framework

Impact Category	Definition	Examples
Direct On-Site	Employment and income and wholly or largely related to the operation of the airport and generated within the airport Operational Area, taking into account any displacement effects.	Airport operator, airlines, handling agents, control authorities, concessions, freight agents, flight caterers, hotels, car parking, aircraft servicing, fuel storage.
Direct Off-Site	Employment and income wholly or largely related to the operation of the airport and generated within an approximate 20-minute drive-time of the airport.	Airlines, freight agents, flight caterers, hotels, car parking.
Indirect	Employment and income generated in the chain of suppliers of goods and services to the direct activities, taking into account any displacement effects.	Utilities, retailing, advertising, cleaning, food, construction.
Induced	Employment and income generated by the spending of incomes earned in the direct and indirect activities, taking into account any displacement effects.	Retailing, restaurants and entertainment.
Environmental, in-combination / isolation (displacement / loss)	Qualitative Impacts (loss / displacement / performance) on sensitive businesses (from noise/visual/vibration/air quality etc); isolation impacts on businesses from customers/ employees changed ability to access the business due to changes in the road network including traffic congestion; impacts on the loss of employment options to residents within specific areas due to an inability to access jobs due to isolation of residential areas (from road closures or traffic congestion).	Facilities such as: <ul style="list-style-type: none"> • hospitality; • recreation and culture; and • retail are adversely affected through environmental effects, or where employees / customers cannot access businesses.

14.5.20 Direct impacts will be derived directly from the survey of employment, with data on average wages and salaries and profits drawn from company accounts and ONS surveys used to estimate direct GVA effects. Emphasis will be placed on identifying the skill level of jobs to inform the assessment of the impact on society.

14.5.21 The assessment will consider displacement effects on businesses permanently relocated or lost following the Proposed Development, through either loss of land, premises or in combination effects of other environmental factors including access, as noted previously. This will enable the establishment of a net employment effect, taking into account displacement of activity from other airports in so far as it impacts employment and GVA within the defined Study Area.

14.5.22 The indirect and induced impacts associated with the operation of LTN will be estimated using data collected on supply chain

purchases combined with Oxford Economics' economic models, based on inter-regional input-output tables. This approach is based on established academic techniques initially developed by Flegg and Webber²⁹⁶. This approach involves constructing regional input-output models by applying Location Quotients (LQs) and regional size adjustments to the standard UK input-output tables. Oxford Economics' regional model was used to provide data on LQ's and regional employment in the baseline estimates for 2015 as presented.

Wider economic impacts

14.5.23 In line with Government policy and best practice as adopted by the Airports Commission, the wider economic impacts of aviation connectivity need to be assessed as well as the economic impacts of an airport's operation. The wider economic impact of LTN will be assessed in terms of the value of aviation services to existing and future users. This will include an assessment of inward investment and location decisions, business productivity, transport investment and overseas tourism spend (business and leisure) in the local area, which are facilitated by the presence and growth of LTN. In line with Government practice, expenditure by UK residents abroad will not be considered as part of the assessment.

14.5.24 The assessment of these impacts will in part be qualitative based on discussions with key stakeholders. In line with recent best practice, the wider economic impacts will be quantified wherever possible under the following headings:

- Strategic Economic Indicators / Wider Gross Value Added (GVA) Impacts; and
- Transport Economic Efficiency (TEE) Effects

14.5.25 In line with the approach taken by the Airports Commission, the potential impact of LTN on the wider economy in terms of GVA and employment effects, will be considered as part of informing the strategic narrative for development. It will focus on estimating the effect on productivity in the Study Area from increased business travel facilitated by the expansion of LTN and on the effects associated with inbound tourism expenditure growth. The former is designed to reflect the ultimate impact of increased trade, inward investment and competition, while the latter articulates the role of the airport in bringing in visitors. The assessment of productivity effects will be based on an estimate of the number of business travellers that are purely reliant on LTN for their connectivity needs and research on the impact of the

²⁹⁶ Flegg and Webber, (2000), 'Regional Size, Regional Specialization and the FLQ Formula'. *Regional Studies*, Vol. 34.6, pages 563–569.

level of business travel on UK productivity undertaken by Oxford Economics.

14.5.26 Tourism effects will be assessed based on data taken from the traffic forecasts for the airport, spend data from VisitBritain and the UK input-output tables. The assessment will also consider the impact on economic welfare from changes to users costs and benefits, consistent with the Airports Commission economic assessment and the Department for Transport's WebTAG guidance. This assessment will consider the impacts on a range of users:

- Passengers – the potential impacts on users travel times (surface, wait and flight times), access costs and air fares will be monetised.
- Airport – the impact on the airports profits will be estimated based publicly available information.
- Airlines – the impact on airline profits, where these are likely to be retained in the UK, will be quantified based on published data on airline financials.
- Government Revenue – the impact on Air Passenger Duty from additional passengers departing UK airports as a result of the Proposed Development will be estimated.
- Construction Costs – the construction costs of the Proposed Development will be set against the benefits of growth.

14.5.27 The TEE assessment will consider a 60 year period, in line with guidance on the assessment of major airport infrastructure developments, and discounted at the recommended HM Treasury discount rate to reflect time preference. This will provide a net present value of the benefits arising from the Proposed Development.

14.5.28 In addition to the above, as LLAL is owned by LBC, part of the airport profits is distributed back to the community in part through the Community Funding Programme. In 2017/18 this was equivalent to £10m and has been worth more than £50m since 2013.

Significance criteria

14.5.29 Significance will be determined by assessing both the magnitude of the impact and the sensitivity of resources and receptors. Taken together magnitude and sensitivity will determine whether effects are considered to be 'significant' or 'not significant'. All effects are to be assessed, including adverse and beneficial.

14.5.30 There are several factors which determine magnitude of impact and sensitivity of resources and receptors. These factors and

thresholds of significance vary for each theme of the economic assessments.

- 14.5.31 The assessment criteria described in this section highlight the types of impacts and effects on resources and relevant receptors. This includes guidance on the factors to consider and thresholds to ensure a consistent approach to assessing significance.
- 14.5.32 The tables below have been established using professional judgement and existing precedents and will be used as the starting point for assessment. In some instances, it may be considered appropriate to adjust sensitivity and magnitude in the light of specific circumstances.

Magnitude of impact

- 14.5.33 Table 14-4 below provides guidelines of the assessment of magnitude in relation to different types of economic impacts.

Table 14-4: Economic magnitude of impact

Impact	Magnitude	Guidelines	Notes
Construction			
Existing businesses / organisations: land required for construction	High	Over 1,000 jobs lost / relocated	Relative to existing direct employment (10,700 jobs)
	Medium	251 to 1,000 jobs lost / relocated	
	Low	51 to 250 jobs lost / relocated	
	Very low	Up to 50 jobs lost / relocated	
Existing businesses / organisations: disturbance due to other environmental (noise, vibration, air quality, visual impacts, access interruption / isolation including employee access) resulting in business closure / relocation or employment loss	High	Over 1,000 jobs lost / relocated	Relative to existing direct employment (10,700 jobs)
	Medium	251 to 1,000 jobs lost / relocated	
	Low	51 to 250 jobs lost / relocated	
	Very low	Up to 50 jobs lost / relocated	
Direct construction employment: Construction employment related to the construction of the airport.	High	Over 1,000 jobs created	Relative to existing construction sector employment (Luton / Three Counties)
	Medium	251 1,000 jobs created	
	Low	51 to 250 jobs created	
	Very low	Up to 50 jobs created	
Indirect construction employment: Employment	High	Over 1,000 jobs created	Relative to existing

Impact	Magnitude	Guidelines	Notes
generated in the chain of suppliers of goods and services related to the construction of the airport.	Medium	251 to 1,000 jobs created	employment (Luton / Three Counties)
	Low	51 to 250 jobs created	
	Very low	Up to 50 jobs created	
Induced construction employment: Employment and income generated by the spending of construction incomes earned.	High	Over 1,000 jobs created	Relative to existing employment (Luton / Three Counties)
	Medium	251 to 1,000 jobs created	
	Low	51 to 250 jobs created	
	Very low	Up to 50 jobs created	
GVA of construction employment	High	Over £150,000,000	Relative to existing construction sector output (Luton / Three Counties)
	Medium	Up to £150,000,000	
	Low	Up to £37,500,000	
	Very low	Up to £7,500,000	
Operation			
Direct on-site employment: Employment and income and wholly or largely related to the operation of the airport and generated within the Airport Operational Area. Examples can include airport operator, airlines, handling agents, control authorities, concessions, freight agents, flight caterers, hotels, car parking, aircraft servicing, fuel storage. This will be combined with Direct off-site employment: Employment and income wholly or largely related to the operation of the airport and generated within an approximate 20-minute drive-time of the airport.	High	Over 2,000 jobs created	Relative to existing employment in Luton and the Three Counties
	Medium	500 to 2,000 jobs created	
	Low	50 to 5,00 jobs created	
	Very low	Up to 50 jobs created	
Indirect employment: Employment and income generated in the chain of suppliers of goods and services to the direct activities. Examples can include utilities, retailing,	High	Over 2,000 jobs created	Relative to existing employment in Luton and the Three Counties
	Medium	501 to 2,000 jobs created	
	Low	50 to 5,01 jobs created	

Impact	Magnitude	Guidelines	Notes
advertising, cleaning, food, construction.	Very low	Up to 50 jobs created	
Induced employment: Employment and income generated by the spending of incomes earned in the direct and indirect activities. Examples can include retailing, restaurants and entertainment.	High	Over 2,000 jobs created	Relative to existing employment in Luton and the Three Counties
	Medium	501 to 2,000 jobs created	
	Low	51 to 5,00 jobs created	
	Very low	Up to 50 jobs created	
GVA of employment	High	Over £300,000,000	Relative to existing employment output (Luton / Three Counties)
	Medium	£60,000,001 to £300,000,000	
	Low	£6,000,001 to £60,000,000	
	Very low	Up to £6,000,000	
Environmental, in-combination / isolation	High	Qualitative measures will be relevant drawing on other disciplines. Magnitude relates to the nature of the effects on the function of the resource.	

Determination of significant effects

- 14.5.34 This table has been established using professional judgement and existing precedents and will be used as the starting point for assessment. In some instances it may be considered appropriate to adjust sensitivity and magnitude in the light of specific circumstances.
- 14.5.35 The matrix to be used for the classification of effects is provided in Table 14-5 below.

Table 14-5: Classification of economic effects

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

- 14.5.36 Major and moderate effects are considered to be significant, whilst minor and negligible effects are considered to be not significant.

14.6 Potential significant effects

14.6.1 The economic assessment will report on all significant effects, as well as those effects which are not significant but are considered of importance to reference given their relevance to the Study Area.

Construction

14.6.2 Construction impacts will include:

- Some loss or displacement of existing businesses through land requirements or construction environmental effects; and
- Creation of direct, indirect and induced employment and GVA.

Operation

14.6.3 Operational impacts will include:

- Creation of direct, indirect and induced employment and GVA;
- Some loss or displacement of existing businesses through land requirements or environmental effects;
- Tax impacts nationally;
- Benefits to users through journey time and air fare savings – reductions in generalised cost; and
- Dividend or Community Funding Programme benefits

Cumulative effects

14.6.4 The economic assessment will assess the following types of cumulative effects:

- Combined effects of different topic effects through the in-combination effect assessment on businesses.
- Cumulative impacts from other 'reasonably foreseeable' relevant employment generating developments within the Study Area will be considered through their implications to employment.

14.6.5 See **Chapter 21 In-Combination and Cumulative Effects** of this Scoping Report for further details regarding methodology.

14.7 Matters scoped out

14.7.1 No quantified assessment of the impact of the Proposed Development on tourism deficit is proposed. The potential impact of outbound leisure passengers on GVA and employment is highly complex and, the extent of the effect, particularly in relation

to considering the impact of individual airports, is open to question. The following issues need to be considered in assessing the potential scale of outbound tourism effects:

- for passengers wanting to travel abroad, airports are to a large extent substitutable;
- in any event, outbound travel from the UK does, in practice, support significant GVA and employment in the domestic economy;
- it is far from clear whether the expenditure lost via people travelling overseas would actually be injected into the UK economy if they were not to travel;
- the potential positive impacts of outbound travel on GVA would also need to be considered as access to air travel for leisure activities is an increasingly important factor in attracting talented individuals to locate within an area.

14.7.2 The ES will take into account tourism effects as far as it is reasonable to do so, but it is not envisaged that the effect on the tourism deficit is capable of robust quantification.

14.8 Mitigation

Embedded mitigation

14.8.1 The ES will identify mitigation measures that will help to avoid, reduce or, where appropriate, offset significant adverse effects.

14.8.2 Mitigation opportunities will continue to be identified during design development prior to the DCO application submission. The EIA process is iterative, which is likely to enable further refinement of the Proposed Development, with the objective of avoiding or reducing significant adverse effects. Mitigation measures will be identified by regularly reviewing the likely significant adverse effects identified during the ongoing assessment process.

14.8.3 Embedded mitigation for the economic assessment will include measures such as:

- avoidance of land take from existing businesses and minimising adverse effects of temporary or permanent relocation;
- careful routing of construction and operation traffic routes to avoid adverse effects on existing business and employment; and
- measures to reduce noise, vibration, air quality or visual effects e.g. noise barriers, mitigation planting.

Additional mitigation

- 14.8.4 Mitigation for the economic assessment will include measures such as developing a specific training and employment programme for the construction and operational phases to maximise employment opportunities and upskilling for hard to reach groups, the employed, young people and those in the local and wider Study Area. It is expected that this will be further agreed and defined with the participating statutory and non-statutory bodies.
- 14.8.5 LLAL's Community Funding Programme will benefit from an increase in airport dividend. The economic assessment will include engagement with LBC to provide further information on the existing and potential future benefits of an expanded programme.

15 HEALTH AND COMMUNITY

15.1 Introduction

15.1.1 This chapter presents the proposed approach to the assessment of the likely significant effects of the Proposed Development on population health and communities.

15.1.2 The health and community assessment applies the established principles and methods of both health impact assessment (HIA) and community assessment. It brings together the assessment of effects on people living close to, or affected by, the Proposed Development in a single chapter.

15.1.3 This chapter identifies 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 the Proposed Development. The impacts with the potential to give rise to these effects include:

- loss or gain of land from public open space and recreational facilities;
- environmental impacts including noise, vibration, air emissions and visual effects affecting residential properties, community facilities (including open space), neighbourhoods and the wider population;
- impacts on the local road network and changes to the amenity and accessibility of residential properties or community facilities as a result of changes to traffic flows;
- opportunities for employment, training and apprenticeships; and local and regional economic growth, where there are likely to be indirect benefits to health and wellbeing of communities.

15.1.4 In HIA, environmental, social and economic factors with the potential to affect health outcomes are termed 'health determinants'. The health assessment considers the exposure of the population to impacts on health determinants, and the health and wellbeing effects arising from this exposure. The community assessment identifies impacts on community resources and the resultant effects on the 'receptors' (people) that use them.

15.2 Legislation, policy and guidance

Legislation

15.2.1 There is no specific legislation applicable to the health and community assessment. Legislation relating to other topics, such as noise and air quality, may be relevant to aspects of the assessment and will be picked up through these topics.

National planning and aviation policy

Airports National Policy Statement – June 2018

- 15.2.2 Although the ANPS¹¹ is primarily concerned with the expansion plans at Heathrow Airport, some paragraphs may have general application for the approach towards health and community assessments at LTN.
- 15.2.3 The ANPS recognises the range of direct, indirect and cumulative health, wellbeing and quality of life impacts, and highlights the need to avoid, reduce or compensate for adverse health impacts as appropriate (paragraphs 4.70-4.73).
- 15.2.4 Paragraph 5.106 sets out the importance of access to high quality open spaces, and the opportunities they provide for sport and recreation. Paragraph 5.112 states that:
- “existing open space, sports and recreational buildings and land should not be developed unless the land is no longer needed, or the loss would be replaced by equivalent or better provision in terms of quantity and quality in a suitable location. If the applicant is considering proposals which would involve developing such land, it should have regard to any local authority’s assessment of need for such types of land and buildings”.*
- 15.2.5 Should exchange land be provided to mitigate impacts on open space, paragraph 5.120 requires that any exchange land *“should be at least as good in terms of size, usefulness, attractiveness, quality and accessibility”*. These requirements are reiterated later in relation to the decision making process at paragraph 5.124.
- “The Secretary of State should not grant consent for development on existing open space, sports and recreational buildings and land, including playing fields, unless an assessment has been undertaken either by the local authority or independently, which has shown the open space or the buildings and land to be no longer needed, or the Secretary of State determines that the benefits of the project (including need) outweigh the potential loss of such facilities, taking into account any positive proposals made by the applicant to provide new, improved or compensatory land or facilities”.*
- 15.2.6 Paragraph 5.123 is concerned with public rights of way and facilities for walkers, cyclists and equestrians and states:
- “The applicant is expected to take appropriate mitigation measures to address adverse effects on National Trails, other public rights of way and open access land and, where appropriate, to consider what opportunities there may be to improve access. In considering revisions to an existing right of*

way, consideration needs to be given to the use, character, attractiveness and convenience of the right of way.”

- 15.2.7 The ANPS has been subject to a Health Impact Analysis and noted impacts that would affect population health. These include noise, air quality and socio-economic impacts.
- 15.2.8 Paragraph 1.37 suggests that application should *“include and propose health mitigation which seeks to maximise the health benefits of the scheme and mitigate any negative health impacts”*.
- 15.2.9 Under the section entitled “Health”, paragraph 4.70 to 4.71 notes that the construction and use of new or enhanced infrastructure has the potential to affect people’s health, wellbeing and quality of life. The *“direct impacts on health because of traffic, noise, vibration, air quality and emissions, light pollution, community severance, dust, odour, polluting water, hazardous waste and pests.”*
- 15.2.10 Similarly, new or enhanced infrastructure could have indirect health impacts on health. For example, affecting *“access to key public services, local transport, opportunities for cycling and walking or the use of open space for recreation and physical activity.”*
- 15.2.11 However, the ANPS also notes that *“increased employment stemming from airport expansion may have indirect positive health impacts”*.
- 15.2.12 Paragraph 4.72 states that *“where the proposed project has likely significant environmental impacts that would have an effect on human beings, any environmental statement should identify and set out the assessment of any likely significant health impacts.”*
- 15.2.13 Furthermore, paragraph 4.73 states that the applicant should:
“identify measures to avoid, reduce or compensate for adverse health impacts as appropriate. These impacts may affect people simultaneously, so the applicant, the Examining Authority and the Secretary of State (in determining an application for development consent) should consider the cumulative impact on health”.
- 15.2.14 The ANPS in paragraph 5.23, acknowledges that there could be adverse effects on human health as a result of worsening air quality. Additionally, paragraph 5.56 refers to the health costs of aircraft noise during the night given that aircraft noise is regarded as the least acceptable aspect of aviation noise and this could lead to higher costs associated with sleep disturbance. There is also potential for adverse impacts on quality of life from noise (paragraph 5.68) and it is recognised that this should be avoided

and “*where possible, contribute to improvements to health and quality of life*”.

- 15.2.15 The ANPS recognises further effects on human health, including the potential effects from hazardous and non-hazardous waste (paragraph 5.135) and the water environment (paragraph 5.172).

National Planning Policy Framework (NPPF) – February 2019

- 15.2.16 Chapter 2, paragraph 8 of the NPPF sets out the overarching objectives to achieve sustainable development, including a social objective “*to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities’ health, social and cultural well-being*”.
- 15.2.17 Paragraph 97 is concerned with the protection of open spaces, sports and recreation buildings and states that these “*should not be built on unless:*
- *an assessment has been undertaken which has clearly shown the open space, buildings or land to be surplus to requirements; or*
 - *the loss resulting from the proposed development would be replaced by equivalent or better provision in terms of quantity and quality in a suitable location; or*
 - *the development is for alternative sports and recreational provision, the benefits of which clearly outweigh the loss of the current or former use.”*
- 15.2.18 Paragraph 96 states that “*access to a network of high quality open spaces and opportunities for sport and physical activity is important for the health and well-being of communities.*”
- 15.2.19 Chapter 15 of the NPPF is concerned with conserving and enhancing the natural environment, including the matters that should be considered for planning decisions in relation to ground conditions and pollution. This includes, at paragraph 180, ensuring “*that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
- Mitigate and reduce to a minimum other adverse impacts resulting from noise from new development and avoid noise*

giving rise to significant adverse impacts on health and quality of life.”

- 15.2.20 The NPPF also acknowledges that it is important that planning policies and decisions aim to “*achieve healthy, inclusive and safe places*”.
- 15.2.21 Chapter 8 of the NPPF is dedicated to promoting healthy and safe communities. Paragraphs 91-101 specifically refer to planning policies and decisions that promote and enable a range of health-promoting plan making principles. For example, encouraging access to high quality open spaces to enable opportunities for sport and physical activity.

Aviation Strategy

- 15.2.22 The emerging Aviation Strategy was published for consultation in December 2018²¹. In relation to noise the Strategy sets out a new measure to set “*a new objective to limit, and where possible, reduce total adverse effects on health and quality of life from aviation noise*” (paragraph 3.115)

Local policy

Hertfordshire Local Transport Plan (2018-2031)

- 15.2.23 HCC adopted a new Local Transport Plan (HLTP) in 2018. The plan recognises the impact of surface access for passengers and employees to LTN on local communities. Overall HLTP is supportive of sustainable airport growth at LTN, which minimises negative impacts on the local road network, environment and quality of life for communities on the surrounding routes.

Luton Local Plan 2011-2031 – November 2017

- 15.2.24 The Luton Local Plan 2011-2031 is the strategic document setting out the vision, objectives and spatial planning strategy for LBC. The Luton Local Plan includes a wide range of policies that relate to community assets and health determinants, for example:
- Policy LLP6 – London Luton Airport Strategic Allocation: supports expansion where noise levels are not increased and impacts on surrounding occupiers are fully assessed.
 - Policy LLP27 – Open Space and Natural Greenspace: development on open space will only be supported where there is evidence that it is surplus to requirements.
 - Policy LLP38 – Pollution and Contamination: requires evidence on effects on air, land or water on neighbouring development, adjoining land or the wider environment.

Luton Local Transport Plan 2011-2026

- 15.2.25 Two areas of focus within the LTP are creating ‘Stronger and Safer Communities’, and improving ‘Health and Wellbeing’. This includes improving accessibility to key social infrastructure, particularly for vulnerable people living in areas of high deprivation, and providing active travel choices to improve impacts on key health determinants.

North Hertfordshire District Council Proposed Submission Local Plan 2011-2031 – October 2016

- 15.2.26 The NHDC Proposed Submission Local Plan (2016) was submitted for examination in June 2017.

- 15.2.27 Policy SP10 of the NHDC Proposed Submission Local Plan states:

“We will provide and maintain healthy, inclusive communities for our residents. We will:

a. Support the retention of existing community, cultural, leisure or recreation facilities;

b. Require appropriate levels of new community, cultural, leisure and built sport & recreation facilities to be provided in new development;

c. Work with the NHS Trust, the Clinical Commissioning Groups and other relevant providers to ensure appropriate coverage of healthcare facilities across the District;

d. Maintain the network of local retail centres identified in Policy SP4 and support the retention of locally-important shops;

e. Work with Hertfordshire County Council and education providers to ensure the planning system contributes to the provision of sufficient school places and facilitates the provision of new or expanded schools in appropriate and accessible locations; and

f. Protect, enhance and create new physical and green infrastructure to foster healthy lifestyles.”

- 15.2.28 The Proposed Submission Local Plan also highlights cross boundary issues for two strategic housing sites – east of Luton (2,100 homes) and King’s Walden (16 homes). Both sites lie in close proximity to LTN flight paths, and mitigation measures may therefore be required.

Central Bedfordshire Local Plan 2035: Pre-Submission – January 2018

- 15.2.29 Central Bedfordshire Local Plan 2035 recognises the west of Luton as a Growth Location due to its strong urban fringe character. The Plan highlights that from the eastern part of the area there is potential for traffic and aircraft noise. However, the Luton-Dunstable Busway is a priority corridor between Luton and Dunstable town centres and provides access to LTN. The overall aim of Central Bedfordshire LTP3 (April 2011-March 2026), is to ensure that development sites are designed to reduce the need for travel and secure modal shifts towards more sustainable forms of transports. The Central Bedfordshire and Luton Transport Model (CBLTM) will form the basis of any assessment of transport capacity requirements.

The South Bedfordshire Local Plan 2004-2011

- 15.2.30 The South Bedfordshire Local Plan 2004-2011 recognises the importance and impacts of LTN, particularly on local communities below the flight paths. It requests that any future expansion is kept within acceptable environmental limits. The Central Bedfordshire Local Plan 2035: Pre-Submission does not propose further policies regarding health and community related airport impacts.

A Healthier Future: Improving Health and Wellbeing in Luton, 2012-2019 (2016 Refresh)

- 15.2.31 This strategy highlights that mortality rates in Luton are higher than the England average and residents suffer poorer health for longer compared with other similar towns. It sets out how the Council plans to improve health across the Borough.

Luton's Joint Strategic Needs Assessment 2015

- 15.2.32 The Joint Strategic Needs Assessment recommends a range of interventions to reduce health inequalities, including increased access to public transport, quality of and access to green space, and increasing involvement of people in the decisions that affect their health.

The Luton Health Inequalities Strategic Plan, 2015-2020

- 15.2.33 The plan states that: “*health considerations need to be integrated into a broader range of related policy areas such as employment, education and social policy to support health equity*”. It includes six objectives for reducing health inequalities. Particularly of relevance to this development are:

- Strategic Objective 3: Creating Fair Employment and Good Work for All: through improving access to good jobs at all

levels, helping disadvantaged people access and keep work, and

- Strategic Objective 5: Create and develop healthy and sustainable places and communities: through creating healthy sustainable places, and preventing communities from suffering social isolation and poor health outcomes.

Luton Green Spaces Strategy Review (2014)

15.2.34 The Luton Green Spaces Strategy Review (2014)²⁹⁷ provides guidance on the scale and type of green space provision across the borough. It includes a spatial analysis of the accessibility, standard and shortfalls/deficits in green space provision by type and location to guide planning decisions.

Guidance

15.2.35 There is no statutory guidance for the assessment of the wider effects of projects on communities or population health. There are, however some well-established ‘toolkits’ and guides available for HIA, including:

- Institute of Environmental Management and Assessment, 2017: Health in Environmental Assessment, a primer for a proportionate approach;
- NHS London Healthy Urban Development Unit (HUDU), 2015. Healthy Urban Planning Checklist and Rapid Health Impact Assessment Tool;
- National Mental Wellbeing Impact Assessment Development Unit 2011: Mental Wellbeing Impact Assessment Toolkit; and
- Health Scotland et al, 2007: Health Impact Assessment for Transport: A Guide.

15.2.36 Similarly, there are no industry-wide accepted methods for assessing community effects for projects of this nature. Methods have been developed for predicting and assessing effects which draw on existing guidance, analysis and methods established for other large infrastructure projects including:

- Accepted practice for community assessments relating to Phase One, 2a and 2b of HS2, Crossrail, Thames Tideway Tunnel and the emerging approach for Heathrow Airport Third Runway EIA; and

²⁹⁷ The Greensand Trust (2014) Green Space Strategy Review on behalf of Luton Borough Council. Available at: <https://www.luton.gov.uk/Environment/Lists/LutonDocuments/PDF/Planning/Local%20Plan/Greenspace%20strategy%20review%20report.pdf> [Accessed March 2019]

- Highways Agency Interim Advice Notes²⁹⁸ and Department of Transport's (DfT's) Transport Analysis Guidance Website (WebTAG)²⁹⁹

15.2.37 Therefore, the approach outlined in this Scoping Report draws on best practice from the assessment of health and community effects for recent national infrastructure projects, and on the approaches set out in the above guidance documents.

15.3 Stakeholder engagement and consultation

Health and community technical stakeholders

15.3.1 The proposed scope and methodology for assessing health and community effects was presented to health and community technical stakeholders at a workshop on 26 November 2018. These stakeholders included Directors of Public Health, health specialists from Clinical Commissioning Groups (CCGs) and Local Authority officers with knowledge of community receptors and resources for Luton, Hertfordshire and Bedfordshire. The purpose of this was to gain feedback on the scope of the assessment and to obtain information on local issues and priorities.

15.3.2 Ongoing consultation with technical stakeholders will help to inform the assessment by providing feedback on emerging findings and identifying potential mitigation strategies and enhancement measures.

15.3.3 The health and community team will continue to engage with stakeholders at pertinent times during the course of the EIA. This will include, but not be limited to:

- Local Authority Public Health Teams
- Local Authority Community Officers (e.g. Community Engagement, Parks and Facilities, Strategic and Commercial Assets)
- Local CCGs (Luton, Bedfordshire, North and East Herts)
- Public Health England

Community consultation

15.3.4 During the assessment and design process, consultation will also be undertaken with representatives from the local community close to LTN. A key objective will be to gather further information

²⁹⁸ DfT and the Highway Agency, various dates, Interim Advice Notes. [Withdrawn]
Available at: <http://www.dft.gov.uk/ha/standards/ians/index.htm> [Accessed March 2019]

²⁹⁹ DfT (2019) Transport Analysis Guidance. Available at: <https://www.gov.uk/guidance/transport-analysis-guidance-webtag> [Accessed March 2019]

on how the existing airport is perceived, local concerns and aspirations in relation to the Proposed Development, and information on community receptors and resources which could potentially be affected.

- 15.3.5 Discussions may also be held with the owners and users of community resources that may be assessed to be significantly affected, to discuss potential mitigation measures.
- 15.3.6 Feedback from the non-statutory consultation held in summer 2018 and comments from technical stakeholders have informed the health and community assessment methodology. Similarly, feedback from the statutory consultation will continue to inform the assessment and design process.

15.4 Baseline conditions

Study Area

- 15.4.1 The Study Area for the health and community assessment will be based on the spatial distribution of the environmental and socio-economic impacts of the Proposed Development and the location of sensitive receptors. This will be determined during the course of the assessment, as the geographic extent of impacts and sensitive receptors is identified. Table 15-1 below identifies those areas anticipated to be included in the Study Areas for the health and community assessments.

Table 15-1: Health and Community Assessment Study Areas

Study Area	Health	Community
Local communities in Luton that are directly affected by the construction and operation of the Proposed Development (e.g. land take).	Y	Y
Areas affected by indirect impacts (e.g. noise and visual impacts of the airport; construction and surface access traffic routes).	Y	Y
Population within the lowest observed adverse effect level (LOAEL) noise contour for aircraft noise (daytime and night time).	Y	N
Population benefitting from economic growth and employment generated by the Proposed Development. It is expected that this will include Luton and the wider Hertfordshire and Bedfordshire area	Y	N

Data gathering and surveys

- 15.4.2 The approach to baseline data gathering and surveys is described below.

Population health profile

- 15.4.3 A profile of the population will be provided for the Luton, Hertfordshire and Bedfordshire area. This will present publicly available data to give an overview of the demographic, social and health status of the population. Commentary will be provided on the general resilience of the population to potential health effects, and the presence and distribution of vulnerable groups within the population.
- 15.4.4 Local authority, Ward and Lower Super Output Area (LSOA) level data will be reviewed with a focus on the neighbourhoods, towns, villages and rural communities that are likely to be impacted by the Proposed Development (including flight paths and surface access routes). The principal sources of data will include:
- ONS annual small area population estimates (ward and local authority level data);
 - ONS Census data, 2011 (ward and local authority level data);
 - Index of Multiple Deprivation 2015 (lower layer super output areas);
 - Public Health England Health Profiles for Luton, Bedfordshire and Hertfordshire;
 - Annual Public Health Reports for Luton, Bedfordshire and Hertfordshire;
 - Local policy and strategy documents such as Joint Strategic Needs Assessments; and
 - Ward level data on key health indicators such as life expectancy and limiting long-term illness or disability, obtained through consultation with local authority public health teams.

Community resources

- 15.4.5 The community baseline will identify community resources within the Luton area, in proximity to the airport and construction traffic and surface access routes. When reporting the community baseline, community resources will usually only be mentioned where they may be affected by the Proposed Development. Consequently, not all community resources within the Study Area will be described.
- 15.4.6 Where baseline information on community resources is reported, this will include information on what they are used for and any links they have to other community resources. The people who use the resource are termed 'receptors'. The receptors considered will comprise the occupiers of residential properties and users and beneficiaries of community resources, including

local residents, organised (community) groups, pupils, patients, congregations etc.

15.4.7 The principle sources of data for community resources will include:

- OS Address Base data which includes information relating to the type of property the address relates to (e.g. dwelling, school, place of worship etc.);
- Search engine mapping features;
- Information from local strategies and policies relating to community resources;
- Data obtained through consultation with community stakeholders; and
- Relevant feedback received from public consultation on the Proposed Development.

15.4.8 The following resources will be described in the Community baseline:

- Residential property, including specialist homes (e.g. retirement housing, student accommodation or mobile homes).
- Community infrastructure for example:
 - health and social care facilities;
 - educational facilities for all age groups and skill levels;
 - facilities used for local community meetings and activities;
 - government, local authority and emergency services which are open to the public e.g. police stations;
 - local high streets and centres; and
 - places of worship.
- Formal and informal publicly accessible open space and play space, including:
 - parks, accessible natural green space, and amenity green space;
 - accessible routes for recreation – includes river and canal banks, recreational (off road) cycle routes and promoted recreational walking routes or bridleways;
 - outdoor sports facilities;
 - allotments, community gardens and urban farms; and
 - outdoor play spaces including provision for children and teenagers.
- Public and private recreational infrastructure (not covered under open space and play space), such as:
 - sports centres and facilities;

- stadia, arena and professional sports clubs which host games and events open to the public;
- indoor children's play facilities;
- cultural centres e.g. museums, theatres, historic buildings open to the public;
- food venues, cafes and restaurants;
- music venues, bars, pubs, social clubs; and
- other recreational facilities, for example animal sanctuaries, zoos or aquariums; paintball venues, fisheries or sailing clubs, visitor centres etc.

Surveys

15.4.9 Additional baseline information will be gathered through surveys of open spaces, recreational spaces and routes, to inform the community impact assessment. This includes:

- quality surveys;
- user count surveys; and
- questionnaires.

15.4.10 Quality surveys will be undertaken at open spaces, recreational spaces and routes within the Study Area. An attribute table will be completed for every open space, using qualitative information obtained from the survey.

15.4.11 The purpose of the quality surveys will be to:

- verify resources identified via desk studies;
- identify any additional resources not picked up from desk studies;
- assess the condition and context of the resources;
- determine the sensitivity of the resources and receptors; and
- allow informed judgements to be made about likely levels and nature of use of the resources, where possible.

15.4.12 It is proposed that the quality surveys will be undertaken at the following locations:

- Wigmore Valley Park;
- Lea Valley Walk;
- Chiltern Way;
- Northern Chiltern Trail promoted Public Rights of Way (PRoW);
- Raynham Way Community Centre (open space outside of the centre);
- Someries Castle; and

- Allotments adjacent to Wigmore Valley Park.
- 15.4.13 These open space quality surveys are not typically seasonal, so it is proposed that they will be undertaken in Spring 2019, following engagement with relevant stakeholders.
- 15.4.14 User count surveys will be conducted at open spaces, recreational spaces and routes and PRow that would be directly affected by the Proposed Development (i.e. Wigmore Valley Park). The purpose of user count surveys will be to obtain information on user numbers, user patterns and demographics.
- 15.4.15 Patterns of use can differ during the day, week and season; therefore, it is proposed that a series of user count surveys will be undertaken throughout the year to obtain quantitative data on usage. The surveys will be undertaken in Spring 2019 (end of April/ early May), early Summer 2019 (end of June), late Summer (start of September 2019), and Autumn 2019 (October). The surveys will range from school term-time to holiday periods, include all times of day, and cover weekdays and weekends. The research will contribute to the greater understanding of the baseline in relation to the patterns of use and nature of activities undertaken.
- 15.4.16 Questionnaires will be targeted at users of open spaces, recreational spaces and routes that would be directly affected by the Proposed Development (i.e. Wigmore Valley Park).
- 15.4.17 The purpose of the questionnaire will be to:
- obtain more robust data to ascertain the sensitivity of receptors and resources; and
 - understand the demographics of users and patterns of use of the resources.
- 15.4.18 Patterns of use can differ during the day, week and season; therefore, it is proposed that the questionnaires will be undertaken throughout the year in parallel with the user count surveys.

Future baseline

- 15.4.19 Over the timescale of the Proposed Development's delivery, the profile of the affected communities is likely to change, influenced by wider economic and health policy, and demographic trends. Where forecasts are available, the future population profile will be considered.
- 15.4.20 Any consented developments which are identified as comprising the 'future baseline' for either construction or operation will be assessed in the same way as existing baseline resources and receptors.

Existing conditions

Community resources

- 15.4.21 A preliminary baseline assessment has been undertaken, using publicly available information, to identify key community resources within Luton and in proximity to the airport.
- 15.4.22 Some of the principal community resources near the Proposed Development include but are not limited to:
- Community infrastructure such as:
 - Wigmore Primary School;
 - University of Bedfordshire;
 - Surrey Street Primary School;
 - St Francis Parish Church;
 - The Parish Church of Saint Anne Luton; and
 - Christ Apostolic Church East of Luton;
 - Open space and play space, such as:
 - Wigmore Valley Park;
 - Lea Valley Walk, Chiltern Way and North Chiltern Trail promoted PRow; and
 - Wigmore Valley Park Allotments.
 - Leisure, sport and recreation facilities such as:
 - Wigmore Pavilion;
 - Raynham Way Community Centre;
 - Someries Castle; and
 - Vauxhall Recreation Club.

Population health profile

- 15.4.23 A review of publicly available data has been undertaken to provide a preliminary profile of the demographic, social and health status of the population in Luton, Hertfordshire and Bedfordshire.

Luton

- 15.4.24 The mid-year 2017 population estimates³⁰⁰ show that the borough of Luton population is currently 214,700. Data from the UK Census show that Luton has a higher than average proportion of the population under 45 (children and working age adults), and a relatively low proportion of older people. Luton is ethnically diverse; according to the 2011 Census data, 55% of Luton's population are White, 30% are Asian and 10% are Black.

³⁰⁰ LBC and Business Intelligence. (2018) Luton 2017 Mid-Year Population Estimates. Available at: <https://www.luton.gov.uk/Environment/Lists/LutonDocuments/PDF/Planning/Observatory/Mid-year-population-estimate.pdf> [Accessed March 2019]

This compares with the England and Wales 2011 figures of 86% White, 7.5% Asian/Asian British and 3.3% Black³⁰¹.

- 15.4.25 The Index of Multiple Deprivation 2015³⁰² (IMD 2015) provides a measure of relative deprivation at the small area level based on Lower Layer Super Output Areas³⁰³. Luton has high levels of overall deprivation, with approximately 75% of LSOAs in the 50% most deprived nationally, and almost a third within the 10-20% most deprived. The more deprived areas are mainly on the southwest side of the town, between the M1 and the town centre, including areas around Farley and Stockwood Park. Other pockets of deprivation are present along Crawley Green Road to the north east of the town centre and along the A505 to the north west.
- 15.4.26 LBC Annual Public Health Report (APHR) for 2013-2014³⁰⁴, gives an overview of the health of the population at borough level for some of the wider determinants of health. Alongside key health indicators from Luton's 2017 health profile³⁰⁵, the report shows that:
- life expectancy at birth in Luton is 78.4 years for males and 82.2 years for females, approximately one year below the national averages;
 - in children aged 10-11 the obesity rate is 26.5%. This is higher than England figures which is 20%;
 - Luton has much higher rates of homelessness and households in temporary accommodation compared to England; and
 - Luton has high levels of noise exposure related to transport compared with England as a whole.
- 15.4.27 The Public Health England Health Profile for Luton (2018) identifies Luton as performing 'significantly worse' than the England average in terms of life expectancy, mortality due to

³⁰¹ ONS (2019) Ethnicity and National Identity in England and Wales: 2011: Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/ethnicity/articles/ethnicityandnationalidentityinenglandandwales/2012-12-11#ethnicity-in-england-and-wales> [Accessed March 2019]

³⁰² IMD (2015) Indices of Multiple Deprivation Explorer 2015 Available at: <http://dclgapps.communities.gov.uk/imd/idmap.html> [Accessed March 2019]

³⁰³ Lower Layer Super Output Areas are a geographic hierarchy designed to improve the reporting of small area statistics in England and Wales. The minimum population is 1000 and the mean is 1500.

³⁰⁴ LBC (2013) Annual Public Health Report. The wider social determinants of health.

Available at:

https://www.luton.gov.uk/Health_and_social_care/Lists/LutonDocuments/PDF/Annual%20Public%20Health%20reports/Annual%20Public%20Health%20Report%202013-14.pdf [Accessed March 2013]

³⁰⁵ Public Health England (2019). Fingertips Tool. Local Authority Health Profiles.

Available at: [REDACTED] [Accessed March 2019]

cardiovascular disease and childhood obesity. The profile also shows that life expectancy gap is 10.4 years lower for men and 6.3 years lower for women in the most deprived areas of Luton compared to the least deprived areas.

Central Bedfordshire

- 15.4.28 Central Bedfordshire is a unitary authority situated to the west of Luton. It is largely rural, with 58% of residents living in rural areas³⁰⁶. The 2017 updated Joint Strategic Needs Assessment, states that Central Bedfordshire is the 11th largest by area and the 15th largest by population size out of the 56 unitary councils in England in 2015.
- 15.4.29 Central Bedfordshire includes the towns of Dunstable, Biggleswade and Leighton Buzzard. The area has a low population density of 391 persons per square kilometre, below the England average of 427 people per square kilometre.
- 15.4.30 According to ONS mid-year 2017 population estimates, Central Bedfordshire has a population of 280,030.
- 15.4.31 The age profile shows that the number of 0-19 year olds in Central Bedfordshire is estimated to be 66,670, which is 25% of the overall population. The number of over 65 year olds is 49,575, which is estimated to be 17.7% of the total population of Central Bedfordshire, similar to the national average in the UK which is 18.1%. Between 2014 and 2031, the total population of Central Bedfordshire is set to increase by 22.6%. This is in line with national trends, with the biggest rate of increase expected in older people.
- 15.4.32 According to the Council's Joint Strategic Needs Assessment (JSNA) approximately 10.3% of residents were from Black and minority ethnic groups. This figure is based on the 2011 census. This is compared with England and Wales 2011 figures of 86% White, 7.5% Asian/Asian British and 3.3% Black.
- 15.4.33 Levels of deprivation in Central Bedfordshire are low, with less than 10% of LSOAs ranked in the 30% most deprived in England for overall deprivation, health deprivation and employment deprivation. The area contains some relatively deprived areas, mostly located on the outskirts of Luton Borough, in the towns of Dunstable and Houghton Regis, and the village of Caddington.
- 15.4.34 The 2017 Health Profile shows that for Central Bedfordshire most of the health indicators perform significantly better or close to the England average. Life expectancy at birth is above average at 81.5 years for males and 84.5 years for females, compared with 79.5 years and 83.1 years respectively. The life expectancy gap

³⁰⁶ Central Bedfordshire (2019) Joint Strategic Needs Assessment. [online] Available at: <https://www.jsna.centralbedfordshire.gov.uk/> [Accessed March 2019]

is relatively small compared with other more deprived Local Authorities, at 6.4 for males and 5.4 for females.

- 15.4.35 Indicators performing significantly worse than England include the rate of people 'killed or seriously injured on roads', which is 46.7 compared to the regional rate of 42.3 and England's 39.7.
- 15.4.36 The percentage of physically active adults is notably better than England 70.8% versus 66% respectively. Similarly, prevalence of obese children in Year 6 (16.3) is better than the England value 20.0.

Hertfordshire

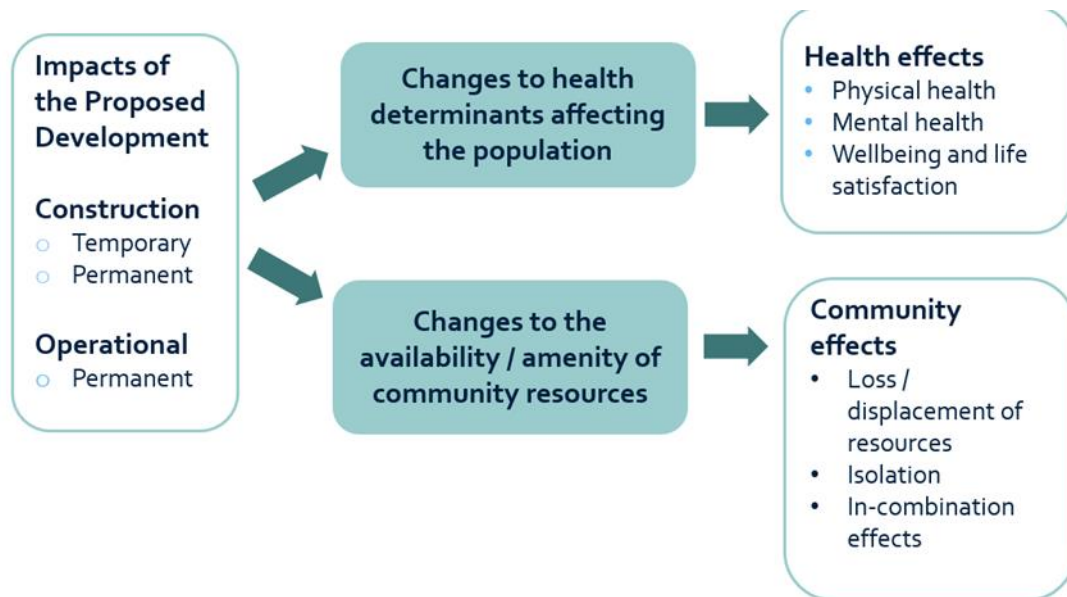
- 15.4.37 The county of Hertfordshire lies to the east and south of Luton, with the districts of North Hertfordshire, Stevenage, Welwyn and Hatfield, St Albans and Dacorum lying closest to the airport. The area is mainly rural, with a low population density. The main settlements are Hitchin, Stevenage, Harpenden, St Albans, Welwyn Garden City and Hatfield. The population density in these towns is generally below average compared with urban areas in England (excluding London). In terms of age profile, these districts are similar to Central Bedfordshire, having a high proportion of children and fewer than average young adults and older people.
- 15.4.38 Levels of deprivation in Hertfordshire are generally low. The LSOAs closest to the existing flight path, east of the airport in North Hertfordshire, are all ranked within the 50% least deprived areas for overall deprivation. In Stevenage, overall deprivation is close to average, with 85% of LSOAs ranking between 40% most and 40% least deprived. St Albans experiences very low levels of deprivation, with no LSOAs ranking within the 30% most deprived areas for both overall deprivation. In Harpenden, the town immediately south of Luton, most of the area is ranked as 20% least deprived.
- 15.4.39 According to the 2017 Health Profile for Hertfordshire, the only indicator performing worse than the England average is 'excess winter deaths' which is 24.4% compared with England 21.1%. All other comparative indicators perform better than the England average. The life expectancy at birth is above average for both genders at 81 years for males and 84.2 for females respectively. However, the life expectancy in the most deprived areas of Hertfordshire is 6.7 years lower for men and 5.4 years lower for women compared to the least deprived areas.

15.5 Assessment Methodology

- 15.5.1 This section sets out the proposed methodology for the health and community assessment including:

- relationship to other EIA topics;
- stages in the assessment process; and
- proposed method for assessing significance of health and community effects.

Figure 15.1: The relationship between and key components of the health and community assessment



Relationship to other EIA topics

15.5.2 The health and community assessment will draw information from other topic assessments in order to identify impacts on health determinants and community resources. These will include:

- Air quality;
- Noise and vibration;
- Traffic and transport;
- Landscape and visual amenity; and
- Economics and Employment.

15.5.3 The health and community assessment will be based on the residual effects identified by these topics, i.e. after mitigation measures, such as noise barriers and landscape planting, have been taken into account.

Assessment stages

15.5.4 The health and community assessment will be completed in the following stages:

- **Population profile:** The demographic, social and health characteristics of the population will be described using publicly available data. This will provide an overview of the population's resilience to health effects, and the prevalence and distribution of vulnerable sub-groups (e.g. deprived communities, people with existing health problems or disabilities, older people, children).
- **Community baseline:** A description of the existing community resources in the Study Area. This will include schools, community centres, parks and open spaces and leisure facilities.
- **Surveys:** Additional baseline information will be gathered through surveys of open spaces, recreational spaces and routes, to inform the community impact assessment. This will include quality surveys, user counts and questionnaires.
- **Health evidence base:** A review of publicly available scientific literature describing how environmental, social and economic factors influence health and wellbeing. The literature review will use credible, up to date sources, focusing on secondary evidence such as Government literature reviews.
- **Assessment of effects:** An assessment of the likely significant health and community effects, using qualitative and quantitative techniques.
- **Mitigation:** A description of measures to be incorporated to reduce the adverse and/or enhance the beneficial effects of the Proposed Development on population health and community receptors.
- **Residual effects:** An assessment of the likely residual effects of the Proposed Development after health and community mitigation measures are implemented.

15.5.5 Engagement with key health and community stakeholders will be ongoing throughout the health and community assessment process (see Section 15.3).

Assessment of health and community effects

General approach

15.5.6 The assessment will identify the impacts (beneficial and adverse, direct and indirect, construction and operational) of the Proposed Development on health determinants, community infrastructure and residential properties. The health and community effects resulting from these impacts will be defined as follows:

- Impacts on community resources, and the resultant effects on the people ('receptors') using those resources, will be identified as community effects.
 - Health effects will be identified when an environmental, social or economic factor that influences health and wellbeing (a 'health determinant') is impacted, and the number of people exposed to this change is considered sufficient to cause a change in health at population level³⁰⁷.
- 15.5.7 The assessment will be largely qualitative in nature. However, in some cases, such as for health effects arising from noise and air quality, the effects may be quantified. Further information on quantitative assessment is provided later in this section.
- 15.5.8 The assessment will determine significance of health and community effects in line with the requirements of the EIA Regulations. This will be a judgement-based exercise to identify those effects that are important enough to be reported in the ES and considered in the overall evaluation of the Proposed Development by decision makers. It should be noted that this assessment does not refer to the 'clinical' or 'statistical' significance of health effects³⁰⁸.
- 15.5.9 The approach for defining significance will consider:
- the magnitude of the impact on a health determinant and/or community resource; and
 - the sensitivity of the population or receptors who will experience the impact.

Magnitude of impact

- 15.5.10 The magnitude of an impact relates to its severity and/or scale. Magnitude will be determined by professional judgement, based on defined assessment criteria. The characteristics of an impact (i.e. whether direct or indirect, secondary or cumulative, short, medium or long-term, permanent or temporary, reversible or irreversible) will be assessed and the magnitude classified as high, medium, low or very low.

³⁰⁷ An effect on population health may be defined as a change in the health outcomes, and the distribution of those outcomes, within a defined group of people at a defined geographical level. Further information on population health available at:

[Redacted] [Accessed March 2019]

³⁰⁸ Statistical significance is attributed to quantitative population-based health indicator outcomes relating to large-scale epidemiological data comparisons and cannot be attributed to a judgement-based assessment without appropriate large-scale population data. Clinical significance is a measure of the importance of changes in health status relating to individual patient outcomes.

- 15.5.11 For the health assessment, the assessment of magnitude will also consider the nature of potential health outcomes associated with the change, e.g. effects on mortality rates, incidence of acute or chronic physical or mental health conditions, symptoms of existing conditions, quality of life, or comfort.
- 15.5.12 For the community assessment, the magnitude of impact on a community resource or receptor reflects consideration of information and analysis relating to the spatial extent (localised/isolated versus widespread with potential secondary effects) and the extent (number of groups and/ or people or households affected).

Sensitivity of population / receptors

Population sensitivity (for health assessment)

- 15.5.13 For the health assessment, sensitivity will be defined by a combination of two factors: the size of the population exposed to an impact, and its vulnerability to health effects.
- 15.5.14 The size of the exposed population will be judged on a scale of high, medium, low and very low, dependent on geographical area and number of people exposed. The vulnerability of the population will also be judged on a scale of high, medium, low and very low based on indicators of the health and social status of the population. More vulnerable populations would include those with higher levels of social deprivation or relatively poor health status. In addition to this, the assessment will take into account the presence of specific vulnerable groups such as:
- age related groups, such as children and young people;
 - income related groups such as the economically inactive, unemployed/workless; and
 - groups who suffer social disadvantage such as people with a physical or learning disability/difficulty, single parent families, and religious groups.
- 15.5.15 These two measures will then be combined to give an overall judgement on sensitivity, or exposure, on a scale of high, medium, low or very low.

Receptor sensitivity (for community assessment)

- 15.5.16 For the community assessment, sensitivity of receptors (people using community resources) will be determined by the extent to which the individuals have the capacity to experience the effect without a significant loss or gain. This will be partly related to the sensitivity of the community resource(s) affected in terms of their importance, scarcity and size. Factors considered when

assessing receptor sensitivity will include personal circumstances and ability to access alternatives.

- 15.5.17 Receptor sensitivity will be classified as high, medium, low and very low.

Determining significance of health and community effects

- 15.5.18 The assessment matrix provided in Table 15-2 will be used to classify health and community effects as major, moderate, minor or negligible.

Table 15-2: Health and community significance matrix

Magnitude of impact	Population/ receptor sensitivity			
	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

- 15.5.19 As a general rule, major and moderate effects will be considered to be significant, whilst minor and negligible effects will be considered to be not significant.

Quantitative assessment of health effects

- 15.5.20 Most potential health effects cannot be reliably quantified because there are currently no robust or scientifically widely agreed upon methods for quantifying them, or because the types of data required cannot realistically be obtained. Therefore, it is anticipated that the assessment will be largely qualitative. However, there are established methods available to quantify the health effects associated with exposure to noise and air pollution.
- 15.5.21 Quantitative assessment of health effects from increased exposure to air pollution has been scoped out, as described in Section 15.7. Health effects associated with changes in noise exposure resulting from additional air traffic movements, fleet mix and operating regime will be assessed quantitatively.
- 15.5.22 Guidance is available for quantifying the effects on human health of noise from a range of transport sources, including aircraft. The Defra guidance document *Environmental Noise: Valuing impacts on: sleep disturbance, annoyance, hypertension, productivity and quiet* includes an appraisal tool for the valuation of transport noise³⁰⁹. The assessment will follow this guidance, which sets

³⁰⁹ Defra (2014). Environmental Noise: Valuing impacts on: sleep disturbance, annoyance, hypertension, productivity and quiet. Available at: <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment>

out a methodology for valuing the health effects of noise. This value is comprised of a number of components:

- amenity (annoyance);
- sleep disturbance;
- acute myocardial infarction (AMI); and
- stroke and dementia.

15.5.23 Chapter 10 Noise and Vibration, describes the methodology for calculating the existing and future noise exposure. The spatial scope of the Study Area will be defined using the lowest observable adverse effect level (LOAEL) for noise from aircraft during the day and night. The number of people within this area will be estimated and exposure response relationships defined by Defra will be used to value the health effect in terms of Disability-Adjusted Life Years (DALYs). This will be compared to the existing health effect due to noise, in DALYs, within the Study Area, based on an assessment of existing ambient noise.

In-combination effects on community receptors and neighbourhood quality

15.5.24 Amenity value is determined by the enjoyment of a resource by a receptor. The amenity value that resources offer receptors may be affected by a combination of environmental factors including: noise and vibration; HGV traffic; air quality and visual impacts. The assessment of in-combination effects on community receptors will draw on the conclusions from other assessment topics, taking into account professional judgement about the sensitivity of the individual receptors to the predicted effects. An in-combination effect occurs where two or more residual significant effects from other EIA topics (air quality, HGV traffic, noise and vibration or visual impact) coincide on specific community receptors.

15.5.25 Neighbourhood quality is determined by the character and attractiveness of the public realm within a neighbourhood, including streets, footpaths, public squares, parks and playing fields. It does not include residential or other private property. Noticeable changes in two or more of the following environmental factors may lead to a neighbourhood quality effect: traffic, noise, air quality, landscape and visual impacts. When these factors are altered, people's levels of satisfaction with their living environment may change, which in turn may affect their wellbeing. This may affect people's enjoyment of outside space

[Accessed March 2019]

and 'sense of place', including feelings of attachment to, and pride in, their neighbourhood.

15.6 Potential significant effects

15.6.1 The likely impacts of the Proposed Development on health determinants and community resources are described below, followed by a description of the potential health and community effects associated with these impacts. These are not exhaustive and may change as a result of information obtained during the assessment process.

Potential impacts on health determinants and community resources

Construction impacts

15.6.2 Impacts that will result from construction works have been divided into two sub types (i) temporary and (ii) permanent.

Temporary construction impacts

15.6.3 The following temporary construction impacts are anticipated:

- land required temporarily for the construction of the Proposed Development³¹⁰ from public open space and recreational facilities;
- environmental impacts including construction noise, vibration, air emissions and visual effects affecting residential properties, community facilities (including open space) and neighbourhoods;
- temporary impacts on the local road network, including road layouts, diversions, traffic flows and HGVs;
- increased opportunities for employment, training and apprenticeships during construction;
- temporary changes to the demand for and availability of community facilities; and
- changes to the nature and size of the local population due to the presence of the construction workforce.

Permanent construction impacts

15.6.4 The following permanent construction impacts are anticipated:

³¹⁰ Calculations of temporary land take will include both land that is required for the permanent Proposed Development and the land required to construct it that can be returned during operation. This is to ensure a worst-case assessment is undertaken for that temporary period.

- permanent loss or gain of community facilities (including open space) due to land required to construct and operate the Proposed Development; and
- permanent changes to the accessibility to residential properties or community facilities due to permanent changes to the road network.

Operational impacts

15.6.5 Operational impacts will be permanent and will relate to the functioning of the Proposed Development. The following operational impacts are anticipated:

- local and regional economic growth associated with increased capacity at the airport;
- new employment opportunities, training and apprenticeships;
- environmental impacts from the operation of the Proposed Development (e.g. road and air traffic movements) including noise, air quality and visual effects, affecting residential properties, community facilities (including open space) and neighbourhoods; and
- changes to the amenity and accessibility of residential properties or community facilities as a result of changes to traffic flows.

Potential health and community effects

15.6.6 Based the potential impacts identified above, the effects described in Table 15-3 will be assessed in the Health and Community chapter of the ES.

Table 15-3: Potential health and community effects to be assessed

Activity / stage	Health or community effect	Health and wellbeing	Community
Planning stage			
Consultation on the Proposed Development	Public concern and uncertainty about the effects of the Proposed Scheme leading to potential planning blight and effects on mental wellbeing	Y	-
Construction stage			
Land required for the construction of the Proposed Development	Reduced access to public open space, affecting opportunities for informal recreation and physical activity	Y	Y
	Displacement of businesses leading to job losses, affecting the wellbeing of some workers	Y	-

Activity / stage	Health or community effect	Health and wellbeing	Community
Construction activities	Changes to the amenity of community resources, due to combined environmental impacts (noise, air quality, traffic, visual effects), affecting enjoyment of resources by receptors	-	Y
	Changes to the character and quality of neighbourhoods, due to combined environmental impacts (noise, air quality, traffic, visual effects), affecting sense of place and wellbeing	Y	-
	Opportunities for construction employment, training and apprenticeships, affecting levels of income and wellbeing	Y	-
	Changes to the local economy arising from the construction supply chain and expenditure by the temporary workforce, resulting in increased incomes, affecting wellbeing	Y	-
	Isolation effects: Measured by the barriers local communities face in making their usual journeys. This includes physical, psychological and social barriers and the effects of this on local communities.	Y	Y
Construction traffic	Increased journey times by private car and public transport, leading to reduced access to services and facilities	Y	Y
	Changes in traffic movements, including increased HGVs, deterring active travel (walking and cycling) and reducing levels of physical activity	Y	-
Construction workforce	Presence of the construction workforce within the local community, potentially affecting trust and social cohesion.	Y	-
Operational stage			
Operation of the expanded airport	Increased opportunities for employment within the expanded airport, affecting levels of income and wellbeing	Y	-

Activity / stage	Health or community effect	Health and wellbeing	Community
	Change in exposure of the population to aircraft noise, resulting from increased ATMs, resulting in direct health effects	Y	-
	Increased journey times by private car and public transport, leading to reduced access to local services and facilities	Y	Y
	Changes to the character and amenity of community resources or public realm, due to combined environmental impacts (noise, air quality, traffic, visual effects), affecting quality of life	Y	Y

Cumulative effects

15.6.7 The health and community assessment will assess the following types of cumulative effects:

- the interaction between the Proposed Development and 'other developments' that are proposed to be constructed or in operation at the relevant assessment time periods. This will require an assessment of cumulative in – combination impacts in relation to noise, air quality, visual and traffic from the combined topics;
- community-wide effects – where a combination of effects on individual resources have a wider impact on a community, such that a significant proportion of people within that community experience a change in terms of their day to day functions (leisure, live, travel, work).

15.6.8 See **Chapter 21 In-Combination and Cumulative Effects** of this Scoping Report for further details regarding methodology.

15.7 Matters scoped out

15.7.1 Health effects resulting from increased population exposure to air pollutants have been scoped out. There is a strong body of evidence that can be used to quantify the effect on respiratory health of a change in exposure to air pollutants experienced by a large population. Quantification of health effects is based on dose-response functions established through epidemiological studies³¹¹. The accuracy of these methods increases with increasing size of the population exposed, degree of change in

³¹¹ COMEAP (2015). Interim statement on quantifying the association of long-term average concentrations of nitrogen dioxide and mortality.

concentration of air pollutants, and the duration of exposure. It is expected that increases in air emissions resulting from the Proposed Development would be localised, affecting residents in areas closest to the airport and key construction and operational traffic routes. The effects on these residents would be assessed in the Air Quality assessment.

- 15.7.2 The Air Quality assessment will predict changes in air quality and identify significant effects on sensitive receptors based on EU limit values, which take account of health effects. An initial review of the likely magnitude and distribution of changes in air quality suggests that these will be localised, affecting receptors closest to the airfield and traffic routes. It is considered that the Proposed Development would not lead to substantial change in population exposure, and therefore would not cause statistically detectable changes in levels of respiratory health at population level. The findings of the air quality assessment will be reviewed during the EIA process, to ensure the continued accuracy of this evaluation.
- 15.7.3 There is a potential for health impacts associated with the electric and magnetic fields around substations, and power lines and cables. The field strength reduces rapidly with distance from such equipment. Health effects associated with electromagnetic interference (EMI) have been scoped out, as the Proposed Development does not include any significant sources of EMI in proximity to sensitive receptors.
- 15.7.4 Health effects associated with ground and water contamination have been scoped out. These effects will be assessed in **Chapter 11 Soils and Geology**, and **Chapter 12 Water Resources**. The risks to health will be assessed in line with the UK framework for the assessment of contaminated land, which is based upon considerations of pollution linkages between contaminated sources and sensitive receptors, using a source-pathway-receptor model of the site. The investigations and assessments undertaken in the EIA will identify any source-pathway-receptor linkages and apply appropriate control and mitigation measures to ensure that health risks are avoided.
- 15.7.5 Health effects associated with increased flooding have been scoped out. A full detailed FRA will accompany the ES. This will set out how legal requirements relating to flood risk management will be addressed, including the requirements of the ANPS to *“Consider the risk of all forms of flooding arising from the development comprised in the preferred scheme, in addition to the risk of flooding to the project, and demonstrate how these risks will be managed and, where relevant, mitigated, so that the development remains safe throughout its lifetime”*. On this basis it is considered that there will be no residual risk of flooding that could be potentially harmful to health.

- 15.7.6 Health effects associated with major accidents and incidents such as air traffic accidents or major pollution incidents have been scoped out. The health assessment identifies health effects resulting from the exposure of the population to the likely impacts of the Proposed Development. This does not allow for the assessment of the wide-ranging potential health outcomes associated with major incidents, which have a low probability of occurrence and potentially major consequences. **Chapter 20 Major Accidents and Disasters**, sets out a risk-based approach to assessing the risks and potential consequences of a major accident or incident. The assessment methodology builds on the principle that the Proposed Development must comply with the UK's civil aviation safety regime, regulated by the CAA as well as all other relevant legislation, listed in Section 20.2.2.
- 15.7.7 Community effects resulting from impacts on individual residents or individual facility users, including equalities impacts or compensation measures, will not be assessed. Impacts on individual business owners or operators, or impacts on agricultural businesses are also scoped out of this assessment. These impacts are addressed in **Chapters 14 Economics and Employment and 16 Agricultural Land Quality and Farming Circumstances** respectively.

15.8 Mitigation

Embedded mitigation

- 15.8.1 During the assessment process, recommendations to avoid or reduce adverse health and community effects and/or maximise the beneficial effects on health or communities will be fed back to other EIA topics and the design team.
- 15.8.2 It is anticipated that the majority of potential design based interventions for health and wellbeing will be incorporated into the design through the wider EIA process, including topics such as noise, landscape and visual. This embedded mitigation will form part of the Proposed Development assessed in the EIA. Examples of embedded mitigation may include:
- design of the airfield layout to minimise impacts on nearby receptors;
 - design of new road layouts to minimise delays; and
 - measures to replace, offset or compensate for adverse effects (e.g. inclusion of replacement park/open space to mitigate the loss of Wigmore Valley Park).

Good practice mitigation

- 15.8.3 Other, non-design related mitigation measures may be included in relation to the construction process and ongoing management

and delivery of the Proposed Development, to reduce adverse health and wellbeing effects and enhance beneficial effects. These will be incorporated into the Draft CoCP and other strategies as appropriate. Examples may include a community engagement strategy to reduce stress and uncertainty associated with the Proposed Development, and Draft CoCP measures to minimise noise and dust emissions.

Additional mitigation

- 15.8.4 After the assessment of the Proposed Development, including embedded and good practice mitigation, further mitigation may be identified to avoid or reduce adverse community or health effects. Examples may include measures to ensure that employment and training opportunities are targeted to deprived and hard to reach groups in order to reduce health inequalities, or optimising the community engagement process before and during the construction process. If additional mitigation is proposed, it will be bespoke to a health or community effect identified in the assessment and may extend to health and community effects that have been identified as not being significant but rather may be of importance to local communities and residents.

16 AGRICULTURAL LAND QUALITY AND FARMING CIRCUMSTANCES

16.1 Introduction

16.1.1 This chapter presents the proposed approach to the assessment of the likely significant environmental effects of the Proposed Development on agricultural interests.

16.1.2 The assessment will consider potential significant environmental effects on agricultural features, including:

- Best and Most Versatile (BMV) agricultural land, i.e. Agricultural Land Classification (ALC) Grade 1, Grade 2 and Subgrade 3a;
- soil resources directly affected by the Proposed Development;
- local agricultural holdings directly affected by the Proposed Development;
- agri-environmental schemes directly affected by the Proposed Development; and
- rural land designations, such as Nitrate Vulnerable Zones (NVZ).

16.1.3 Where possible, the Proposed Development will be designed to avoid or reduce adverse effects on agricultural interests in accordance with policy and best practice.

16.2 Legislation, policy and guidance

16.2.1 National and local planning policy of relevance to the assessment of land use and agricultural receptors is set out below.

National planning and aviation policy

Airports National Policy Statement - June 2018

16.2.2 Guidance on airport development involving the BMV agricultural land and soil resources is set out in the ANPS¹¹ at paragraphs 5.108, 5.109, 5.110, 5.115, 5.118 and 5.126. The ANPS cross refers to relevant guidance in the NPPF (see NPPF below) and recommends the use of best practice for the sustainable management of soil on construction sites (see guidance below). Paragraph 5.115 states:

“The applicant should take into account the economic and other benefits of best and most versatile agricultural land. Where significant development of agricultural land is demonstrated to be necessary, the applicant should seek to use areas of poorer quality land in preference to that of a higher quality. The applicant

should also identify any effects, and seek to minimise impacts, on soil quality, taking into account any mitigation measures proposed.”

National Planning Policy Framework (NPPF) – February 2019

16.2.3 Chapter 15 of the NPPF includes policy on ‘*Conserving and Enhancing the Natural Environment*’. Paragraph 170 is of relevance to the assessment of agricultural land quality and soil and states that “*decisions should contribute to and enhance the natural and local environment by:*

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland.”

National Planning Practice Guidance (NPPG)

16.2.4 The following paragraphs set out in the National PPG, 2014, are relevant to the assessment as follows:

“Paragraph 025: The National Planning Policy Framework states that the planning system should protect and enhance valued soils and prevent the adverse effects of unacceptable levels of pollution. This is because soil is an essential finite resource that provides important ‘ecosystem services’, for example as a growing medium for food, timber and other crops, as a store for carbon and water, as a reservoir of biodiversity and as a buffer against pollution. As part of the Government’s ‘Safeguarding our Soils’ strategy (Ref. 12.10), Defra has published a code of practice on the sustainable use of soils on construction sites, which may be helpful in development design and setting planning conditions (see below); and

“Paragraph 026: The National Planning Policy Framework expects local planning authorities to take into account the economic and other benefits of the best and most versatile agricultural land”.

Local Policy

16.2.5 The Main Application Site is located mainly in the Borough of Luton. Some agricultural land to the east of LTN, which is within the ownership of LLAL, falls within North Hertfordshire District.

Luton Local Plan 2011-2031 – November 2017

- 16.2.6 Current local planning policy is set out in the Luton Local Plan 2011-2031. The Luton Local Plan does not include a specific policy regarding development on agricultural land. Paragraph 170 of the NPPF should therefore be considered (as set out above).

North Hertfordshire District Council Proposed Submission Local Plan 2011-2031 – October 2016

- 16.2.7 The 'saved policies' in the current North Hertfordshire Local Plan, which was adopted in 1996, does not include specific policy regarding development on agricultural land. The adopted local plan will eventually be replaced by a new Local Plan 2011-2031³¹². A Proposed Submission Local Plan 2011-2031 does not include specific policy regarding development on agricultural land either. Paragraph 170 of the NPPF should therefore be considered (as set out above).

Guidance

- 16.2.8 The Department for Environment, Food and Rural Affairs (Defra) has published 'Safeguarding our Soils – A Strategy for England' (24th September 2009). The Soil Strategy was published in tandem with a 'Code of Practice for the Sustainable Use of Soils on Construction Sites'³¹³.

16.3 Stakeholder engagement and consultation

- 16.3.1 There are no specific statutory organisations that should be consulted regarding likely significant effects of the Proposed Development on agricultural and soil receptors. Natural England (NE) provides technical advice on agricultural land quality and soil issues to local planning authorities. Where agricultural land is required temporarily or permanently to construct the Proposed Development, the land owners/farmers directly affected will be interviewed in order to assess the effects on the day to day operations of the agricultural business, and to devise mitigation measures where possible.

³¹² North Hertfordshire District Council (2016). *Local Plan 2011-2031*. Available at: <https://www.north-herts.gov.uk/sites/northherts-cms/files/Proposed%20Submission%20Local%20Plan.pdf> [Accessed March 2018].

³¹³ Department for Environment, Food and Rural Affairs (2009). *Construction Code of Practice for the Sustainable Use of Soil on Construction Sites*. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69308/pb13298-code-of-practice-090910.pdf [Accessed March 2019]

16.4 Baseline conditions

Study Area

16.4.1 The Study Area for this assessment of land use and agriculture is the Main Application Site, i.e. land required for constructing the Proposed Development. The Off-site Car Parks and Off-site Highway Interventions included in the Proposed Development will not impact agricultural land. The Main Application Site measures approximately 360ha, of which approximately 106ha (or approximately 29% of the Main Application Site) is currently in agricultural production.

Data gathering and survey

16.4.2 The assessment will include a desktop study of relevant published information, in conjunction with a detailed ALC survey to fill in any data gaps, i.e. where detailed (post-1988) ALC information held by NE, and available on MAGIC.gov.uk, does not cover all the agricultural land within the Main Application Site. Relevant published sources of information include:

- Soil Survey of England and Wales (1983). Soil Map for Eastern England (1:250,000);
- C.A.H. Hodge, R.G.O. Burton, W.M. Corbett, R. Evans, and R.S. Searle (1984) 'Soils and their use in Eastern England', Soil Survey of England and Wales Bulletin No.13, Harpenden;
- National Soil Resources Institute (NSRI), Cranfield University. Soil Auger Bore Records (where available);
- Ministry of Agriculture, Fisheries and Food (MAFF). Provisional (Pre 1988) Agricultural Land Classification of the Eastern Region (1:250,000). 1983 (Reprinted 1993);
- Natural England also maintains the national database on Agricultural Land Classification (ALC). Information on provisional (pre-1988) and detailed (post-1988) ALC is held on the MAGIC.gov.uk website, and published ALC information will be utilised in this assessment as part of the baseline studies.
- Department for Environment, Food and Rural Affairs (2005). Likelihood of Best and Most Versatile Agricultural Land (1:250,000);
- Meteorological Office. (1989) Gridpoint Meteorological data for Agricultural Land Classification of England and Wales and other Climatological Investigations;
- British Geological Survey. Solid and superficial deposits from the Geology of Britain viewer. Available online

www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html; and

- Soil survey data collected on site as part of previous investigations carried out on behalf of LLAL.

Existing conditions

- 16.4.3 From published information and detailed ALC surveys carried out by the former MAFF, and on behalf of LLAL to date, the existing conditions at the Main Application Site may be summarised as follows.
- 16.4.4 The bedrock geology of the land in and surrounding LTN dates from the Cretaceous period and is comprised of Upper Chalks and Middle Chalk. The bedrock is covered by superficial deposits of 'Clay-with-flints.'
- 16.4.5 The soils surrounding LTN are defined by the National Soil Resources Institute (NSRI) to comprise 'slightly acid loamy and clayey soils with impeded drainage'. The soils developed in clay-with-flints are grouped in the Batcombe association.
- 16.4.6 Provisional ALC Strategic Maps (published by Natural England) indicate that agricultural land surrounding LTN is classified as being ALC Grade 3 (not differentiated between Subgrade 3a and Subgrade 3b).
- 16.4.7 A detailed (post-1988) ALC survey carried out by the former MAFF covers agricultural land in the east of the Main Application Site. This determined a mixture of Subgrade 3a and Subgrade 3b land (broadly 50:50). Where the application boundary of the Main Site includes agricultural land not covered by the MAFF post-1988 ALC survey, a complementary ALC survey has been carried out in June 2018 following the current MAFF ALC Guidelines (October 1988). The additional ALC carried out in June 2018 determined mainly Subgrade 3a on slightly stony (flinty) silty clay loam over clay soils (c.f. Batcombe series), with some localised pockets of Subgrade 3b where the topsoil is moderately stony (flinty), or due to gradient (i.e. angle of slope between 7° and 11°). A composite ALC map, which shows the MAFF post-1988 ALC and the additional ALC survey carried out in June 2018, is given as Figure 16.1 (Volume 2).
- 16.4.8 There are a number of areas within the Main Application Site which are subject to Agri-Environmental Schemes or Forestry and Woodland Schemes.
- 16.4.9 The agricultural land within the Main Application Site is designated as a Nitrate Vulnerability Zone (2017).

16.5 Assessment methodology

16.5.1 The Agricultural Land Quality and Farming Circumstances assessment will follow the EIA methodology set out in Section 5.3 of this Scoping Report. A Farm Impact Assessment (FIA) will be undertaken to determine the nature and size of the affected farm business, in order to agree the main likely significant effects of the Proposed Development, and to devise appropriate mitigation where possible. There are no further notable assumptions or limitations to this assessment.

Significance criteria

16.5.2 As described in IEMA's EIA Guidelines (2004)³¹⁴, "...the assessment of significance is based on the characteristics (or magnitude) of the impact and the sensitivity of the receptor..."

16.5.3 There are currently no standard criteria for assessing the significance of the effects of the Proposed Development on soil resources, agricultural land quality and agricultural holdings. Therefore, whilst following the same approach as the EIA methodology set out in Section 5.3, bespoke criteria for assigning the magnitude of the impact and the sensitivity of the receptor, and assessing the significance of effect with regard to agricultural land quality, soil resources and agricultural holdings are presented in this chapter.

Magnitude of impact

Agricultural land quality

16.5.4 For the purpose of this assessment, the magnitude of impact of the loss of agricultural land to the national resource will be described as either 'High', 'Medium', 'Low' or 'Very Low' as shown in Table 16-1.

Table 16-1: Magnitude of Impact – Agricultural Land

Impact magnitude	Definition
High	20.0ha or more of BMV agricultural land is affected by the Proposed Development, and/or change is likely to cause a direct adverse or permanent or long term (more than 10 years) impact on the integrity/value of the receptor (see Note 1).
Medium	Between 10.0 ha to 19.9 ha of BMV agricultural land, and/or 50 ha or more of lower quality agricultural land is affected by the Proposed Development. The latter specifically relates to the effect of the loss of land in grades 3b, 4 and 5 to national agricultural land resource, and does not take account of landscape character, or ecological qualities that low quality agricultural land may have, and/or change is likely to impact adversely the integrity/value of the receptor but recovery is

³¹⁴ Institute of Environmental Management and Assessment (IEMA) (2004) 'Guidelines for Environmental Impact Assessment'

Impact magnitude	Definition
	predicted in the medium term (>5 to 10 years) and there is predicted to be no permanent impact on its integrity.
Low	Between 5.0 ha to 9.9 ha of BMV agricultural land, and/or 10.0 ha to 49.9 ha of lower quality agricultural land. is affected by the Proposed Development. (See Note 2).
Very Low	4.9 ha or Less of BMV agricultural land or less than 10.0 ha of lower quality agricultural land, or non-agricultural/other land, is affected by the Proposed Development. The effect of the loss of land in grades 3b, 4 and 5 is in terms of the national agricultural land resource, and does not take account of landscape character, or ecological qualities that low quality agricultural land may have.

Note 1: A 20 ha threshold follows the approach of the Town and Country Planning (Development Management Procedure) (England) Order 2015).

Soil resources

16.5.5 The magnitude of the predicted impact on soil resources will be assessed as 'High', 'Medium', 'Low' or 'Very Low' following the criteria given in Table 16-2.

Table 16-2: Magnitude of Impact – Soil Resources

Magnitude of Impact	Soil Resources
High	50,000m ³ of soil or more Based on soil resources within 20.0 ha (200,000m ²) of land area or more, affected by development with an average 0.25m layer of soil (topsoil or subsoil) (see Note 1).
Medium	25,000m ³ to 49,999m ³ of soil Based on soil resources within 10.0 ha to 19.9 ha (100,000m ² to 199,999m ²) of land area, with an average 0.25m layer of soil (topsoil or subsoil).
Low	12,500m ³ to 24,999m ³ of soil Based on soil resources within 5.0 ha to 9.9 ha (50,000m ² to 99,999m ²) of land area affected by development, with an average 0.25m layer of soil (topsoil or subsoil) (see Note 2)
Very Low	12,499m ³ or less Based on soil resources within 4.9 ha or less (49,999m ² or less) of land area affected by the development, with an average 0.25m (25cm) layer of soil (topsoil or subsoil).

Note 1: A 20.0ha threshold follows the approach of the Town and Country Planning (Development Management Procedure) (England) Order 2015.

Agricultural holdings

16.5.6 The magnitude of the predicted impact on agricultural holdings will be assessed as 'High', 'Medium', 'Low' or 'Very Low' following the criteria given in Table 16-3.

Table 16-3: Magnitude of Impact – Agricultural Holdings

Impact magnitude	Definitions			
	Land-take	Severance	Infrastructure	Nuisance (e.g. noise/dust)
High	>20% of all land farmed	No access available to severed land	Direct loss of farm dwelling, building or structure	Nuisance discontinues land use or enterprise
Medium	>10% < 20% of all land farmed	Access available to severed land via the public highway	Loss of or damage to infrastructure affecting land use	Nuisance necessitates change to scale or nature of land use or enterprise
Low	> 5% <10% of all land farmed	Access available to severed land via private way	Infrastructure loss/damage does not affect land use	Nuisance does not affect land use or enterprise
Very Low	5% or less of all land farmed	No new severance	No impact on farm infrastructure	No nuisance on land use or enterprise

Sensitivity of receptor

Agricultural land

16.5.7 The sensitivity of agricultural land in the different ALC grades will be assessed as ‘High’, ‘Medium’, ‘Low’ or ‘Very Low’ as set out in Table 16-4.

Table 16-4: Sensitivity of Receptor – Agricultural Land

Value	Receptors
High	BMV
Medium	ALC Subgrade 3b agricultural land
Low	Grade 4 or 5 agricultural land
Very Low	Non-agricultural land, including woodland, access tracks and hard-standing.

16.5.8 The sensitivity of soil receptors, in this case specifically soil resources available on the Main Application Site, which are available for reuse (e.g. for restoring agricultural land, reuse in residential gardens, reuse in landscaping schemes, or reuse in ecological schemes etc.) will be described as ‘High’, ‘Medium’, ‘Low’ or ‘Very Low’ are shown in Table 16-5.

Table 16-5: Sensitivity of Receptor – Soil Resources

Value	Soil Receptors
High	Soil types with low resilience to structural damage when being handled. Heavy soils with >27% clay content: heavy silty clay loam (HZCL), heavy clay loam (HCL), sandy clay (SC), silty clay (ZC), clay (C).
Medium	Soil types with moderate resilience to structural damage when being handled. Medium textured soils with <27% clay content: silt loam (ZL), medium silty clay loam (MZCL), medium clay loam (MCL), sandy clay loam (SCL).
Low	Soil types with high resilience to structural damage when being handled. Light textured soils – sand (S), loamy sand (LS), sandy loam (SL), sandy silt loam (SZL).
Very Low	Soil types unsuitable for reuse in restoring agricultural land, reuse in residential gardens, reuse in landscaping schemes, or reuse in ecological schemes etc. For example, Made Ground/contaminated land.

Agricultural holdings/rural land designations

16.5.9 The sensitivity of agricultural holdings will be described as ‘High’, ‘Medium’, or ‘Low’ as shown in Table 16-6.

Table 16-6: Sensitivity of Receptor – Agricultural Holdings and Rural Land Designations

Value	Agricultural Holdings and Rural Land Designations
High	<p>Farm types in which the operation of the enterprise is dependent on the spatial relationship of land to key infrastructure, and where there is a requirement for frequent and regular access between the two, or dependent on the existence of the infrastructure itself; for example:</p> <ul style="list-style-type: none"> • Dairying, in which milking cows must travel between fields and the parlour at least twice a day; • Irrigated arable cropping and field-scale horticulture, which are dependent on irrigation water supplies; • Intensive livestock or horticultural production which is undertaken primarily within buildings, often in controlled environments; • Marginal agricultural holdings; • Horses; • Fruit crops; • Land in agri-environmental schemes (Higher Level Stewardship); • Land in agri-environmental schemes (Organic Entry Level Stewardship); • Land with organic/organic conversion status; • Land with Notifiable Weeds; • Land with Notifiable Scheduled Diseases; • Land in woodland/forestry grant schemes; or • Statutory rural land designations, e.g. Nitrate Vulnerable Zones (re EU Nitrate Directive (91/676/EC)).

Value	Agricultural Holdings and Rural Land Designations
Medium	<p>Farm types in which there is a degree of flexibility in the normal course of operations; for example:</p> <ul style="list-style-type: none"> • Combinable arable farms; and grazing livestock farms (other than dairying); • Unimproved pasture; • High value crops; or • Land in agri-environmental schemes (Entry Level Stewardship).
Low	<p>Large agricultural holdings Tenancy or other short-term arrangements, e.g. annual grass keep Farm types and land uses undertaken on a non-commercial basis</p>

Significance of effect

- 16.5.10 The predicted effect may be Beneficial or Adverse on soil, agricultural land quality and agricultural holdings, the significance of which will be assessed as either 'Major', 'Moderate', 'Minor' or 'Negligible' according to the magnitude of the effect and sensitivity of the receptor, as described in Table 16-7.

Table 16-7: Effect Assessment Matrix for Agricultural assessment

Magnitude of effect	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

- 16.5.11 Major and moderate effects are considered to be significant, whilst minor and negligible effects are considered to be not significant. However, professional judgement can also be applied where necessary.

16.6 Potential significant effects

- 16.6.1 This section sets out the impacts which are likely to give rise to significant environmental effects and are therefore scoped in to the ES.

Construction

Temporary construction impacts

Agricultural land

- 16.6.2 During the construction of the Proposed Development to the east of the Main Application Site, it is likely that some BMV agricultural land, and some lower quality agricultural land, will be required temporarily for haul roads, construction compounds and other

earthworks. This is likely to give rise to temporary significant adverse effects on BMV land.

Soil resources

- 16.6.3 There is a potential for significant, temporary adverse effects on soil resources (topsoil and subsoil) during the construction of the Proposed Development.

Agricultural holdings

- 16.6.4 It is likely that agricultural land required temporarily for constructing the Proposed Development will cause significant temporary adverse effects on daily farming operations, as a result of severance and/or fragmentation of the agricultural holding for example.

Permanent construction impacts

Agricultural land

- 16.6.5 Some BMV, and some lower quality agricultural land, will be required permanently for constructing the Proposed Development. This is likely to give rise to a significant permanent adverse effect on the national resource of BMV land.

Soil resources

- 16.6.6 By implementing best practice set out in Defra's Code of Practice for the Sustainable Use of Soil on Construction Sites (2009), see Mitigation below, permanent adverse effects on soil resources (topsoil and subsoil) can be reduced to minor adverse, which is not significant.

Agricultural holdings

- 16.6.7 The permanent requirement for some agricultural land to construct the Proposed Development will reduce the size (area) of the affected agricultural holding, which is likely to result in a reduction of agricultural income. This has the potential to have a significant permanent adverse effect on the affected agricultural holding compared to its current level of business.

Operation

- 16.6.8 It is predicted that, once the Proposed Development is constructed, there will be no significant effects on land use and agricultural/soil receptors during the operation life of the Proposed Development.

Cumulative effects

- 16.6.9 The assessment will consider any likely significant cumulative effects of the Proposed Development in combination with other

committed developments involving development on agricultural land in the vicinity of LTN.

- 16.6.10 See **Chapter 21 In-Combination and Cumulative Effects** of this Scoping Report for further details regarding methodology.

16.7 Matters scoped out

- 16.7.1 The Proposed Development is unlikely to have any significant effect on the rural land designations identified in the Main Application Site, for example, on Nitrate Vulnerable Zone (NVZ). This is primarily an agricultural policy to reduce the amount of runoff (surface-water and ground-water) containing inorganic and organic fertilizer, especially nitrates and phosphates, from agricultural land entering water courses. As the Proposed Development will not contain any agricultural land, the assessment of effects on these designations is scoped out of further assessment. Measures to reduce soil erosion, and the potential for soil material being discharged into water courses during construction, will be included in the Soil Management Plan as part of the Draft CoCP.

- 16.7.2 Once the Proposed Development is constructed, it is unlikely there will be any significant adverse effects on agricultural land quality, soil resources or agricultural holdings during the operation life of the Proposed Development. This is because agricultural land required to construct the Proposed Development will be taken out of agricultural production during the construction phase and no further loss of agricultural land will occur during the operational phase. Therefore, potential operational effects are scoped out of the assessment.

16.8 Mitigation

- 16.8.1 There is no mitigation for the loss of agricultural land required permanently (i.e. the land use will be permanently changed) during the construction phase, but it is possible to mitigate for effects of the Proposed Development on soil resources.
- 16.8.2 The quality and quantity of soil within the Main Application Site should therefore be maintained by implementing appropriate techniques for stripping, storing and re-use. Soil resources would be protected by producing a Soil Management Plan as a requirement of the Draft CoCP. Interviews will be carried out as part of the ES preparation, therefore specific mitigation measures for any significant effects on farm holdings are not known at this stage. This is consistent with the findings and recommendations of recent research carried out on behalf of Defra, including the development of a 'Code of Practice for the Sustainable Management and Use of Soil on Construction Sites' (September 2009), as described in Section 15.2.10.

17 BIODIVERSITY

17.1 Introduction

17.1.1 This chapter presents the proposed approach to the assessment of the likely significant environmental effects of the Proposed Development on biodiversity and nature conservation interests.

17.1.2 The assessment will consider potential impacts on ecological features, including:

- designated sites;
- priority habitats;
- protected species; and
- notable flora and fauna.

17.1.3 Where possible, the Proposed Development will be designed to avoid or reduce adverse effects on valued ecological features and deliver benefits for biodiversity in accordance with policy and best practice.

17.2 Legislation, policy and guidance

Designated sites

17.2.2 Natura 2000 is the name given to the European Union-wide network of nature conservation sites established under the EC Habitats³¹⁵ and Birds Directives³¹⁶ and comprises Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971.

17.2.3 Originally notified under the National Parks and Access to the Countryside Act 1949³¹⁷, Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs) were re-notified under the Wildlife and Countryside Act 1981³¹⁸. Improved provisions for the protection and management of these sites were also introduced by the Countryside and Rights of Way (CRoW) Act 2000³¹⁹.

³¹⁵ Council Directive 92/43/EEC. Available at: [REDACTED]
[REDACTED] Accessed March 2019]

³¹⁶ Council Directive 2009/147/EC (formerly 79/409/EEC). Available [REDACTED]
[REDACTED] [Accessed March 2019]

³¹⁷ National Parks and Access to the Countryside Act 1949. Available at:
<https://www.legislation.gov.uk/ukpga/Geo6/12-13-14/97/contents> [Accessed March 2019]

³¹⁸ Wildlife and Countryside Act 1981. Available at:
<http://www.legislation.gov.uk/ukpga/1981/69/introduction> [Accessed March 2019]

³¹⁹ Countryside and Rights of Way Act 2000. Available at:
<http://www.legislation.gov.uk/ukpga/2000/37/contents> [Accessed March 2019]

Habitats and Species of Principal Importance

17.2.4 Habitats and Species of Principal Importance for the conservation of biodiversity in England are listed under the provisions of Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006³²⁰. These include all the habitats and species in England that were identified as requiring action in the now succeeded UK Biodiversity Action Plan (UK BAP), which continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework.

17.2.5 Section 40 of the NERC Act 2006 places a general duty on all public authorities to pay due regard to conservation and enhancement of biodiversity within their decision making, particularly with reference to those habitats and species listed within Section 41 of the Act.

Hedgerows

17.2.6 The Hedgerows Regulations 1997³²¹ are designed to protect 'Important' countryside hedgerows from removal. To qualify as 'Important', a hedgerow must be at least 30 years old and meet certain qualifying criteria, which identify hedgerows of particular archaeological, historical, wildlife and landscape value.

17.2.7 It is an offence to remove an 'Important' hedgerow without planning consent or a hedgerow removal notice.

Badger

17.2.8 Badgers (*Meles meles*) are afforded protection through the provisions of the Protection of Badgers Act 1992³²², which is based primarily on the need to protect badgers from baiting and deliberate harm or injury. As such, without a licence from Natural England, it is an offence to:

- wilfully kill, injure, take, possess or cruelly ill-treat a badger;
- damage or interfere with a sett; or
- disturb a badger whilst it is occupying a sett.

Bats

17.2.9 Bats and the sites that they use for breeding or resting are afforded protection through the provisions of the Wildlife and Countryside Act 1981 (as amended), and The Conservation of

³²⁰ *Natural Environment and Rural Communities Act 2006*. Available at: <https://www.legislation.gov.uk/ukpga/2006/16/part/3/data.pdf> [Accessed March 2019]

³²¹ *The Hedgerow Regulations 1997 (SI 1997/1160)*. Available at: <http://www.legislation.gov.uk/uksi/1997/1160/contents/made> [Accessed March 2019]

³²² *Protection of Badgers Act 1992*. Available at: <http://www.legislation.gov.uk/ukpga/1992/51/crossheading/offences> [Accessed March 2019]

Habitats and Species and Planning (Various Amendments) (England and Wales) Regulations 2018³²³. It is an offence, without a licence from Natural England, to:

- kill, injure or capture a bat;
- damage, destroy or obstruct access to any bat breeding site or resting place; or
- disturb a bat if it is likely to:
 - impair its ability to:
 - survive, breed or reproduce or rear/nurture young;
 - hibernate or migrate; or
 - significantly affect the local distribution or abundance of the species to which they belong.

17.2.10 A roost is protected whether or not bats are present. Works affecting a roost, even when bats are absent, are likely to require a European Protected Species (EPS) licence from Natural England to authorise actions that would otherwise be illegal.

Hazel dormouse

17.2.11 Hazel dormouse (*Muscardinus avellanarius*) is afforded protection through the provisions of the Wildlife and Countryside Act 1981 (as amended), CRoW Act 2000 and The Conservation of Habitats and Species and Planning (Various Amendments) (England and Wales) Regulations 2018. As such, without a licence from Natural England it is an offence to:

- kill, injure or capture a dormouse;
- damage, destroy or obstruct access to any breeding site or resting place of a dormouse; and
- disturb a dormouse while it is occupying a structure or place that it uses for shelter or protection.

Riparian mammals

17.2.12 Otter (*Lutra lutra*) and sites that they use for breeding or shelter are afforded protection through the provisions of the Wildlife and Countryside Act 1981 (as amended), and The Conservation of Habitat and Species and Planning (Various Amendments) (England and Wales) Regulations 2018. It is an offence, without a licence from Natural England to:

- kill, injure or capture an otter; or

³²³ *Conservation of Habitats and Species and Planning (Various Amendments) (England and Wales) Regulations 2018*. SI 2018/1307 Available at: <http://www.legislation.gov.uk/uksi/2018/1307/made> [Accessed March 2019]

- damage, destroy or obstruct access to any otter breeding or resting site.

17.2.13 Water vole (*Arvicola amphibius*) is afforded legal protection through provisions in the Wildlife and Countryside Act 1981 (as amended) and the CRow Act 2000. It is an offence to kill or injure water voles, and to damage, destroy or obstruct access to any place that water vole use for shelter or protection, or to disturb water voles while they are using such a place.

Amphibians

17.2.14 Great crested newt (*Triturus cristatus*) is afforded protection through the provisions of the Wildlife and Countryside Act 1981 (as amended), CRow Act 2000 and The Conservation of Habitat and Species and Planning (Various Amendments) (England and Wales) Regulations 2018. As such, without a licence from Natural England it is an offence to:

- kill, injure or capture a great crested newt;
- damage, destroy or obstruct access to any breeding site or resting place of a great crested newt; and
- disturb a great crested newt while it is occupying a structure or place that it uses for shelter or protection.

17.2.15 The legislation applies to all stages of the life cycle including eggs, larvae and juveniles.

17.2.16 In addition, natterjack toad (*Bufo calamita*) is afforded full protection under the legislation listed above but is unlikely to be present within the Main Application Site.

Reptiles

17.2.17 Widespread reptile species; grass snake (*Natrix natrix*), adder (*Vipera berus*), slow-worm (*Anguis fragilis*) and common lizard (*Zootoca vivipara*), are subject to protection through the provisions of the Wildlife and Countryside Act 1981 (as amended) and the CRow Act 2000. This legislation makes it illegal to intentionally kill or injure a reptile.

Breeding birds

17.2.18 All wild birds, their nests and their eggs are afforded legal protection through provisions in the Wildlife and Countryside Act 1981 (as amended) and the CRow Act 2000. It is an offence, with certain exceptions, to:

- kill, injure or take any wild bird;
- take, damage or destroy the nest of any wild bird while it is in use or being built;

- take or destroy the egg of any wild bird; and
- have in one's possession or control any wild bird (dead or alive), part of a wild bird or egg of a wild bird which has been taken in contravention of the Act, the Protection of Birds Act 1954 or the law of any EU Member State (which implements the EU Birds Directive 1979).

17.2.19 In addition to the above listed offences, it is also illegal to intentionally or recklessly disturb any wild bird listed on Schedule 1 of the Wildlife and Countryside Act whilst nesting.

17.2.20 Species that are listed on Schedule 1 of the Act, such as barn owl (*Tyto alba*), brambling (*Fringilla montifringilla*), redwing (*Turdus iliacus*) and red kite (*Milvus milvus*), are also subject to special penalties at all times and consent from Natural England would be required to cause disturbance while nesting or to disturb its dependent young.

Roman snail

17.2.21 The Roman snail (*Helix pomatia*) is included within Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), making it an offence to:

- intentionally kill, injure or take (including taking by hand) a Roman snail;
- possess or control alive or dead Roman snail, or any part of one; or
- sell, offer for sale or advertise for, live or dead Roman snails.

Other Invertebrates

17.2.22 Certain invertebrate species listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and the CRoW Act 2000 are afforded legal protection and it is an offence to:

- intentionally kill, injure or capture;
- intentionally or recklessly disturb;
- intentionally or recklessly damage, destroy or obstruct places of shelter or protection, including breeding sites (occupied or not);
- possess or transport an animal (or any part thereof) unless under licence; and
- sell or exchange animals.

17.2.23 The legislation refers to all life stages (eggs, larvae, juveniles and adults).

17.2.24 British Red Data Book (RDB)³²⁴ species are those that are either nationally rare (recorded in 1 to 15 10km squares of the Ordnance Survey national grid) or are of international nature conservation importance. British Red Data Book status is further subdivided as follows:

- RDB1: Endangered – Species which have shown a rapid continuous decline over the last 20 years and now exist in 5 or fewer 10km squares;
- RDB2: Vulnerable – Species likely to qualify as RDB1 in the near future, as most populations are declining throughout their range; and
- RDB3: Rare – Species with small populations which are localised or thinly scattered, but do not at present qualify under RDB1 or RDB2 criteria.

17.2.25 Nationally scarce (Notable) species are those that have been recorded in 16 to 100 10km squares and are further subdivided into Category A (Na) species (recorded in 16 to 30 10km squares), Category B (Nb) species (recorded in 31 to 100 10km squares) and Nationally Scarce (N) species (that do not fall within RDB categories but which are nonetheless uncommon in Great Britain recorded in 16 to 100 10km squares).

17.2.26 In addition to the above, International Union for the Conservation of Nature (IUCN) Red List Categories and Criteria version 3.1³²⁵ have been applied to British butterflies, dragonflies, water beetles and several other invertebrate groups. Using the Great Britain Rarity Status these are subdivided into:

- Nationally Rare (NR) – Native species which have not been recorded from more than 15 British hectads (10km by 10km squares) in recent decades; and
- Nationally Scarce (NS) – Native species which are not regarded as Nationally Rare and have not been recorded from more than 100 British hectads in recent decades.

National planning and aviation policy

Airports National Policy Statement – June 2018

17.2.27 Paragraphs 5.89 – 5.91 of the ANPS¹¹ set out the considerations for an assessment of biodiversity and ecological conservation,

³²⁴ Shirt, D.B. (ed.) (1987). *British Red Data Books: 2. Insects*. Peterborough: Nature Conservancy Council.

³²⁵ IUCN (2001). *IUCN Red List Categories and Criteria: version 3.1. Prepared by the IUCN Species Survival Commission*. Gland, Switzerland: International Union for Conservation of Nature.

with a general aim of achieving no net loss to biodiversity. Paragraph 5.89 states:

“.....the environmental statement submitted with its application for development consent clearly sets out any likely significant effects on internationally, nationally and locally designated sites of ecological or geological importance, protected species, and habitats and other species identified as being of principal importance for the conservation of biodiversity.”

17.2.28 Paragraphs 5.92 to 5.95 describe some of the ecological mitigation measures that could be incorporated into an airport development during construction or operation. Although aimed at Heathrow some of these measures could be relevant to LTN. Paragraph 5.94 emphasises that *“the applicant’s proposal should address the mitigation hierarchy (which supports efforts to conserve and enhance biodiversity), which is set out in the National Planning Policy Framework.”*

17.2.29 Paragraph 5.95 also states that *“The application of a 2:1 compensation ratio³²⁶ is considered to represent the minimum requirement. However, there are other mechanisms for establishing compensation ratios, such as Defra’s biodiversity offsetting metric.”*

17.2.30 Paragraph 5.104 is concerned with opportunities for enhancement of biodiversity as part of the design process and states:

“The proposed development comprised in the preferred scheme should provide many opportunities for building in beneficial biodiversity as part of good design. When considering proposals, the Secretary of State will consider whether the applicant has maximised such opportunities in and around developments, and particularly to establishing and enhancing green infrastructure. The Secretary of State may use requirements or planning obligations where appropriate in order to ensure that such beneficial features are delivered.”

National Planning Policy Framework (NPPF) – February 2019

17.2.31 Chapter 15 of the NPPF is focused on the need to conserve and enhance the natural environment. Paragraph 170 states that *“decisions should contribute to and enhance the natural and local environment by:*

- a) *protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a matter*

³²⁶ Details are not defined within the ANPS. However, this is taken to mean that compensation habitat should represent at least 200% (i.e. double) of the area of habitat lost that is assessed as being of ecological value.

commensurate with their statutory status or identified quality in the development plan);

- b) *recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services - including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
- c) *maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- d) *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- e) *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environment conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*
- f) *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.”*

17.2.32 Paragraph 175 sets out principles in relation to habitats and biodiversity that local planning authorities should apply when determining planning applications and includes:

- a) *If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort compensated for, then planning permission should be refused:*
- b) *development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that that make it of scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;*
- c) *development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists and*

- d) *development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.*

Local policy

Luton Local Plan 2011-2031 – November 2017

17.2.33 The Luton Local Plan 2011-2031 was adopted on 7 November 2017. This document identifies two strategic objectives relating to the natural (and historic) environment:

- Strategic Objective 5 – *“improve the built and natural environment to deliver quality places, through high quality and sustainable design.”*
- Strategic Objective 10 – *“improve, protect and enhance biodiversity of natural areas within the town, including the quality, accessibility, health and recreational value of green space.”*

17.2.34 In addition, Policy LLP28 relates to biodiversity and nature conservation and states that:

“The Council will work with partner organisations to positively assess, manage and designate sites and ecological networks including giving support to development proposals which add to the net stock of wildlife habitats or where they can help deliver a net gain in the conservation and enhancement of such sites.”

North Hertfordshire District Council Proposed Submission Local Plan 2011-2031 – October 2016

17.2.35 NHDC is in the process of replacing the current Local Plan (adopted 1996) with a new Local Plan to cover the period 2011 to 2031. The draft proposals that are relevant to this assessment include:

- ENV5 – *“Environmental: Strategic objective to increase biodiversity and protect and enhance the quality of existing environmental assets by enhancing new green spaces and networks of green space for both recreation and wildlife.”*
- SP1 – *“Sustainable development: Protect key elements of North Hertfordshire’s environment including important landscapes, heritage assets and green infrastructure.”*
- SP10 – *“Healthy communities: Protect, enhance and create new physical and green infrastructure to foster healthy lifestyles.”*

- SP12 – *“Green infrastructure, biodiversity and landscape: Protect, enhance and manage the green infrastructure network and seek opportunities to create new green infrastructure; and to Protect, enhance and manage biodiversity networks including wetland and riverine habitats and seek opportunities for net gains for biodiversity.”*
- NE5 – *“New and improved public open space and biodiversity: Incorporate an open space buffer(s) where necessary for landscape, visual, ecological or air quality reasons; and to contribute to net gains for biodiversity, ecological networks and the water environment and/or restores degraded or isolated habitats.”*
- NE6 – *“Designated biodiversity and geological sites: Protect, enhance and manage designated sites; submit an ecological survey and demonstrate that adverse effects can be satisfactorily minimised via mitigation and/or off-setting measures; manage construction impacts by (i) demonstrating how existing wildlife habitats will be retained, safeguarded and managed during construction (ii) providing a buffer of complimentary habitat for all connective features for wildlife habitats or priority habitats.”*

Central Bedfordshire Council Local Plan 2035: Pre-Submission (January 2018)

17.2.36 CBC has recently published their pre-submission Local Plan for 2015-2035³²⁷. The draft policies that are relevant to this assessment include:

- EE2 – *“Enhancing biodiversity: development proposals should provide a net gain in biodiversity through enhancement and creation of ecological networks by (i) incorporating and enhancing existing and creating new biodiversity features within their design, and (ii) maximising opportunities to enhance and create links between ecological networks and habitats of principal importance. Links should be created both on-site and, where possible, with nearby features.”*
- EE3 – *“Nature conservation: up to date, comprehensive ecological surveys undertaken in accordance with industry guidelines and standards will be required to support and inform development proposals what would affect sites for nature conservation, protected species or species/habitats of principal importance demonstrating development will deliver a net gain.”*

³²⁷ Central Bedfordshire Council (2018). *Central Bedfordshire Local Plan 2035: Pre-Submission*. Available at: http://www.centralbedfordshire.gov.uk/Images/pre-submission-local-plan-compressed-v2_tcm3-27081.pdf

- EE4 – *“Trees, woodlands and hedgerows: woodlands, including semi-natural woodlands, planted ancient woodland sites, orchards, hedgerows and specimen trees found outside woodlands will be protected and buffered from development. Existing hedgerows and trees should be incorporated to enhance developments. Hedgerows and treed boundaries should be reinforced, safeguarded within green corridors and extended where possible to create linkage.”*

17.2.37 This policy also states:

“Ancient woodlands, and aged and veteran trees are irreplaceable resources that are protected from development in the NPPF. Construction close to, though not directly involving destruction of an ancient or semi-ancient woodland, trees and hedgerows, can nevertheless still be damaging. A minimum buffer of 15 metres should be maintained between the development boundary and the woodland edges.”

Local Biodiversity Action Plans

17.2.38 The following Local Biodiversity Action Plans (LBAPs) list habitats and species which are county conservation priorities. The lists include Habitats and Species of Principal Importance, as well as those of county importance.

Bedfordshire and Luton Local Biodiversity Action Plan

17.2.39 Actions for maintaining or enhancing the conservation status of certain habitats and species listed on the Bedfordshire and Luton Local Biodiversity Action Plan (LBAP)³²⁸ have been prepared. Those listed that are likely to be relevant at this stage include (but not necessarily limited to):

- lowland meadow and calcareous grassland;
- hedgerows;
- arable field margins;
- ponds;
- woodland;
- great crested newt; and
- hazel dormouse.

Hertfordshire Local Biodiversity Action Plan

17.2.40 Actions for maintaining or enhancing the conservation status of certain habitats and species listed on the Hertfordshire Local

³²⁸ Biodiversity Recording and Monitoring Centre (2019). *Biodiversity Action Plan*. Available at: [\[REDACTED\]](#) [Accessed March 2019]

Biodiversity Action Plan (HLBAP)³²⁹ have been prepared. Those listed which are relevant to this assessment include:

- woodland;
- farmland;
- neutral grassland;
- Natterer's bat (*Myotis nattereri*);
- tree sparrow (*Passer montanus*);
- song thrush (*Turdus philomelos*);
- great crested newt; and
- hazel dormouse.

Guidance

17.2.41 Office of the Deputy Prime Minister (ODPM) Circular 06/2005³³⁰ provides guidance on the application of the law relating to planning and nature conservation as it applies in England, complementing the NPPF.

17.2.42 Individual surveys will be conducted in accordance with the relevant best practice guidance and the ecological assessment will follow the Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland³³¹.

17.3 Stakeholder engagement and consultation

17.3.1 Principal consultees have been identified and focussed engagement (through both informal and formal consultation) will be undertaken and recorded throughout the pre-application stages of the project. Consultees include:

- Natural England;
- Environment Agency;
- LBC;

³²⁹ Hertfordshire Environmental Forum (2006). *A Biodiversity Action Plan for Hertfordshire*. Available at: [REDACTED]. [Accessed March 2019]

³³⁰ ODPM (2015). *Government Circular 06/2005: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System*. Available at: <https://www.gov.uk/government/publications/biodiversity-and-geological-conservation-circular-06-2005> [Accessed March 2019]

³³¹ CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester.

- NHDC³³²;
- HCC;
- CBC;
- Wildlife Trust for Bedfordshire, Cambridgeshire and Northamptonshire; and
- Herts and Middlesex Wildlife Trust.

17.3.2 A 'Biodiversity Technical Working Group' was set up in April 2018 with quarterly meetings to discuss survey scope, survey results and proposed mitigation/enhancement measures. Attendees to date have included representatives from LBC, HCC, CBC, the Wildlife Trust for Bedfordshire, Cambridgeshire and Northamptonshire and Herts and Middlesex Wildlife Trust. The scope and extent of surveys undertaken in 2018/2019 has been discussed and agreed with this Technical Working Group.

17.4 Baseline conditions

17.4.1 This section presents a description of the existing site conditions based on desk-based data gathering and surveys undertaken between 2016 and 2018. Further data gathering and survey proposals are set out in Section 17.5 below.

Study Area

Site description

17.4.2 The Main Application Site covers approximately 360ha, of which approximately 170ha comprises previously undeveloped, predominantly arable land, with hedgerows, trees and shrub-lined margins. Occasional woodland blocks, copses and windbreaks are present with areas of scrub, rough grassland, ruderal vegetation, conservation headlands and game cover adjacent to field edges.

17.4.3 The Main Application Site also includes two non-statutory designated sites which are detailed below:

- Wigmore Park County Wildlife Site (CWS), which covers the southern half of Wigmore Valley Park (15.4ha), is recognised for its neutral and calcareous grassland and hedgerows as well as supporting at least four species of orchid (including common spotted, common twayblade, pyramidal and bee orchids). The northern part of the park is comprised of amenity grassland with public facilities, including a playground, skate park, community centre and conference

³³² North Hertfordshire District Council do not have an in-house ecologist therefore Hertfordshire County Council are providing planning advice on their behalf in this instance.

facility. The northern part is not covered by the CWS designation.

- Winch Hill Wood straddles the Bedfordshire and Luton/Hertfordshire border and is therefore designated as a CWS within Bedfordshire and a Local Wildlife Site (LWS) within Hertfordshire. It comprises ancient semi-natural broadleaved woodland with ancient woodland indicator species and hedgerows of value. The site is a remnant (less than 2ha) of a larger ancient woodland.

17.4.4 The existing airport is generally dominated by hardstanding with amenity grassland and small patches of scrub.

Zone of Influence

17.4.5 The ZOI vary between receptors and are also dependent upon the area over which the impacts of the Proposed Development may be detected. As a result, the following Study Areas for biodiversity receptors are proposed from the Main Application Site, in line with standard best practice methodology:

- Statutory designated sites within 10km (within 30km for those designated for bat and bird species).
- Non-statutory designated sites within 2km.
- Section 41 priority habitats within/adjacent to the Main Application Site.
- Protected and notable species:
 - Reptiles, Roman snail, terrestrial invertebrates and other notable mammals within the Main Application Site;
 - Bats, breeding birds, hazel dormouse and wintering birds within 100m;
 - Badgers and great crested newts (in waterbodies) within 500m; and
 - Barn owl, hobby and red kite within 1.5km.

17.4.6 The proposed Off-site Car Parks and Off-site Highway Interventions (including signalisation of junctions) are located on existing areas of hardstanding with negligible ecological value, therefore, these locations are not considered to form part of the Study Area for biodiversity receptors and not discussed further in the description of the baseline.

Data gathering and survey

17.4.7 The biodiversity baseline data gathering exercise to date has focussed upon assembling information on international, national and local designated sites and protected and notable species. The following sources have been accessed:

- Bedfordshire and Luton Biodiversity Recording and Monitoring Centre (BLBRMC);
- Herts Environmental Records Centre (HERC);
- Multi-Agency Geographic Information for the Countryside (MAGIC) database interactive mapping tool;
- Aerial photography as a scale of 1:25,000;
- Ordnance Survey mapping (at scales of 1:50,000 and 1:25,000).

17.4.8 Ecological data gathering has been ongoing on site for several years. The most recent suite of survey work includes a phase 1 habitat survey covering the Main Application Site undertaken in 2018, followed by surveys for protected species (including badgers, bats, hazel dormouse, amphibians, reptiles, breeding and wintering birds, barn owl and terrestrial invertebrates) and National Vegetation Classification (NVC) surveys of broadleaved woodland, calcareous and neutral grassland and arable weeds. In addition, surveys for Roman snail were undertaken as part of the Luton DART planning application in 2017. Further ecological surveys are ongoing in 2019.

Existing conditions

Designated nature conservation sites

- 17.4.9** There are no international designated sites³³³ within 10km of the Main Application Site and no sites designated for bat species within 30km. Lea Valley SPA is located approximately 24km south east of the Main Application Site and comprises embanked water supply reservoirs, sewage treatment lagoons and former gravel pits that support a range of man-made, semi-natural and valley bottom habitats. These wetland habitats support wintering wildfowl, in particular Gadwall (*Anas strepera*) and Shoveler (*Anas clypeata*), which occur in numbers of European importance as well as significant numbers of wintering Bittern (*Botaurus stellaris*).
- 17.4.10** The closest international designated site is Chiltern Beechwoods SAC, located approximately 13km south west of the Main Application Site.
- 17.4.11** There are fourteen statutory designated sites within 10km of the Main Application Site. Ten of these sites are SSSIs, some of which are also designated as NNRs or LNRs, and four are LNRs, as detailed in Table 17-1 below and on Figure 17.1 (Volume 2).

³³³ Including Special Areas of Conservation (SACs), candidate SACs (cSACs), Special Protection Areas (SPAs), potential SPAs (pSPAs) and Ramsar sites.

Table 17-1: Statutory Designated Sites within 10km of the Main Application Site

Site Name	Location	Reason for Designation
Sites of Special Scientific Interest (SSSIs)		
Wain Wood SSSI	4.8km north east	An ancient semi-natural oak/hornbeam woodland, approaching the northern limit of its natural range, it represents an example of a habitat now much reduced in extent nationally.
Galley and Warden Hills SSSI / LNR	3.8km north west	Unimproved neutral and calcareous grassland supporting a characteristic downland flora, including many locally uncommon species and nationally rare plants, both within Bedfordshire and nationally. Chalk downland is a habitat that has been greatly reduced in extent and quality through changes in agriculture.
Deacon Hill SSSI	6.5km north	Remnant of chalk downland with a characteristic species rich, calcareous grassland flora. Many of the plants are now uncommon in Bedfordshire. Nationally this is a habitat that has been greatly reduced in extent and quality through changes in agriculture.
Blow's Down SSSI	5.6km west	A rich and varied site with a large area of open, unimproved grassland. Such sites have declined nationally and this site is a fine example of what little remains of this important habitat.
Knebworth Woods SSSI	7.5km east	This woodland site is of a type nationally rare, but well represented in Hertfordshire. It is a most important woodland in the north of the county, almost all ancient in origin and is ecologically diverse with rides, ponds and small areas of both acidic and neutral grassland.
Kensworth Chalk Pit SSSI	6.7km west	Designated for its geological interest
Barton Hills SSSI	7.1km north	Chalk escarpment retaining an extensive cover of unimproved chalk grassland supporting many species of grasses and flowering plants. Opposite, a small ancient beech (<i>Fagus sylvatica</i>) wood.
Oughtonhead Lane SSSI	8.3km north east	Designated for its geological interest.
Knocking Hoe SSSI / NNR	8.1km north	Lower Chalk escarpment retaining areas of unimproved calcareous grassland supporting a downland flora, which includes several nationally rare plants and other species rare in Bedfordshire.
Smithcombe, Sharpenhoe & Sundon Hills SSSI	7.6km north west	Lower Chalk escarpment with areas of unimproved calcareous grassland with a rich assemblage of characteristic plants. Many of the plants associated with this site are now uncommon in Bedfordshire and nationally. This is a habitat that has been greatly reduced in extent and quality through changes in agriculture.
Local Nature Reserves (LNRs)		
Batford Springs LNR	5.6km south	Fresh springs that serve a small network of chalk lined streams and ponds. The River Lea flows through the

Site Name	Location	Reason for Designation
		site and there is open grassland and a small wooded area.
Marshalls Heath LNR	6.0km south	A small fragment of acid grass heath dominated by secondary woodland and scrub, with more than 1,300 species of plant and animal recorded in recent years, including more than 40 species now on national lists of threatened species. The site is well-known locally for its large anthills constructed by yellow hill ants (<i>Lasius flavus</i>).
Cottage Bottom Fields LNR	5.4km west	Flower-rich grassland rich in wildlife and full of colour with areas of scrub providing shelter for birds and insects. The slopes are home to possibly the largest population of great pignut (<i>Bunium bulbocastanum</i>) in the country.
Wheathampstead LNR	8.5km south	Secondary ash woodland grades with mature hedgerow bounding the western edge of the site and areas of rough unimproved neutral grassland, ruderal habitat and a pond/scrape area.

17.4.12 There are 29 non-statutory designated sites, generally associated with remnant areas of ancient woodland located within 2km of the Main Application Site. Local authorities use different terms to refer to wildlife sites with Hertfordshire using LWS and Bedfordshire and Luton classifying them as CWS and District Wildlife Site (DWS). Details of these sites are shown in Table 17-2 below and on Figure 17.2 (Volume 2).

Table 17-2: Non-statutory Designated Sites within 2km of the Proposed Development

Site Name	Location	Reason for Designation
Luton Parkway Verges DWS	Immediately adjacent to the Proposed Development	This site is recognised for its calcareous and neutral grassland with several calcareous/neutral grassland indicators recorded.
Burnt Wood LWS	Immediately adjacent to the Proposed Development	Ancient Woodland Inventory site; remnant semi-natural canopy; ancient physical features; woodland indicators. Ancient semi-natural pendunculate/hornbeam woodland largely replanted with conifers. Old pits, wood banks and quite diverse ground flora, including bluebells, add to interest.
Luton Hoo Park CWS	120m south	This site is recognised for its ancient woodland, special woodland interest and diversity of habitats. Habitats present include lowland mixed deciduous woodland, standing open water, plantation, neutral grassland, parkland, ruderal vegetation and bracken.
River Lea CWS	260m south	River with associated riparian habitats with fen, marsh and swamp in addition to neutral grassland, scrub, hedgerows and trees. The river supports a population of water vole.

Site Name	Location	Reason for Designation
Diamondend Springs, Limekiln Wood, Pondcroft LWS	360m south east	Ancient woodland with a semi-natural canopy suggesting ancient origin; woodland indicators. Ancient semi-natural pendunculate oak with hornbeam, beech and wild cherry (<i>Prunus avium</i>) to the east and ash, hornbeam and hazel (<i>Corylus avellana</i>) to the west with a ground flora dominated by bluebell and dog's mercury (<i>Mercurialis perennis</i>).
Slaughter's Wood and Green Lane CWS	440m north	Ancient semi-natural woodland with an understorey of coppiced hazel. The site is recognised for ancient woodland and hedgerows with historical importance. Also present are neutral grassland, scrub and bracken.
Withstocks Wood LWS	570m south	Ancient Woodland Inventory site; woodland indicators. Ancient semi-natural pendunculate oak/ hornbeam coppice woodland. Dense growth of silver birch (<i>Betula pendula</i>) with some wild cherry. Planted Scots pine (<i>Pinus sylvestris</i>), European larch (<i>Larix decidua</i>) and a few old Norway spruce (<i>Picea abies</i>). Quite diverse ground flora with a number of ferns recorded.
Sloughs Wood LWS	630m south	Former oak/ hornbeam coppice woodland. Small area of hornbeam coppice to the west, mainly replanted with conifers. Small area of hornbeam coppice. Main area has been replanted with conifers.
George Wood CWS	740m south	Ancient semi-natural woodland with mixed plantation and coniferous plantation.
River Lea DWS	760m west	Undeveloped floodplain associated with the river. Also present are neutral grassland, scrub, trees, hedgerows and allotments.
Kidney and Bull Woods CWS	780m south west	Ancient semi-natural woodland with conifer and mixed plantation and neutral and marshy grassland.
Sewett's Wood & Sellbarn's Dell LWS	790m south east	Ancient Woodland Inventory site; woodland indicators. Ancient semi-natural pendunculate oak/ hornbeam coppice with standards woodland. Part replanted with conifers and mixed plantation. Ground flora dominated by bluebell and bramble (<i>Rubus fruticosus agg.</i>).
Church Cemetery CWS	970m west	The cemetery is recognised for its neutral grassland with trees and shrubs.
Watkins Wood & Lords Wood LWS	1090m east	Ancient Woodland Inventory site with areas of semi-natural canopy and ancient physical features. Ancient semi-natural pendunculate oak/ hornbeam coppice with standards woodland largely replanted with broadleaved and coniferous species. Ground flora dominated by bluebell.
Hurst Wood LWS	1120m south east	Ancient Woodland Inventory site; woodland indicators. Ancient semi-natural pendunculate oak/

Site Name	Location	Reason for Designation
		hornbeam coppiced woodland with wild cherry and ash. Species rich ground flora with bluebell.
Haringdell and Fernell's Wood CWS	1130m south	The majority of the site is ancient woodland with broadleaved woodland and plantation.
Chiltern Green CWS	1160m south	Lowland mixed-deciduous woodland with ancient semi-natural woodland, neutral grassland scrub and standing water.
Laysbury Dells LWS	1260m south east	Semi-natural broadleaved woodland supporting oak, ash, hazel and beech. Hazel dormouse has been recorded.
Stubbock's Wood LWS	1270m north	Ancient Woodland Inventory site (part); remnant semi-natural canopy; ancient physical features; woodland indicators. Ancient semi-natural woodland part replanted with broadleaved and coniferous species. Thought to be oak and hornbeam in origin with hazel ash (<i>Fraxinus excelsior</i>) and elm (<i>Ulmus spp</i>) Further woody species and a field layer of bluebell and dog's mercury.
Horsley's Wood CWS	1310m south	Ancient semi-natural woodland largely replanted with conifers. Mixed plantation with tall herb and fern.
Wandon End Park CWS	1375m north	The site is recognised as meeting the criteria for a hedgerow system and containing biologically significant trees.
Hitchin Road Spinney DWS	1550m north west	Semi-natural broadleaved woodland with veteran trees.
Whiteway Bottom Copse LWS	1700m south east	Ancient woodland with a semi-natural canopy. Ancient semi-natural pedunculate oak/ hornbeam woodland with beech. Field layer dominated by bluebell.
Long Lane LWS	1840m	Wooded green lane with features and structure indicative of ancient origins; woodland indicators. Old hedgerows and open areas of grassland with scattered trees and scrub. Hedges comprise range of woody species including field maple, hazel, hawthorn, ash, holly. A good diversity of woodland indicators recorded including bluebell, moschatel and dog's mercury.
People's Park CWS	1930m north west	An area of parkland on chalky soils containing grassland and woodland habitats. Recognised for its neutral grassland with calcareous grassland, broadleaved woodland, mature trees, scrub and hedgerows also present.
The Chase CWS	1970m north west	A belt of broadleaved woodland grading into dense scrub to the north. The woodland contains coppiced hazel and field maple and has a grassland ground flora in its more open areas.

- 17.4.13 Updated designated sites records will be obtained in Spring 2019, which will include ancient woodland inventory sites and any designated roadside verges within 2km of the Main Application Site.

Habitats

- 17.4.14 The Main Application Site is located on the eastern edge of Luton, with industrial and residential properties to the west and north, and agricultural fields to the east and south.
- 17.4.15 NVC surveys and a search for notable plant species were undertaken within areas of neutral/calcareous grassland and woodland during 2018, following the survey methods presented in Rodwell (2006)³³⁴.
- 17.4.16 Plantlife, a conservation charity, has developed a methodology for determining sites of importance for arable plant conservation (Byfield & Wilson, 2005)³³⁵. Although it is aimed principally at identifying nationally important sites (Important Arable Plant Areas), the methodology works equally well on a smaller scale. It works on the premise that certain rare and declining plants indicative of arable habitats are assigned a numerical score. When assessing the arable plant assemblage of a site (at farm, field or field margin level), the individual scores are summed to give an overall score. This methodology was employed during 2018 in relevant arable areas of the Main Application Site as required.
- 17.4.17 Due to the extent of the Proposed Development a number of habitats of note are present, forming a mosaic of inter-connected habitat. A brief summary of the main habitat types is provided below.

Grassland

- 17.4.18 Wigmore Valley Park supports the main area of grassland within the Main Application Site and lies immediately north and east of LTN. A large proportion of this is amenity grassland covering around 46% of the 39ha that form the wider park. More floristically diverse areas of neutral and calcareous grassland are found in the south of Wigmore Valley Park covering around 4ha.
- 17.4.19 Other patches of grassland are spread across the wider Main Application Site and are largely formed of set aside, field margins and other small patches within a largely arable setting. These are

³³⁴ Rodwell, J.S (2006). *National Vegetation Classification Users' Handbook*. Joint Nature Conservation Committee, Peterborough.

³³⁵ Byfield A. and Wilson P. 2005. *Important Arable Plant Areas: Identifying priority sites for arable plant conservation in the United Kingdom*. Plantlife, Salisbury.

of semi natural typology of neutral to calcareous grassland and will provide habitats for a wide range of species.

- 17.4.20 NVC surveys have revealed localised areas of botanical interest. These include areas of wet grassland (MG10) and species-rich shortly grazed grassland (MG1A, MG5, MG6 and sub-community MG6a) within the southern section of Wigmore Valley Park. In addition, areas of calcareous grassland MG6c, CG7 and CG2 have been identified in the eastern section of the Main Application Site.

Woodland

- 17.4.21 Woodlands formed from copses and plantation woodland of various ages are scattered across the Main Application Site. Woodland associated with Wigmore Valley Park is mainly linear and plantation in nature and consists of young to semi-mature stands in a parkland setting. Winch Hill Wood, an area of ancient woodland, is also located within the Main Application Site, to the east of the existing airport boundary, and comprises W10 and W8-10.
- 17.4.22 Further to the east are small areas (around 2.5ha) of both semi-natural (W8) and plantation woodland that are bounded by arable fields.

Hedgerows and field margins

- 17.4.23 A limited number of hedgerows across the Main Application Site are species-rich and intact, with some including trees, details of which are to be provided within the ES. The majority of hedgerows are, however, species poor and often defunct.

Scrub

- 17.4.24 Large areas of scrub, covering approximately 8ha, are present in the south and east of Wigmore Valley Park with some evolving into early growth woodland.

Arable

- 17.4.25 Arable fields make up large areas of habitat within the east of the Main Application Site. These arable fields have associated hedgerows, field margins, woodlands and grassland habitats, forming a mosaic of farmland landscapes.

Water bodies

- 17.4.26 There are five ponds within the Main Application Site; two water lagoons adjacent to the fire training area to the east of the existing airport, one man-made pond, with steep brick sides adjacent to the eastern boundary of the airport, and two surface water attenuation ponds in the north west corner of Wigmore

Valley Park. There are a further six ponds within 500m of the Main Application Site. This excludes any residential garden ponds to the north or west of the site due to Vauxhall Way and Eaton Green Road which are likely to act as dispersal barriers.

Species

Badger

- 17.4.27 A review of desk study data identified several records of badger within 2km of the Main Application Site. Historic records (those older than 15 years) have been omitted as they are not considered to accurately reflect the current status of local badger populations. The closest of the recent records are three setts within the Main Application Site, recorded in 2006. A large number of recent (2004-2014) badger road kill records have also been provided by BLBRMC, originating from a section of the B653 Lower Harpenden Road which occurs to the south west of the site, beyond the A1081.
- 17.4.28 Surveys undertaken in 2017 indicated that four main setts occur and at least four independent social groups are active within the Main Application Site. Several annexe, subsidiary and outlier setts have also been recorded within the Main Application Site. Additional surveys undertaken in 2018 confirmed that this baseline has not changed with only minor amendments to the locations and activity of outlier setts recorded.

Bats

- 17.4.29 A review of desk study data identified several records of bat species within 2km of the Main Application Site. Historic records (those older than 15 years) have been omitted as they are not considered to accurately reflect the current status of local bat populations. The closest of the recent records from HERC are field records of a long-eared (*Plecotus sp.*) and a common pipistrelle bat (*Pipistrellus pipistrellus*) to the south east of the Main Application Site, recorded in 2007. BLBRMC have returned several recent (2009-2014) records of bats originating from the Luton Hoo Park CWS, located approximately 120m south of the Main Application Site with brown-long-eared (*Plectocus auritus*), common pipistrelle, soprano pipistrelle (*Pipistrellus pygmaeus*), noctule (*Nyctalus noctula*), serotine (*Eptesicus serotinus*) and Myotis sp. having been recorded. BLBRMC have also returned records of a common pipistrelle from within the residential area immediately north of the Main Application Site recorded in 2008.
- 17.4.30 The habitat within the Main Application Site is considered to be of moderate suitability for roosting and foraging bats. This is defined as “*Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub*” and potential roost sites “*unlikely to support a roost of*

high conservation status."⁴¹ A suite of bat surveys were undertaken across the majority of the Main Application Site during 2016 as part of the New Century Park planning application. In line with guidance, the following surveys were also undertaken during 2018:

- static detector and activity surveys on a monthly basis between April and October;
- ground-based assessment of trees, followed by targeted aerial assessment of trees considered to have moderate and high bat potential; and
- trapping surveys using mist nets/harp traps with an acoustic lure within areas of ancient woodland.

17.4.31 Previous surveys undertaken in 2016 identified three common pipistrelle roosts within the Main Application Site, one to the north west of Wigmore Valley Park and two within mature trees along the eastern boundary of the existing airport. Further unconfirmed roosts were indicated in the Winch Hill Wood CWS and in trees along the central woodland belt within the Main Application Site, running north west to south east. Surveys undertaken in 2018 did not identify any additional bat roosts.

17.4.32 Bat species recorded in 2016 and 2018 within the Main Application Site included common, soprano and Nathusius' pipistrelle, (*Pipistrellus nathusii*) noctule, Leisler's bat (*Nyctalus leisleri*), serotine, Myotis species, brown long-eared and barbastelle (*Barbastella barbastelleus*).

17.4.33 Key commuting routes were identified north to south from Eaton Green/Darley Road to the airport, from Eaton Green Road to Winch Hill Lane via the central woodland belt through the Main Application Site, the southern boundary from Wigmore Valley Park scrub to Winch Hill CWS and to the north of Wigmore Valley Park.

17.4.34 Key foraging areas were identified to the south of Wigmore Valley Park, the mature tree line running along the eastern boundary of Wigmore Valley Park, along the central woodland belt through the Main Application Site and along the southern boundary adjacent to the airport.

Hazel dormouse

17.4.35 A review of desk study data returned no recent records of hazel dormouse within 2km of the Main Application Site. However, a historic record exists in the new park area to the east, recorded in 1995, and hazel dormouse have been recorded within Laysbury Dells LWS, located 1.27km south east.

- 17.4.36 A nest tube survey was undertaken between April and November 2018 in line with standard guidance (Bright et al, 2011)³³⁶, including 80 tubes and 20 nest boxes. This survey did not identify any evidence of the presence of hazel dormouse, confirming likely absence of this species from the Main Application Site.

Riparian mammals

- 17.4.37 A review of desk study data returned no recent records of otter or water vole within 2km of the Main Application Site. However, a historic record of water vole exists from the River Lea, recorded in 1995, and water vole are included within the citation for the River Lea CWS, located 230m west.
- 17.4.38 No surveys for riparian mammals have been undertaken due to the lack of suitable habitats for these species within and adjacent to the Main Application Site. Waterbodies surveyed for great crested newts have all been assessed as unsuitable for water vole and otter; therefore, these species are considered likely absent from the Main Application Site.

Amphibians

- 17.4.39 A review of desk study data returned no recent records of great crested newt within 2km of the Main Application Site. However, a historic record of great crested newt exists for Luton Hoo Park CWS, recorded in 1980.
- 17.4.40 BLBRMC returned one recent record of common toad (*Bufo bufo*) from the Slaughter's Wood and Green Lane CWS, recorded in 2008, in addition to several historic records (1991-1997) from within the search area. HERC also returned one recent record of common toad from Brickkiln Wood, approximately 780m north east, recorded in 2016.
- 17.4.41 Surveys of ponds in 2016 were limited by restricted access. Torchlight surveys, egg searches and refuge searches (bottle trap surveys were not possible) were undertaken on the three ponds within the existing airport boundary, which confirmed likely absence of great crested newts in these ponds.
- 17.4.42 Habitat Suitability Index (HSI) assessment and environmental DNA (eDNA) surveys were undertaken at all 12 waterbodies located within 500m of the Main Application Site during 2018. eDNA surveys are a technique using genetic material left in the environment to identify the presence of a target species (in this

³³⁶ Bright, P., Morris, P. and Mitchell-Jones, T.J. (2011). *The Dormouse Conservation Handbook*. English Nature, Peterborough

case great crested newts). The survey methodology followed accepted methods defined by Defra (Biggs et. al, 2014)³³⁷.

- 17.4.43 Presence/absence surveys were then undertaken on all suitable waterbodies within 500m (where access was permitted) following the methodology described in Natural England (formally English Nature) guidelines (2001)³³⁸.
- 17.4.44 Surveys undertaken in 2018 confirmed likely absence of great crested newts in the 12 ponds assessed. Smooth newt was recorded in one of the airfield drainage ponds.
- 17.4.45 While undertaking the surveys for reptiles in both 2016 and 2018, common toad was also identified within the Main Application Site.

Reptiles

- 17.4.46 A review of desk study data returned a recent record of slow-worm from a residential garden approximately 1km north west, recorded in 2015, and a further record from East Hyde disused railway approximately 750m south, recorded in 2017.
- 17.4.47 Surveys undertaken in 2016 identified low numbers of slow-worm within the Main Application Site, to the north of Wigmore Valley Park (a single animal). Further population surveys, comprising of 20 survey visits during suitable weather conditions in 2018 confirmed that a small population of slow-worm is present within the Main Application Site, to the north of Wigmore Valley Park.

Birds (breeding, wintering and barn owl)

- 17.4.48 Several records of bird species have been returned by HERC. Historic records, those older than 15 years, have been omitted as they are not considered to accurately reflect the current status of local bird populations. The closest and most recent of these records (2015/16) include a record of a barn owl (*Tyto alba*) and several records of red kite (*Milvus milvus*) within the Main Application Site and a cuckoo and great tit from Sewett's Wood. BLBRMC also returned a number of records, the closest of which are red kite recorded in 2015, fieldfare (*Turdus pilaris*) recorded in 2003 and redwing (*Turdus iliacus*) recorded in 2013 within Wigmore Park CWS. In addition, there are records of barn owl, recorded in 2015, and brambling (*Fringilla montifringilla*) in 2008 both recorded within LTN.
- 17.4.49 Breeding bird surveys undertaken in 2016/17 recorded a total of 35 species within the Study Area. These included Schedule 1

³³⁷ Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R.A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. and Dunn, F (2014). *Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067*. Freshwater Habitats Trust: Oxford.

³³⁸ English Nature (2001). *Great Crested Newt: Mitigation Guidelines*. English Nature, Peterborough.

(see Section 17.2) species red kite and barn owl, nine red list and six amber list Birds of Conservation Concern³³⁹ (BoCC).

- 17.4.50 Further breeding bird surveys undertaken in 2018 recorded a total of 25 species within the Study Area. These included Schedule 1 species red kite and barn owl, four red list and three amber list BoCC. A barn owl potential nest site was recorded in a building at Someries Farm.
- 17.4.51 Wintering surveys undertaken in 2016/17 recorded a total of 40 species of bird within the Study Area. These included the Schedule 1 species red kite, seven Section 41 Priority Species, eight red list and seven amber list BoCC.

Roman snail

- 17.4.52 Records of Roman snail have been returned by HERC from LTN, recorded in the far western side of the airfield in 2017.
- 17.4.53 Surveys for Roman snail were undertaken along the south west boundary of the existing airport as part of the Luton DART planning application in 2017, which identified 20 live snails in this area.

Other invertebrates

- 17.4.54 Several records of invertebrate species have been returned by HERC. Historic records, those older than 15 years, have been omitted as they are not considered to accurately reflect the current status of local invertebrate assemblages. The closest and most recent of these records originate from Withstocks Wood LWS, 730m south, and include a number of moth species such as small square-spot (*Diarsia rubi*), large nutmeg (*Apamea anceps*) and mouse moth (*Amphipyra tragopoginis*), recorded in 2003. BLBRMC also returned several moth and butterfly records including chalk hill blue (*Polyommatus coridon*) recorded in 2010, small blue (*Cupido minimus*) recorded in 2009 and small heath (*Coenonympha pamphilus*) most recently recorded in 2015 within Wigmore Park CWS.
- 17.4.55 Surveys undertaken in 2016 identified the presence of the rare fly (*Dorycera graminum*), a Section 41 Priority Species. In addition, 17 Former UK BAP moth species, two red data book species, 19 'nationally scarce' species, four 'nationally notable' and 51 'nationally local' species were identified.
- 17.4.56 During 2018 the Main Application Site was visited on a monthly basis to establish the invertebrate assemblage present and

³³⁹ Eaton M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. and Gregory, R. (2015): Birds of Conservation Concern 4: The Red List of Birds, British Birds 108, pp. 708-746.

define areas of important habitat for these species. Sampling techniques included:

- sweep netting;
- beating trees and bushes;
- suction pumping;
- pan trapping;
- pitfall trapping; and
- malaise trapping.

17.4.57 The above surveys identified the presence of two Section 41 species: the set-aside downy-back beetle *Ophonus laticollis*, and the picture-winged fly *Dorycera graminum* was again recorded.

17.4.58 Seventy two species from the combined species list from 2016 and 2018 surveys of 1,404 are here regarded as 'Key Species' (i.e. with rare, scarce, threatened or near threatened conservation status).

Other mammals

17.4.59 Several records of brown hare (*Lepus europaeus*) have been returned, the closest of which is from within LTN and recorded in 2010. There are further records from Diamondend Springs, Limekiln Wood, Pondcroft LWS, located 430m south east.

17.4.60 Several records of hedgehog (*Erinaceus europaeus*) have been returned, recorded in 2013 and 2014 in a residential area within Stopsey, which lies to the north of the Main Application Site. One record of a polecat (*Mustela putorius*) has also been returned, recorded in 2013 in a residential area within Stopsey.

17.4.61 Incidental sightings of brown hare and hedgehog have been noted both within the existing airport and the wider Main Application Site during surveys undertaken in 2018.

17.4.62 On the basis of data gathered to date, the habitat types present and considering the position of the Proposed Development within the wider landscape, a range of further ecological surveys will be undertaken during spring/summer 2019 to inform the assessment. The following surveys are proposed in line with standard methodology in order to further inform the ecological impact assessment of the Proposed Development.

Further data gathering

Ecological desk study

17.4.63 Updated Information about designated nature conservation sites and species of conservation concern (and/or subject to the provisions of legislation) within a 2km radius of the Main

Application Site will be obtained from HERC and BLBRMC. Additional information will also be gathered from local species / special interest groups.

Hedgerows

- 17.4.64 A Hedgerows Regulations 1997 survey will be undertaken for hedgerows within the Main Application Site during spring 2019, following survey methods detailed within the Hedgerow Survey Handbook (Defra, 2007)³⁴⁰.

Badger

- 17.4.65 Due to the presence of several main setts within the Main Application Site, further information on surrounding badger activity is required. Badger bait marking surveys are planned for March/April 2019 and will follow standard methodology in line with Delahay et al. (2000)³⁴¹ including baiting main setts within the survey boundary and monitoring latrines over a 21-day period.

Bats

- 17.4.66 Emergence/re-entry surveys on all buildings suitable to support roosting bats within the footprint of the Main Application Site and any trees considered to provide moderate or high potential following aerial assessment will be undertaken in spring/summer 2019.

Riparian mammals

- 17.4.67 No surveys are currently proposed for riparian mammals, due to the lack of suitable habitats for these species within and adjacent to the Main Application Site.

Birds (breeding, wintering and barn owl)

- 17.4.68 Wintering bird surveys are ongoing, and due to be completed at the end of March 2019 in line with Gilbert et al (1998)³⁴². Barn owl surveys will also be undertaken at an appropriate time of year (for the various survey stages) during 2019 following guidance published by CIEEM (previously IEEM) (Shawyer, 2011)³⁴³.

³⁴⁰ Defra (2007). *Hedgerow Survey Handbook: A Standard procedure for Local Surveys in the UK 2nd Edition*. Defra, London.

³⁴¹ Delahay RJ, Brown JA, Mallinson PJ, Spyvee PD, Handoll D, Rogers LM and Cheeseman C L (2000). *The use of marked bait in studies of the territorial organisation of the European badger (Meles meles)*. Mammal Review 30: 73-87.

³⁴² Gilbert, G., Gibbons DW & Evans J (1998) *Bird Monitoring Methods: A Manual of Techniques for Key UK Species*. RSPB, Bedfordshire.

³⁴³ Shawyer, C. R (2011). *Barn Owl (Tyto alba) Survey Methodology and Techniques for use in Ecological Assessment: Developing Best Practice in Survey and Reporting*. IEEM, Winchester.

Roman snail

- 17.4.69 There is currently no standardised or published survey methodology for Roman snail. However, from discussions with recognised experts in the field, it is considered that a combination of a daytime hand search and nocturnal torchlight surveys in suitable weather conditions is sufficient to enable an assessment of presence or probable absence of Roman snail at a site. It is recommended that nocturnal surveys are undertaken in wet weather or within 24 hours following rainfall. Two survey visits (covering several days) will be undertaken between May and July 2019 as part of these surveys. These surveys were due to be undertaken during 2018; however, due to the extended period of dry weather over summer 2018 it was not possible to complete these surveys.

Other mammals

- 17.4.70 No dedicated surveys for Section 41 priority mammal species are proposed within the Main Application Site. However, incidental recording of these species is proposed during surveys undertaken across the Main Application Site.

17.5 Assessment methodology

Ecological impact assessment methodology

- 17.5.1 Impacts to habitats and species that may occur as a result of the Proposed Development during construction and operation will be assessed. The method of determining ecological value and significant effects will be in line with the CIEEM guidance on Ecological Impact Assessment (2018)³⁴⁴.
- 17.5.2 Wherever possible, maintaining favourable conservation status will be determined by reference to literature, including the LBAP objectives and targets, and by professional judgement in the absence of clear guidance. An effect is considered 'beneficial' if it helps to deliver conservation policy or 'adverse' if it is contrary to conservation policy.
- 17.5.3 The scale at which impacts to habitats and species matter is determined according to the value of the ecological feature. Therefore, a significant effect at a national level would be a material consideration for a NSIP, and a significant effect at district level should be a material consideration for a planning application considered within a district setting.

³⁴⁴ CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester.

- 17.5.4 Mitigation measures to avoid or reduce potentially significant adverse effects will be proposed. The residual effects on impacted ecological features following the implementation of proposed mitigation will be assessed. If significant adverse effects are still identified after mitigation strategies have been devised and their success considered, it may then be necessary to provide appropriate compensation measures to offset significant residual adverse effects.
- 17.5.5 Opportunities will also be taken to provide biodiversity benefits in accordance with policy and best practice. A Defra Biodiversity Offsetting calculation will also be undertaken to quantify impact, mitigation and compensation as part of the assessment. This calculation will follow guidance produced by Defra (2012)³⁴⁵ and will utilise the metric developed by Natural England (in consultation with a range of experts) to allow biodiversity losses and compensation to be quantified.

Significance criteria

Determination of important ecological features

- 17.5.6 Ecological features can be important for a variety of reasons. Importance may relate, for example, to the quality or extent of designated sites or habitats, to habitats/species rarity, to the extent to which they are threatened throughout their range, or to their rate of decline.
- 17.5.7 The importance of each ecological feature is evaluated within a defined geographical context. The following frame of reference is used to define ecological importance of features:
- international and European;
 - national;
 - regional;
 - metropolitan, county, vice-county or other local authority-wide area; and
 - local.

Determination of significant effects

- 17.5.8 Impacts to ecological features, both adverse and beneficial, are identified and characterised with reference to the following factors:
- magnitude;

³⁴⁵ Defra (2012). *Biodiversity Offsetting Pilots Technical Paper: The Metric for the Biodiversity Offsetting Pilot in England*. Defra, London. Available at: <https://www.gov.uk/government/publications/technical-paper-the-metric-for-the-biodiversity-offsetting-pilot-in-england> [Accessed March 2019]

- spatial extent;
- duration;
- reversibility;
- timing; and
- frequency.

17.5.9 For consistency across all disciplines, the factors listed above will be used to inform the determination of magnitude of impact, importance of receptor, and assess effects using the criteria detailed in Section 5.3 of this report.

17.5.10 Following this criteria (as a general rule) major and moderate effects are considered to be significant, whilst minor and negligible effects are considered to be not significant. However, professional judgement can also be applied where necessary.

17.5.11 Beneficial effects that are not likely to be significant will also be described in the ES. Information about these effects may assist the competent authorities in determining whether the Proposed Development complies with the guidance in the ANPS and references in the NPPF (which may be relevant and important to the Secretary of State's decision) relating to biodiversity enhancement, to which both significant and not significant effects can make a contribution.

17.6 Potential significant effects

17.6.1 Informed by the results of previous surveys and other desk-based data gathering (detailed in Section 17.4 above), a number of ecological features have been identified as having the potential to be significantly affected by the Proposed Development, as detailed in Table 17-3. These ecological features will be scoped into the EclA and the likely construction and operational effects will be assessed. However, this list is subject to change based on the results of ongoing and proposed surveys and consultation with stakeholders.

Table 17-3: Ecological features scoped in for assessment

Species	Habitat
Badger	Designated sites
Bats	Arable and field margins
Birds (breeding, wintering & barn owl)	Grassland (neutral & calcareous)
Common amphibian species	Hedgerows with standards
Reptiles	Scrub
Roman snail	Waterbodies
Terrestrial invertebrates	Woodland (ancient & semi-natural)

17.6.2 A Habitats Regulations Assessment: Test of Likely Significance (screening assessment) has also been undertaken to ascertain potential impacts to European sites (as detailed in Section 5.4 above). This assessment has determined 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. Further details and results of this assessment are provided in Appendix C of this Scoping Report.

Construction

17.6.3 Impacts that will result from construction works have been divided into two sub types (i) temporary and (ii) permanent.

Temporary construction impacts

17.6.4 The following temporary construction impacts are anticipated:

- *Designated Sites:* fragmentation and severance effects between sites, impacting on landscape-scale habitat connectivity.
- *Habitats:* temporary habitat loss and fragmentation due to earthworks construction activities. In addition, dust generated from on-site soil storage/movements could smother the foliage of plants and affect their ability to photosynthesise.
- *Species:* Noise, vibration and disturbance arising from site activities could displace bats, badgers and birds. Temporary alterations in night time light conditions could also displace bats from foraging/commuting routes. Temporary habitat loss could result in loss of foraging resource for various protected species. Temporary fragmentation and severance of habitat could also result in barriers to species dispersal.

Permanent construction impacts

17.6.5 The following permanent construction impacts are anticipated:

- *Designated Sites:* Wigmore Park CWS would be lost in its entirety to the Proposed Development. Winch Hill Woods CWS is not directly impacted by the Proposed Development, however, earthworks in the vicinity of the CWS have the potential to alter the hydrology which may impact the woodland; this will be considered in the assessment. In addition, air quality changes have the potential to impact on sensitive habitats within designated sites.
- *Habitats:* loss and fragmentation of Section 41 priority habitats, including arable field margins, hedgerows, ponds, lowland calcareous grassland, lowland mixed deciduous

woodland and wood-pasture/parkland due to earthwork construction activities. In addition, air quality changes have the potential to impact on nitrogen sensitive habitats.

- *Species*: loss of at least two known bat roosts (common species in low numbers) and three main badger setts as well as potential impacts on populations of Roman snail, reptiles and breeding birds. Additional impacts on fauna include reduced foraging resource, disturbance and fragmentation of species populations. In addition, there is the potential for mortality from collision with construction traffic.

Operation

17.6.6 Operational impacts of the Proposed Development include:

- *Designated Sites*: air quality changes due to increased road and air traffic have the potential to impact on sensitive habitats within designated sites.
- *Habitats*: air quality changes due to increased road and air traffic have the potential to impact on nitrogen sensitive habitats.
- *Species*: increased noise, vibration and visual disturbance due to increased number and frequency of flights and associated airport infrastructure could displace bats, badgers and birds. There would also be an increased collision risk to birds and bats due to additional daily flight movements, which will be considered during the assessment. In addition, permanent alterations in night time light conditions could displace bats and birds from their breeding/roosting sites and their foraging habitat.

Cumulative effects

17.6.7 The assessment will consider whether there will be any cumulative effects with respect to nature conservation (e.g. effects of noise, dust, lighting), either beneficial or adverse, of the Proposed Development and other reasonably foreseeable proposed construction projects in the area.

17.6.8 See **Chapter 21 In-Combination and Cumulative Effects** of this Scoping Report for further details regarding methodology.

17.7 Matters scoped out

17.7.1 There are no watercourses within (or immediately adjacent to) the Main Application Site. Potential impacts on otter, water vole, white-clawed crayfish and other aquatic invertebrates have therefore been scoped out of further assessment, as it is considered that there is no impact pathway from the Proposed Development to these receptors, and no significant effects are

anticipated. In addition, surveys undertaken during 2018 have confirmed the likely absence of great crested newt and hazel dormouse within and adjacent to the Main Application Site. These species have therefore been scoped out of further assessment.

- 17.7.2 The proposed Off-site Car Parks and Off-site Highway Interventions (including signalisation of junctions) are located on existing areas of hardstanding with negligible ecological value. Given that works in these locations will be minimal and limited to the highway boundary, it is considered that they are not likely to give rise to significant effects and have therefore been scoped out of further assessment.

17.8 Mitigation and enhancement

- 17.8.1 Mitigation measures or mechanisms to reduce any potential significant adverse effects arising from construction impacts of the Proposed Development will be proposed in the ES. Opportunities to enhance habitats for a range of species and deliver biodiversity gain will be sought.

- 17.8.2 A proportionate series of habitat creation, improvement and management works will be required to mitigate for habitat lost and/or damaged by the Proposed Development, as well as species-specific measures, which will be informed by the baseline ecology surveys. This will focus on enhancing existing ecological features within the wider landscape and providing new high-quality habitats that are characteristic of the local area. These enhancements will primarily aim to maintain and enhance the landscape-level network of 'green corridors' throughout the site, which supports many of the species found on site. There may also be a requirement for enhancement measures, potentially including off-site works and contributions to local wildlife projects in partnership with statutory bodies, local wildlife trusts and local interest groups to tailor enhancements to be in line with local wildlife and community needs. By creating different types of habitats, a variety of sources of food and shelter for wildlife will be provided, supporting local BAP targets. Enhanced connectivity between different green spaces will add resilience within local wildlife populations. Mitigation and enhancement measures will be detailed in a Landscape and Biodiversity Management Plan, which will be prepared and submitted as part of the ES.

- 17.8.3 To provide a high-level quantification of the level of biodiversity that will be lost to the Proposed Development a Defra Biodiversity Offsetting Calculation will be undertaken. Offsetting of impacts would be the final step within the mitigation hierarchy and would not replace the need to 'avoid', 'minimise' and 'restore' as set out in relevant guidance.

- 17.8.4 The long-term aim will be to leave a positive legacy for wildlife in Luton, Bedfordshire and Hertfordshire and to facilitate/enhance public access to this resource.

18 LANDSCAPE AND VISUAL

18.1 Introduction

18.1.1 This chapter presents the proposed approach to the assessment of the likely significant landscape and visual impact effects of the Proposed Development.

18.1.2 The assessment will consider potential impacts on:

- the constituent elements of the landscape;
- the specific aesthetic or perceptual qualities of the landscape;
- the character of the landscape; and
- people who will be affected by changes in views or visual amenity.

18.2 Legislation, policy and guidance

18.2.1 National and planning policy of relevance to the assessment of effects on landscape and visual receptors is set out below.

National planning and aviation policy

Airports National Policy Statement - June 2018

18.2.2 Paragraphs 5.214 to 5.216 of the ANPS¹¹ are concerned with the assessment of landscape and visual impacts and paragraph 5.214 states:

“Where the development is subject to an Environmental Impact Assessment, the applicant should undertake an assessment of any likely significant landscape and visual impacts and describe them in the environmental statement. The landscape and visual assessment should reference any landscape character assessment and associated studies as a means of assessing landscape impacts relevant to the preferred scheme.”

18.2.3 Paragraphs 5.223 to 5.224 are concerned with development outside nationally designated areas and paragraph 5.223 states: state *“outside nationally designated areas, there are local landscape and townscapes that are highly valued locally and may be protected by local designation. Where a local development document in England has policies based on landscape character assessment, these should be given particular consideration”*.

18.2.4 Paragraph 5.217 is concerned with mitigation measures and states that *“Adverse landscape and visual effects may be minimised through appropriate design (including choice of materials), and landscaping schemes.”*

- 18.2.5 Paragraph 5.224 states *“in taking decisions, the Secretary of State will consider whether the preferred scheme has been designed carefully, taking account of environmental effects on the landscape and siting, operational and other relevant constraints, to avoid adverse effects on landscape or to minimise harm to the landscape, including by reasonable mitigation”*.
- 18.2.6 Paragraph 5.225 states further that *“the Secretary of State will judge whether effects on sensitive receptors, such as local residents, and other receptors, such as visitors to the local area, outweigh the benefit of the development.”*

National Planning Policy Framework (NPPF) – February 2019

- 18.2.7 The NPPF includes several references to landscape and visual matters as outlined below.
- 18.2.8 Chapter 3 is concerned with “plan making” and at paragraph 20 states, amongst other things, that *“strategic policies should set out an overall strategy for the pattern, scale and quality of development, and make sufficient provision for...(the) conservation and enhancement of the natural, built and historic environment, including landscape and green infrastructure...”*
- 18.2.9 Chapter 12 is concerned with “achieving well designed places” and at paragraph 127 states that planning decisions should ensure, amongst other matters, that developments *“are sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change (such as increased densities).”*
- 18.2.10 Chapter 15 is concerned with “conserving and enhancing the natural environment” and at paragraph 170 advises that *“decisions should contribute to and enhance the natural and local environment by ...protecting and enhancing valued landscapes”*.
- 18.2.11 Paragraph 172 of this chapter also affords protection to Areas of Outstanding Natural Beauty (AONB) stating that:
- 18.2.12 *“Great weight should be given to conserving and enhancing landscape and scenic beauty in...Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues”*.
- 18.2.13 The site is not located within an AONB but the Chilterns AONB is located within 5km of the site, as shown in Figure 18.1 (Volume 2).

Regional and County Policy

- 18.2.14 Currently there is no regional landscape and/or visual policies relevant to the Main Application Site or the Proposed Development.
- 18.2.15 The Area of Great Landscape Value (AGLV) designation remains a saved policy within the 'Bedfordshire Structure Plan' (adopted 25 March 1997), however this designation has been superseded by the Landscape Character Assessment within the local planning policy documents³⁴⁶.

Local Policy

- 18.2.16 Relevant local landscape and visual policies are contained within the following policy documents:
- Local Luton Plan 2011-2031 (adopted November 2017);
 - North Hertfordshire District Local Plan No. 2 (Saved Policies from September 2007);
 - North Hertfordshire District Local Plan 2011-2031 Proposed Submission version (October 2016); and
 - Central Bedfordshire Local Plan 2035: Pre-Submission (January 2018).

Local Luton Plan 2011-2031 (adopted November 2017)

- 18.2.17 Policy LLP6 specifically provides for development within and adjoining LTN. The policy sets out several design criteria for development in this area, some of which are related to contributors to landscape value (e.g. "*bio-diversity should be enhanced and improved*", "*proposals should fully assess the impacts upon heritage assets and their setting*" etc.).
- 18.2.18 Part F of the policy sets out development criteria for the wider LTN Strategic Allocation including:
- "appropriate strategic landscaping to be provided both on and off site, which shall have regard to the potential for significant visual prominence within the wider area of built development at New Century Park and which does not increase risk to aviation operations;"*
- 18.2.19 and:
- "the height and design of buildings will reflect the site's rural fringe setting, its high visibility from surrounding countryside and its proximity to LLA."*

³⁴⁶ Central Bedfordshire Council 'Policy Coverage – A Guide to Relevant Policies' (version 6.0 - July 2016).

- 18.2.20 Policy LLP29 affords protection to national landscape areas (e.g. Chilterns AONB, Registered Parks and Gardens) and local landscape areas. The latter comprise AGLV and Areas of Local Landscape Value (ALLV). This policy also provides for the protection or enhancement of the PRoW network and access to the countryside.

North Hertfordshire District Local Plan No. 2 (Saved Policies from September 2007)

- 18.2.21 Saved Policy 11 of this Plan affords protection to the Chilterns AONB.
- 18.2.22 The Plan also contains several policies which relate to contributors to landscape value (e.g. Policy 14, which recognises the need for nature conservation on sites).

North Hertfordshire District Council Proposed Submission Local Plan 2011-2031 - October 2016

- 18.2.23 Chapter 11 of the Draft Plan contains various policies on the Natural Environment.
- 18.2.24 Policy SP12 sets out objectives to protect and enhance the natural environment including landscape character and locally sensitive features notably the Chilterns AONB.
- 18.2.25 Policy NE1 (Landscape) essentially states that development should respect landscape features and the landscape character of immediate surroundings and wider area.
- 18.2.26 Policy NE3 (The Chilterns AONB) sets out several criteria for development within or affecting the setting of the Chilterns AONB.
- 18.2.27 The Draft Plan also contains several policies which relate to contributors to landscape value (e.g. Policy NE6 affords protection to biodiversity sites).

Central Bedfordshire Local Plan 2035: Pre-Submission - January 2018

- 18.2.28 Chapter 15 of the Central Bedfordshire Local Plan 2035: Pre-Submission contains various landscape related policies which are relevant to the Main Application Site and the Proposed Development.
- 18.2.29 Policy EE5 (Landscape Character and Value) emphasises that development must consider the key characteristics, sensitivities and setting of the site and should respect, retain and enhance the character and distinctiveness of the local landscape. It also that confirms that development proposals which have an

unacceptable adverse impact on valued landscapes will be refused.

- 18.2.30 Policy EE12 (PRoW) explains that developments should protect, enhance and promote the PRoW network within Central Bedfordshire.
- 18.2.31 There are also several policies which relate to contributors to landscape value for instance Policy EE2 (Enhancing Biodiversity), Policy EE4 which affords protection to trees, woodlands and hedgerows and Policy HE2 which affords protection to Registered Parks and Gardens or their settings.

Guidance

- 18.2.32 The Landscape Institute (LI) and IEMA published the third edition of the 'Guidelines for Landscape and Visual Impact Assessment – GLVIA3' (17 April 2013). This is a primary resource for landscape professionals, which advises the framework and approach to be taken when carrying out landscape and visual impact assessments.

18.3 Stakeholder engagement and consultation

- 18.3.1 A pre-scoping meeting was held with landscape officers from LBC, NHDC and CBC on Tuesday 10 April 2018. This meeting explained the content of the LVIA section of the Scoping Report as drafted at that time and discussed the assessment viewpoint locations that were being considered for inclusion in the LVIA and items proposed to be scoped out.
- 18.3.2 The landscape and urban design officer from HCC was also invited to the above meeting but advised that the officer from North Hertfordshire would be able to make representation on their behalf.
- 18.3.3 Several Non-Statutory Consultation events took place in July and August 2018. These events were accompanied by a consultation document and attended by members of the public and several statutory stakeholders. A section on landscape and visual effects was included in the consultation document and consultants from the LVIA team were available to discuss the potential impacts of the development at most of the events. The public were also asked to advise in a questionnaire their views about the measures outlined in the consultation document to manage the landscape and visual effects of airport expansion.
- 18.3.4 Extensive feedback was received in response to Non-Statutory Consultation, including several formal responses from statutory stakeholders. LLAL's responses to this feedback are detailed in the Non-Statutory Consultation report available on the project

website¹⁵ and will be used to help inform the design proposals and any mitigation recommendations advised through the LVIA.

- 18.3.5 A further pre-scoping meeting and site visit was held with officers from LBC, NHDC, CBC, HCC and the Chilterns Conservation Board on 26 February 2019. This meeting and site visit provided an update on the airport expansion proposals and on formal stakeholder feedback received through the Non-Statutory Consultation process; and identified any proposed changes to approach or methodology in response to design evolution or stakeholder feedback.
- 18.3.6 Further consultation with relevant stakeholders will be conducted as required as part of the assessment.

18.4 Baseline conditions

Study Area

- 18.4.1 The Study Area for assessing the landscape and visual effects of the Proposed Development, as shown in Figure 18.1 (Volume 2), extends 5km from the perimeter of the Main Application Site, plus the full extent of any character areas that may be affected within that envelope.
- 18.4.2 The Study Area has been defined through a survey of the pattern of existing land use, landform (shown in Figure 18.2, Volume 2) and land cover (shown in Figure 18.3, Volume 2) within the landscape surrounding LTN and through field survey activities.
- 18.4.3 It is important to note that the boundary of the Study Area does not define the area beyond which there will be no effect, rather it contains the area within which the likely significant landscape and visual effects are predicted to occur.

Data gathering

- 18.4.4 The LVIA will include a desk-based study of relevant published information in conjunction with field survey activities.
- 18.4.5 A preliminary exercise has been undertaken to define the Study Area and to identify potentially sensitive landscape and visual receptors and potentially suitable assessment viewpoint locations, these are shown in Figure 18.4 (Volume 2).
- 18.4.6 The Study Area and potential assessment viewpoint locations will be reviewed and confirmed as part of the LVIA once the parameters for the Proposed Development have been further developed and a Zone of Theoretical Visibility (ZTV) has been prepared.
- 18.4.7 Relevant published sources of information include:

- The 'Luton Borough Landscape Character Assessment' (LBLCA), prepared by The Greensand Trust on behalf of LBC and published June 2014;
- The 'Central Bedfordshire Landscape Character Assessment' (CBLCA), prepared by Land Use Consultants for CBC and published in January 2015;
- The 'North Herts Landscape Study (Character, Sensitivity and Capacity)', which was based on the original Landscape Character Assessment work carried out by the Babbie Group in 2004 and the subsequent Sensitivity and Capacity work carried out by The Landscape Partnership in 2011 and agreed as background evidence to support the North Herts LDF in 2011 (HLCA);
- 'A Green Infrastructure Plan for Luton', produced by The Greensand Trust on behalf of LBC and published March 2015;
- The 'Green Space Strategy Review', produced by The Greensand Trust on behalf of LBC and published October 2015;
- The 'Nature Conservation Strategy', produced by LBC and published December 1992;
- The 'Proposed Local Landscape Designations for Luton', produced by The Greensand Trust on behalf of LBC and published June 2014;
- The 'Review of Environmental Sensitivity Study to inform Potential Growth Areas around Luton', produced by The Landscape Partnership and published July 2009;
- The 'North Hertfordshire District Green Infrastructure Plan' produced by Land Use Consultants and published August 2009;
- The 'North Hertfordshire Design Supplementary Planning Document', produced by North Hertfordshire District Council and published July 2011;
- 'Design in Central Bedfordshire', produced by CBC and published September 2014;
- The 'Bedfordshire & Luton Strategic Green Infrastructure Plan', produced by the Bedfordshire & Luton Green Infrastructure Consortium and published February 2007;
- The 'Luton and Southern Bedfordshire Green Infrastructure Plan', produced by The Greensand Trust on behalf of Luton and Southern Bedfordshire Joint Technical Unit and published July 2009;

- The ‘Chilterns Area of Outstanding Natural Beauty Management Plan 2014-2019’, produced by The Chilterns Conservation Board and adopted April 2014;
- ‘Development Affecting the Setting of the Chilterns AONB’, a position statement produced by The Chilterns Conservation Board and adopted June 2011; and
- The ‘Tranquillity Map’ for Bedfordshire and Hertfordshire, produced by the Campaign to Protect Rural England and published March 2007.

Existing conditions

- 18.4.8 The airport is located on a raised platform at the north-eastern end of the Chiltern Hills (as shown in Figure 18.1, Volume 2). The land to the north of the Main Application Site is predominantly residential; the land to the west includes a mixture of both industrial and residential; and the land to the east and south is predominantly rural, comprising arable fields with intermittent woodland.
- 18.4.9 The landscape surrounding the Main Application Site includes several areas that are designated for their landscape value either nationally (e.g. the Chiltern’s AONB) or locally (e.g. Luton Hoo / Hyde AGLV, Wigmore Rural ALLV and Someries Farm & Dane Street Farm ALLV).
- 18.4.10 There are also several designated and undesignated cultural heritage assets (e.g. Scheduled Monuments, listed buildings, registered parkland, etc.), biodiversity assets (e.g. ancient woodlands, historic hedgerows, county wildlife sites, etc.) and amenity assets (e.g. district parks, rights of way, etc.) which are considered to contribute to the value of this landscape.
- 18.4.11 The airport is a prominent and visually intrusive feature within views from the surrounding area, from the east (at the edge of Breachwood Green and The Heath and in glimpsed views from Tea Green and Ley Green); from the north (at the residential edge of Wigmore and in glimpsed views from Crawley Green Road and Someries Hill); from the northwest (in the Hart Hill residential area and in more distant views from Dallow Downs), from the west (within Capability Green, from the Park Town residential area and in glimpsed views from Luton Hoo Memorial Park); from the southwest (within elevated locations in Luton Hoo Registered Park and Garden); and from the south (in glimpsed views from Chiltern Green Road and from the surroundings to Someries Castle). Views towards the Application Site are also possible from several rights of way within the surrounding area, including the Chiltern Way and Chiltern Way Cycle Route, and in distant views from within the Chilterns AONB, near Warden Hill.

18.5 Assessment methodology

- 18.5.1 The assessment methodology to be adopted for the LVIA will follow the principles and approaches set out in the third edition of the Guidelines for Landscape & Visual Impact Assessment (GLVIA3) and associated clarifications published by the GLVIA Panel.
- 18.5.2 GLVIA3 recognises a clear distinction between the ‘impact,’ as the action that is being taken, and the ‘effect,’ as the change resulting from that action, and advises that the term ‘impact’ should not be used to mean a combination of several effects. To be consistent with terminology used throughout this Scoping Report, ‘magnitude of impact,’ is referred to when describing changes/actions included combinations.
- 18.5.3 The assessment process comprises the following key stages:
- identifying potential landscape and visual receptors to an environmental effect;
 - considering the value and the susceptibility or sensitivity of these receptors to the type of change proposed;
 - determining the magnitude of change that would be experienced by those or at those receptors; and
 - applying professional judgement to advise the significance that should be attributed that effect.
- 18.5.4 Landscape and visual assessments are separate, although linked, procedures. The landscape baseline, its analysis and the assessment of landscape effects all contribute to the baseline for visual assessment studies.
- 18.5.5 The LVIA will cover several years to reflect the phased build-up of passenger throughput and to understand the effects of proposed structure planting measures and changes to land management objectives. The current expected assessment years are:
- 2020 – 18 mppa;
 - 2024 – 21 mppa;
 - 2029 – 25 mppa;
 - 2039 – 32 mppa; and,
 - 2050 – 32 mppa.

Significance criteria

Receptors

- 18.5.6 Potentially sensitive landscape receptors may include:

- physical influences on the constituent elements of the landscape (e.g. geology, soils, landform, drainage and waterbodies);
- land cover of the landscape (e.g. the different types of vegetation and patterns and types of tree cover);
- influences of human activity on the landscape (e.g. the land use and its management, the character of settings and buildings and the patterns and types of fields and enclosures);
- aesthetic or perceptual qualities of the landscape (e.g. its scale, its complexity, its openness, its tranquillity or its wildness); and
- the character of the landscape (i.e. any distinctive landscape character types or areas that can be identified), which may include published character assessment reports and / or defined character areas identified as part of the assessment process.

18.5.7 Potentially sensitive visual receptors may include people living in the area, people who work there, people passing through on road, rail or other forms of transport, people visiting the area or people engaged in recreation within the area.

Sensitivity

18.5.8 The sensitivity of a landscape or visual receptor will be derived through the consideration of:

- the susceptibility of the receptor to the type of change arising from the specific proposal; and
- the value attached to that receptor.

18.5.9 It is important to note that in LVIA ‘value’ informs ‘sensitivity’, whereas **Chapter 5 Approach to Assessment** of this Scoping Report uses the terms ‘sensitivity’ and ‘value’ of receptors interchangeably.

Landscape sensitivity

18.5.10 Judgements about the susceptibility of a landscape receptor to change will be recorded as being High, Medium or Low, based on the criteria set out in Table 18-1 below.

Table 18-1: Landscape Susceptibility to Change

Value	Typical Criteria
High	Receptors with an inability to accommodate the Proposed Development without undue consequences for the maintenance of the baseline situation and / or the achievement of the landscape planning policies and strategies.

Value	Typical Criteria
Medium	Receptors with some ability to accommodate the Proposed Development without undue consequences for the maintenance of the baseline situation and / or the achievement of the landscape planning policies and strategies.
Low	Receptors with an ability to accommodate the Proposed Development without undue consequences for the maintenance of the baseline situation and / or the achievement of the landscape planning policies and strategies.

18.5.11 Judgements about the value of a landscape receptor will be recorded as being Very High, High, Medium, Low or Very Low, based on the criteria set out in Table 18-2 below.

Table 18-2: Landscape Value

Value	Typical Criteria	Typical Scale	Typical Examples
Very High	High Importance (or Quality) and Rarity. No or limited potential for substitution.	International, National	World Heritage Site, National Park, AONB.
High	High Importance (or Quality) and Rarity. Limited potential for substitution.	National, Regional, Local	National Park, AONB, AGLV, Conservation Area
Medium	Medium Importance (or Quality) and Rarity. Limited potential for substitution.	Regional, Local	Undesignated but value perhaps expressed through non-official publications or demonstrable use.
Low	Low Importance (or Quality) and Rarity	Local	Areas identified as having some redeeming feature or features and possibly identified for improvement.
Very Low	Low Importance (or Quality) and Rarity.	Local	Areas identified for recovery.

Visual sensitivity

18.5.12 Judgements about the susceptibility of a visual receptor to change in views and visual amenity is mainly a function of:

- The occupation and activity of people experiencing the view at particular locations; and
- The extent to which their attention or interest may therefore be focused on the views and the visual amenity they experience at particular locations.

18.5.13 Judgements about the susceptibility of a visual receptor will be recorded as being High, Medium or Low, typically reflecting the

criteria set out in Table 18-3 below. Judgements may vary however depending on the nature of the receptor who will be affected and the extent to which their attention is likely to be focused on views or visual amenity.

Table 18-3: Visual Susceptibility to Change

Value	Typical Criteria
High	<ul style="list-style-type: none"> • Residents at home, although this will depend on the rooms occupied during waking hours; • People, whether residents or visitors, who are engaged in outdoor recreation, including users of public rights of way, whose attention or interest is likely to be focused on the landscape and on views; • Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience; • Communities where views contribute to the landscape setting enjoyed by residents in the area; and • Where travel involves recognised scenic routes awareness of views is likely to be particularly high.
Medium	<ul style="list-style-type: none"> • Communities where views partly contribute to the landscape setting experienced by residents in the area; • Users of public rights of way and footpaths where attention is not focused on the landscape and/ or views; and • Travellers on road, rail and other transport routes where awareness of views is limited.
Low	<ul style="list-style-type: none"> • Communities where views do not contribute to the landscape setting experienced residents in the area; • People engaged in outdoor sport and recreation which does not involve or depend upon appreciation of views of the landscape; and • People at their place of work whose attention may be focused on their work or activity, not on their surroundings, and where the setting is not important to the quality of their working.

18.5.14 Judgements about the value of a visual receptor will be recorded as being High, Medium or Low, based on the criteria set out in Table 18-4 below.

Table 18-4: Visual Important / Value

Value	Typical Criteria
High	<ul style="list-style-type: none"> • Unique or identified view (e.g. shown as such on an Ordnance Survey map, guidebook or tourist map) or one noted in literature or art; • A view where a landscape and/or heritage asset makes an important contribution to the view.
Medium	<ul style="list-style-type: none"> • A view where a landscape and/or heritage asset makes some contribution to the view.
Low	<ul style="list-style-type: none"> • Undistinguished or unremarkable view.

Magnitude

18.5.15 The magnitude of impact on a landscape and visual receptor will be assessed in terms of its:

- size or scale;
- the geographical extent of area influenced;
- their duration (short-term, medium-term and long-term); and
- reversibility (i.e. temporary or permanent).

18.5.16 Judgements about the magnitude of impact on landscape or visual receptors will identify whether the impact will be negative (adverse) or positive (beneficial) and will be recorded as being High, Medium, Low, Very Low or no change, based on the criteria set out in Table 18-5 and Table 18-6 below.

Table 18-5: Magnitude of Landscape Impact

Magnitude of Impact	Typical Criteria Descriptors
High adverse	Total loss or large-scale damage to existing character or distinctive features and elements, and/or the addition of new but uncharacteristic conspicuous features and elements.
Medium adverse	Partial loss or noticeable damage to existing character or distinctive features and elements, and/or the addition of new but uncharacteristic noticeable features and elements.
Low adverse	Slight loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements.
Very Low adverse	Barely noticeable loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements.
No change	No noticeable loss, damage or alteration to character or features or elements.
Very Low beneficial	Barely noticeable improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic features and elements, or by the addition of new characteristic elements.
Low beneficial	Slight improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic features and elements, or by the addition of new characteristic elements.
Medium beneficial	Partial or noticeable improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic and noticeable features and elements, or by the addition of new characteristic features.
High beneficial	Large scale improvement of character by the restoration of features and elements, and/or the removal of uncharacteristic and conspicuous features and elements, or by the addition of new distinctive features.

Table 18-6: Magnitude of Visual Impact

Magnitude of Impact	Typical Criteria Descriptors
High adverse	The proposals would form a significant and immediately apparent deterioration to the scene that is likely to damage its overall character.
Medium adverse	The proposals would form a visible and recognisable new element that would deteriorate the overall scene to some extent and would be readily noticed by the observer.
Low adverse	The proposals would be perceptible but would not alter overall balance of features and elements that comprise the existing view or markedly deteriorate the overall quality of the scene.
Very Low adverse	Only a very small part of the proposals would be discernible, and / or the proposals would be at such a distance that it would form a barely noticeable feature or element of the view and consequently would result in very little deterioration to the scene.
No change	No part of the project, or work or activity associated with it, would be discernible.
Very Low beneficial	Only a very small part of the proposals would be discernible, and / or the proposals would be at such a distance that it would form a barely noticeable feature or element of the view and consequently would result in very little improvement to the scene.
Low beneficial	The proposals would be perceptible but would not alter overall balance of features and elements that comprise the existing view or markedly improve the overall quality of the scene.
Medium beneficial	The proposals would form a visible and recognisable new element that would improve the overall scene to some extent and would be readily noticed by the observer.
High beneficial	The proposals would form a significant and immediately apparent improvement to the scene that is likely to enhance its overall character.

Classification of effects

- 18.5.17 The significance of a landscape or visual effect will be assessed through professional judgement, combining the sensitivity of the receptor with the magnitude of impact. Judgements will typically follow the rationale and criteria set out in Table 18-7, Table 18-8 and Table 18-9 below.

Table 18-7: Significance of Effect

Table LV7 – Significance of Effect						
		Magnitude of Impact				
		No Change	Very Low	Low	Medium	High
Sensitivity of Receptor	High	No Effect	Minor	Minor / Moderate	Moderate/ Major	Major
	Medium	No Effect	Negligible/ Minor	Minor	Moderate	Moderate/ Major
	Low	No Effect	Negligible/ Minor	Negligible/ Minor	Minor	Minor / Moderate

Table 18-8: Significance of Landscape Effect

Significance	Typical Criteria Descriptors
Major adverse	<p>The project would:</p> <ul style="list-style-type: none"> • Be at considerable variance with the character (including quality and value) of the landscape and substantially degrade or diminish the integrity of a range of characteristic features and elements and their setting. • Damage a sense of place. • Such effects would be incapable of full mitigation and would degrade the integrity of a high-quality landscape.
Moderate adverse	<p>The project would:</p> <ul style="list-style-type: none"> • Conflict with the character (including quality and value) of the landscape and have an adverse impact on characteristic features or elements and their setting • Diminish a sense of place. • Proposals are likely to be out of scale with the existing topography, grain, scale and pattern of the landscape
Minor adverse	<p>The project would:</p> <ul style="list-style-type: none"> • Not quite fit the character (including quality and value) of the landscape and is at variance with characteristic features and elements and their setting. • Detract from a sense of place. • Effects may temporarily damage or does not logically complement the existing topography, grain, scale and pattern of the landscape to constitute an unsympathetic outcome.
Negligible adverse / beneficial	<p>The proposals will affect minor landscape features which have no or limited value.</p>
No Effect	<p>The project would:</p> <ul style="list-style-type: none"> • Maintain the character (including quality and value) of the landscape. • Blend in with characteristic features and elements. • Enable a sense of place to be retained.

Significance	Typical Criteria Descriptors
Minor beneficial	<p>The project would:</p> <ul style="list-style-type: none"> • Complement the character (including quality and value) of the landscape and maintain or enhance characteristic features and elements and their setting. • Enable some sense of place to be restored. • Proposals would enable moderate and / or short-term restoration of degraded landscape character, features and their setting.
Moderate beneficial	<p>The project would:</p> <ul style="list-style-type: none"> • Improve the character (including quality and value) of the landscape and enable the restoration of characteristic features and elements partially lost or diminished as a result of changes from inappropriate management or development. • Enable a sense of place to be restored. • Such effects may be capable of further mitigation so as to maximize the benefits of the proposal
Major beneficial	<p>The project would:</p> <ul style="list-style-type: none"> • Substantially enhance the character (including quality and value) of the landscape and enable the restoration of characteristic features and elements lost as a result of changes from inappropriate management or development. • Enable a sense of place to be enhanced. • Fundamentally improve on previous condition through the introduction of integrated features and landscape design which would result in a more harmonious and distinctive landscape character. • Such effects may be capable of further mitigation to maximize the benefits of the proposal.

Table 18-9: Significance of Visual Effects

Significance	Typical Criteria Descriptors
Major adverse	The proposals would cause major deterioration to a view experienced by a highly sensitive receptor and would constitute a major discordant element in the view.
Moderate adverse	The proposals would cause obvious deterioration to a view experienced by a moderately sensitive receptor or perceptible damage to a view experienced by a more sensitive receptor.
Minor adverse	The proposals would cause limited deterioration to a view experienced by a moderately sensitive receptor or cause greater deterioration to a view experienced by a low sensitivity receptor.
Negligible adverse / beneficial	Only a very small part of the proposal would be discernible and / or would be at such a distance that it will be scarcely appreciated.
No effect	No perceptible change to the view.
Minor beneficial	The proposals would cause limited improvement to a view experienced by a receptor of medium sensitivity or would cause greater improvement to a view experienced by a receptor of low sensitivity.
Moderate beneficial	The proposals would cause obvious improvement to a view experienced by a moderately sensitive receptor or perceptible improvement to a view experienced by a more sensitive receptor.

Significance	Typical Criteria Descriptors
Major beneficial	The proposals would lead to a major improvement to a view experienced by a highly sensitive receptor.

18.5.18 In line with guidance set out at Paragraph 5.53 of GLVIA3, the rationale for the overall judgement will be clear and will demonstrate how the assessments of sensitivity and magnitude have been linked in determining the overall significance of each effect.

18.5.19 **Chapter 5 Approach to Assessment** of this Scoping Report explains that major and moderate effects are generally considered to be 'significant', whilst minor and negligible effects are generally considered to be 'not significant'. The classification of significance of landscape and visual effects will align with this approach; however, it should be noted that, in line with clause 3.34 of GLVIA3³⁴⁷ effects not considered to be significant will not be totally disregarded.

Effects on tranquillity

18.5.20 The ANPS³⁴⁸ advises that '(the assessment of) landscape and visual effects (should) also include tranquillity effects.' It is LLAL's interpretation that the ANPS does not envisage that tranquillity should be assessed as a separate topic area alongside landscape and visual effects, but rather that in determining effects on landscape and visual receptors any effects on tranquillity should be included and given consideration.

18.5.21 This approach is in keeping with guidance on tranquillity matters set out within GLVIA3, which references tranquillity alongside a range of other factors that can help in the identification of valued landscapes, stating in relation to perceptual aspects of valued landscapes that '*A landscape may be valued for its perceptual qualities, notably wildness and/or tranquillity*'³⁴⁹.

18.5.22 Judgements regarding the significance of impacts on landscape receptors will consider the value afforded by tranquillity both as a contributor to the overall character of the wider landscape and as a perceptual quality of landscape in its own right.

18.5.23 Published tranquillity maps (e.g. those prepared by the Campaign to Protect Rural England) will, alongside other resources, be used to help inform judgements regarding effects on tranquillity.

³⁴⁷ ³⁴⁷ LI and IEMA (2013) Guidelines for Landscape and Visual Impact Assessment 3rd Edition Paragraph 3.34

³⁴⁸ Clause 5.2.11, Revised Draft Airports National Policy Statement

³⁴⁹ LI and IEMA (2013) Guidelines for Landscape and Visual Impact Assessment 3rd Edition, Box 5.1 pp84

18.6 Potential significant effects

18.6.1 There are several key landscape and visual attributes of the Main Application Site and Study Area which may be affected by the Proposed Development, which could result in significant effects; these are summarised below.

Construction

18.6.2 Construction of the Proposed Development will be phased but will potentially result in effects on constituent elements of the landscape; aesthetic or perceptual qualities of the landscape; the character of the landscape; and the views and visual amenity experienced by people within differing parts of the landscape.

18.6.3 The landscape receptors that it is considered may be potentially affected by the Proposed Development are as follows:

- the underlying geology, soils and landform east of LTN;
- the mixed ancient deciduous and plantation woodlands east of LTN;
- the mature remnant hedgerows and hedgerow trees east of LTN;
- the irregular - predominantly large - arable field patterns, with smaller fields on sloping ground east of LTN;
- the parkland setting of Wigmore Valley Park;
- the narrow winding lanes and associated hedge banks east of LTN;
- the outlying cottages and scattered farmsteads east of LTN;
- the network of rights of way east of LTN;
- LBLCA Area 4c – Lea Valley Lower;
- LBLCA Area 13 – Wigmore Rural;
- LBLCA Area 14 – Luton Airport;
- LBLCA Area 15 – Dane Street & Someries Farm;
- LBLCA Area 16 – Luton South Industrial;
- LBLCA Area 22 – Stockwood Park;
- HLCA Area 200 – Peters Green Plateau;
- HLCA Area 201 – Kimpton and Whiteway Bottom;
- HLCA Area 202 – Breachwood Green Ridge;
- HLCA Area 203 – Whitwell Valley;
- HLCA Area 211 – Offley and St. Paul's Walden;
- CBLCA Area 11B – Caddington / Slip End Chalk Dipslope;

- CBLCA Area 11C – Luton Hoo Chalk Dipslope;
- CBLCA Area 11D – Luton Airport / Chiltern Green Chalk Dipslope;
- CBLCA Area 12C – Slip End Chalk Valley;
- CBLCA Area 12D – Lea Chalk Valley; and

18.6.4 The aesthetic or perceptual characteristics of the landscape within the Chilterns AONB.

18.6.5 The visual receptors that it is considered may be potentially sensitive to the Proposed Development and affected by views towards the Proposed Development are as follows:

Users of open space

- visitors to Wigmore Valley Park;
- visitors to Someries Castle and Grounds;
- users of Dallow Downs Public Open Space;
- visitors to Luton Hoo Memorial Park;
- users of Raynham Recreation Ground and Community Centre;
- users of the area of greenspace next to Polzeath Close;
- users of Powdrills Field;
- users of Stockwood Park; and,
- users of Stopsley Common.
- users of PRoW
- users of the unnamed footpath to the east of Wigmore;
- users of the unnamed footpath to the southeast of Wigmore Valley Park and to the east of the existing LTN airfield;
- users of the Chiltern Way long distance footpath (specifically users of footpaths and bridleways Offley 002; Kings Walden 004; Kings Walden 006; Kings Walden 041; Kings Walden 052);
- users of public rights of way to the west of Breachwood Green (specifically users of footpaths and bridleways Kings Walden 007; Kings Walden 008; Kings Walden 009; and, where not forming part of the Chiltern Way, Kings Walden 052);
- users of footpaths Kings Walden 041, where not forming part of the Chiltern Way, and Kings Walden 043, which pass through the Main Application Site;

- users of footpaths near Lye Hill (including users of footpaths Kings Walden 003; Kings Walden 005; and Kings Walden 051);
- users of footpaths near Ley Green (specifically users of footpaths Kings Walden 012 and Kings Walden 022);
- users of public rights of way south of LTN (including bridleways Hyde 2 and Hyde 3; and footpaths Hyde 4, east of Someries Castle, and Hyde 5);
- users of public footpath Hyde 4, west of Someries Castle;
- users of the Lea Valley Cycle Route, nr. Park Street;
- users of footpath Offley 026, west of Cockernhoe;
- users of footpath St Pauls Walden 024, nr. Bendish;
- users of rights of way on or adjoining the flight path east of Breachwood Green;
- users of rights of way on or adjoining the flight path near Caddington; and
- users of rights of way on or adjoining the flight path within the Chilterns AONB.

Local residents and users of public buildings

- residents and users of Luton Hoo Hotel and Parkland;
- residents of Wandon End and Ivy Cottages;
- residents of South Wigmore;
- residents of Winch Hill House & Winch Hill Cottages;
- residents of Darleyhall and visitors to the Fox Inn public house;
- residents of Breachwood Green, The Heath and Lye Hill; and,
- users of Wigmore Hall Conference Centre.

Motorists and road users

- users of the Chiltern Way Cycle Route;
- users of Darley Road;
- users of Eaton Green Road;
- users of Winch Hill Lane;
- users of Vauxhall Way;
- users of Kimpton Road and Airport Way; and
- users of New Airport Way.

Operation

- 18.6.6 It is considered that several of the construction phase effects on the constituent elements of the landscape, land cover and land use will be residual within the operational phase.
- 18.6.7 It is similarly considered that potential effects on views and visual amenity, the aesthetic and perceptual characteristics of the surrounding landscape and key characteristics of locally identified landscape character areas may also be residual within the operational phase without suitable mitigation.

Cumulative effects

- 18.6.8 A cumulative landscape and visual impact assessment (CLVIA) will be carried out to determine the likely significant cumulative landscape and visual effects arising during either the construction or operation of the Proposed Development.
- 18.6.9 The CLVIA will adopt a two-stage process, assessing first 'total effects' (i.e. the combined effects of past, present and future proposals together with the Proposed Development against the existing baseline) and secondly 'additional effects' (i.e. the effects of the Proposed Development assuming past, present and future proposals are already present within the existing baseline). Where no 'total effects' (stage 1) are considered likely, the subsequent 'additional effects' (stage 2) assessment - to recognise the contribution that the Proposed Development makes to the total effects - will not be carried out³⁵⁰.
- 18.6.10 It is anticipated that the CLVIA Study Area will be the same as the LVIA Study Area. The CLVIA assessors will however use professional judgement in this regard and will, if appropriate, extend the CLVIA Study Area as necessary to ensure all likely significant cumulative landscape and visual effects are identified.
- 18.6.11 See **Chapter 21 In-Combination and Cumulative Effects** of this Scoping Report for further details regarding methodology.

18.7 Matters scoped out

- 18.7.1 LVIA's are generally undertaken on the basis that viewpoints identified as part of the process of assessing visual effects are publicly accessible. It is therefore proposed that effects on private views from residential properties will be scoped out.
- 18.7.2 Notwithstanding this, it is proposed that a supportive 'Non-EIA Residential Visual Amenity Appraisal' will be prepared and

³⁵⁰ IEMA, EIA Quality Mark Article, Cumulative: Additional, Combined or Both? Available at:

[REDACTED]
[REDACTED] accessed March 2019]

submitted alongside the ES. This will be an appraisal of residential visual amenity based on desktop analysis and information gathered from publicly accessible areas only. The appraisal will stop short of determining significance of visual effect but will make judgements, based on desktop and site research, about the likely sensitivity of potential residential receptors to the type of development proposed and the anticipated magnitude of impact.

18.8 Mitigation

18.8.1 The LVIA will include a description of the measures envisaged to prevent, reduce and, where relevant, offset any significant adverse landscape and/or visual effects resulting from the Proposed Development.

18.8.2 As per Section 5.3 of this Scoping Report the LVIA will consider Primary, Secondary and Tertiary mitigation.

18.8.3 Measures that may help to reduce potentially adverse landscape and visual effects include, but are not limited to³⁵¹:

- adjustment of site levels;
- use of appropriate form, detailed design, materials or finishes where it is neither desirable nor practicable to screen buildings and associated development – in these circumstances, the design of the structures and materials, colour treatment and textural finishes would be selected to aid integration with the surroundings;
- alterations to landforms (including creation of bunds or mounds) together with structure planting on and / or off site; and / or
- avoiding or reducing obtrusive light.

³⁵¹ Paragraph 4.27, Guidelines for Landscape and Visual Impact Assessment 3rd Edition

19 CULTURAL HERITAGE

19.1 Introduction

19.1.1 This chapter presents the proposed approach to the assessment of the likely significant environmental effects of the Proposed Development on cultural heritage

19.1.2 This has been informed by the current understanding of existing baseline conditions, and identifies the potential significant environmental effects associated with the Proposed Development.

19.1.3 The assessment will consider potential impacts on the historic environment, including:

- Designated heritage assets, including Scheduled Monuments, listed buildings, Registered Parks and Gardens and conservation areas; and
- Non-designated heritage assets, including locally listed buildings and archaeology.

19.2 Legislation, policy and guidance

Legislation

The Ancient Monuments and Archaeological Areas Act 1979

19.2.2 The Act imposes a requirement for Scheduled Monument Consent for any works of demolition, repair, and alteration that might affect a Scheduled Monument. For non-designated archaeological assets, protection is afforded through the development management process as established both by the Town and Country Planning Act 1990 and the NPPF.

The Planning (Listed Buildings and Conservation Areas) Act 1990

19.2.3 The Act sets out the principal statutory provisions which must be considered in the determination of any application affecting either listed buildings or conservation areas.

19.2.4 Protection is placed on a listed building by Section 7 of the Act which states that “*no person shall execute or cause to be executed any works for the demolition of a listed building or for its alteration or extension in any manner which would affect its character as a building of special architectural or historic interest, unless the works are authorised*”. Authorisation is granted through listed building consent (Section 8).

19.2.5 Applications for consent should contain as a minimum:

- sufficient particulars to identify the building to which it relates, including a plan;
- such other plans and drawings as are necessary to describe the works which are the
- subject of the application; and
- such other particulars as may be required by the authority (Section 10(2)).

19.2.6 Section 66 of the Act states that in considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses. By virtue of Section 1(5) of the Act a listed building includes any object or structure within its curtilage.

19.2.7 Section 72 of the Act states that with respect to buildings or land within a conservation area, special attention should be paid to the desirability of preserving or enhancing the character or appearance of that area.

National planning and aviation policy

Airports National Policy Statement – June 2018

19.2.8 Paragraphs 5.193 to 5.195 of the ANPS¹¹ set out the approach to the assessment on the historic environment. Paragraph 5.193 states:

“As part of the environmental statement, the applicant should provide a description of the significance of the heritage assets affected by the proposed development, and the contribution of their setting to that significance. The level of detail should be proportionate to the asset’s importance, and no more than is sufficient to understand the potential impact of the proposal on the significance of the asset. Consideration will also need to be given to the possible impacts, including cumulative, on the wider historic environment. At a minimum, the relevant Historic Environment Record³⁵² should be consulted and the heritage assets assessed using appropriate expertise. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, the applicant should include an appropriate desk-based assessment and,

³⁵² Historic Environment Records are information services maintained and updated by (or on behalf of) local authorities and National Park Authorities with a view to providing access to comprehensive and dynamic resources relating to the historic environment of an area for public benefit and use. Details of Historic Environment Records in England are available from the Heritage Gateway website. Historic England should also be consulted where relevant

where necessary, a field evaluation. The applicant should ensure that the extent of the impact of the proposed development on the significance of any heritage asset affected can be adequately understood from the application and supporting documents.”

- 19.2.9 In considering the minimisation of impacts on the historic environment of the Proposed Development, paragraph 5.198 states:

“the Secretary of State will take into account the particular nature of the significance of the heritage asset and the value that they hold for this and future generations. This understanding should be used to avoid or minimise conflict between their conservation and any aspect of the proposal.”

- 19.2.10 Paragraphs 5.209 to 5.212 are concerned with the recording of heritage features and paragraph 5.210 states:

“Where the loss of the whole or part of a heritage asset’s significance is justified, the Secretary of State will require the applicant to record and advance understanding of the significance of the heritage asset before it is lost (wholly or in part).”

National Planning Policy Framework (NPPF) – February 2019

- 19.2.11 The revised NPPF continues to set out the Government’s planning policies for England and how these should be applied to contribute to the achievement of sustainable development. There are policies protecting the historic environment throughout the revised NPPF. Section 12 highlights the importance of good design as a key aspect of sustainable development. Paragraph 127c draws attention to the importance of the design being *“sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change (such as increased densities)”*. In addition, paragraph 127d points out that planning policies and decisions should ensure that *“developments establish or maintain a strong sense of place, using the arrangement of streets, spaces, building types and materials to create attractive, welcoming and distinctive places to live, work and visit”*.
- 19.2.12 Section 16 of the revised NPPF deals specifically with *“conserving and enhancing the historic environment”*. Where changes are proposed, the NPPF sets out a clear framework to ensure that heritage assets are conserved, and where appropriate enhanced, in a manner that is consistent with their significance.

- 19.2.13 The NPPF sets out the importance of being able to assess the significance of heritage assets that may be affected by a development. Significance is defined in Annex 2 as being the, *'value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic.'* Significance is not only derived from an asset's physical presence, but also from its setting. The setting of a heritage asset is also defined in Annex 2 as, *'the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve.'*
- 19.2.14 Paragraph 189 of the NPPF states that LPAs should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. Similarly there is a requirement on LPAs, having assessed the particular significance of any heritage asset that may be affected by a proposal; to take this into account when considering the impact of a proposal on a heritage asset (paragraph 190).
- 19.2.15 The LPAs should take account of the following three points:
- The desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;
 - The positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality;
 - The desirability of new development making a positive contribution to local character and distinctiveness (paragraph 192); and
 - Opportunities to draw on the contribution made by the historic environment to the character of a place.
- 19.2.16 Paragraphs 193 to 197 of the NPPF introduce the concept that heritage assets can be harmed or lost through alteration, destruction or development within their setting. This harm ranges from less than substantial through to substantial. With regard to designated assets, paragraph 193 states that the more important the asset, the greater the weight should be on its conservation. This is irrespective of the level of harm to its significance as a result of any proposals. In paragraph 194, a distinction is made in respect of those assets of the highest significance (e.g. grade I and grade II* listed buildings) where substantial harm to or loss should be wholly exceptional.

- 19.2.17 In instances where development would cause substantial harm to or total loss of significance of a designated asset consent should be refused unless that harm or loss is '*necessary to achieve substantial public benefits that outweigh that harm or loss*' (paragraph 195). In instances where development would cause less than substantial harm to the significance of a designated asset the harm should be weighed against the public benefits of the proposal including its optimum viable use (paragraph 196).
- 19.2.18 Paragraph 197 states that '*the effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that affect directly or indirectly non designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset*'. Distinction is made between those non-designated assets of archaeological interest which are demonstrably of equivalent significance to scheduled monuments they should be considered against policies for designated heritage assets (footnote 63).
- 19.2.19 The NPPF therefore recognises that a balance needs to be struck between the harm caused to heritage assets and the delivery of public benefit.

Local policy

Hertfordshire Local Transport Plan (2018-2031)

- 19.2.20 The new Local Transport Plan Strategy (LTP4) will provide a framework to guide all the future transport planning and investment for the county.
- 19.2.21 Policy 21 states that as far as the historic environment is concerned, the county council will seek to:

“a) Ensure the impacts of traffic and transport infrastructure on the natural, built and historic environment are minimised.”

Luton Borough Council

Luton Local Plan 2011-2031 – November 2017

- 19.2.22 Luton Local Plan 2011-2031 was adopted in November 2017. In terms of natural and historic environment Strategic Objective 5 of the Local Plan states that high quality and sustainable design will be sought in order to improve the built and natural environment and deliver quality places.
- 19.2.23 In terms of the historic environment, Policy LLP30 – Historic Environment is of relevance. Policy LLP30 states that proposals for new development should take into consideration the

character, setting, local distinctiveness (including materials and detailing) of local affected heritage assets and features of particular importance.

- 19.2.24 The policy also states that any degree of harm and benefit arising from development proposals will be assessed against the significance of any affected heritage assets. There will be a presumption in favour of the retention of heritage assets while any harm or loss to a heritage asset will require clear and convincing justification.

Central Bedfordshire Council

South Bedfordshire Local Plan, 2004

- 19.2.25 South Bedfordshire Local Plan was adopted in 2004. A number of policies were saved by the Secretary of State in September 2007 and continue to be part of the development plan. In terms of the historic environment, the saved Policy BE7 - Conservation and Enhancement of Historic Parks and Gardens is of relevance. According to Policy BE7, the council will encourage the conservation, enhancement and restoration of the historic parks and gardens identified as important in their local plan.

Pre-submission Local Plan 2015-2035, January 2018

- 19.2.26 Section 2 of the emerging Local Plan recognises that the key challenge of the Plan is to find ways in which new development can be used to strengthen and enhance heritage assets.

- 19.2.27 Of relevance to the historic environment are:

- Policy HE1: Archaeology and Scheduled Monuments, whereby proposals which cause substantial harm to the significance of archaeological heritage assets or their settings will be refused unless the application demonstrates public benefits which will substantially outweigh the loss of significance.
- Policy HE2: Historic Parks and Gardens whereby development proposals that would degrade the character, appearance and setting resulting in the loss of significance of Registered Parks and Gardens will be refused unless it can be demonstrated that the public benefits will bring substantially outweighs the loss of significance; and
- Policy HE3: Built Heritage whereby proposals that could affect the significance of listed buildings, conservation areas and non-designated heritage assets including their setting will need to comply with national policies as well as the relevant section of the Design Guide for Central Bedfordshire.

North Hertfordshire District Council

Saved Policies - District Local Plan No.2 with Alterations, 1996

- 19.2.28 Saved Policy 16: Areas of Archaeological Significance and other Archaeological Areas states that in terms of archaeological areas, the council may require a preliminary evaluation of any potential archaeological remains before deciding to permit or to refuse development proposals. Saved Policy 19 mentions that the council will not grant permission for development proposals that will destroy or result in any loss of the value of any historic parks and gardens.

Local Plan 2011 – 2031, Proposed Submission, October 2016

- 19.2.29 NHDC are preparing a new Local Plan that will replace the existing 1996 Local Plan.
- 19.2.30 Policy HE1 regarding designated heritage assets points out that development proposals affecting such assets or their setting will be granted permission if they “*enable the heritage asset to be used in a manner that secures its conservation and preserves its significance*”.
- 19.2.31 Policy HE3 regarding local heritage states that the loss of a building of local interest will only be permitted if “*the replacement building contributes to preserving the local character and distinctiveness of the area*”.
- 19.2.32 Policy HE4 sets out a series of requirements to be put in place where development will result in loss of archaeological features.

Policy guidance

National Planning Practice Guidance

- 19.2.33 The National PPG is a government produced interactive on-line document that provides further advice and guidance that expands the policy outlined in the NPPF. It expands on terms such as ‘significance’ and its importance in decision making. The PPG clarifies that being able to properly assess the nature, extent and the importance of the significance of the heritage asset and the contribution of its setting, is very important to understanding the potential impact and acceptability of development proposals (Paragraph: 009, Ref. ID: 18a-009-20140306).
- 19.2.34 The PPG states that in relation to setting a thorough assessment of the impact on setting needs to take in to account, and be proportionate to, the significance of the heritage asset under consideration and the degree to which proposed changes

enhance or detract from that significance and the ability to appreciate it (Paragraph: 013, Ref. ID: 18a-013-20140306).

- 19.2.35 The PPG usefully discusses how to assess if there is substantial harm. It states that what matters in assessing if a proposal causes substantial harm is the impact on the significance of the asset. It is the degree of harm to the asset's significance rather than the scale of the development that is to be assessed (Paragraph: 017, Ref. ID: 18a-017-20140306). Generally, harm to heritage assets can be avoided or minimised if proposals are based on a clear understanding of the heritage asset and its setting (Paragraph: 019, Ref. ID: 18a-019-20140306).
- 19.2.36 The NPPF indicates that the degree of harm should be considered alongside any public benefits that can be delivered by development. The PPG states that these benefits should flow from the Proposed Development and should be of a nature and scale to be of benefit to the public and not just a private benefit and would include securing the optimum viable use of an asset in support of its long-term conservation (Paragraph: 020, Ref. ID: 18a-020-20140306).

Historic England Good Practice Advice Notes

- 19.2.37 Historic England has published a series of Good Practice Advice (GPA) of which those of most relevance to this appraisal are GPA2 Managing Significance in Decision-taking (March 2015) and GPA3 (Second Edition) The Setting of Heritage Assets (December 2017).
- 19.2.38 GPA2 emphasises the importance of having a knowledge and understanding of the significance of heritage assets likely to be affected by the development and that the 'first step for all applicants is to understand the significance of any affected heritage asset and, if relevant the contribution of its setting to its significance' (para 4). Early knowledge of this information is also useful to a local planning authority in pre-application engagement with an applicant and ultimately in decision making (para 7).
- 19.2.39 GPA3 (Second Edition) provides detail on the setting of heritage assets and consolidates and supersedes earlier advice on that matter published by Historic England in 2015 and 2011 (Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets, 2015) and Seeing the History in the View: a Method for Assessing Heritage Significance within Views, 2011). GPA3 (Second Edition) provides general advice on understanding setting, and how it may contribute to the significance of heritage assets and allow that significance to be appreciated. The document also provides advice on how views contribute to setting.

- 19.2.40 Paragraph 8 of the advice note confirms the extent of the setting, as defined in the NPPF, is not fixed and may change as the asset and its surroundings evolve.
- 19.2.41 Paragraph 9 states that although the setting is not itself a heritage asset, nor a heritage designation, land comprising a setting may itself be designated. The concept of a 'core', 'wider' and 'extended' setting are introduced in the same paragraph (under the section on Designated Views) however it is acknowledged that there is no formal meaning for these terms and they will only apply to certain cases.
- 19.2.42 Paragraph 13 states that 'where complex issues involving views come into play in the assessment of such views – whether for the purposes of providing a baseline for plan-making or for development management – a formal views analysis may be merited'.

19.3 Stakeholder engagement and consultation

- 19.3.1 An introductory non-statutory stakeholder meeting for all the environmental disciplines was held on 26 February 2018 to brief consultees on the headline issues associated with the Proposed Development. This was attended by the CBC Archaeologist who agreed with the inclusive and proactive approach to the consultation process outlined at the meeting.
- 19.3.2 A follow up teleconference was held on 7 March 2018 with the Historic England Inspector of Monuments during which areas of responsibility and arrangements for the provision of advice to the Project design team were discussed. It was agreed that a technical meeting with the other key stakeholders would be desirable to achieve consensus.
- 19.3.3 A meeting with the Historic England Inspector of Monuments and the CBC Archaeologist was held on 28 March 2018. The aim of the meeting was to provide an overview of the scheme and to discuss with the stakeholders the proposed methodology of the assessment and initial views on potential impacts of the Proposed Development on cultural heritage. The meeting also gave the opportunity to the stakeholders to provide some initial advice and identify any issues that need to be taken into consideration.
- 19.3.4 A meeting with the CBC Archaeologists was held on 17 July 2018 to discuss the project and achieve consensus on the requirements for the evaluation of LLAL holdings inside the Proposed Development boundary within Bedfordshire. It was agreed that the land immediately to the east of Wigmore Valley Park should be evaluated by archaeological trial trenching.

- 19.3.5 A meeting was held on 9 November 2018 with HCC Archaeologists to discuss the likely requirements for the evaluation of LLAL holdings within Hertfordshire. The technical requirements for the geophysical survey of this area were discussed and HCC provided further detailed guidance on the preferred specifications in an email (dated 12 November 2018).

19.4 Baseline conditions

Study Area

- 19.4.1 Due to the semi-rural location of the Main Application Site and the nature and size of the Proposed Development, a core Study Area encompassing a 2km radius surrounding the Main Application Site has been used to identify all known designated heritage assets and to inform and provide context for the assessment. Every asset within this area will be identified; however, only those where there is the potential for impacts to occur will be discussed. This takes into account the ZOI of the Proposed Development; in particular, it considers the character of the Study Area to the west which lies within the urban core of Luton.
- 19.4.2 An extended Study Area will be used to assess the visual and setting impacts on designated assets of the highest significance (Grade I and II* listed buildings and registered parks and gardens, and scheduled monuments). This extended Study Area will be reviewed and confirmed during a site walkover survey and in collaboration with the landscape architects to reflect the ZTV developed for the LVIA (see **Chapter 18 Landscape and Visual** of this Scoping Report).
- 19.4.3 Known non-designated heritage assets will be identified within 0.5km radius surrounding the Main Application Site to inform and provide context for the assessment.

Data gathering and survey

- 19.4.4 The following data sources have been used in order to inform this Scoping Report:
- Historic England's National Heritage List for England (NHLE);
 - Heritage Gateway website available online via [REDACTED]
 - LBC, CBC, NHDC and HCC websites.
 - The Archaeology Data Service available online at
 - [REDACTED]
- 19.4.5 The following sources will also be consulted in the preparation of the full Cultural Heritage baseline:

- English Heritage National Heritage List;
- The Central Bedfordshire and Luton Historic Environment Record (HER);
- Hertfordshire Historic Environment Record;
- Bedfordshire and Luton Archives and Records Service;
- Hertfordshire Archives and Local Studies;
- Local Studies collection in Luton Central Library;
- Luton Museum;
- Historic Ordnance Survey and pre-Ordnance Survey mapping;
- A site walkover survey and setting assessment; and
- Various internet and documentary sources.

19.4.6 In order to augment the baseline understanding of the area recorded in the CBC and HCC Historic Environment Records, some initial archaeological evaluation surveys have been conducted, the results of which will be considered in the ES.

19.4.7 A coordinated programme of archaeological evaluation has been agreed with the Central Bedfordshire and Hertfordshire Archaeologists. As part of this geophysical survey of the LLAL holdings within Hertfordshire was conducted in accordance with a Written Statement of Investigation (dated 21 December 2018) which was approved by HCC on 7 January 2019. The survey took place between 4 January 2019 and 28 January 2019. The results show that there are a small number of linear geophysical anomalies present within the survey area.

19.4.8 The archaeological evaluation by trial trenching of the LLAL holdings to the east of Wigmore Valley Park, within Central Bedfordshire is imminent. A brief for the conduct of the evaluation was issued by CBC dated 8 August 2018. A Written Statement of Investigation (dated 7 February 2019) was submitted to CBC and approved by email on 8 February 2019. The archaeological trial trench evaluation commenced on 21 February 2019.

19.4.9 Further archaeological surveys may include, but not be limited to: walkover surveys, earthwork surveys, surface artefact collection (fieldwalking) surveys, geophysical survey, geoarchaeological borehole surveys and archaeological evaluation trenching.

Existing conditions

19.4.10 The Main Application Site lies close to the southern limit of the Anglian Ice sheet, and the Bedfordshire Archaeological

Resource Framework³⁵³ notes that the area around Luton has produced a number of important finds of Palaeolithic material. The available evidence, which often occurs in brick earth deposits or sand or gravel quarries shows that in the Upper Palaeolithic period activity was concentrated within river valleys and uplands areas affording good vantage points, such as the Greensands ridge and the Chilterns.

- 19.4.11 At Caddington (to the south west of the airport) evidence was found of short-term, small-scale Palaeolithic activity around ponds and watering holes. These formed in funnel-shaped solution hollows (dolines) which penetrate the superficial deposits into the underlying chalk bedrock. The Main Application Site has the potential for similar geological conditions and therefore has the potential for the survival of in situ Palaeolithic deposits.
- 19.4.12 The Main Application Site covers approximately 360 ha of which approximately 190 ha lies within the existing LTN boundary. Much of the Main Application Site (especially the western end) has been subject to a variety of previous ground disturbance, including the building and subsequent duelling of New Airport Way. This means that whilst there are a number of non-designated heritage assets recorded in the HER which lie within the western side of the Main Application Site there is a low/unknown potential that any remains relating to these assets is preserved.
- 19.4.13 At the eastern end of the Main Application Site, within the fields south of Wandon End there is the site of an Iron Age-Romano British double ditched enclosure and occupation site (HER no. 10808), and two further areas where cropmarks have been recorded from aerial photographs. These have been interpreted as linear pit alignments of probable prehistoric origin. This area, covering approximately 50 ha is, therefore, known to have a high potential to preserve significant archaeology of local and regional importance. This area is currently being evaluated by archaeological trial trenching, the results will be available to inform the ES.
- 19.4.14 Other sites from the same period include the Iron Age/Romano-British enclosure south of Chiltern Hall and the cropmarks of possible prehistoric enclosures adjacent to Winch Hill to the east. A series of excavations at Stopsley to the north of the Site, in an area of similar topography revealed a complex, multi period landscape with evidence of settlement from the later Neolithic/Bronze Age through to the Medieval period.

³⁵³ Oake, M Luke, M et al. (2007) Bedfordshire Archaeology Research and Archaeology: Resource Assessment, Research Agenda and Strategy Bedfordshire Archaeology Monograph 9, Bedford.

Designated assets

- 19.4.15 There are no World Heritage Sites or Registered Battlefields within the 2 km Study Area. There is one scheduled monument, 113 listed buildings, two Registered Parks and Gardens (RPGs) and five Conservation Areas within the Study Area. Five of the listed buildings lie within or adjacent the Main Application Site. These include:
- Wigmore Hall Farmhouse (Grade II, NHLE 1321368);
 - Wandon End Farmhouse (Grade II, NHLE 1102448);
 - Wandon End House (Grade II, NHLE 1307874); and
 - Office Block, Vauxhall Motors (Grade II, NHLE 1249000).
- 19.4.16 Winchill Farmhouse (Grade II, NHLE 1307881) is also located within the Main Application Site. A listed building application (18/03263/LBC) for the demolition of Winch Hill Farmhouse has been submitted to NHDC.
- 19.4.17 Someries Castle (SM, NHLE 1008452) is located to the south of the Proposed Development. The scheduled monument includes upstanding and buried foundations of the late medieval magnate's residence known as Someries Castle and the adjacent garden earthworks to the south-west.
- 19.4.18 The Grade II* Luton Hoo RPG (NHLE 1000578) is located directly to the south west of the Main Application Site. Luton Hoo RPG contains 11 Grade I, Grade II* and Grade II listed buildings and structures including the Grade I Luton Hoo house (NHLE 1321301). The Grade II Putteridge Bury RPG (NHLE 1000917) is located to the north of the Main Application Site. There are six listed buildings and structures associated with this park including the Grade II Putteridge Bury (Luton College of Higher Education) (NHLE 1347083).
- 19.4.19 There are five Conservation Areas within the Study Area. These include:
- The High Town Conservation Area;
 - Luton South Conservation Area;
 - Plaiters Lea Conservation Area;
 - Town Centre Conservation Area; and
 - Luton Hoo Conservation Area, within Luton Hoo RPG falls within the south-western part of the Study Area.
- 19.4.20 Rothesay Road Conservation Area falls outside the Study Area to the west.

Non-designated heritage assets

- 19.4.21 There are 23 non-designated archaeological assets recorded in the 0.5km Study Area (see Figure 19.1, Volume 2 and Table 19-1).
- 19.4.22 These are of a wide variety of site types and range from the Neolithic to the Twentieth Century in date. Many have been identified from aerial photographic analysis and in some cases the original identification of the site has been tested by fieldwalking (surface collection of artefacts), geophysics and excavation.

Table 19-1: Non-designated heritage assets in the 0.5km Study Area

Site Type	Description	Period	HER number
BOUNDARY	LINEAR CROPMARK, West of Someries Farm	Medieval	MBD12441
CHALK PIT	CHALK PIT, West of Bush Pasture	Post-medieval	MBD18043
LYNCHET	LYNCHETS, Brendon Ave/Falconers Road	Unknown	MBD12369
Site of MANOR	HAVINGING MANOR	Medieval	MBD10821
FLINT SCATTER	PREHISTORIC FLINTS, North of Stopsley Sports Ground	Neolithic to Bronze Age	MBD16030
Site of PRISONER OF WAR CAMP	World War II PRISONER OF WAR CAMP	20th Century	MBD17918
Site of QUARRY	QUARRY, West of Wigmore Hall Farm	Post-medieval	MBD12420
FLINT SCATTER	FLINT SCATTER, Wigmore Lane	Neolithic to Bronze Age	MBD17168
Site of QUARRY	QUARRY, East of Wigmore Hall Farm	Post-medieval	MBD12421
INHUMATION	SKELETON, Luton Airport Parkway	Post-medieval	MBD17774
Site of BUILDING, CHAPEL, PALACE, TOWER	TOWER & CHAPEL OF ST ANNE	Medieval to Post-medieval	MBD361
TRAPEZOIDAL ENCLOSURE	CROPMARKS, S and SW of Chiltern Hall	Iron Age to Romano-British	MBD15155
Site of RAILWAY	HATFIELD LUTON AND DUNSTABLE BRANCH RAILWAY (Great Northern Railway)	Post-medieval	MBD14086

Site Type	Description	Period	HER number
RAILWAY	FORMER MIDLAND RAILWAY LINE	Post-medieval to 21st Century	MBD12933
Site of WESLEYAN METHODIST CHAPEL	SITE OF METHODIST CHAPEL, DARLEY ROAD, DARLEYHALL, KING'S WALDEN	Post-medieval	MHT31267
WANDON END, KING'S WALDEN	Site of DESERTED SETTLEMENT?, HAMLET	Medieval to Post-medieval	MHT1837
BLACKSMITHS WORKSHOP	SMITHY, CROUCHMOOR, OFFLEY	Post-medieval	MHT18715
DITCH	EARLY MEDIEVAL DITCH, WANDON END, KINGS WALDEN	Early Medieval to Medieval	MHT9679
Site of BUILDING?, FINDSPOT	POSSIBLE SITE OF POST-MEDIEVAL BUILDING, WANDON END, OFFLEY	Post-medieval	MHT15063
BOUNDARY DITCH?, ENCLOSURE?	SOILMARKS OF POSSIBLE SETTLEMENT AND FARMING FEATURES, DIAMOND END, KING'S WALDEN	Unknown	MHT17234
FINDSPOT	LATE NEOLITHIC/EARLY BRONZE AGE STONE AXE HAMMER, KINGS WALDEN	Neolithic to Bronze Age	MHT27579
ENCLOSURE, DITCH	UNDATED ENCLOSURE, SOUTH OF BRICKKILN WOOD, OFFLEY	Unknown	MHT30173
PIT	POSSIBLY PREHISTORIC PIT, SOUTH OF BRICKKILN WOOD, OFFLEY	Prehistoric	MHT30174

19.4.23 There are 17 non-designated archaeological assets recorded within the area of the indicative Main Application Site boundary (see Figure 19.1, Volume 2 and Table 19-2).

Table 19-2: Non-designated archaeological assets within the Main Application Site

Site Type	Description	Period	HER number
Site of BRICKWORKS	BRICK, TILE WORKS AND LIME KILN, Eaton Green	Post-medieval	MBD6732
Site of BUILDING, HOSPITAL	HOSPITAL OF ST MARY MAGDALENE	Medieval to Post-medieval	MBD362
Site of PILLBOX	World War II PILLBOX	20th Century	MBD17904
Site of INFECTIOUS DISEASES HOSPITAL	SPITTLESEA HOSPITAL FOR INFECTIOUS DISEASES	20th Century	MBD17194
Site of GUN EMPLACEMENT, QUARRY	MILITARY EARTHWORKS, North West of Kimpton Lane	20th Century	MBD12423
DOUBLE DITCHED ENCLOSURE, OCCUPATION SITE	RING DITCHES & ROMAN OCCUPATION, South East of Wigmore Hall Farm	Iron Age to Romano-British	MBD10808
Site of BUILDING	FALCONER'S HALL, North of Luton Airport Main Runway	Post-medieval	MBD17772
CIVIL AIRPORT, MILITARY TRAINING SITE	LUTON AIRPORT	20th to 21st Century	MBD9271
PIT, LINEAR FEATURE	CROPMARKS, North East of Luton Airport	Unknown	MBD12422
EARTHWORK	EARTHWORKS, near Lower Harpenden Road	20th Century	MBD12424
Site of RABBIT WARREN	THE WARREN, Kimpton Lane	Medieval to Post-medieval	MBD12371
Site of CHALK PIT	CHALK PIT	Post-medieval	MBD6733
Site of RABBIT WARREN	CONEY GROUND, near Someries Farm	Medieval to Post-medieval	MBD12372
FIELD BOUNDARY	PLOUGHED LINEAR EARTHWORKS north and south of Dane Street Farm	Post-medieval	MBD22725
Site of FARMSTEAD,	ROMANO-BRITISH OCCUPATION,	Romano-British	MHT7358

Site Type	Description	Period	HER number
OCCUPATION SITE	WINCH HILL FARM, KINGS WALDEN		
ENCLOSURE?, EXTRACTIVE PIT	CROPMARKS OF POSSIBLE ENCLOSURES AND EXTRACTION PIT OR RING DITCH, WINCH HILL FARM, KING'S WALDEN	Unknown	MHT17218
DITCH, PIT, ENCLOSURE?	CROPMARKS OF POSSIBLE ENCLOSURES AND PITS, SOUTH OF WINCH HILL HOUSE, KING'S WALDEN	Unknown	MHT17219

- 19.4.24 Ten of these are the recorded sites of assets which are no longer extant ('sites of'), although there is potential for remains associated with these sites to be preserved below ground.
- 19.4.25 There are three sites identified as cropmarks visible on aerial photographs, some of these are quite extensive and lie both within and outside the indicative Main Application Site boundary.
- 19.4.26 The site of an Iron Age/Romano British settlement, identified from cropmarks and fieldwalking and subsequent geophysical survey (HER no. 10808) lies to the south of Wigmore Hall. This is an extensive series of ditches with possible internal features including the remains of a possible Romano British building. This asset is currently being evaluated by archaeological trial trenching
- 19.4.27 There are two non-designated buildings within the Main Application Site. These are the Fire Station at LTN (HER no.: 19823) and the World War II Airfield Battle Headquarters (HER no. 17921), to the rear of the Wigmore Hall Hotel, north of LTN. The latter is a brick building with a flat concrete roof. Most of the structure is located underground with only a hexagonal cupola visible. The airport itself is also a non-designated heritage asset.
- 19.4.28 A series of non-designated buildings, as identified on the Heritage Gateway website, fall within the ZOI of the Main Application Site. Five of these buildings, including a war memorial, are located to the west, north west of the Main Application Site and are associated with Vauxhall Motors.
- 19.4.29 A number of non-designated places of worship are located to the north west of the Main Application Site, all of which fall within the

built-up area of Luton while the rest of the non-designated assets were noted to the east and south and comprise mainly farms and farm buildings.

- 19.4.30 LBC has prepared a local list of around 160 non-statutory locally listed buildings that are recognised for their local architectural and historic interest and their contribution to the town's streetscape, history, character and identify. LBC's local list of heritage assets has recently been updated to include some new additions. An initial review of the list confirms that there is one locally listed building within the ZOI of the Main Application Site. This comprises Hayward Tyler, a World War II gun emplacement that is part of Hayward Tyler's works. The company dates back to 1815 and opened its Luton factory in 1871.
- 19.4.31 NHDC has also prepared a series of Registers of Buildings of Local Interest. However, these registers only include buildings of local interest in Baldock, Hitchin, Letchworth, Newnham, Knebworth (parish) and Royston. None of these buildings are located within the ZOI of the Proposed Development.

19.5 Assessment methodology

- 19.5.1 The cultural heritage assessment will be undertaken following guidelines from the Chartered Institute for Archaeologists (CIfA) Standards and Guidance for Historic Desk-Based Assessment (2017).
- 19.5.2 The cultural heritage assessment will be carried out in accordance with the NPPF and Planning Practice Guidance and Historic England's guidance, which includes their Historic Environment Good Practice Advice in Planning Notes:
- GPA2. Managing Significance in Decision-Taking in the Historic Environment (2015), which provides guidance on how to assess the impact of development upon the significance of a heritage asset;
 - GPA3 (Second Edition). The Setting of Heritage Assets (2017), which sets out a process for assessing the impact of development upon the setting of heritage assets.
- 19.5.3 Other relevant Historic England guidance is as follows:
- Conservation Area Designation, Appraisal and Management (2016) which provides advice on assessing whether buildings make a positive contribution to the character and appearance of a Conservation Area;
 - English Heritage, 'Conservation Principles' (2008)³⁵⁴;

³⁵⁴ English Heritage (2008), Conservation Principles, *Conservation Principles, Policies and Guidance*. Available at: [REDACTED]

Value criteria

19.5.4 The value of a heritage asset (its heritage significance) is guided by its designated status but is derived also from its heritage interest which may be archaeological, architectural, artistic or historic (NPPF Annex 2, Glossary). The value of a place is defined by the sum of its heritage interest. Each identified heritage asset can be assigned a value in accordance with the criteria set out in Table 19-3. Using professional judgement and the results of consultation, heritage assets are also assessed on an individual basis and regional variations and individual qualities are taken into account where applicable.

Table 19-3: Cultural heritage guidelines

Value	Guidelines
High	Assets of international importance, such as World Heritage Sites, Grade I and II* listed buildings, Grade I and II* registered historic parks and gardens, Registered battlefields, Scheduled monuments, Non-designated archaeological assets of schedulable quality and importance.
Medium	Grade II listed buildings, Grade II listed registered historic parks and gardens, Conservation Areas, Locally listed buildings included within a Conservation Area Non-designated heritage assets of a regional resource value.
Low	Non-designated heritage assets of a local resource value as identified through consultation; Locally listed buildings.
Very low	Non-designated heritage assets whose heritage values are compromised by poor preservation or damaged so that too little remains to justify inclusion into a higher grade.

19.5.5 Some sites may not fit into the categories in this table. In these cases professional judgement will be used as the basis for the assessment. Each heritage asset is assessed on an individual basis and takes into account regional variations and individual qualities of sites.

19.5.6 Having identified the value of the heritage asset, the next stage in the assessment is to identify the level and degree of impact to an asset arising from the Proposed Development. Impacts may arise during construction or operation and can be temporary or permanent. Impacts can occur to the physical fabric of the asset or affect its setting.

[Redacted]
[Redacted] / [Accessed March 2019]

- 19.5.7 The level and degree of impact (impact rating) is assigned with reference to a four-point scale as set out in Table 19-4. In respect of cultural heritage, an assessment of the level and degree of impact is made with consideration of any embedded mitigation.

Table 19-4: Cultural heritage magnitude of impact guidelines

Magnitude	Guidelines
High	Change such that the significance of the asset is totally altered or destroyed. Comprehensive change to setting affecting significance, resulting in a serious loss in our ability to understand and appreciate the asset.
Medium	Change such that the significance of the asset is affected. Noticeably different change to setting affecting significance, resulting in erosion in our ability to understand and appreciate the asset.
Low	Change such that the significance of the asset is slightly affected. Slight change to setting affecting significance resulting in a change in our ability to understand and appreciate the asset.
Very low	Changes to the asset that hardly affect significance. Minimal change to the setting of an asset that have little effect on significance resulting in no real change in our ability to understand and appreciate the asset.

- 19.5.8 An assessment of the level of significant effect, having taken into consideration any embedded mitigation, is determined by cross-referencing between the heritage value of the asset (Table 19-3) and the magnitude of impact (Table 19-4) and using the effects matrix provided in **Chapter 5 Approach to Assessment** (Table 5-5). Major and moderate effects are considered to be significant, whilst minor and negligible effects are considered to be not significant, however, professional judgment may be applied in some circumstances.
- 19.5.9 Within the NPPF, impacts affecting the value of heritage assets are considered in terms of harm and there is a requirement to determine whether the level of harm amounts to 'substantial harm' or 'less than substantial harm'. There is no direct correlation between the significance of effect as defined by the method described in the previous paragraph, which follows normal EIA conventions, and the level of harm caused to heritage significance. A major effect on a heritage asset would, however, more often be the basis by which to determine that the level of harm to the significance of the asset would be substantial. A moderate effect is unlikely to meet the test of substantial harm and would therefore more often be the basis by which to determine that the level of harm to the significance of the asset would be less than substantial.
- 19.5.10 An assessment of the predicted significance of effect is made both prior to the implementation of additional (secondary) mitigation and after the implementation of additional mitigation to identify residual effects. This first highlights where mitigation may

be appropriate and then demonstrates the effectiveness of mitigation and provides the framework for the assessment of significance which takes mitigation measures into consideration.

19.6 Potential significant effects

19.6.1 A number of designated and non-designated assets have been identified within the defined Study Area as having the potential to be significantly affected by the Proposed Development. The potential significant effects are described in the following sections.

Construction

19.6.2 Construction of the Proposed Development has the potential to result in a number of direct impacts on the cultural heritage resource.

19.6.3 Winch Hill Farmhouse (Grade II, NHLE 1307881) and Wigmore Hall Farmhouse (Grade II, NHLE 1321368) are located within the Main Application Site and adjacent to it respectively. A listed building application (18/03263/LBC) for demolition of Winch Hill Farmhouse has been submitted to NHDC. In addition, there are two non-designated buildings within the Main Application Site. These are the Fire Station at LTN (HER no.: 19823) and the World War II Airfield Battle Headquarters (HER no.: 17921), to the rear of the Wigmore Hall Hotel, north of LTN.

19.6.4 For the designated heritage assets and non-designated historic buildings and structures identified within the Main Application Site and the Study Area, the principal impacts during construction will comprise visual and noise impacts on their setting which may affect the significance of the assets.

19.6.5 There is potential that Someries Castle (SM, NHLE 1008452) and the Grade II* Luton Hoo RPG (NHLE 1000578) with its associated listed buildings, may experience significant adverse effects, due to noise and visual intrusion during the construction of the Proposed Development.

19.6.6 The construction of the Proposed Development is likely to impact directly upon buried archaeological remains, should they exist within the footprint of the Proposed Development (including associated aspects required to deliver the Proposed Development, such as haul roads and construction compounds).

19.6.7 Known non-designated heritage assets that may be subject to physical impacts include the site of an Iron Age/Romano-British enclosure (HER no.: 10808). This would be completely removed by the earthworks required for the Proposed Development.

- 19.6.8 An Archaeological Alert Area, the probable site of a Romano British building lies within the proposed replacement open space to the east of Winch Hill Farm. Depending on the landscaping requirements here this may lead to physical impacts on the archaeological resource.

Operation

- 19.6.9 During the operation of the Proposed Development, the principal impacts on the designated and non-designated built heritage assets, identified within the Study Area will comprise visual and noise impacts on their setting which may affect the significance of the assets.

- 19.6.10 Operational impacts of the Proposed Development may include:

- impacts of expanded airport operational ground noise on the setting of a series of heritage assets within the Study Area;
- impacts of changes to lighting on the setting of the Someries Castle, Luton Hoo RPG, Luton Hoo Conservation Area and other heritage assets around the Main Application Site; and
- impacts of noise, vibration and visual intrusion as a result of the increased aviation and associated road traffic on the setting of the Someries Castle, Luton Hoo RPG, Luton Hoo Conservation Area and other heritage assets around the Application Site.

Cumulative effects

- 19.6.11 The potential cumulative impacts on the heritage resource as a result of 'other developments' in combination with the Proposed Development will be considered as part of the heritage assessment.

- 19.6.12 See **Chapter 21 In-Combination and Cumulative Effects** of this Scoping Report for further details regarding methodology.

19.7 Matters scoped out

- 19.7.1 The Proposed Development has the potential to significantly affect a series of designated and non-designated heritage assets. No matters associated with Cultural Heritage are, therefore, scoped out of the heritage assessment.

19.8 Mitigation

- 19.8.1 Mitigation measures or mechanisms to reduce any potential significant adverse effects arising from construction impacts of the Proposed Development will be proposed in the ES. Opportunities to enhance public engagement with the cultural heritage resource and contribute to placemaking will be sought.

- 19.8.2 A programme of archaeological evaluation of the areas of the Proposed Development considered archaeologically sensitive has been agreed with the CBC and HCC Archaeologists. The programme of surveys is underway and will inform the assessment and design. The results will be included in the ES and will be used to inform an iterative design process which will aim to reduce direct impacts on the archaeological resource where possible.
- 19.8.3 Measures to mitigate the impact of the Proposed Development upon the setting of heritage assets may include, but not be limited to: consideration of the detailed design to reduce the visual prominence and careful siting of lighting or signage. Further mitigation could be provided through the use of landscape mitigation measures such as bunds, planting or materials to reduce the visual prominence and noise of the Proposed Development and aid its integration with the surrounding landscape.
- 19.8.4 Where direct impacts are identified that cannot be mitigated by design a full programme of archaeological preservation by record or historic building recording will be agreed with the CBC and HCC Archaeologists and Conservation Officers (as appropriate).
- 19.8.5 The mitigation and approach to managing effects on the historic environment will be defined during the EIA, in consultation with statutory stakeholders, and described in a Cultural Heritage Management Plan as part of the ES. This can then be used by the archaeological contractor when appointed after DCO is granted, to develop appropriate Written Scheme(s) of Investigation for agreement with the appropriate authority prior to construction.

20 MAJOR ACCIDENTS AND DISASTERS

20.1 Introduction

- 20.1.1 This chapter presents the proposed approach to the assessment of the likely significant environmental effects of ‘major accidents and (natural) disasters’ (MA&D)³⁵⁵ in the context of the Proposed Development.
- 20.1.2 Major accidents and disasters is a new EIA topic that requires the assessment of expected significant effects arising from the ‘vulnerability’³⁵⁶ of the Proposed Development to MA&D. In broad terms, risks associated with MA&D will be identified, assessed against criteria to be defined based on project context, and mitigated during the design, construction, operation and maintenance of the Proposed Development.
- 20.1.3 The underlying objective of the assessment is to ensure that appropriate precautionary actions are taken for those projects which may have a vulnerability to MA&D. This includes a description of measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies. This meets the requirement of the EIA Regulations, and the 2014/52/EU amendment to the EIA Directive 2011/92/EU.
- 20.1.4 The assessment will also include a consideration of how the Proposed Development could impact on the risk profile or vulnerability of nearby sites to MA&D events which could, in turn, cause significant environmental effects related to MA&D. For example, the Proposed Development will aim to not adversely

³⁵⁵ A **major accident**, in the context of this assessment, means an uncontrolled event caused by a man-made activity or asset that may result in immediate or delayed serious damage to human health, welfare and/or the environment and requires the use of resources beyond those of LLAL or its contractors to manage. It should be noted that malicious intent is not accidental, however, the outcome e.g. aeroplane crash, may be the same and therefore the same mitigation measures will apply to both deliberate and accidental events.

A **disaster** in the context of this assessment, is a naturally occurring phenomenon such as an extreme weather event (e.g. storm, flood, extreme temperatures) or ground-related hazard events (e.g. subsidence, landslide, earthquake) with the potential to cause an event or situation that leads to immediate or delayed serious damage to human health, welfare and/or the environment and requires the use of resources beyond those of LLAL or its contractors to manage.

Combined, the term **major accident and/or disaster (MA&D)**, captures events triggered both internally and externally to the Proposed Development, where the presence of the Proposed Development could contribute to serious damage.

³⁵⁶ **Vulnerability** describes the susceptibility of an individual, a community, assets or systems to the impacts of hazards (UNISDR, 2017).

Accessed March 2019). Within this assessment, the term ‘**vulnerability**’ is used to describe the ability of the Proposed Development to plan, control, resist and recover from a MA&D event in a timely manner.

impact, through impeding access or emergency plans for any neighbouring sites that have hazard substance consents (including COMAH), or other safety related permits, or increase the time necessary to evacuate the site or surrounding areas in the event of a MA&D, as this could potentially exacerbate the effects of a MA&D event on the environment.

20.2 Legislation, policy and guidance

20.2.1 This section sets out the legislation, policy and guidance that have influenced the proposed MA&D scope and method of assessment.

Legislation

2014/52/EU Directive on the Assessment of the Effects of Certain Public and Private Projects on the Environment

20.2.2 This Directive provides the framework for the environmental assessment of public and private projects. Paragraph 14 of the directive includes reference to ‘A Community approach on the prevention of natural and man-made disasters’, 2009, and a requirement for major accidents and disasters to be considered as part of the EIA process.

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

20.2.3 The Infrastructure Planning (EIA) Regulations 2017, transposing the European Directive 2014/52/EU, have introduced the requirement for “*expected significant effects arising from the vulnerability of the proposed development to major accidents or disasters that are relevant to that development*” (Regulation 5(4)) to be assessed within EIAs where the potential for significant effects has been identified.

Health and safety legislation

20.2.4 The design, construction and operation of the Proposed Development must comply with relevant health and safety legislative requirements, namely:

- EU Regulation No 2018/1139³⁵⁷ on common rules in the field of civil aviation and establishing a European Union Aviation

³⁵⁷ Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council

Safety Agency (EASA). The principal objective of the Regulation is to establish and maintain a high and uniform level of civil aviation safety in Europe. This includes safety requirements in air operations and personnel licensing, aerodromes, ATM/air navigation services and the authorisation of third country operations into, within or out of the territory of the EU;

- European Commission (EC) Regulation No 300/2008³⁵⁸ on common rules in the field of civil aviation security. This Regulation repealed EC Regulation No 2320/2002 which established a common approach to civil aviation security following the events of 11th September 2001 in the United States. The Regulation seeks to protect persons and goods within the EU against acts of unlawful interference with civil aircraft that jeopardise the security of civil aviation by establishing common rules for safeguarding civil aviation as well as mechanisms for monitoring compliance.
- Health and Safety at Work etc. Act 1974 (HSWA). This legislation places general duties on employers, people in control of premises, manufacturers and employees;
- Lifting Operations and Lifting Equipment Regulations 1998 (LOLER). These Regulations under the HSWA aim to reduce the risk of injury from lifting equipment used at work and outline control measures to minimise the risk;
- Construction (Design and Management) (CDM) 2015 Regulations. These regulations place specific duties on clients, designers and contractors, so that health and safety is taken into account throughout the life of a construction project from its inception to its subsequent final demolition and removal;
- The Management of Health and Safety at Work Regulations 1999. This legislation places health and safety duties on employers and employees, which go beyond those included within the CDM Regulations;
- The Workplace (Health, Safety and Welfare) Regulations 1992. This legislation covers a wide range of basic health, safety and welfare issues and apply to most workplaces (except those involving construction work on construction sites);

and Council Regulation (EEC) No 3922/91. Available at:

[REDACTED] j [Accessed March 2019]

³⁵⁸ Regulation (EC) No 300/2008 of the European Parliament and of the Council of 11 March 2008 on common rules in the field of civil aviation security and repealing Regulation (EC) No 2320/2002. Available at: [REDACTED] [Accessed March 2019]

- Control of Major Accident Hazards (COMAH) Regulations 2015. COMAH aims to prevent and mitigate the effects of major accidents involving dangerous substances which can cause serious damage/harm to people and/or the environment. COMAH treats risks to the environment as seriously as those to people;
- Planning (Hazardous Substances) Regulations 2015. These regulations set out planning procedures in relation to sites where hazardous substances are held and for land near those sites;
- Pipeline Safety Regulations 1996. This legislation outlines the requirements for safety systems, safe operation, emergency procedures, plans and prevention for pipelines;
- Control of Asbestos Regulations 2012. These regulations place specific duties on employers to manage and control asbestos, for the identification of the presence of asbestos and the licensing and notification of associated work;
- Control of Substances Hazardous to Health Regulations 2002 (COSHH). COSHH Regulations place requirements on employers to assess and manage health risks associated with hazardous substances, maintain and monitor control measures and plan for emergencies;
- The Regulatory Reform (Fire Safety) Order 2005. (FSO) This legislation places duties on employers to reduce the risk from fire and ensure safe escape routes in case of fire;
- The Civil Contingencies Act (CCA) 2004 (Contingency Planning) Regulations 2005. The CCA establishes a statutory framework of roles and responsibilities for those involved in emergency preparation and response at the local level. This includes emergency powers that might be necessary to deal with the effects of serious emergencies;
- The Building Regulations 2010 set out national building standards and requirements for specific aspects of building design and construction, including to control health and safety risks.

National Planning and Aviation Policy

Airport National Policy Statement – June 2018

- 20.2.5 Paragraph 4.5 of the ANPS states “*safety, social and economic benefits and adverse impacts should be considered at national, regional and local levels. These may be identified in the Airports NPS, or elsewhere. The Secretary of State will also have regard to the manner in which such benefits are secured, and the level of confidence in their delivery.*”

20.2.6 Paragraph 4.35 states “*The Examining Authority and Secretary of State will take into account the ultimate purpose of the infrastructure and bear in mind the operational, safety and security standards which the design has to satisfy.*”

20.2.7 Paragraph 4.47 states in relation to climate change adaption that “*Where transport infrastructure has safety-critical elements, and the design life of the asset is 60 years or greater, the applicant should apply the latest available UK Climate Projections high emissions scenario against the 2080 projections at the 10%, 50% and 90% probability levels, so as to include high impact, low likelihood scenarios.*”

20.2.8 Paragraphs 4.63 to 4.69 are concerned with national security and safety considerations and is primarily concerned with security issues in relation to terrorism. Paragraph 4.68 focuses on safety and states:

“Air transport is one of the safest forms of travel, and the UK is a world leader in aviation safety. Maintaining and improving that record, while ensuring that regulation is proportionate and cost-effective, remains of primary importance to the UK. Since 2003, rules and standards for aviation safety in Europe have increasingly been set by the European Aviation Safety Agency. The UK will continue to work closely with the European Aviation Safety Agency to ensure that a high and uniform level of civil aviation safety is maintained across Europe.”

National Planning Policy Framework (NPPF) – February 2019

20.2.9 Paragraph 45 of the NPPF states that:

“Local planning authorities should consult the appropriate bodies when considering applications for the siting of, or changes to, major hazard sites, installations or pipelines, or for development around them”

20.2.10 Paragraph 95 of the NPPF states that planning decisions “*should promote public safety and defence requirements by*”, amongst others: “*anticipating and addressing possible malicious threats and natural hazards, especially in locations where large numbers of people are expected to congregate... This includes appropriate and proportionate steps that can be taken to reduce vulnerability, increase resilience and ensure public safety and security.*”

Aviation Strategy

20.2.11 The emerging Aviation Strategy was published for consultation in December 2018²¹. Section 6 of the Strategy is entitled “Ensure a safe and secure way to travel”. It sets out a number of policy objectives for the Government including:

- mandate peer support programmes across all safety critical elements of aviation, building on the EASA-regulated pilot schemes by extending schemes to all safety critical roles including engineers and air traffic controllers (paragraph 6.12);
- incentivise take up of existing technology and new innovation by working with industry to set out common specifications to facilitate greater interoperability, reduce cost, and to mitigate safety risks (paragraph 6.12); and
- review the UK approach to General Aviation safety to re-evaluate the risk picture and risk appetite (paragraph 6.15).

Aviation Policy Framework – March 2013

- 20.2.12 Paragraphs 5.14-5.16 of the APF²⁰ focusses on Public Safety Zones, areas within which development is restricted to limit the number of people living and working near airports. This policy is reflected within the Department for Transport Circular 01/2010, Control of Development in Airport Public Safety Zones, and within the Luton Local Plan 2011-2031 Policy LLP34 (paragraphs 4.48, 11.19-11.23) explored further below.

Local Policy

Luton Local Plan 2011-2031 – November 2017

- 20.2.13 LBC Local Plan 2011-2031 makes reference to local emergency planning primarily in the context of flooding and FRAs. Policy LLP36 A(ii) states “*ensuring that all new development addresses flood resilience, the effective management of flood risk including opportunities for appropriate dry access for emergency vehicles*”.
- 20.2.14 The Local Plan refers to the public safety zone at LTN within paragraphs 4.48 and 11.19-11.23 “*Department for Transport Circular 01/2010 relates to the Control of Development in Public Safety Zones (PSZ). PSZ’s are areas at either end of the runway within which development is restricted in order to control the number of people living, working or congregating on the ground in that area, in order to minimise the risk in the event of an accident on take off or landing.*”

Luton Local Transport Plan 3 2011-2026

- 20.2.15 Policy 11 of the Luton Transport Plan³⁵⁹ focusses on improving safety of the local community, and Policy 12 ‘Targeted Accident

³⁵⁹ Luton Borough Council (2011) Luton Local Transport Plan 3 [online]. Available at: https://www.luton.gov.uk/Transport_and_streets/Lists/LutonDocuments/PDF/Engineering%20and%20Transportation/LTP%203/Luton%20Local%20Transport%20Plan%202011-2026.pdf [Accessed March 2018].

Reduction Measures' includes priority to reduce road traffic accidents.

Central Bedfordshire Local Plan 2035: Pre-Submission - January 2018

20.2.16 The Central Bedfordshire Local Plan 2035: Pre-Submission includes the following policies relevant to the Proposed Development:

- Policy T2 Highway Safety and Design emphasises “*new developments must not have a detrimental effect on highway safety and patterns of movement*”. Ensuring safe and secure layouts and not impeding emergency service access.
- Policy EE14 Applications for Mineral and Waste Development are required where relevant to “*include an assessment of the impact on aviation safety and demonstrate that there will not be an unacceptable adverse impact*”.

20.2.17 Paragraph 17.1.12 of the Central Bedfordshire Local Plan 2035: Pre-Submission also emphasises that the design of new developments is expected to address community safety and ensure clear boundaries are provided between public and private space.

North Hertfordshire District Council Proposed Submission Local Plan 2011-2031 – October 2016

20.2.18 The NHDC Pre-submission Local Plan 2011-2031 predominant safety focus is associated with highways. Policies SP6 Sustainable Transport, ETC2 Employment development outside Employment Areas, and T1 Assessment of transport matters, require developments to demonstrate safety precautions and ensure changes are not detrimental to the existing safety level.

Guidance

20.2.19 There is currently no published guidance for the application of this aspect of the new EIA Directive. However, other relevant guidance is outlined below:

- Reducing Risks, Protecting People: HSE’s decision making process³⁶⁰;
- HSE Major Hazard Regulatory Model: Safety Management in Major Hazard Sectors³⁶¹;

³⁶⁰ HSE (2001) Reducing Risks, Protecting People: HSE’s decision making process. <http://www.hse.gov.uk/risk/theory/r2p2.pdf> [Accessed March 2019]

³⁶¹ HSE (2003) Major Hazard Regulatory Model: Safety Management in Major Hazard Sectors. <http://www.hse.gov.uk/regulating-major-hazards/major-hazards-regulatory-model.pdf> [Accessed March 2019]

- Chemicals and Downstream Oil Industries Forum (CDOIF) Guidelines, Environmental Risk Tolerability for COMAH Establishments³⁶²;
- Department for Transport Circular 01/2010, Control of Development in Airport Public Safety Zones³⁶³;
- Defra's The Green Leaves III Guidelines for Environmental Risk Assessment³⁶⁴;
- The International Standards Organization's ISO 31000:2018 Risk Management – Guidelines;
- European Union Aviation Safety Agency (EASA) Certification Safety Specification and Guidance for Aerodromes Design³⁶⁵;
- Civil Aviation Authority (CAA) Guidance:
 - For specific airport safeguarding issues, guidance can be obtained from documents including the following published by the Civil Aviation Authority: CAP168 Licensing of Aerodromes³⁶⁶, CAP670 ATS Safety Requirements³⁶⁷, CAP738 Safeguarding of Aerodromes³⁶⁸, CAP760 Safety case for aerodrome operators and air traffic service providers³⁶⁹, CAP772 Wildlife Hazard Management at Aerodrome³⁷⁰, CAP795 Safety Management Systems³⁷¹, CAP1223 Framework

³⁶² CDOIF. Environmental Risk Tolerability for COMAH Establishments. 2nd ed.

[Redacted] Accessed March 2019]

³⁶³ DfT (2010) Circular 01/2010. Control of Development in Airport Public Safety Zones. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/36536/circular.pdf [Accessed March 2019]

³⁶⁴ Department for Environment, Food and Rural Affairs (Defra) (2011). Guidelines for Environmental Risk Assessment and Management Green Leaves III, Defra

³⁶⁵ EASA Certification Safety Specification and Guidance for Aerodromes Design. CS-ADR-DSN Issue 4. [Redacted]

[Redacted] [Accessed March 2019]

³⁶⁶ CAA (2019) Licensing of Aerodromes. 11th ed.

[Redacted] [Accessed March 2019]

³⁶⁷ CAA (2014) ATS Safety Requirements. 3rd ed.

[Redacted] df [Accessed 7th March 2019]

³⁶⁸ CAA (2006) Safeguarding Aerodromes 2nd ed. [online] Available at:

[Redacted] [Accessed March 2018]

³⁶⁹ CAA (2010) Guidance on the Conduct of Hazard Identification, Risk Assessment and the Production of Safety Cases, 1st ed. [online] Available at:

[Redacted] [Accessed March 2018]

³⁷⁰ CAA (2017) Wildlife Hazard Management at Aerodrome 2nd ed. [online] available at:

[Redacted] [Accessed March 2018]

³⁷¹ CAA (2015) Safety Management Systems - Guidance to Organisations. 1st ed.

[Redacted] [Accessed March 2019]

for an Aviation Security³⁷², and CAP1273 Implementing a Security Management System³⁷³.

20.3 Stakeholder engagement and consultation

20.3.1 Key consultees have been identified, and focussed engagement (through both informal and formal consultation) will be undertaken and recorded throughout the pre-application stages of the project. Consultees include:

- Local Planning Authorities (LBC, CBC, NHCC) and relevant emergency planning bodies (including the Local Resilience Forum);
- COMAH and other Hazardous Substance Consent site operators (including those within the Main Application Site) that may be impacted by the Proposed Development;
- Civil Aviation Authority (CAA);
- Department for Transport (DfT);
- National Air Traffic Services (NATS);
- Health and Safety Executive (HSE);
- Environment Agency; and
- LLAOL's risk management team.

20.3.2 An initial meeting with LBC and CBC was undertaken on 14 March and with NHDC on 26 March to introduce the new EIA chapter to the LPAs and to discuss the general approach to the assessment.

20.4 Baseline conditions

20.4.1 This section presents a description of the existing site conditions based on desk-based data gathering.

Study Area

20.4.2 Each potential MA&D event would have a specific impact area associated with the particular hazard and therefore, the potential maximum impact extent will be determined during the assessment.

³⁷² CAA (2018) Framework for an Aviation Security. 2nd ed.

[Accessed March 2019]

³⁷³ CAA (2018) Implementing a Security Management System: An Outline. 2nd ed,

- 20.4.3 To inform this Scoping Report, a desk based search was undertaken to identify relevant hazard sources with the potential to interact with LTN and the Proposed Development.

Data gathering and survey

- 20.4.4 The assessment will use baseline information collected from other disciplines of the EIA to define the receptors and the vulnerability of the Proposed Development to MA&D. In particular, baseline information on climate change (**Chapter 8** of this Scoping Report), health and community (**Chapter 15**), biodiversity (**Chapter 17**), agricultural land quality (**Chapter 16**), economics and employment (**Chapter 14**), traffic and transport (**Chapter 7**), water resources (and flood risk) (**Chapter 12**) is pertinent to the assessment. Close interaction with these disciplines is important to gather this information.
- 20.4.5 No site data needs to be generated specifically for the MA&D assessment, and therefore, no further surveys are proposed in addition to those undertaken for other EIA topic chapters (see **Chapter 11 Soils and Geology**, **Chapter 15 Health and Community** and **Chapter 17 Biodiversity** of this Scoping Report).
- 20.4.6 Other baseline information on features which may constitute a potential source of hazard to the Proposed Development was gathered during a desk-based assessment. Other information includes:
- Hazardous Substance Consent (including COMAH) site locations;
 - Environment Agency permitted sites (landfill, mining waste etc.);
 - hazardous ground conditions;
 - proximity to other infrastructure;
 - fuel pipeline locations;
 - fuel storage locations; and
 - Public Safety Zone.
- 20.4.7 Further information relevant to the MA&D assessment will be obtained from a number of other sources, including:
- risk registers (CDM and project) for the Proposed Development at agreed design freeze stages;
 - LLAL and LLAOL's safety management strategy and other relevant documentation (to avoid duplication or contradiction with what already exists);
 - Draft CoCP;

- airport specific safety records and certification;
- other relevant local risk assessment and studies undertaken (for example, geotechnical investigations);
- Cabinet Office National Risk Register of Civil Emergencies³⁷⁴;
- European Commission's Major Accident Reporting System (eMARS)³⁷⁵;
- Bedfordshire Community Risk Register³⁷⁶; and
- CAP1036 Global Fatal Accident Review 2002 to 2011³⁷⁷.

Existing conditions

- 20.4.8 The Main Application Site is located within Flood Zone 1 and as such is at low risk of flooding from rivers.
- 20.4.9 Although the UK climate is temperate, weather is often changeable and unsettled. Historic climate data obtained from the Met Office recorded at the nearest meteorological station to LTN (Rothamsted No.2) for the period 1981-2010 measured average annual maximum daily temperature as 13.7°C, with a mean maximum of 21.8°C and mean minimum of 1°C. This information will be used as part of the Climate Change assessment to predict future scenarios, further details of which are contained in **Chapter 8 Climate Change** of this Scoping Report.
- 20.4.10 The CAA works “*with industry to demonstrably reduce safety risk across the total aviation system*”. LTN operates within an existing CAA Aerodrome Licence and Certificate. Air carriers operating at LTN must also be licenced and certified with the CAA.
- 20.4.11 Shell UK Oil Products Limited fuel farm is an existing holder of a COMAH site licence within LTN. As part of the Proposed Development, the fuel farm will be retained, and therefore any change in risk profile resulting from the Proposed Development will be reviewed with the HSE and the licence holder.
- 20.4.12 The HSE hold consultation distances for COMAH sites, similarly Local Planning Authorities (LPAs) hold consultation distances for Hazardous Substances Consent sites. If an interaction between the Proposed Development and these consultation zones is

³⁷⁴ Cabinet Office (2017) National Risk Register of Civil Emergencies. <https://www.gov.uk/government/publications/national-risk-register-of-civil-emergencies-2017-edition>. [Accessed March 2019] Note: This does not consider risks beyond five years, and therefore will not extend for the full lifespan of the Proposed Development.

³⁷⁵ EC eMARS website: <https://emars.jrc.ec.europa.eu/en/emars/content> [Accessed March 2019]

³⁷⁶ Maintained in accordance with the Civil Contingencies Act 2004.

³⁷⁷ CAA (2013) Global Fatal Accident Review 2002 to 2011

identified in consultation with the HSE and the LPAs, further assessment may be required.

- 20.4.13 Ground investigations and desk based studies are being undertaken, as described in **Chapter 11 Soils and Geology** of this Scoping Report, to determine the potential for hazardous materials and ground gas within the historic landfill, the potential risk for unexploded ordnance and any other hazards associated with ground conditions within the Main Application Site. Results of which will identify risks to be recorded within the appropriate risk registers.
- 20.4.14 The M1 is located approximately 3.2km west from LTN, while the Midlands Mainline railway line is approximately 1.5km west. Potential risks to these key infrastructure routes will be recorded within the appropriate risk registers and considered within the assessment.
- 20.4.15 The existing PSZ extends beyond LTN to the east and west, along flight paths beyond the end of the runway.

Receptors

- 20.4.16 The MA&D assessment will consider all environmental factors identified in the EIA Regulations, i.e. population and human health, biodiversity, land, soil, water, air and climate and material assets, cultural heritage and the landscape.
- 20.4.17 The relevant receptors for the MA&D assessment will be those identified by other disciplines considered in the EIA. Key relevant receptors include:
- populations, including members of the public and local communities;
 - the built environment, including infrastructure;
 - the historic environment, including built heritage and archaeology; and
 - the natural environment, including soil, water, land, air, biodiversity.

20.5 Assessment methodology

- 20.5.1 The assessment methodology builds on the principle that the Proposed Development must comply with the UK's civil aviation safety regime, regulated by the CAA as well as all other relevant legislation listed in Section 20.2.2.

Definition of receptors

- 20.5.2 Consultation will be undertaken with other EIA topics to identify relevant receptors which may be at risk of potential MA&D.

Identification of risks

- 20.5.3 The Proposed Development may result in a significant effect associated with a MA&D due to the following:
- vulnerability of the Proposed Development to a natural disaster;
 - creating a new or altering the source of a major accident;
 - creating a new pathway between a source of a MA&D and receptor; and
 - impacting on the vulnerability of a receptor to a MA&D.
- 20.5.4 Therefore, a risk register will be developed to identify reasonably foreseeable MA&D to be scoped into the EIA. To avoid duplication of risk assessments, existing and planned risk assessments, impact assessments and other studies will be used to identify risks which may arise due to the Proposed Development.
- 20.5.5 Risks will be collated into an Environmental Risk Record. This record acts as an evidence base of all the identified risks relevant to the MA&D assessment. Each risk is then reviewed to identify whether there is a linkage pathway to any of the environmental receptors identified.

Screening of risks for potential effects

- 20.5.6 The reasonable worst case environmental impact will be identified for each risk event with a valid receptor. This is an approximation of the most severe possible outcome of a risk event, based on professional experience and in consultation with other environmental disciplines regarding the possible consequences of a risk event.
- 20.5.7 These reasonable worst-case impacts are then screened to remove those which are not relevant to the overall assessment.
- 20.5.8 Risks will be screened out if there is no source-pathway-receptor linkage, or if the receptor has previously been scoped out of the assessment (see Section 20.7).
- 20.5.9 Risk events with the potential to cause 'serious damage'³⁷⁸, and therefore the potential to fall within the definition of a MA&D are considered further.

³⁷⁸ Serious damage includes the potential loss of life or permanent injury and/or permanent or long-lasting damage to an environmental receptor which cannot be restored through minor clean-up and restoration efforts.

Consideration of embedded and good practice mitigation

- 20.5.10 The likelihood of the reasonable worst case environmental impact(s) occurring may be reduced by measures already embedded within the design or management of the Proposed Development. Therefore, embedded and good practice mitigation, which will include risk mitigation required for compliance with legislation and guidance summarised in Section 20.2, will be evaluated to confirm that identified risks will be appropriately managed.

Identification of further mitigation

- 20.5.11 Remaining risks which have not been addressed fully through embedded design and safety measures inherently have the potential to result in a significant effect (refer to significance criteria below).
- 20.5.12 For example, if the risk event has been managed appropriately in terms of safety of staff and passengers, but the actions taken to manage this risk do not adequately mitigate the potential for long-term or irreversible harm to an environmental receptor, such as a water course beyond the Main Application Site boundary, further mitigation might be required.
- 20.5.13 Further consultation will be undertaken to ensure that all risks are as low as reasonably practicable (ALARP). This may involve the identification of further mitigation or changes to the Proposed Development, to ensure that all risks with the potential to lead to a significant effect are appropriately managed.
- 20.5.14 A record of how each risk is addressed will be maintained in the Environmental Risk Record.

Significance criteria

- 20.5.15 A number of factors are considered in the identification of a potential significant effect:
- the sensitivity of the identified receptors;
 - the duration of the effect. Effects which are long lasting or permanent (irreversible) are more likely to be considered significant;
 - the geographic extent of the effect. Effects beyond the Main Application Site's boundaries are more likely to be considered significant;
 - the severity of the effect. In terms of number of receptors affected and degree of harm, and the response effort required. Events which trigger the mobilisation of substantial

civil response effort are more likely to be considered significant;

- the effort required to restore an affected environment. Effects which require substantial clean-up and restoration are more likely to be considered significant.

20.5.16 The Seveso III Directive defines criteria for notifying the European Commission of the occurrence of a major accident in Annex VI³⁷⁹ (Table 20-1). These criteria are not absolute, but offer guidance to what might constitute a significant effect, and have influenced the definition for this assessment.

Table 20-1: Criteria for notification of a major accident to the European Commission

Paragraph	Consequence
1	Injury to persons and damage to property
a	a death;
b	six persons injured within the establishment and hospitalized for at least 24 hour;
c	one person outside the establishment hospitalised for at least 24 hours;
d	a dwelling outside the establishment damaged and unusable as a result of the accident;
e	the evacuation or confinement of persons for more than 2 hours where the value (persons x hours) is at least 500; or
f	the interruption of drinking water, electricity, gas or telephone services for more than 2 hours where the value (persons x hours) is at least 1,000.
2	Immediate damage to the environment
a	permanent or long-term damage to terrestrial habitats – i. 0.5 hectares or more of a habitat of environmental or conservation importance protected by legislation; or ii. 10 or more hectares of more widespread habitat, including agricultural land;
b	significant or long-term damage to freshwater and marine habitats – i. 10 km or more of river or canal; ii. 1 hectare or more of a lake or pond; iii. 2 hectares or more of delta; or iv. 2 hectares or more of a coastline or open sea; or
c	significant damage to an aquifer or underground water: 1 hectare or more.
3	Damage to property
a	damage to property in the establishment, to the value of at least EUR 2,000,000; or

³⁷⁹ Article 18(1) of Directive 2012/18/EU and Regulation 26 of COMAH Regulations 2015

Paragraph	Consequence
b	damage to property outside the establishment, to the value of at least EUR 500,000.
4	Cross-border damage: any major accident directly involving a dangerous substance giving rise to consequences outside the territory of the Member State concerned.

20.5.17 A significant adverse effect for the Proposed Development is an event which has the potential to cause permanent injury or loss of human life, and/or permanent or long-lasting damage to an environmental receptor which cannot be restored without clean-up and restoration efforts. The determination of significance takes into account other factors listed above, and will be determined based on professional judgement.

20.5.18 Furthermore, reference will be made to the tolerability criteria of MA&D hazards³⁸⁰ established within existing guidance documents to conclude whether an effect is considered to be significant.

20.6 Potential significant effects

20.6.1 This section presents an initial identification of the potential MA&D events which may lead to significant effects as a result of the Proposed Development. The assessment to be included within the ES will not be restricted to the list below, and other relevant risks will be identified over the course of the assessment, as relevant.

Construction

20.6.2 Potential risks identified during the construction phase of the Proposed Development include:

- vulnerability of the Proposed Development to the following natural hazards during construction resulting in significant environmental effects on sensitive receptors:
 - extreme rainfall events, storms and temperatures, snow, drought, lightning, forest fires, ground instability, disease outbreak, infestation, ash clouds and other natural phenomenon;
- vulnerability of the Proposed Development to the following incidents originating from off-site sources during the

³⁸⁰ HSE (2001) Reducing Risks, Protecting People: HSE's decision making process. <http://www.hse.gov.uk/risk/theory/r2p2.pdf> [Accessed March 2019] and CDOIF. Environmental Risk Tolerability for COMAH Establishments. 2nd ed.

[Accessed March 2019]

construction phase and resulting in significant environmental effects on sensitive receptors as a result of that vulnerability:

- fire/ explosion/ structural collapse at neighbouring sites;
- contamination or release of hazardous substances by off-site sources;
- potential sources of major accidents created by the construction of the Proposed Development;
 - fire/ explosion/ structural/ excavation collapse at the Main Application Site;
 - major leaks and spillages at the Main Application Site resulting in contamination or release of hazardous substances during the construction of the Proposed Development;
 - unearthing a historic site with a specific hazard (e.g. unexploded ordnance, contaminated land, ground gas, asbestos etc.);
 - impacts on road safety caused by the construction traffic of the Proposed Development;
 - transport accidents including aircraft caused by the construction of the Proposed Development;
 - loss of utilities due to the construction of the Proposed Development;
 - emergency response activities implemented on the Main Application Site impacting on sensitive receptors (for example water from fire extinguishing efforts draining into an area of ancient woodland);
 - increased risk of bird strike at LTN due to construction practices on the Main Application Site;
- potential impacts on pathways between a source of a MA&D event and a sensitive receptor created by the construction of the Proposed Development, e.g. by creating new drainage pathways;
- potential impacts on the vulnerability of a sensitive receptor to a MA&D event, e.g. by limiting the ability of an emergency response plan to be implemented.

Operation

20.6.3 Potential risks identified during the operational phase of the Proposed Development include:

- vulnerability of the Proposed Development to the following natural hazards during its operation resulting in significant environmental effects on sensitive receptors:
 - extreme rainfall events, storms and temperatures, snow, drought, lightning, forest fires, ground stability, disease

outbreak, infestation, ash clouds and other natural phenomenon;

- vulnerability of the Proposed Development to the following incidents originating from off-site sources during the its operation and resulting in significant environmental effects on sensitive receptors:
 - fire/ explosion/ structural collapse at neighbouring sites;
 - contamination or release of hazardous substances by off-site sources;
 - cyber-attack and digital/ data security;
 - civil unrest/ protests;
- potential sources of major accidents created by the operation of the Proposed Development;
 - fire/ explosion/ structural/ embankment collapse or subsidence at the Main Application Site;
 - major leaks and spillages at the Main Application Site resulting in contamination or release of hazardous substances during the operation of the Proposed Development;
 - impacts on road safety due to changed infrastructure during operation;
 - transport accidents including aircraft due to changes to the airport layout and surrounding areas;
 - loss of utilities due to the operation of the Proposed Development;
 - emergency response activities implemented on the Main Application Site impacting on sensitive receptors;
 - increased risk of bird strike due to changes to the airport layout and surrounding areas;
 - vandalism/crime/terrorism leading to increased risk to personal safety of member of public, including vehicles intruding into pedestrian areas;
- potential impacts on pathways between a source of a MA&D event and a sensitive receptor created by the operation of the Proposed Development:
- potential impacts on the vulnerability of a sensitive receptor to a MA&D event, e.g. by limiting the ability of an emergency response plan to be implemented.

Cumulative effects

20.6.4 The MA&D assessment will inherently consider combined effects related to other topics being assessed as part of the EIA which have the potential to lead to a risk event or to affect identified receptors within the Study Areas identified by each

environmental discipline, as these will be captured in relevant risk registers.

- 20.6.5 Comprehensive risk assessments will capture relevant cumulative risks associated with 'other developments' relevant to the Proposed Development. These will be screened and assessed in line with the methodology described above.

20.7 Matters scoped out

- 20.7.1 There are a number of elements which will not be considered as part of the scope of the MA&D assessment. These include:

- MA&D events where no source-pathway-receptor linkages exist, such as natural disasters unlikely to affect the Application Site (e.g. tsunamis, sea level rise).
- Activities already undertaken by LTN or within adjacent sites which are not altered by the Proposed Development or do not affect the vulnerability of the Proposed Development to MA&D events, as the severity and emergency response to MA&D events associated with these activities would not be affected by the Proposed Development.
- MA&D events which are not specific to the Proposed Development and the control of which would not be altered by the Proposed Development (e.g. outbreaks of disease).
- Members of the public who wilfully trespass will not be considered as sensitive receptors, as LTN has and will maintain appropriate measures to provide a secure boundary to the airport in line with appropriate standards of compliance.
- Events of any likelihood with a low consequence. The EIA Regulations place emphasis on events which could lead to MA&D and result in significant harm. Slips, trips and falls or similar accidents will not constitute as MA&D for this assessment.
- Expected or planned impacts. These will be covered as part of the other EIA topics.

20.8 Mitigation

- 20.8.1 There are several measures which will be implemented to reduce the vulnerability of the Proposed Development to MA&D, and to mitigate significant effects on the environment should they occur.

- 20.8.2 A description of the measures envisaged to prevent or mitigate potential significant adverse effects of MA&D on the environment will be provided as part of the ES, in accordance with Schedule 4 Paragraph 8 of the EIA Regulations. Mitigation for MA&D will include measures to minimise the risk of the occurrence of a MA&D and to mitigate the effects of a MA&D, if it was to occur,

including the resilience of the Proposed Development to such events. This will also include details of preparedness for and proposed response to such emergencies.

20.8.3 Measures may include best practice included within the Draft CoCP, emergency response plans, provision of facilities for emergency services (e.g. fire services training grounds), consideration of optimal layout and design options to minimise health and safety risks (e.g. restricting development in the Public Safety Zone), and mitigation proposed by other environmental disciplines. As a minimum, the Proposed Development will be constructed and operated in line with the legislative requirements summarised in Section 20.2. An iterative approach will be applied to mitigate all significant risks associated with MA&D to be ALARP.

21 IN-COMBINATION AND CUMULATIVE EFFECTS

21.1 Introduction

21.1.1 This chapter sets out the proposed approach to the assessment of In-Combination effects and Cumulative effects.

- In-Combination effects are those which arise due to the interaction within the Proposed Development between multiple factors (for example noise and air quality) which combine to affect a single receptor at a determined point in time.
- Cumulative effects are those which arise when the Proposed Development interacts with ‘other developments’ external to the DCO project. An initial long list of ‘other developments’ that will be considered as part of the cumulative assessment is provided. However, this is subject to change and will be ‘frozen’ at key points in the ongoing assessment process.

21.2 Legislation, policy and guidance

Legislation

21.2.1 The EIA Regulations requires an EIA to include an assessment of the interaction between factors within Regulation 5(2)(e):

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

21.2.2 Schedule 4 of the EIA Regulations states that an ES should include a description of the likely significant effect arising from:

5. (e) “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”

Policy

21.2.3 The ANPS reiterates the need for combined effects and cumulative effects to be considered within the EIA and presented within an ES under Paragraph 4.14-4.15:

“When considering significant cumulative effects, any environmental statement should provide information on how the effects of an applicant’s proposal would combine and interact with the effects of other development (including projects for which consent has been granted, as well as those already in existence if they are not part of the baseline).

The Examining Authority should consider how significant cumulative effects, and the interrelationship between effects, might as a whole affect the environment, even though they may be acceptable when considered on an individual basis or with mitigation measures in place.”

Guidance

- 21.2.4 It should be noted that there is no standard approach to the assessment of In-combination and Cumulative effects, however, the methodology outlined below will broadly follow Planning Inspectorate Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects.

21.3 Stakeholder engagement and consultation

- 21.3.1 The screening criteria and outline approach to be employed to identify relevant developments to be considered in the cumulative assessment was described to LBC, NHDC, CBC and HCC in a meeting on the 12 December 2018. The long list of identified ‘other developments’ was provided to LPAs for comment on the 4 February 2019. No further ‘other developments’ were identified by the LPAs.

21.4 Assessment methodology

In-combination effects

Baseline

- 21.4.2 The In-combination effects assessment focusses on individual receptors that have the potential to be affected by multiple impacts addressed under more than one specialist topic in the EIA as a result of the Proposed Development. Therefore, the baseline for the In-combination effects assessment will be determined by the results of the individual topic assessments - the receptors identified and the likely effects they will experience.
- 21.4.3 The ES will include descriptions of the receptors and effects identified through the assessment process.

Methodology

- 21.4.4 There is no consistent guidance or standardised approach to the assessment of In-combination effects. However, it is recognised that the Proposed Development has the potential to give rise to a variety of impacts upon a number of different receptors some of which may combine to become significant effects. Therefore, the following methodology is proposed.
- 21.4.5 A receptor-based approach will be used to undertake the In-combination effects assessment. Table 21-1 summarises the

proposed assessment process to be used for both construction and operation of the Proposed Development.

Table 21-1: In-combination effects assessment process

Step	Description
Step 1: Identify and categorise receptors	Identify all topic sensitive receptors and their geographical locations. These will then be categorised by type, for example but not limited to, population and human health, biodiversity, land, soil, water, air, material assets, cultural heritage, and landscape.
Step 2: Identify impacts	Identify all topic impacts associated with sensitive receptor(s)/ receptor types.
Step 3: Screen receptors and associated impacts	A screening exercise will be undertaken upon the identified receptors and impacts. Items are screened out from further assessment if they are: Receptors where no topic impacts overlap; Receptors with no temporal overlap with topic impacts; or Receptors where topic impacts are identified as 'negligible'
Step 4: Assess in-combination effects	Qualitative assessment based on professional judgement of in-combination effects.
Step 5: Report findings	Outcomes of the qualitative assessments reported and shared within the ES.

- 21.4.6** There is potential for an individual receptor, or group of receptors, to be affected by adverse impacts under one topic and beneficial impacts under another, sometimes as a result of the same feature of the Proposed Development. This highlights the inability to quantify impacts in an additive manner. In such cases, it is necessary to determine the balance between the two and apply professional judgement based on the significance criteria identified in topic **Chapters 6 to 20**.
- 21.4.7** In-combination effects within each technical discipline will be considered and reported as part of that technical assessment; for example, the combined effect of different type of impacts on a particular species or habitat.
- 21.4.8** In-combination effects of different environmental effects, as identified and assessment by different technical disciplines, on the population and community receptors is an inherent part of the Health and Community assessment and will be reported as part that assessment.
- 21.4.9** The remaining In-Combination effects will be identified and assess as described in Table 21-1 and reported in the ES using the generic assessment criteria provided in Table 5-5.

Cumulative effects

Baseline

- 21.4.10 The existing environment conditions to be considered in the cumulative assessment will be identified by each technical discipline considered in the ES.

Methodology

- 21.4.11 The Planning Inspectorate Advice Note 17³¹ defines a four stage approach for undertaking a Cumulative Effects Assessment (CEA):

- Stage 1: Establish the NSIP's ZOI and identify long list of 'other development';
- Stage 2: Identify shortlist of 'other development' for CEA;
- Stage 3: Information gathering; and
- Stage 4: Assessment.

- 21.4.12 The approach to Stage 1 of the CEA is described below and was undertaken as part of this Scoping Report. The methodology for Stage 2-4 has been outlined further below as part of this Scoping Report, in line with Planning Inspectorate Advice Note 17. It is proposed that exclusion criteria is considered as part of Scoping to ensure that the cumulative effects assessment is proportionate, and only considers 'other developments' which have the potential to lead to likely significant environmental effects. These criteria are defined as part of Stage 1.

Stage 1

Identify ZOI

- 21.4.13 Where practicable, the ZOI or maximum geographical area around the Main Application Site where likely significant effects may occur, for each environmental topic has been established based on accepted industry guidance and relevant standards. These are described in Table 21-2 and shown Figure 21.1 (Volume 2)

Table 21-2: Environmental topics CEA ZOI

Environmental Topics	Zone of Influence
Air quality	15km x 15km domain centred on the Airport
Traffic and transportation	The traffic and transport assessment is based on surface access modelling which is inherently cumulative as it includes employment and housing development projections. Therefore, a ZOI will not be identified.

Environmental Topics	Zone of Influence
Climate change resilience	This assessment considers potential impacts of climate change on the Proposed Development itself only.
GHGs	A ZOI is not identified for GHG assessment as gases are not geographically bound, but rather globally distributed.
Noise and vibration	The ZOI will be identified once the Study Area is confirmed. This is dependent on the results of the air traffic and surface access modelling, and subsequent noise modelling.
Soil and geology	250m from the boundary of the Proposed Development for risk of ground contamination from gases. 1km from the boundary of the Proposed Development for landfills and contamination to groundwater.
Water resources	1km from the boundary of the Proposed Development
Waste and resource	Waste management sites and other construction projects within Bedfordshire, Hertfordshire and Buckinghamshire
Economics and employment	Principally the 'Three Counties' of Bedfordshire, Hertfordshire and Buckinghamshire. And wider economic impacts.
Health and community	Dependent on the spatial distribution of likely impact identified by other disciplines.
Agriculture	Land within the boundary of the Proposed Development.
Biodiversity	Up to 1.5km depending on species, where interactions with other effects or developments may occur.
Landscape and visual	5km from the boundary of the Proposed Development, plus the full extent of any character areas that may be affected within that envelope.
Cultural heritage	2km from the boundary of the Proposed Development. Additional areas may be identified dependent on noise modelling.
Major accidents and disasters	Dependent on the spatial distribution of likely impact identified by other disciplines.

Identify long list of 'other developments'

21.4.14 An initial set of temporal, spatial and development sizing screening criteria was devised, based on experience from other

EIAs of major infrastructure projects, to identify a long list of ‘other developments’. This was to ensure proportionality, limiting the search so that only the developments which have the potential to lead to significant cumulative effects are identified and included in the assessment. Should other relevant developments be identified by statutory stakeholders, these will also be considered.

21.4.15 This search included projects/developments submitted within the last five years. This temporal limit was used as most consented developments typically will require commencement within three to five years of receiving permission.

21.4.16 Further criteria applied to this search included categorisation of unit sizing and spatial scope of data collection, as shown in Table 21-3. This was to ensure data collected was proportionate to the scale of the Proposed Development, removing very small scale developments.

Table 21-3: CEA Stage 1 - Categorisation by unit size, application and development type, and distance

Development		Housing unit (no)	Housing land (ha)	Non-residential – sqm	Non-residential – ha	Distance from Redline boundary
Nationally Significant Infrastructure Projects		All	All	All	All	15km
Transport and Works Act Orders Mineral and Waste EIA application Transport allocations in non-statutory plans e.g. Local Transport Plans		All	All	All	All	5km
Applications or Allocations	Large Scale major	200+	4+	10,000+	2+	5km
	Small Scale major	10-199	0.5-4	1,000-10,000	1-2	1km
	Minor	1-9	Less than 0.5	Less than 1,000	Less than 1	200m

21.4.17 The results of the initial search were then categorised into three ‘tiers’ based on the level of detail likely to be available about them, as outlined in Planning Inspectorate Advice Note 17. Table 21-4 defines these tiers.

Table 21-4: 'Other development' for inclusion in CEA

Tier	'Other development'
Tier 1	Under construction Permitted application(s), whether under the PA2008 or other regimes, but not yet implemented; Submitted application(s) whether under the PA2008 or other regimes but not yet determined;
Tier 2	Projects on the Planning Inspectorate's Programme of Projects where a scoping report has been submitted.
Tier 3	On the Planning Inspectorate's Programme of Projects where a scoping report has not been submitted; Identified in the relevant Development Plan (and emerging Development Plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited; and Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

21.4.18 The search was used to produce a long list of 'other developments and allocations to be considered as part of the CEA, categorised into their respective Tiers which is presented in Appendix D of this Scoping Report. 'Other developments' are shown in Figure 21.2 and plans are shown in Figure 21.3 (Volume 2).

21.4.19 The search will be updated as necessary over the course of the EIA and frozen three months ahead of the submission of the ES.

Stage 2

21.4.20 The long list of 'other developments' presented in Appendix D of this Scoping Report (and any additional identified) will be screened against a series of inclusion and exclusion criteria to compile a more proportionate short list of 'other development' during Stage 2.

21.4.21 These criteria include the following when considering the 'other developments':

- Their scale and nature;
- Their temporal scope;
- The spatial scope; and
- Whether they have been subject to environmental assessment and suitable information for consideration is available.

21.4.22 Advice Note 17 recommends that 'other developments' categorised within Tier 1 and 2 should be included within the CEA. Where possible, Tier 3 developments should be included

also, however, recognising the potential limitations associated with the availability of information for these developments.

- 21.4.23 Professional judgement will be used in the development and application of the inclusion and exclusion criteria, and relevant planning authorities and statutory consultees will be consulted.
- 21.4.24 Local development plans, policies and programmes will be reviewed to determine present and future potential interactions with the Proposed Development. This information may be limited, however could identify emerging developments relevant to the EIA.
- 21.4.25 Should applications for 'other developments' be submitted after the submission of the application for this project, these necessarily should include this Proposed Development in an assessment of the cumulative effects for their development.

Stage 3: Information gathering

- 21.4.26 Stage 3 requires the collection of environmental information associated with the identified 'other developments' to allow a robust assessment of the likely cumulative effects.
- 21.4.27 This will include:
- the development location;
 - the nature of the development;
 - planning status;
 - known the potential environmental effects or other relevant environmental information;
 - programme of works and approximate completion date; and
 - details of construction and operation.

- 21.4.28 This search will be updated and frozen three months ahead of the submission of the ES to allow technical assessment of the cumulative effects.

Stage 4: Assessment

- 21.4.29 After the compilation of the relevant information associated with the 'other developments' in Stage 3, a review will be undertaken of each development in turn to assess whether significant cumulative effects may arise. This will require the application of professional judgement to identify cumulative effects associated with a particular environmental topic.
- 21.4.30 Justification for scoping out potential cumulative effects which will not lead to significant effects will be clearly provided.

Significance criteria

- 21.4.31 When undertaking the CEA, the same significance criteria for each independent environmental topic as outlined in **Chapters 6 to 20** will be used where applicable. If not suitable or preferred, the generic significance criteria described in Tale 5.6 will be employed.
- 21.4.32 Should significant adverse cumulative effects be identified, mitigation measures will be developed and implemented.
- 21.4.33 Although cumulative effects will be identified at an individual topic level, they will be reported in a summary table, containing the cumulative effects identified, their significance, any proposed mitigation measures and residual cumulative effects as part of a 'Cumulative Effects' Chapter within the ES. This will be documented in line with the Planning Inspectorate Advice Note 17 Matrix 2.

21.5 Potential significant effects

- 21.5.1 The selection criteria and assessment process described above have been developed to identify 'other developments' that have the potential to result in significant cumulative effects and will therefore be considered in the ES.

21.6 Matters scoped out

- 21.6.1 Greenhouse gasses will not be considered in the In-combination or cumulative effects assessment as all relevant emissions will be considered in that assessment, and the global atmosphere is the receptor.

21.7 Mitigation

- 21.7.1 The In-combination and cumulative assessment will consider residual effects after the implementation of all mitigation identified is assumed in place. If significant adverse cumulative effects are identified as a result of the contribution of the Proposed Development, and further mitigation can be identified and practicably implemented to reduce that contribution, it will be considered in the ES.

22 PROPOSED STRUCTURE OF THE ENVIRONMENTAL STATEMENT

22.1 Next steps

- 22.1.1 A Preliminary Environmental Information Report (PEIR) is proposed to be prepared in 2019 following the receipt of the Scoping Opinion from the Secretary of State. This is the next stage in the Environmental Impact Assessment process. The PEIR will document the likely significant environmental effects of the Proposed Development, which will inform Statutory Consultation.
- 22.1.2 After Statutory Consultation feedback is received, an ES will be prepared in full.
- 22.1.3 Advice Note Seven suggests applicants provide “*an outline of the structure of the proposed ES*” as part of their Scoping Report.
- 22.1.4 The outline structure proposed for the ES is presented in Table 22-1.

Table 22-1: Structure of Environmental Statement

Environmental Statement	Outline Content
Volume 1	
Introduction	A summary of the background of the Proposed Development An overview of key features of the development A summary of other relevant assessments associated with the EIA Details of the applicant team competencies.
Policy Context	A summary of the legislative context including national, regional and local planning policy Other relevant guidance and policies.
Development case	A description of the need for development
Alternatives considered	A description of the alternatives considered and justifications for the choice of the preferred option
Site and surroundings	A description of the existing site and its surroundings
Description of the Proposed Development	Features of the development including size and location. A description of associated developments Embedded mitigation measures incorporated into design
Approach to Environmental Impact Assessment	A description of the EIA process Outcomes from the scoping process A summary of stakeholder engagement undertaken Definition of baseline conditions and assessment years Significance criteria Approach to cumulative effects assessment
Technical topic assessments	Approach to the technical assessment Baseline data

Environmental Statement	Outline Content
	Assessment Proposed mitigation Cumulative effects
Summary	A summary table of the likely significant effects and proposed mitigation.
Volume 2	
Appendices	Reports supporting the EIA For example WFD, FRA.
Volume 3	
Drawings	Drawings supporting the EIA
Non-technical Summary (NTS)	

- 22.1.5 At this stage, it is assumed that the PEIR will broadly follow the structure of the ES. However, it should be noted that feedback received in the Scoping Opinion and/or design evolution requirements may lead to minor alterations to the outline content provided in this Scoping Report.

Appendix A– Abbreviations and Glossary

Term	Description
AADT	Annual Average Daily Traffic
AAWT	Average Annual Weekday Traffic
ACRP	Airport Cooperatives Research Programme
ACS	Asbestos Contaminated Soils
AEDT	Aviation Environmental Design Tool
AEED	Aircraft Engine Emissions Databank
AGLV	Areas of Great Landscape Value
ALARP	As Low as Reasonably Practicable
ALC	Agricultural Land Classification
ALLV	Areas of Local Landscape Value
AMI	Acute Myocardial Infarction
ANPS	Airports National Policy Statement
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
APF	Aviation Policy Framework
APHR	Annual Public Health Report
APIS	Air Pollution Information System
The Applicant	London Luton Airport Limited
APU	Auxiliary Power Units
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
ARN	Affected Road Network
ARP	Adaptation Reporting Power
ASR	Annual Status Report (related to air quality)
ATM	Air Transport Movements
AURN	Automatic Urban and Rural Network
AVDC	Aylesbury Vale District Council
BAP	Biodiversity Action Plan
Baseline	Existing environmental conditions
BGS	British Geological Society
BLBAP	Bedfordshire and Luton Local Biodiversity Action Plan
BLBRMC	Bedfordshire and Luton Biodiversity Recording and Monitoring Centre
BMV	Best and Most Versatile
BNL	Basic Noise Level

Term	Description
BoCC	Birds of Conservation Concern
BRES	Business Register and Employment Survey
BS	British Standard
CAA	Civil Aviation Authority
CAEP	Committee on Aviation Environmental Protection
Category IIIB	Instrument Landing System categorisation.
CBC	Central Bedfordshire Council
CBLTM	Central Bedfordshire and Luton Transport Model
CCC	Committee on Climate Change
CCR	Climate Change Resilience
CCRA	Climate Change Risk Assessment
CCTV	Closed Circuit Television
CDE	Construction Demolition and Excavation
CDM	Construction (Design and Management) Regulations 2015
CDOIF	Chemicals and Downstream Oil Industries Forum
CEA	Cumulative Effects Assessment
CEMP	Construction Environmental Management Plan
CH4	Methane
C&I	Commercial and Industrial
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
CLP	Construction Logistics Plan
CoCP	Code of Construction Practice
Code [x] aircraft	International Civil Aviation Organisation aircraft categorisation based on size.
COMAH	Control of Major Accident Hazards
CoP	Code of Practice
COP21	21st Conference of Parties
Competent experts	Specialists that have demonstrable expertise in their fields, either in number of years experience in the field, or professional qualification.
Contact stand	An aircraft stand connected to the terminal building.
CO2	Carbon Dioxide
CORSIA	Carbon Offsetting Reduction Scheme for International Aviation
COSHH	Control of Substances Hazardous to Health Regulations 2002
CPAR	Century Park Access Road
CRoW	Countryside Rights of Way
CRTN	Calculation of Road Traffic Noise

Term	Description
CSM	Conceptual Site Model
CTMP	Construction Traffic Management Plan
CTRN	Calculation of Road Traffic Noise
CWS	County Wildlife Site
DALYs	Disability-Adjusted Life Years
DART	Direct Air to Rail Transit
DAS	Discretionary Advice Service
dB	Decibel - The range of audible sound pressures is approximately 2×10^{-5} Pa to 200 Pa. Using decibel notation presents this range in a more manageable form, 0 dB to 140 dB.
dB(A)	The human ear does not respond uniformly to different frequencies. "A" weighting is commonly used to simulate the frequency response of the ear. It is used in the assessment of risk of damage of hearing due to noise.
DCLG	Department for Communities and Local Government
DCO	Development Consent Order
DEFRA	Department for Environment Food & Rural Affairs
DfT	Department for Transport
Disaster	In the context of this assessment, is a naturally occurring phenomenon such as an extreme weather event (e.g. storm, flood, extreme temperatures) or ground-related hazard events (e.g. subsidence, landslide, earthquake) with the potential to cause an event or situation that leads to immediate or delayed serious damage to human health, welfare and/or the environment and requires the use of resources beyond those of LLAL or its contractors to manage.
DM	Do-Minimum
DMRB	Design Manual for Roads and Bridges
Do Nothing	An assessment scenario describing the conditions without the Proposed Development in place.
Do Something	An assessment scenario describing the conditions with the Proposed Development in place
DQRA	Detailed Quantitative Risk Assessment
DS	Do Something
DWS	District Wildlife Site
EA	Environment Agency
EASA	European Union Aviation Safety Agency
EC	European Commission
eDNA	Environmental Deoxyribonucleic Acid
EEA	European Economic area
Effect	The consequence of impacts.
EHO	Environmental Health Officer

Term	Description
EIA	Environmental Impact Assessment
EIA Regulations	Infrastructure Planning (Environmental Impact Assessment) Regulations 2017
eMARS	European Commission's Major Accident Reporting System
EMI	Electromagnetic Interference
EPS	European Protected Species
EPUK	Environmental Protection UK
EqIA	Equality Impact Assessment
ES	Environmental Statement
ETS	Emission Trading Scheme
EU	European Union
FAA	Federal Aviation Administration
FASI	Future Airspace Strategy Implementation
FEGP	Fixed Electrical Group Power
FIA	Farm Impact Assessment
FOCA	Swiss Federal Office of Civil Aviation
FOI	Swedish Defence Research Agency
FRA	Flood Risk Assessment
FTE	Full Time Equivalent
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GI	Ground Investigation
GPA	Good Practice Advice
GPLC	Guiding Principles for Land Contamination
GPU	Ground Power Units
GQRA	Generic Quantitative Risk Assessment
GSE	Ground Support Equipment
GVA	Gross Value Added
ha	Hectare
HAWRAT	Highways Agency Water Risk Assessment Tool
HCA	Homes and Communities
HCC	Hertfordshire County Council
HDV	Heavy Duty Vehicle
HERC	Herts Environmental Records Centre
HFC	Hydrofluorocarbons
HGV	Heavy Goods Vehicle
HIA	Health Impact Assessment

Term	Description
Highway Interventions	Junction and road improvement works included in the Proposed Development for which consent is being sought as part of the DCO Application (as shown on Figure 2.1 in Volume 2 of this report).
HLBAP	Hertfordshire Local Biodiversity Action Plan
HLTP	Hertfordshire Local Transport Plan
HRA	Habitats Regulations Assessment
HSE	Health and Safety Executive
HSI	Habitat Suitability Index
HSWA	Health and Safety at Work etc. Act 1974
HUDU	Healthy Urban Development Unit
IAQM	Institute of Air Quality Management
ICAO	International Civil Aviation Organisation
ICCAN	Independent Commission on Civil Aviation Noise
ICCI	In-combination Climate Change Impacts
ICE	Inventory of Carbon and Energy
IDBR	Inter Departmental Business Register
IEA	Institute of Environmental Assessment
IEMA	Institute of Environmental Management and Assessment
IMD	Index of Multiple Deprivation
Impact	A change or outcome which results from an action/source.
INM	Integrated Noise Model
IPCC	Intergovernmental Panel on Climate Change's
ISO	International Standards Organization
IUCN	International Union for the Conservation of Nature
kg	Kilogramme
km	Kilometre
kph	Kilometres per hour
L _{Aeq,16h}	The average equivalent continuous A-weighted sound pressure level over a 16-hour period from 07:00 to 23:00 accounting for the daily average of aircraft movements during the 92-day summer period from 19 June to 15 September.
L _{Aeq,8h}	The average equivalent continuous A-weighted sound pressure level over an 8-hour period from 23:00 to 07:00 accounting for the daily average of aircraft movements during the 92-day summer period from 19 June to 15 September.
L _{ASmax}	The maximum A-weighted sound level measured during an aircraft fly-by using a 'slow' time weighting, which corresponds to noise measurements at 1 second intervals.
LBC	Luton Borough Council
LBAP	Local Biodiversity Action Plans
LEP	Local Enterprise Partnership

Term	Description
LFRMS	Local Flood Risk Management Strategy
LLAL	London Luton Airport Limited, the owners of London Luton Airport
LLAOL	London Luton Airport Operations Limited, the current operators of London Luton Airport
LDC	Least Developed Countries
LLDC	Landlocked Developing Countries
LLFA	Lead Local Flood Authorities
LNR	Local Nature Reserve
LOAEL	Lowest Observable Adverse Effect Level
LPA	Local Planning Authority
LSOA	Lower Super Output Area
LTN	London Luton Airport
LTO	Landing and Take-off
LTP	Local Transport Plan
Luton DART	Luton Direct Air to Rail Transit
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
m	metre
MA&D	Major Accidents and Disasters Captures events triggered both internally and externally to the Proposed Development, where the presence of the Proposed Development could contribute to serious damage.
MAFF	Ministry of Agriculture, Fisheries and Food
Main Application Site	The area to the east of Luton Airport where the main works for the Proposed Development will take place (as shown on Figure 2.1 in Volume 2 of this report). Excludes the Off-site Car Park and Highway Interventions.
Major accident	In the context of this assessment, means an uncontrolled event caused by a man-made activity or asset that may result in immediate or delayed serious damage to human health, welfare and/or the environment and requires the use of resources beyond those of LLAL or its contractors to manage. It should be noted that malicious intent is not accidental.
MMP	Materials Management Plan
mm/s	Millimetres per second
mppa	Million passengers per annum
MSA	Mineral Safeguarding Area
MSCP	Multi-storey Car Park
NATS	National Air Traffic Services
NAP	Noise Action Plan
NAEI	National Atmospheric Emissions Inventory

Term	Description
NCP	New Century Park is a proposed mixed-use business park to the east of London Luton Airport.
NE	Natural England
NEDG	Noise Envelope Design Group
NERC	Natural Environment and Rural Communities
NF ₃	Nitrogen trifluoride
NHDC	North Hertfordshire District Council
NHLE	National Heritage List for England
NIA	Noise Important Area
NNR	National Nature Reserves
NNG	Night Noise Guidelines for Europe
NOEL	No Observed Effect Level
N ₂ O	Nitrous Oxide
NO _x	Oxides of Nitrogen
NO ₂	Nitrogen Dioxide
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPS	National Policy Statement
NPSE	Noise Policy Statement for England
NPS NN	National Policy Statement for National Networks
NR	Nationally Rare
NS	Nationally Scarce
NSIP	Nationally Significant Infrastructure Project, as defined under the Planning Act 2008
NSRI	National Soil Resources Institute
NTS	Non-technical Summary
NVC	National Vegetation Classification
OAG	Official Airline Guide
ODPM	Office of the Deputy Prime Minister
Off-site Car Parks	The two locations to the south west of Luton Airport, outside of the airport boundary, where car parking is included in the Proposed Development (as shown on Figure 2.1 in Volume 2 of this report).
ONS	Office for National Statistics
OS	Ordnance Survey
PFC	Perfluorocarbons
PEIR	Preliminary Environmental Information Report
PFRA	Preliminary Flood Risk Assessment
PHE	Public Health England
PIC	Personal Injury Collision

Term	Description
PM ₁₀	Particulate Matter 2.5 to 10 micrometers in diameter.
PM _{2.5}	Particulate Matter 2.5 micrometers or smaller in diameter
PPE	Personal Protection Equipment
PPG	Planning Practice Guidance
PPV	Peak Particle Velocity
PRA	Preliminary Risk Assessment
Primary mitigation	Also referred to as embedded mitigation. Mitigation which is included within the design of the Proposed Development.
Proposed Development	All works for which consent is being sought as part of the DCO Application, including works at the: Main Application Site; Off-site Car Parks; and Highway Interventions.
PRoW	Public Rights of Way
PSZ	Public Safety Zones
R&D	Research and Development
RAG	Red amber green
RDB	British Red Data Book
Residual effects	Effects which remain after the implementation of mitigation measures
RICS	Royal Institute of Chartered Surveyors
RIGS	Regionally Important Geological Site
ROA	Remediation Options Appraisal
RPG	Registered Park and Garden
RSPB	Royal Society for the Protection of Birds
RTK	Revenue Tonne Kilometres
SAC	Special Areas of Conservation
Scoped in	Elements identified to be included in the Environmental Impact Assessment
Scoped out	Elements identified to be excluded from the Environmental Impact Assessment
Secondary mitigation	Additional mitigation that has been identified as a result of the Environmental Impact Assessment process.
SEMLEP	South East Midlands Local Enterprise Partnership
SFRA	Strategic Flood Risk Assessment
SIDS	Small Island Developing States
SOAEL	Significant Observed Adverse Effect Level
SoCC	Statement of Community Consultation
SoNA	Survey of Noise Attitudes
SPA	Special Protection Area

Term	Description
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Urban Drainage Systems
SF ₆	Sulphur hexafluoride
SWMP	Site Waste Management Plan
TA	Transport Assessment
tCO _{2e}	Tonnes of Carbon Dioxide Equivalent
TEE	Transport Economic Efficiency
Tertiary mitigation	Also referred to as good practice mitigation or inexorable. Mitigation measures that are based on best practice, standards or legislative requirements that would be in place without the need for an impact assessment.
UK	United Kingdom
UKBAP	UK Biodiversity Action Plan
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
Very special circumstances	Paragraph 144 of the NPPF states “ <i>Very special circumstances’ will not exist unless the potential harm to the Green Belt by reason of inappropriateness, and any other harm resulting from the proposal, is clearly outweighed by other considerations.</i> ”
VOC	Volatile Organic Compounds
Waste FD	European Waste Framework Directive (2008/98/EC
WBCSD	World Business Council for Sustainable Development
WFD	Water Framework Directive
WHO	World Health Organisation
WRI	World Resources Institute
UKCP18	United Kingdom Climate Change Projections 2018
UXO	Unexploded Ordnance
ZOI	Zone of Influence
ZTV	Zone of Theoretical Visibility
µg/m ³	Microgrammes per metre cubed

Appendix B – Transboundary Screening Matrix

B1 Transboundary Screening Matrix

Screening Criteria	Description
<p>Characteristics of the development</p> <p>Considerations:</p> <ul style="list-style-type: none"> Size of the development Use of natural resources Production of waste Pollution and nuisances Risk of accident Use of technologies 	<p>The Proposed Development will increase the capacity of Luton airport from the current consent limit of 18mppa to a future capacity of 32mppa by 2038. To facilitate this additional infrastructure is required including the extension of the existing airfield to support additional aircraft stands, the construction of a second terminal, supporting aviation facilities, and highway junction improvement in the area around the airport and on major access roads.</p> <p>The geographical extent of the Main Application Site (see Figure 2.1, Volume 2 of this Scoping Report) is 360ha, of which approximately 170ha is previously undeveloped open space or agricultural land. New structures are largely located within LBC.</p> <p>Extensive earthworks to construct an airfield platform are required. This material will be locally won from excavation of land owned by the applicant to the east of the airport, extending into north Hertfordshire. Natural resource consumption and waste production will therefore be limited to typical construction requirements, locally sourced as far as practicable. Best practice will be implemented through a CoCP reducing the risk of pollution, nuisance and accidents during construction.</p> <p>The increase in passenger capacity will require an increase on Air Transport Movements from around 135,500 in 2017 to approximately 212,500 per annum by 2038. This will result in increased potential for environmental impacts associated with aviation, within the airspace in the control of the airport operators, particularly local noise and air quality impacts.</p> <p>The risk of accident and use of technology in aviation are strictly controlled by domestic and international safety guidance and regulations. Therefore, the Proposed Development is not expected alter the risk affecting other EEA states.</p>
<p>Location of development and geographical area</p> <p>Considerations:</p> <ul style="list-style-type: none"> What is the existing use? What is the distance to another EEA? What is the extent of the area of a likely impact under the jurisdiction of another EEA state? 	<p>The Proposed Development is located immediately adjacent to the existing airport, as it will be using the existing runway. The required infrastructure and associated earthworks will result in the loss of arable agricultural land, and open space which will be replaced as part of the Proposed Development in an area next to that lost.</p> <p>Luton airport is located in Bedfordshire adjacent to the Hertfordshire county boundary, in the south east of England. The Proposed Development is therefore at least 90 km from the coast and 180km from the nearest EEA state, France, to the south east.</p> <p>The Scoping Report identifies the maximum extent of any Zone of Influence for potential impacts as 15km from the Proposed Development. Noise is only considered to be material consideration for aircraft</p>

Screening Criteria	Description
	below 7000 feet. Therefore, no likely significant effects are identified in any another EEA State.
<p>Environmental importance Considerations: Are particular environmental values (e.g. protected areas – name them) likely to be affected? Capacity of the natural environment Wetlands, coastal zones, mountain and forest areas, nature reserves and parks, Natura 2000 sites, areas where environmental quality standards already exceeded, densely populated areas, landscapes of historical, cultural or archaeological significance.</p>	<p>There are no international designated sites within 10km of the Main Application Site, and no sites designated for bat species within 30km. The closest international designated site is Chiltern Beechwoods Special Area of Conservation (SAC), located approximately 13km south west. There are no European biodiversity sites in other EEA States which could potentially be affected.</p> <p>There are fourteen statutory designated sites within 10km of the Main Application Site. Ten of these sites are Sites of Special Scientific Interest (SSSIs), some of which are also designated as National Nature Reserves (NNRs) or Local Nature Reserves (LNRs), and four are LNRs.</p> <p>There are 30 non-statutory designated sites, generally associated with remnant areas of ancient woodland located within 2km of the Proposed Development. A County Wildlife Site will be lost and require replacement.</p> <p>There are no World Heritage Sites or Registered Battlefields within the 2 km study area. There is one scheduled monument, 113 listed buildings, two Registered Parks and Gardens (RPGs) and five conservation areas within the study area. Five listed buildings lie within or adjacent the boundary of the Main Application Site. These comprise Wigmore Hall Farmhouse (Grade II, NHLE 1321368); Winchill Farmhouse (Grade II, NHLE 1307881); Wandon End Farmhouse (Grade II, NHLE 1102448); Wandon End House (Grade II, NHLE 1307874); and Office Block, Vauxhall Motors (Grade II, NHLE 1249000).</p> <p>The Someries Castle (SM, NHLE 1008452) is located to the south of the Main Application Site, and the Grade II* Luton Hoo RPG (NHLE 1000578) is located to the south west. Luton Hoo RPG contains 11 Grade I, Grade II* and Grade II listed buildings and structures including the Grade I Luton Hoo house (NHLE 1321301). The Chilterns AONB is located to the north and west. These assets are not directly impacted by works, but may be affected by changes in noise.</p> <p>There are three Air Quality Management Areas (AQMA's) with Luton designated for approaching or breaching standards for NOx (oxides of nitrogen). or</p> <p>There are no European sites, or designated sites within another EEA state, which are likely to be affected.</p>
<p>Potential impacts and carrier Considerations: By what means could impacts be spread (i.e. what pathways)?</p>	<p>Potential impact pathways include transport of contaminants by air (dust, and vehicle emissions, construction activities), land and water (rivers and groundwater), and disturbance to protected species (noise, vibration and emissions).</p> <p>The Scoping Report identifies the maximum extent of the Zone of Influence, area in which potential effects may occur, as 15km from the Main Application Site.</p>

Screening Criteria	Description
	No potential impacts or pathways identified are likely affect another EEA State.
<p>Extent Considerations: What is the likely extent of the impact (geographical area and size of the affected population)?</p>	<p>The Scoping Report identifies the maximum extent of the Zone of Influence, area in which potential effects may occur, as 15km from the Main Application Site. No potential impacts identified are likely affect another EEA State.</p>
<p>Magnitude Considerations: What will the likely magnitude of the change in relevant variables relative to the status quo, taking into account the sensitivity of the variable?</p>	No potential impacts identified are likely affect another EEA State.
<p>Probability Considerations: What is the degree of probability of the impact? Is the impact likely to occur as a consequence of normal conditions or exceptional situations, such as accidents?</p>	The Proposed Development is almost certain to impact local receptors; however, no impacts have been identified which are likely to have significant effects on the environment in another EEA State.
<p>Duration Considerations: Is the impact likely to be temporary, short-term or long-term? Is the impact likely to relate to the construction, operation or decommissioning phase of the activity?</p>	No impacts identified are likely to have significant effects on the environment in another EEA State.
<p>Frequency Considerations: What is likely to be the temporal pattern of the impact?</p>	No impacts identified are likely to have significant effects on the environment in another EEA State.
<p>Reversibility Considerations: Is the impact likely to be reversible or irreversible?</p>	No impacts identified are likely to have significant effects on the environment in another EEA State.
<p>Cumulative impacts Considerations: Are other major developments close by?</p>	The Scoping Report identifies other plans and developments within the Zones of Influence identified for various environmental subjects, considered likely to contribute to cumulative effects. No other NSIP's are identified with 15km.

Screening Criteria	Description
	No impacts identified are likely to have significant effects on the environment in another EEA State.

Appendix C – Habitats Regulations Assessment (HRA) Screening

Future LuToN: Making best use of our runway

Habitats Regulation Assessment Screening Report

28 March 2019

LLADCO-3B-ARP-00-00-RP-YE-0003 | Issue 1

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Tables

Table 1: European Sites within 30km of the Proposed Development

Table 2. Summary of effects during construction and operation on European Sites within 30km of the Proposed Development.

Appendices

Appendix A - Figures

1 INTRODUCTION

1.1 Background

1.1.1 London Luton Airport Ltd (LALL) wishes to submit a Development Consent Order (DCO) application for works that will allow Luton Airport (LTN) to expand to accommodate 32 million passengers per annum (mppa). An Environmental Impact Assessment (EIA) Scoping Report has been prepared which sets out the proposed scope of the EIA that will be undertaken and reported in the Environmental Statement (ES) that will accompany the DCO application.

1.1.2 As part of the EIA Scoping exercise this Habitats Regulation Assessment (HRA) screening report, has been prepared to determine if there is potential for effects from the Proposed Development on European Sites (which comprise Special Areas of Conservation¹ (SACs) and Special Protection Areas² (SPAs), possible SPAs and candidate SACs) and Ramsar sites³, in compliance with the requirements of The Conservation of Habitats and Species Regulations 2017 (as amended) ('Habitats Regulations').

1.2 Report Structure

1.2.1 This report is structured as follows:

- Section 2 describes the Proposed Development (the 'project') and the environmental baseline;
- Section 3 outlines the data and methodology used in the assessment;
- Section 4 provides information on European Sites that are considered in the assessment;
- Section 5 provides a screening assessment for the potential pathways for effects; and
- Section 6 provides a summary and conclusion.

¹ European Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC) ('Habitats Directive') requires Member States to identify Special Areas of Council (SACs) for rare or vulnerable species listed in Annex 1 of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance (Article 4).

² European Council Directive on the Conservation of Wild Birds (79/409/EEC) ('Birds Directive') requires Member States to identify Special Protection Areas (SPAs) for habitats and species listed in Annex 1 and Annex 2 of the Directive that area considered to be in most need of conservation at a European level (excluding birds) (Article 3).

³ The Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (Ramsar Convention) requires contracting parties to identify Ramsar sites for wetland habitats and species of international nature conservation importance.

1.3 HRA Process

- 1.3.1 Regulation 61 of the Habitats Regulations requires a competent authority to undertake an 'appropriate assessment' of any plan or project (alone or in-combination with other plans and projects) which is likely to have a significant effect on the features or a European Site, unless the project is directly connected with the management of the site. In light of the conclusions of the assessment, the competent authority may proceed with or consent to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site. UK Government policy requires proposed SACs and SPAs to be treated as European Sites along with Ramsar sites.
- 1.3.2 All plans and projects should identify any possible effects early in the plan/project making process and then either alter the plan/project to avoid them or introduce mitigation measures to the point where no adverse effects remain. The 'Competent Authority' shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site or sites concerned. In coming to a conclusion, the Competent Authority must consult with the Statutory Nature Conservation Organisation (Natural England) and have regard to their comments. They may also consult the general public if considered appropriate.
- 1.3.3 The assessment of a project under the Habitats Regulations can be split into four stages. Stage 1 is the assessment of the likelihood of a plan or project having a significant effect on the features of a European Site. This is the trigger for the need for an Appropriate Assessment as set out in Regulation 61(1). The Appropriate Assessment (Stage 2) is the detailed consideration of the potential effects of the plan or project in relation to the conservation objectives for the features of the European Site(s) to determine if there is likely to be an adverse effect on the integrity of the site (i.e. an effect that would compromise the site meeting its conservation objectives). Providing it can be demonstrated that with appropriate mitigation measures the plan or project would not give rise to an adverse effect on the integrity of a European Site, the plan or project can proceed.
- 1.3.4 Where this cannot be demonstrated or there is uncertainty, the assessment would then need to consider if there were any other alternatives to the plan or project (Stage 3) that would not give rise to adverse effects on the integrity of the European Site. If there are no alternatives, Stage 4 would then consider if there are any Imperative Reasons of Overriding Public Interest, only at this stage can Compensatory Measures be considered. It is very unusual for plans for projects to be considered in Stages 3 or 4.

- 1.3.5 With regards to recent case law (People Over Wind and Sweetman v Coillte Teoranta⁴) the inclusion of plainly established and uncontroversial mitigation during Stage 1 is no longer considered appropriate. Consequently, any project which identifies an impact on a European Site and where avoidance and mitigation is applicable will need to address these measures during Stage 2 Appropriate Assessment.

⁴ People Over Wind, Case C323/17 European Court of Justice, 12th April 2018. [redacted] accessed 7th March 2019].

2 PROJECT DESCRIPTION

2.1 Site Location

2.1.1 The Proposed Development at LTN is located to the immediate east and north east of the existing airport. New infrastructure will be predominately located within Luton Borough, with earthworks, construction activities and replacement open space extending into north Hertfordshire. The Main Application Site is broadly centred on National Grid Reference TL124215. Further information on the Main Application Site and surroundings is provided in **Chapter 2 Application Sites and Surroundings** in Volume 1 of the EIA Scoping Report (LLADCO-3B-ARP-00-00-RP-YE-0001).

2.2 Proposed Works

2.2.1 The Proposed Development mainly consists of the provision of new infrastructure including:

- an apron expansion on a built land platform;
- a new terminal building;
- ancillary aviation support facilities;
- car parking;
- highway junction improvements, and,
- relocation and enhancement of Wigmore Valley Park.

2.2.2 Further information on the Proposed Development is provided in **Chapter 3 The Proposed Development** in Volume 1 of the EIA Scoping Report (LLADCO-3B-ARP-00-00-RP-YE-0001).

2.3 Environmental Baseline

2.3.1 The undulating land within 2km of the Proposed Development mainly comprises the existing airport, Luton town and transport infrastructure, buildings, amenity grassland, species-poor semi-improved grassland, arable land, hedgerows, scrub and semi-natural broadleaved woodland.

2.3.2 Detailed studies for various ecological receptors have been undertaken to support the project and are reported separately. A full ecological assessment of impacts from the project will be presented within the Environmental Statement that will accompany the DCO application for the project.

3 GUIDANCE AND METHODOLOGY

3.1 Guidance and Policy

3.1.1 This information has been informed by the following guidance and policy documents:

- Tyldesley, D. & Chapman, C. (2017⁵). *The Habitats Regulations Assessment Handbook* (6th Issue); and,
- Tyldesley, D. & Chapman, C. (2018⁶). *People Over Wind – some Implications of the Judgment*. *The Habitat Regulations Journal*, 10, 19 to 23.
- The Planning Inspectorate (2017): *Habitats Regulations Assessment Advice note ten: Habitats Regulations Assessment relevant to nationally significant infrastructure projects*⁷.

3.1.2 This guidance is intended to improve understanding of how projects are regulated under the Habitats Directive. This guidance draws on project experience and case law in Britain and Europe.

3.2 Desk Study Information

3.2.1 In addition to the guidance noted above, the following websites were used to gather information on the European Sites:

- Multi-Agency Geographic Information for the Countryside (MAGIC) website; and,
- Joint Nature Conservation Committee (JNCC) website.

3.2.2 These websites provide information about European Sites including Conservation Objectives for their qualifying features, which are the primary reason for designation. The features are considered to have Favourable Conservation Status only when the conservation objectives are being met. These objectives therefore provide an indication of the type of effects which could affect the features of a designated site. An effect which could affect the ability of a site or feature to meet its objective could be considered to be an adverse effect on the integrity of the designated site concerned.

⁵ Tyldesley & Chapman. (2017). *The Habitats Regulations Assessment Handbook* (6th Edition). DTA Publications Limited, Wokingham.

⁶ Tyldesley & Chapman. (2018). *People Over Wind – some Implications of the Judgment*. *The Habitats Regulations Journal*, 10, 19 to 23. DTA Publications Limited, Wokingham.

⁷ The Planning Inspectorate (2017) *Habitats Regulations Assessment Advice Note ten: Habitats Regulation Assessment relevant to nationally significant infrastructure projects*. Available on-line at: <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/06/Advice-note-10v4.pdf> [Accessed 20 March 2019]

3.3 HRA Methodology

3.3.1 To understand the potential implications for European Sites from the project it is necessary to identify those that are located nearby or are linked by pathways such as hydrological connections.

3.3.2 All European Sites were identified using Geographic Information System data from datasets downloaded from the JNCC and MAGIC.

Understanding Qualifying Features and Conservation Objectives

3.3.3 For each of the European Sites identified the features were established and the conservation objectives for each feature were obtained. Information was also sought to understand the potential vulnerability of the features to any effects that might arise from the project.

Identification of the Potential Effects of the Project

3.3.4 Any potential pathways for effect on European Sites resulting from the project were identified prior to consideration of best practice procedures (e.g. Guidelines for Pollution Prevention and CIRIA guidance) or the integration of any mitigation measures.

Identification of Plans or Projects Considered for In-combination Effects

3.3.5 An 'in-combination' assessment is required where the project may have an effect on a European Site, but on its own the effects would not be significant. The potential effects of the project should be considered in-combination with other plans or projects that similarly may have an effect, but where on their own those effects would not be significant. The combined effects may therefore become significant.

3.3.6 Details of other plans and projects which are currently proposed or consented within the vicinity of the European Sites and/or European sites identified were obtained to inform the in-combination assessment of the project.

Consideration of the Significance of Potential Effects

3.3.7 The significance of potential effects was assessed in the absence of avoidance or other mitigation measures other than those which are standard construction practices such as pollution control or those incorporated into the scheme. The assessment has been made with awareness of the conservation objectives for the features of the European Sites, although as stated in the relevant guidance the assessment of the project against the conservation

objectives is not required until the Appropriate Assessment stage of the HRA process.

3.3.8 In the assessment of the potential for significant effects, professional judgement was applied using the following criteria, as often insufficient information about the elements and interests is available:

- the vulnerability/sensitivity of the receiving environment/features of interest;
- when the risk of effects is likely to occur (e.g. construction and/or operation);
- the likely geographical extent of the effects; and,
- likelihood of significant effects (e.g. those above negligible in magnitude) occurring based on previous experience with similar elements, where available.

3.3.9 Professional judgement was used in the carrying out of this work where professional guidance was not available. Where there was not enough information about the risk of qualifying interest being present, or of the risk of effects, the assessment used the precautionary principle to inform the judgement.

3.3.10 The precautionary principle has been applied to ensure that any assessment errs on the side of caution, without being overly cautious. This principle means that the conservation objectives should prevail where there is uncertainty or that harmful effects will be assumed in the absence of evidence to the contrary.

4 EUROPEAN SITES POTENTIALLY AFFECTED BY THE PROPOSED DEVELOPMENT

4.1.1 Figure 1 shows the location of the Proposed Development in relation to European Sites within 30km⁸ of the proposed development.

4.1.2 There are four designated sites of relevance within 30km of the Proposed Development (distances and direction are measured as a straight line from the Main Application Site boundary), which are as follows:

- Chilterns Beechwoods SAC (13.5km to the south-west);
- Wormley Hoddesdonpark Woods SAC (23.2km to the south-east);
- Lee Valley SPA (25.3km to the south-east); and,
- Lee Valley Ramsar site (25.3km to the south-east).

4.1.3 The qualifying features for Sites have are summarised in Table 1.

⁸ This is the zone of influence around the proposed development where there is potential for effects to the qualifying features which are associated with the designation of European Sites.

Table 1: European Sites within 30km of the Proposed Development

Site name and code	Site description	Qualifying features	Conservation Objectives	Vulnerability
<p>Chilterns Beechwoods Special Area of Conservation, UK0012724.</p>	<p>The site occupies an area of approximately 1,286ha, which is located north of Berkhamsted either side of the Hertfordshire/Buckinghamshire border. The site comprises a mixture of ancient semi-natural and secondary woodland, plantation, scrub, bracken and grassland.</p>	<p>9130 Asperulo-Fagetum beech forests (this is listed on Annex 1 of the 'Habitats Directive' and is the primary reason for designation of this site). This Annex I habitat type is represented by an extensive tract of Asperulo-Fagetum beech forest in the centre of the habitat's UK range. The woodland is an important part of a grassland-scrub-woodland mosaic. A distinctive feature in the woodland flora is the Nationally Scarce⁹ coralroot bitter-cress (<i>Cardamine bulbifera</i>). 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates <i>Festuco-Brometalia</i>, which includes the priority feature '*important orchid rich sites' (this is listed on Annex I of the 'Habitats Directive' but is</p>	<p>Ensure that the integrity of the site and the favourable conservation status of its qualify features are maintained or restored as appropriate in accordance with the 'Habitats Directive'.</p>	<p>The cited adverse threats to the qualifying features at this site relate to habitat degradation as consequence of change in plant community structure and species composition because of competition from:</p> <ul style="list-style-type: none"> • invasive non-native plant species; • invasive native plant species; and, • interspecific plant relations. <p>Although not cited, it is considered that there is potential for additional adverse threats to the qualifying features at this site which also relate to habitat degradation, such as: air pollution and deposition of air-borne pollutants; and, human intrusive activities.</p>

⁹ A species which has been recorded in between 16 and 100 of the hectads (10km squares) in Britain.

Site name and code	Site description	Qualifying features	Conservation Objectives	Vulnerability
		<p>not the primary reason for designation of this site).</p> <p>1083 Stag beetle (<i>Lucanus cervus</i>) (this is listed on Annex II of the 'Habitats Directive' but is not a primary reason for designation of this site).</p> <p>1166 Great crested newt (<i>Triturus cristatus</i>) (this is listed on Annex II of the 'Habitats Directive' but is not a primary reason for designation of this site).</p>		
<p>Wormley Hoddesdonpark Woods Special Area of Conservation, UK0013696.</p>	<p>The site occupies an area of approximately 337ha, which is located west of Hoddesdon in Hertfordshire. The site mainly comprises ancient semi-natural and secondary woodland, wood-pasture and heaths.</p>	<p>9160 Sub-Atlantic and medio-European oak or oak-hornbeam forests of the <i>Carpinion betuli</i> (this is listed on Annex I of the 'Habitats Directive' and is the primary reason for designation of this site).</p> <p>This Annex I habitat type is represented at this site by large stands of almost pure hornbeam (<i>Carpinus betulus</i>), with sessile oak (<i>Quercus petraea</i>) standards. Areas dominated by bluebell (<i>Hyacinthoides non-scripta</i>) do occur, but</p>	<p>Ensure that the integrity of the site and the favourable conservation status of its qualify features are maintained or restored as appropriate in accordance with the 'Habitats Directive'.</p>	<p>The cited adverse threats to the qualifying features at this site relate to habitat degradation as consequence of:</p> <p>1) change in plant community structure and species composition because of competition from:</p> <ul style="list-style-type: none"> • invasive non-native plant species; • invasive native plant species; and, • interspecific plant relations.

Site name and code	Site description	Qualifying features	Conservation Objectives	Vulnerability
		<p>elsewhere there are stands of great wood-rush (<i>Luzula sylvatica</i>) with carpets of the mosses (<i>Dicranum majus</i>) and (<i>Leucobryum glaucum</i>). Locally, a bryophyte community more typical of continental Europe occurs, including the mosses (<i>Dicranum montanum</i>, <i>D. flagellare</i> and <i>D. tauricum</i>).</p>		<p>2) air pollution and deposition of air-borne pollutants. 3) human intrusive activities.</p>
<p>Lee Valley Special Protection Area, UK9012111.</p>	<p>The site comprises four discrete areas located within a lowland valley floodplain with extensive waterbodies between Ware, Hertfordshire and Finsbury Park, London.</p>	<p>The site regularly supports: 6% (5-year peak mean for 1992/93 to 1996/97) of the British wintering population of bittern (<i>Botaurus stellaris</i>) (which satisfies Article 4.1 of the Birds Directive and is a key reason for designation of this site). 1% (5-year peak mean for 1993/94 to 1997/98) of the British wintering populations of gadwall (<i>Anas strepera</i>) and shoveler (<i>Anas clypeata</i>) (which satisfies Article 4.2 of the Birds Directive 79/409/EEC and are key reasons for designation of this site).</p>	<p>Ensure that the integrity of the site and the favourable conservation status of its qualify features are maintained or restored as appropriate in accordance with the 'Birds Directive'.</p>	<p>The cited adverse threats to the qualifying features at this site relate to: 1) habitat degradation as consequence of: <ul style="list-style-type: none"> • aquaculture; • change in hydrology (affecting water level); • groundwater pollution; and, • ecological succession (habitat change); and, 2) species disturbance because of human recreation.</p>

Site name and code	Site description	Qualifying features	Conservation Objectives	Vulnerability
<p>Lee Valley Ramsar site, UK11034.</p>	<p>The site comprises four discrete areas located within a lowland valley floodplain with extensive waterbodies between Ware, Hertfordshire and Finsbury Park, London.</p>	<p>The site supports: a Nationally Rare¹⁰ water-boatman (<i>Micronecta minutissima</i>); and, the Nationally Scarce whorled water-milfoil (<i>Myriophyllum verticillatum</i>). (which satisfies Criterion 2 of the Ramsar Convention and are key reasons for designation of this site). The site regularly supports: 2.6% (5-year peak mean between 1998/9 and 2002/3) of the British wintering population of gadwall (<i>Anas strepera</i>); and, 1.9% (5-year peak mean between 1998/9 and 2002/3) of the British spring/autumn passage population of shoveler (<i>Anas clypeata</i>). (which satisfies Criterion 6 of the 'Ramsar Convention' and are key reasons for designation of this site).</p>	<p>Ensure that the integrity of the site and the favourable conservation status of its qualify features are maintained or restored as appropriate in accordance with the 'Ramsar Convention'.</p>	<p>Although not cited, it is considered that there is potential for additional adverse threats to the qualifying features at this site which relate to:</p> <p>1) habitat degradation as consequence of:</p> <ul style="list-style-type: none"> • aquaculture; • change in hydrology (affecting water level); • groundwater pollution; and, • ecological succession (habitat change); and, <p>2) species disturbance because of human recreation.</p>

¹⁰ A species which has been recorded in 15 or fewer hectads (10km squares) in Britain.

5 SCREENING ASSESSMENT

5.1 Potential Effects of the Proposed Development

5.1.1 Pathways for effects to occur on qualifying features of the four European Sites are considered for the construction and operation phases of the Proposed Development and described in see Table 2.

5.1.2 The potential pathways for effect include:

- habitat loss;
- habitat degradation;
- habitat severance;
- species disturbance; and,
- species mortality/injury.

5.2 Consideration of Effects and Significance

5.2.1 It is concluded that there is no pathway for effect on the qualifying features of the designated sites. Justification for this overall conclusion is provided separately for each of four designated sites, as follows:

Chilterns Beechwoods SAC

5.2.2 The Proposed Development is approximately 13.5km north-east of this site. Given the separation distance between the Proposed Development and this Site, no pathways for effect have been identified. This has included consideration of potential air quality changes and associated deposition of air-borne pollutants from aircraft arriving and departing the airport.

5.2.3 According to the Airport Air Quality Manual (ICAO, 2011¹¹), local deposition of air-borne pollutants on the ground typically occurs from overflying aircraft at up to 1,000ft (305m) above ground-level.

5.2.4 Detailed air quality and noise assessments with associated modelling is ongoing for the project. However, based on typical ascent/descent angles it is currently considered that aircraft will fly above 305m when further than 6km maximum distance from LTN.

5.2.5 Therefore, there is no pathway for air pollution and deposition of air-borne pollutants to the Chiltern Beechwoods SAC.

¹¹ International Civil Aviation Organization (2011). Doc 9889, Airport Air Quality Manual. ICAO, Montreal.

Wormley Hoddesdonpark Woods SAC

- 5.2.6 The Proposed Development is approximately 23.2km north west of this site. Given the separation distance between the Proposed Development and this Site, no pathways for effect have been identified. This has similarly included consideration of potential air quality changes and associated deposition of air-borne pollutants from aircraft arriving and departing LTN.
- 5.2.7 For the reasons outlined above for the Chiltern Beechwood SAC, given the distance between LTN and Wormley Hoddesdonpark Woods SAC, no pathway for effect from air quality changes has been identified.

Lee Valley SPA and Lea Valley Ramsar Site

- 5.2.8 The Proposed Development is approximately 23.2km north west of the Lea Valley SPA and 25.3km from the Lea Valley Ramsar Site. The screening exercise has considered the potential pathway for adverse effects on certain qualifying features (populations of bittern, gadwall and shoveler); this includes disruption to a functionally link, such as regularly frequented contributory habitat and/or documented bird dispersal route.
- 5.2.9 It is recognised that the qualifying bird populations will disperse to other locations away from Lee Valley SPA/Ramsar Site. However, there is no suitable habitat within 2km of the Proposed Development that is known to regularly support important wintering populations of bittern, gadwall or shoveler. The Proposed Development is also not hydrologically connected to the SPA/Ramsar Site and is not on a known fly-way connected to these European Sites.
- 5.2.10 In line with Natural England guidance, none of the habitats within 2km of LTN are considered to provide a potentially important role in maintaining or restoring the protected SPA/Ramsar Site populations at Favourable Conservation Status¹².
- 5.2.11 Therefore, there is no evidence of functional linkage and thus no pathways for effect on qualifying species of the SPA/Ramsar Site.

Other Plans and Projects

- 5.2.12 Since there is no pathway for effect on the qualifying features of the European Sites, there can be no potential for in-combination effects with other plans or projects.

¹² Natural England Commissioned Report NECR207: *Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects – a review of authoritative decisions*. 29 February 2016.

5.2.13 For the aforementioned reasons, subsequent stages of Habitats Regulations Assessment are not considered necessary.

Table 2. Summary of effects during construction and operation on European Sites within 30km of the Proposed Development.

Pathways for Effects	Chilterns Beechwoods SAC	Wormley Hoddesdonpark Woods SAC	Lee Valley SPA	Lee Valley Ramsar Site
	<p>9130 Asperulo-Fagetum beech woodland, which support the Nationally Scarce coralroot bitter-cress.</p> <p>6210 Semi-natural calcareous Festuco-Brometalia grasslands with scattered scrub, which are of importance for orchids.</p> <p>1083 Stag beetle and 1166 Great crested newt.</p>	<p>9160 Sub-Atlantic and medio-European oak or oak-hornbeam Carpinion-Betuli woodland.</p>	<p>Wetlands which support:</p> <ul style="list-style-type: none"> wintering population of bittern; wintering population of gadwall; and, wintering population of shoveler. 	<p>Wetlands which support:</p> <ul style="list-style-type: none"> a Nationally Rare water-boatman (<i>Micronecta minutissima</i>); the Nationally Scarce whorled water-milfoil; wintering population of gadwall; and, spring/autumn passage population of shoveler.
Construction				
Habitat loss	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects
Habitat degradation	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects
Habitat severance	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects
Species disturbance	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects
Species mortality / injury	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects
Operation				
Habitat loss	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects
Habitat degradation	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects
Habitat severance	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects
Species disturbance	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects

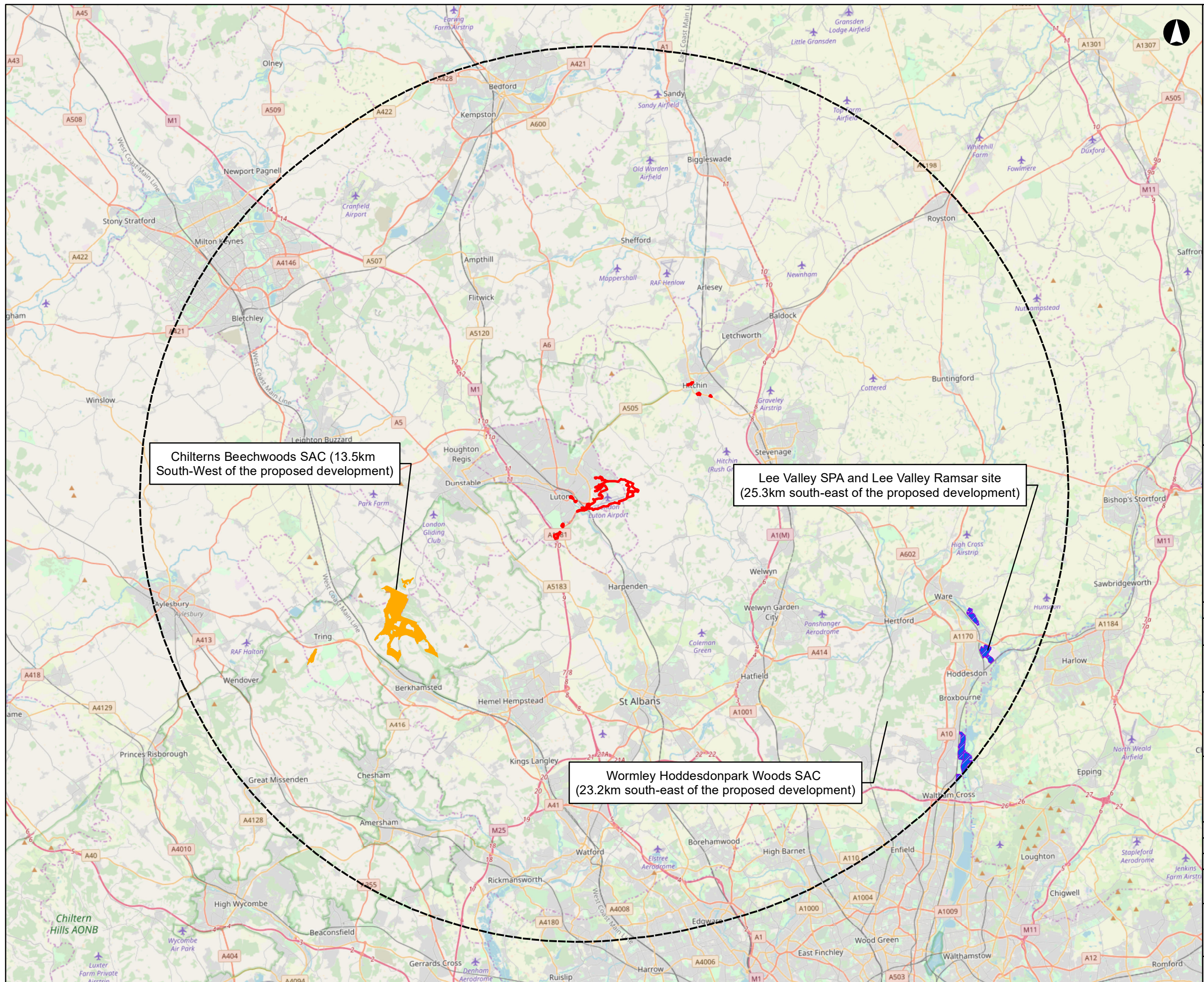
Pathways for Effects	Chilterns Beechwoods SAC	Wormley Hoddesdonpark Woods SAC	Lee Valley SPA	Lee Valley Ramsar Site
	<p>9130 Asperulo-Fagetum beech woodland, which support the Nationally Scarce coralroot bitter-cress.</p> <p>6210 Semi-natural calcareous Festuco-Brometalia grasslands with scattered scrub, which are of importance for orchids.</p> <p>1083 Stag beetle and 1166 Great crested newt.</p>	<p>9160 Sub-Atlantic and medio-European oak or oak-hornbeam Carpinion-Betuli woodland.</p>	<p>Wetlands which support:</p> <ul style="list-style-type: none"> wintering population of bittern; wintering population of gadwall; and, wintering population of shoveler. 	<p>Wetlands which support:</p> <ul style="list-style-type: none"> a Nationally Rare water-boatman (<i>Micronecta minutissima</i>); the Nationally Scarce whorled water-milfoil; wintering population of gadwall; and, spring/autumn passage population of shoveler.
Species mortality / injury	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects

6 CONCLUSION

- 6.1.1 This draft Habitats Regulations Assessment Screening Report has considered the Proposed Development and European Sites within 30km. Potential effects have been discussed and associated pathways described.
- 6.1.2 Based on information available at this point in time, no pathway for effect on any European Site has been identified and thus no effects on such sites is predicted to occur. With the conclusion of no effect from the Proposed Development, no potential for in-combination effect can occur.
- 6.1.3 No screening matrices included within Appendix 1 of PINS guidance¹³ are necessary as no pathways for effect are present.
- 6.1.4 This document will be updated as technical assessments and models for the project are finalised.

¹³ <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/06/Advice-note-10v4.pdf>

Appendix A - Figures



Legend

- Proposed Development Boundary
- 30 km Buffer
- Special Areas of Conservation (SAC)
- Ramsar
- Special Protection Areas (SPA)

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Kilometres

0 1 2 4 6 8 10

Revision Details	By	Check	Date	Suffix

Purpose of Issue: **ISSUE FOR INFORMATION**

Client: **London Luton Airport Ltd**

Project Title: **Future LuToN: Making best use of our runway**

Drawing Title: **Habitats Regulations Assessment Screening Report, Figure 1. European Sites Location Plan**

Designed: N/A	Drawn/Checked: MW	Checked: SN	Approved: CS	Date: 25/03/2019
Project No. LLADCO	Suitability ISSUE			
Scale @ A3 1:250,000	Zone Area Wide			

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Appendix D – Long list of ‘other developments’

D1 CEA Long List of 'other developments'

ID	Local authority	LPA Application Reference Number	Applicant for 'other development' and brief description of development	Distance from project	Development 'Type' (NSIP/ TWAO/ Minerals or Waste/ Application Large Scale, small Scale, Minor)	Status	Date Received	Date Validated/ Registered	Date Approved	Tier
NSIP										
None current within 15km										
TWAO										
None within 5km										
Minerals and Waste EIA planning applications										

ID	Local authority	LPA Application Reference Number	Applicant for 'other development' and brief description of development	Distance from project	Development 'Type' (NSIP/ TWAO/ Minerals or Waste/ Application Large Scale, small Scale, Minor)	Status	Date Received	Date Validated/ Registered	Date Approved	Tier
	CBC	CB/18/02363/SCO	Request for Scoping Opinion in respect of the construction and operation of a Combined Heat and Power (CHP) facility that would import up to 500,000 tonnes per annum of Refuse Derived Fuel (RDF) or similar residual waste including new access off Lower Harpenden Road, ancillary development and installation of underground pipeline and cable for transfer of heat and energy to new connection points/substation near London Luton Airport.	2km	Large Scale Major	Proposed - Scoping Report	20/06/2018	25/06/2018	31/08/2018	1
Transport Allocations / Schemes										
M1-A6 Northern Link Road	CBC	CB/18/02714/SCO	EIA scoping report for a scheme comprising of a new 2.75 mile (4.4km) long road link between the M1 and A6 between M1 J11a in the west and A6 in the east, with three intermediate junctions. To effectively form a northern bypass for Luton. Allocated in	5km	Large Scale Major	Proposed	13/07/2018	13/07/2018		3

ID	Local authority	LPA Application Reference Number	Applicant for 'other development' and brief description of development	Distance from project	Development 'Type' (NSIP/ TWAO/ Minerals or Waste/ Application Large Scale, small Scale, Minor)	Status	Date Received	Date Validated/ Registered	Date Approved	Tier
			the Luton Local Transport Plan 2011-2026.							
Planning Applications										
Luton Borough Council										
	LBC	13/00280/OUT	Outline application for 'Napier Park', a mixed use development: residential (685 units), office (30,150sqm), storage and distribution (16,500sqm), retail, hotel and casino uses	1km	Large Scale Major	Permission	20/03/2013	20/03/2013	16/04/2015	1
	LBC	14/00591/FUL	Demolition of existing structures and construction of an apron area for aircraft, 4m high acoustic fence and associated infrastructure	Within DCO boundary	Minor	Constructed	26/09/2014	29/09/2014	22/10/2014	1

ID	Local authority	LPA Application Reference Number	Applicant for 'other development' and brief description of development	Distance from project	Development 'Type' (NSIP/ TWAO/ Minerals or Waste/ Application Large Scale, small Scale, Minor)	Status	Date Received	Date Validated/ Registered	Date Approved	Tier
	LBC	14/01176/REG3	Erection of nine new classrooms, relocation of three mobile units and removal of three mobile units together with external works to improve Key Stage 2 playground facilities.(Wigmore Expansion). Erection of a two storey special school block with 14 classrooms and associated works.(Richmond Hill Special School- (Second Site).	1km	Small Scale Major	Constructed	22/09/2014	25/09/2014	08/12/2014	1
	LBC	14/01609/OUT	Outline application for the erection of 394 residential units with associated open space, landscaping and car parking.	3km	Large Scale Major	Permitted	23/12/201	24/02/2015	26/03/2015	1
	LBC	15/00936/FUL	Erection of a mixed use building comprising of 230 student bedrooms and 26 four bed flats with commercial units at ground floor and associated parking.	2km	Large Scale Major	Permitted	23/06/2015	07/07/2015	14/10/2016	1
	LBC	15/00812/FUL	Erection of a new three bedroom detached house	200m	Minor	Permitted	03/06/2015	05/06/2015	29/07/2015	1

ID	Local authority	LPA Application Reference Number	Applicant for 'other development' and brief description of development	Distance from project	Development 'Type' (NSIP/ TWAO/ Minerals or Waste/ Application Large Scale, small Scale, Minor)	Status	Date Received	Date Validated/ Registered	Date Approved	Tier
	LBC	16/01400/OUTEIA	Outline application for a mixed use development comprising a new football stadium and ancillary facilities, residential floor space, flexible education / community / commercial uses, hotel, retail uses	2km	Large Scale Major	Proposed	02/08/2016	17/08/2016		1
	LBC	16/01102/FUL	Erection of three 4 to 9 storey buildings comprising 137 one bedroom, 99 two bedroom and 2 studios and 1 commercial A3/A4 unit with associated paths, fences, walls, cycle storage and soft landscaping.	2km	Large Scale Major	Permitted	22/06/2016	22/06/2016	16/06/2017	1
	LBC	16/01401/OUTEIA	Outline planning permission, with all matters reserved except for access, for mixed-use development comprising: 56,500sqm office floorspace (use class B1(a)); 37,500sqm retail floorspace (use class A1); 8,500sqm food and beverage floorspace (use class A3 - A5); 8,500sqm leisure floorspace (use class D2); 13,000sqm hotel (use class C1), car and cycle parking	2km	Large Scale Major	Proposed	02/08/2016	17/08/2016		1

ID	Local authority	LPA Application Reference Number	Applicant for 'other development' and brief description of development	Distance from project	Development 'Type' (NSIP/ TWAO/ Minerals or Waste/ Application Large Scale, small Scale, Minor)	Status	Date Received	Date Validated/ Registered	Date Approved	Tier
	LBC	16/01499/FUL	Erection of 214 flats, comprising 195 one bedroom flats, 15 two bedroom flats and 4 three bedroom flats, Part 8 and part 12 storey building with associated access, car parking and landscaping.	3km	Large Scale Major	Permitted	17/08/2016	25/01/2017	17/11/2017	1
	LBC	16/01649/FUL	Erection of three new mixed-use development blocks comprising 318 residential units and 4 commercial units on ground floor	2km	Large Scale Major	Permitted	09/09/2016	19/10/2016	13/10/2017	1
	LBC	16/02127/FUL	Erection of nine storey hotel comprising 250 bedrooms with bar/restaurant and meeting rooms on ground floor, together with car parking and associated works	200m	Small Scale Major	Under construction	30/11/2016	15/12/2016	24/05/2017	1
	LBC	17/00002/GPDOP D	Permitted Development consultation for proposed relocation of airport services and mid stay car park facilities and new airside access gate	Within DCO boundary	Small Scale Major	Permitted	21/07/2017	21/07/2017	11/09/2017	1

ID	Local authority	LPA Application Reference Number	Applicant for 'other development' and brief description of development	Distance from project	Development 'Type' (NSIP/ TWAO/ Minerals or Waste/ Application Large Scale, small Scale, Minor)	Status	Date Received	Date Validated/ Registered	Date Approved	Tier
	LBC	17/00003/GPDOP D	Permitted Development consultation for proposed works falling outside of the red line boundary: re-aligned airside perimeter road, temporary construction compound and fencing	Within DCO boundary	Minor	Permitted	11/09/2017	11/09/2017	15/09/2017	1
	LBC	17/00004/GPDOP D	Permitted Development consultation for proposal to construct a multi-storey car park (known as MSCP2) and a new permanent drop off zone in the central terminal area of London Luton Airport	Within DCO boundary	Small Scale Major	Permitted	13/09/2017	13/09/2017	19/01/2018	1
	LBC	17/00283/FUL	Hybrid planning application for 2.2km Mass Passenger Transit system between Luton Parkway Station and Luton Airport	Within DCO boundary	Large Scale Major	Under Construction	14/02/2017	17/02/2017	30/06/2017	1
	LBC	17/01038/FUL	Erection of 1200 place secondary school	1km	Small Scale Major	Permitted	12/06/2017	12/06/2017	18/09/2017	1
	LBC	17/01745/FUL	Erection of hotel with 202 bedrooms and additional 33 rooms on upper floors	2km	Large Scale Major	Permitted	03/10/2017	26/10/2017	05/03/2018	1

ID	Local authority	LPA Application Reference Number	Applicant for 'other development' and brief description of development	Distance from project	Development 'Type' (NSIP/ TWAO/ Minerals or Waste/ Application Large Scale, small Scale, Minor)	Status	Date Received	Date Validated/ Registered	Date Approved	Tier
	LBC	17/02215/FUL	Erection of two story office building with staff and visitor car parking spaces	200m	Minor	Permitted	30/12/2017	08/01/2018	04/04/2018	1
	LBC	17/02219/FUL	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, and diversion of the airside perimeter road	Within DCO boundary	Large Scale Major	Permitted	21/12/2017	21/12/2017	02/03/2018	1
	LBC	17/02300/EIA	Outline consent for Century Park business park; and full application for construction of 2km Century Park Access Road and associated highway works, the creation of new public open space, construction of a new skate park / children's play area, and construction of a replacement airport technical services building	Within DCO boundary	Large Scale Major	Proposed	15/12/2018	03/01/2018		1

ID	Local authority	LPA Application Reference Number	Applicant for 'other development' and brief description of development	Distance from project	Development 'Type' (NSIP/ TWAO/ Minerals or Waste/ Application Large Scale, small Scale, Minor)	Status	Date Received	Date Validated/ Registered	Date Approved	Tier
	LBC	17/00590/FUL	Erection of 11 buildings to provide a total of 340 dwellings comprising 118 one bedroom and 222 two bedroom flats, together with car parking, landscaping and ancillary works.	3km	Large Scale Major	Permitted	27/03/2017	29/03/2017	0/09/2017	1
	LBC	17/01040/FUL	Re-development of site to provide 224 residential units comprising of 21 Two Bedroom houses, 20 Three Bedroom houses and 75 one bedroom flats and 108 two bedroom flats with associated car parking and landscaping.	5km	Large Scale Major	Permitted	09/06/2017	12/06/2017	09/03/2018	1
	LBC	17/02069/FUL	Redevelopment of the site to create commercial units within flexible use (B1(c), B2 and B8), parking, landscaping, access, lighting and other associated works	4km	Large Scale Major	Permitted	28/11/2017	18/12/2017	05/06/2018	1
	LBC	18/00062/FUL	Erection of 92 bedroom hotel, undercroft and surface parking, after demolition of existing buildings	Within DCO boundary	Small Scale Major	Permitted	17/01/2018	13/02/2018	23/07/2018	1

ID	Local authority	LPA Application Reference Number	Applicant for 'other development' and brief description of development	Distance from project	Development 'Type' (NSIP/ TWAO/ Minerals or Waste/ Application Large Scale, small Scale, Minor)	Status	Date Received	Date Validated/ Registered	Date Approved	Tier
	LBC	18/00271/EIA	Full planning application for the erection of a hotel, office building (7,830sqm) and an MSCP	1km	Small Scale Major	Proposed	21/02/2018	10/04/2018		1
	LBC	18/01207/OUT	Outline planning application for the development of land for residential use to accommodate 240 apartments	2km	Large Scale Major	Proposed	02/08/2018	16/08/2018		1
	LBC	18/01303/FUL	Full planning application for the erection of three new mixed use development blocks comprising 369 residential units	2km	Large Scale Major	Proposed	17/08/2018	14/09/2018		1
	LBC	18/00515/EIASCR	EIA screening request for erection of an industrial building and retaining wall in addition to resurfacing works, reconfiguration of access on Provost Way, car parking and landscaping	Within DCO boundary	Small Scale Major	Proposed	29/03/2018	29/03/2018	04/05/2018	1
North Hertfordshire District Council										
	NHDC	16/02014/1	Outline planning application for the erection of 660 dwellings	1km	Large Scale Major	Proposed	31/08/2016	31/08/2016		1

ID	Local authority	LPA Application Reference Number	Applicant for 'other development' and brief description of development	Distance from project	Development 'Type' (NSIP/ TWAO/ Minerals or Waste/ Application Large Scale, small Scale, Minor)	Status	Date Received	Date Validated/ Registered	Date Approved	Tier
	NHDC	17/00830/1	Outline planning application with all matters reserved for a mixed use application for 1,400 new dwellings with retail, educational and community facilities	200m	Large Scale Major	Proposed	13/04/2017	13/04/2017		1
Central Bedfordshire Council										
	CBC	CB/18/02363/SCO	Request for Scoping Opinion in respect of the construction and operation of a Combined Heat and Power (CHP) facility	2km	Large Scale Major	Proposed (scoping)	20/06/2018	25/06/2018	31/08/2018	1
Local Plan Allocations										
Luton Borough Council										

ID	Local authority	LPA Application Reference Number	Applicant for 'other development' and brief description of development	Distance from project	Development 'Type' (NSIP/ TWAO/ Minerals or Waste/ Application Large Scale, small Scale, Minor)	Status	Date Received	Date Validated/ Registered	Date Approved	Tier
	LBC	Policy LLP6	The London Luton Airport Strategic Allocation (approximately 325 hectares) includes land within the airport boundary, Century Park and Wigmore Park. The allocation serves the strategic role of London Luton Airport and associated growth of business and industry, including aviation engineering, distribution and service sectors.	Within DCO boundary	Allocation	Adopted				3
	LBC	Policy LLP8	Napier Park is a brownfield site of around 25 hectares, located on the former Vauxhall car plant. The site is allocated for a mixed use neighbourhood development, with employment uses, residential provision and a retail led neighbourhood centre	1km	Allocation	Adopted				3
	LBC	Policy LLP10	The High Town Strategic Allocation is for a sustainable, vibrant, historic neighbourhood destination delivered through residential-led mixed use development	2km	Allocation	Adopted				3

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	North Hertfordshire District Council									
	NHDC	Site EL1 / EL2 / EL3	Strategic housing sites East of Luton for 2,100 homes	200m	Allocation	Proposed				3
	NHDC	Site KW1	Land west of The Heath, Breachwood Green - allocation for 16 dwellings	1km	Allocation	Proposed				3
	Central Bedfordshire Council									
	No adopted or emerging allocations in 5km radius									
	St Albans									
	No adopted or emerging allocations in 5km radius									
	Dacorum									

ID	Local authority	LPA Application Reference Number	Applicant for 'other development' and brief description of development	Distance from project	Development 'Type' (NSIP/ TWAO/ Minerals or Waste/ Application Large Scale, small Scale, Minor)	Status	Date Received	Date Validated/ Registered	Date Approved	Tier
No adopted or emerging allocations in 5km radius										
Minerals and Waste Local Plan Allocations										
		West of Stevenage - Preston	Land identified as a 'Mineral Resource Block', and designated as an 'adopted mineral consultation area'	5km	Allocation	Adopted				3