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London Luton Airport Expansion

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5.01 Chapter 13 Health and Community

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5.01 ENVIRONMENTAL STATEMENT CHAPTER 13: HEALTH AND COMMUNITY

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13 HEALTH AND COMMUNITY

13.1 Introduction

13.1.1 This chapter presents the assessment of likely significant effects of the Proposed Development on population health and community.

13.1.2 The EIA Scoping Report set out the proposed scope for the assessment of health and community effects. The health and community assessment identifies effects on the health of the 'population' and on the lives of people within the local community, arising from direct and indirect impacts on community resources and the environmental, social and economic impacts of the Proposed Development. It brings together the assessment of effects on people living close to, or affected by, the Proposed Development in a single chapter. The assessment of health effects is provided at a 'population', rather than an 'individual' level.

13.1.3 In summary, the following have been assessed in this chapter:

a. Health effects arising from impacts on the following environmental, social, or economic factors that influence health and wellbeing ('health determinants'):
    i. access to open space, recreation, and physical activity;
    ii. access to services;
    iii. employment and income;
    iv. housing;
    v. increased population exposure to air pollutants;
    vi. neighbourhood quality;
    vii. aircraft noise;
    viii. perception and uncertainty; and
    ix. social capital.
b. Impacts on community resources, and the resultant effects on the people ('receptors') using those resources, including:
    i. residential properties;
    ii. schools;
    iii. community facilities;
    iv. open spaces and Public Rights of Way (PRoW); and
    v. leisure and recreation facilities.

13.1.4 The following matters have been scoped out of the assessment:

a. Health effects arising from impacts on the following health determinants:
    i. electromagnetic interference (EMI);
    ii. ground and water contamination;
    iii. increased flooding; and
    iv. major accidents and incidents, such as air traffic accidents or major pollution incidents.
b. Impacts on individual business owners or operators.

13.1.5 Further details on the matters which have been scoped out are provided in **Section 13.3** of this chapter.

13.1.6 The remainder of this chapter consists of:

a. **Section 13.2** Legislation, policy and guidance relevant to the scope and methodology of the health and community assessment;
b. **Section 13.3** Scope of the assessment;
c. **Section 13.4** Stakeholder engagement undertaken to inform the assessment;
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m. **Section 13.14** Assessment summary.

13.2 Legislation, policy and guidance

13.2.1 This section identifies the key legislation, policy, and guidance relevant to the scope and methodology for the population health and community assessment which may influence the type of mitigation measures that could be incorporated into the Proposed Development during construction or operation.

13.2.2 **Table 13.1** to **Table 13.4** provides a description of the relevant legislation, policy, and guidance, and where each of these have been addressed in the ES.

Legislation

Table 13.1: Health and community legislation

Legislation	How and where addressed in ES
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref. 13.1) Section 5 paragraph 2 states the requirement that *"the EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the Proposed Development on the following factors – (a) population and human health."*	This chapter includes a community and health assessment summarised in **Section 13.14.**
Health and Social Care Act 2012 (Ref. 13.2) The aim of the act is to promote improvements in the health service to secure improvements in the physical and mental health of the people of England. A key duty of the Act is to look at the need to reduce inequalities in terms of the benefits they can expect to obtain from the health service.	This chapter includes a health assessment which appraises the impact of the Proposed Development on health and wellbeing of the population. The assessment considers the potential for an inequitable distribution of effects on 'vulnerable groups'. Vulnerable groups are identified in **Section 13.7**. Disproportionate or differential effects on vulnerable groups are considered within the assessment in **Section 13.9**
Equality Act 2010 (Ref. 13.3) The aim of the Equality Act is to protect individuals from unfair treatment and promote a fair and more equal society. The legislation acts to protect those under unfair treatment based on certain personal characteristics. This applies to	This health assessment considers the potential for an inequitable distribution of effects on 'vulnerable groups'. Vulnerable groups are identified in **Section 13.7**. Disproportionate or differential effects on vulnerable groups are considered within the assessment in **Section 13.9.**

Legislation	How and where addressed in ES
discrimination based on: Age, Race, Sex, Gender reassignment, Disability, Religion or belief, Sexual orientation, Marriage or civil partnership, pregnancy and maternity.	An **Equality Impact Assessment** has also been submitted as part of the application for development consent **[TR020001/APP/7.11]** which assesses any disproportionate and/or differential effects of the Proposed Development on the protected characteristic groups covered by the Equality Act.

Policy

Table 13.2: Health and community policy

Policy	How and where addressed in ES
National	
National Planning Policy Framework, July 2021 (Ref. 13.4) Paragraph 7 of the NPPF sets out the government's objective of achieving sustainable development. The three overarching objectives of sustainable development include the economic, social, and environmental objectives. These are interdependent and mutually supportive. The social objective seeks "*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 well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being".* Chapter 8 of the NPPF states that planning policies and decisions should aim to achieve healthy, inclusive, and safe places (paragraph 92). Paragraph 98 emphasises that "…*access to a network of high-quality open spaces…is important for the health and well-being of communities*…" Paragraph 99 indicates that existing open space should not be built on unless "…*the loss resulting from the proposed*	This chapter includes a health assessment which assesses the impact of the Proposed Development on various health determinants including housing, social capital, access to open space, access to services, and neighbourhood quality. Details of any significant health effects and mitigation measures are provided in **Section 13.9** and **Section 13.8**, respectively. Open spaces and recreational infrastructure are assessed as part of the health and community assessment in **Section 13.9**. Details of the noise assessment are provided in **Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]**. The health and community assessment considers any significant residual noise effects in the in-combination assessment in **Section 13.9.** Details of mitigation measures identified by the noise assessment relevant to the health and community assessment are summarised in **Section 13.8** of this chapter. Any effects of aircraft noise on health have been quantitatively assessed using Government guidance and reported in the ES.

Policy	How and where addressed in ES
development would be replaced by equivalent or better provision in terms of quantity and quality in a suitable location." Paragraph 100 emphasises that public rights of way should be protected and enhanced. Paragraph 130 seeks to ensure that developments create places which "…*promote health and well-being, with a high standard of amenity for existing and future users*. Paragraph 185 seeks to ensure that development is appropriate for its location taking into account the likely effects of pollution on heath, living conditions and the natural environment. In doing so, the policy states that development should: "*a) mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life*."	
National Policy Statement for National Networks – December 2014 (NPSNN) The NPSNN sets out the need for, and Government's policies to deliver, development of nationally significant infrastructure projects on the national road and rail networks in England. It provides planning guidance for promoters of nationally significant infrastructure projects (NSIP) on the road and rail networks.	There are no elements of the Proposed Development on the national road or rail network that would be classified as a NSIP in their own right. However, the NPSNN remains an important and relevant consideration, particularly as works are proposed on the Strategic Road Network (SRN) at Junction 10 of the M1 as part of the Proposed Development. The relevant polices of the NPSNN are consistent with the relevant policies of the ANPS and have not, therefore, been repeated here and accordingly the ANPS compliance table **(Table 13.3)** provides the necessary policy response.
Aviation 2050: The Future of UK Aviation (2018) (Ref. 13.5). This Green Paper contains objectives relating to air quality and noise and is referred to in Flightpath to the Future (Ref: 13.6). For air quality, this includes	Details of the air quality assessment and noise assessment are provided in **Chapter 7** Air Quality and **Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]**, respectively. The health and community assessment considers any significant residual air quality and noise effects in the

Policy	How and where addressed in ES
proposed measures improving the monitoring of air pollution. For noise, this includes setting a new objective, and where possible, reducing total adverse effects on health and quality of life from aviation noise. The draft strategy described in this consultation document proposes new measures at paragraph 3.115 as follows: • setting a new objective to limit, and where possible, reduce total adverse effects on health and quality of life from aviation noise; and • routinely setting noise caps as part of planning approvals (for increase in passengers or flights). The aim is to balance noise and growth and to provide future certainty over noise levels to communities. The draft strategy states at paragraph 3.106: "*The government is considering the recent new environmental noise guidelines for the European region published by the World Health Organization (WHO). It agrees with the ambition to reduce noise and to minimise adverse health effects, but it wants policy to be underpinned by the most robust evidence on these effects, including the total cost of action and recent UK specific evidence which the WHO report did not assess*"	in-combination assessment in **Section 13.9**. **Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]** demonstrates how the Proposed Development will mitigate and reduce to a minimum any potential adverse impact resulting from noise from the Proposed Development – and avoid noise giving rise to significant adverse impacts on health and the quality of life. This chapter includes an assessment in **Section 13.9** of any potential effects on health resulting from long-term exposure of a population to aircraft noise using established exposure-response relationships for specific health outcomes published by Defra. It also undertakes a sensitivity test using the 2018 World Health Organisation European Noise Guidelines (Ref: 13.48). More details on the methodology used can be found in **Section 13.5** of this chapter.
Flightpath to the Future: a strategic framework for the aviation sector (May 2022) (Ref. 13.6) Flightpath to the Future is a strategic framework for the aviation sector that supports the Department for Transport's vision for a modern, innovative and efficient sector over the next 10 years. Flightpath to the Future does not provide any specific updates to noise policy but	Whilst the next steps for noise policy referred to in Flightpath to the Future have yet to be published, the Government has clarified that the draft policies and noise aims in Aviation 2050 remain very relevant. See above how Aviation 2050 has been considered in relation to the health and community assessment.

Policy	How and where addressed in ES
refers to the draft policies and aims set out in Aviation 2050 (Ref: 13.5) noting that "*these aims remain very relevant and we will set out next steps in 2022/2023*".	
Fair Society, Healthy Lives, The Marmot Review 2010 (Ref. 13.7) The key objective of the Marmot review is to propose the most effective evidence-based strategies for reducing health inequalities in England. The report looks at the links between health inequalities and the social determinants of health. Key policy areas include creating fair employment and good work for all; ensuring a healthy standard of living for all; and creating and developing healthy and sustainable places and communities.	This chapter includes an assessment of the impact of the Proposed Development on health and wellbeing of the population. Health effects have been identified when an environmental, social, or economic factor that influences health and wellbeing (a 'health determinant') is impacted. The assessment considers the potential for any inequitable distribution of effects on 'vulnerable groups'. Vulnerable groups are identified in **Section 13.7. Any** disproportionate or differential effects on vulnerable groups are considered within the assessment in **Section 13.9**
Public Health Outcomes Framework 2013 (Ref. 13.8) The framework focuses on two main objectives which include increased healthy life expectancy and reducing the differences in life expectancy and healthy life expectancy between communities. The framework establishes the indicators that will help us understand how well public health is being improved and protected. The Public Health Outcomes Framework focuses on achieving positive health outcomes for the population and reducing inequalities in health.	This chapter includes an assessment of the impact of the Proposed Development on health and wellbeing of the population. The assessment considers the potential for any inequitable distribution of effects on 'vulnerable groups'. Vulnerable groups are identified in **Section 13.7**. Any disproportionate or differential effects on vulnerable groups are considered within the assessment in **Section 13.9**
Department for Transport (DfT), Transport Analysis Guidance (TAG) UNIT A4.1, Social Impact Appraisal, 2019 (Ref. 13.9)	Any impacts on physical activity, severance and accessibility have all be considered as part of this health and community assessment. Details of any significant health effects and mitigation measures are

Policy	How and where addressed in ES
The Social Impact Appraisal contains qualitative data which covers the human experience of the transport system and its impact on social factors. These include physical activity, severance and accessibility.	provided in **Section 13.9** and **Section 13.8,** respectively.
Planning Practice Guidance – Healthy and Safe Communities, 2022 (Ref. 13.10) This guidance identifies that the design and use of the built and natural environments, including green infrastructure are major determinants of health and wellbeing. It identifies that a healthy place is one which supports and promotes healthy behaviours and environments and a reduction in health inequalities for people of all ages; will provide the community with opportunities to improve their physical and mental health; and support community engagement and wellbeing.	The health assessment considers the impact of the Proposed Development on both 'Access to open space, recreation and physical activity' and 'neighbourhood quality' as determinants of health in **Table 13.20**. Open spaces and recreational infrastructure are assessed as part of the health and community assessment in **Section 13.9**. The assessment considers the potential for any inequitable distribution of effects on 'vulnerable groups'. Vulnerable groups are identified in Section **13.7.** Any disproportionate or differential effects on vulnerable groups are considered within the assessment in Section **13.9**
Transport, health and wellbeing: An evidence review for the Department for Transport, 2019 (Ref. 13. 11) This outlines key findings around the relationship between transport and health, including the role it plays in access to services, how modes of transport affect physical and mental health, and how transport acts as a facilitator for social interactions and social inclusion. The guidance highlights how vulnerable groups are disproportionately affected by the adverse impacts of transport. Accessibility of transport varies by user groups, so some often do not experience the health benefits from transport policy and are more likely to experience the	An assessment of any impacts on open spaces, PRoW and recreational routes likely to be affected by the Proposed Development has been undertaken as part of the health and community assessment in **Section 13.14.**

Policy	How and where addressed in ES
negatives involved such as noise and air pollution.	
Local	
Central Bedfordshire Local Plan 2015-2035, July 2021 (Ref. 13.12) Policy EE6 states: "*Developments should consider how they would affect tranquillity, using existing tools such as […] Health Impact Assessment […]*" The Policy seeks to: "*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.*" Policy EE12 states that "*Development should protect, enhance and promote the public rights of way network*". Policy T2 states that "*The proposal retains or enhances existing footpaths and cycleway links; The proposal promotes walking and cycling permeability and ensure that linkages and publicly-accessible through routes are created to successfully integrate the development into wider networks; The development provides safe and convenient access in accordance with appropriate standards, that promote accessibility for all users and all modes of transport.*" Policy HQ1 seeks to promote high quality development including ensuring development does not have an unacceptable adverse impact upon nearby existing or permitted uses, including impacts on amenity, privacy, noise, or air quality.	This chapter includes a health and community assessment which considers any impacts on open spaces and recreational routes through the in-combination assessment in **Section 13.9.** User count surveys have been undertaken along these routes likely to be directly affected by the Proposed Development and at Wigmore Valley Park. An assessment of tranquillity in accordance with NPPF paragraph 185b has been undertaken as part of the Noise and Vibration Assessment **Chapter 16** of this ES **[TR020001/APP/5.01]. Chapter 14** Landscape and Visual **[TR020001/APP/5.01]** also considers tranquillity in the assessment of landscape effects (including the Chilterns Area of Outstanding Natural Beauty). **Chapter 10** Cultural Heritage **[TR020001/APP/5.01]** considers tranquillity where appropriate when assessing effects on heritage assets. Details of the air quality, noise and transport assessments are provided in **Chapter 7** Air Quality, **Chapter 16** Noise and Vibration, and **Chapter 18** Traffic and Transportation of this ES **[TR020001/APP/5.01]**, respectively. Details of mitigation measures identified by the noise assessment relevant to the health assessment are summarised in **Sections 13.8 and 13.10** of this chapter. Any effects of aircraft noise on health have been quantitatively assessed in **Section 13.9** using Government guidance.

Policy	How and where addressed in ES
Luton's Population Wellbeing Strategy 2019-2024, January 2020 (Ref. 13.13) Luton's Population Wellbeing Strategy 2019 – 2024 aims to make Luton "*a more equitable place where people thrive, have the opportunity to live a healthy life mentally, socially and physically; and maximize their potential.*"	This chapter includes a health assessment which appraises the potential impacts of the Proposed Development on the health and wellbeing of the population, including any impacts on vulnerable groups. Details of any significant health effects and mitigation measures are provided in **Section 13.9** and **Section 13.8**, respectively.
Luton 2020 – 2040 A Place to Thrive, October 2020 (Ref. 13.14) Luton's strategic priorities aim to *"protect the most disadvantaged in our town by prioritising services and interventions that focus on prevention, alleviate the impact of poverty and reduce health inequalities"* and *"make Luton a child-friendly town, where our children and young people grow up feeling happy, healthy and secure, with a voice that matters and the opportunities they need to thrive."*	This chapter includes a health assessment which appraises the potential impact of the Proposed Development on vulnerable groups. Details of any significant health effects and mitigation measures are provided in **Section 13.9** and **Section 13.8**, respectively.
Oxford-Cambridge Arc: Government ambition and joint declaration between Government and local partners, March 2019 (Ref. 13.15) The Oxford-Cambridge Arc aims to improve access to the environment for existing and new communities in order to improve health and wellbeing. It hopes to create places valued by local communities and improve access to wider services including health and education.	This chapter includes a health and community assessment which appraises the potential impact of the Proposed Development on access to services and access to open space, recreation, and physical activity. Details of any significant health effects and mitigation measures are provided in **Section 13.9** and **Section 13.8**, respectively.
Luton Local Plan 2011-2031, November 2017 (Ref. 13.16) Policy LLP25 seeks to promote high quality design which is safe and easily accessed by all members of the community. The policy notes that provision should improve access to open spaces and promote sport and physical activity and healthy communities.	This chapter includes a health and community assessment which appraises the potential impact of the Proposed Development on access to open space, recreation, and physical activity. Details of any significant health effects and mitigation measures are provided in **Section 13.9** and **Section 13.8**, respectively.

Policy	How and where addressed in ES
Policy LLP27 seeks to safeguard and enhance existing networks of open space. Clause B refers to the loss of open space and notes that "*exceptionally, losses will be permitted where: i) replacement open space provision can be made that is of an equivalent type, quality, and quantity or better and is accessible and within the vicinity; or ii) the proposal is for alternative or ancillary sports and recreational provision, the need for which clearly outweighs the loss*." Clause C of the policy refers to development on open space and indicates that "*development will only be permitted where development is ancillary, complementary, and limited in scale securing the efficient and effective use of the existing green space*." Policy LLP38 seeks to limit pollution and contamination and states that "*the scheme will need to demonstrate whether the development (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."*	Any potential effects on open spaces and recreational infrastructure are assessed as part of the health and community assessment in **Section 13.9**. Details of the air quality assessment and noise assessment are provided in **Chapter 7** Air Quality and **Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]**, respectively. Details of mitigation measures identified by the noise assessment relevant to the health assessment are summarised in **Section 13.10** of this chapter. The potential effects of aircraft noise on health have been quantitatively assessed in **Section 13.9** using Government guidance.
North Hertfordshire Local Plan 2011- 2031, November 2022 (Ref. 13.17) Policy SP10 states that "*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; and* *f) Protect, enhance and create new physical and green infrastructure to foster healthy lifestyles.*"	This chapter includes an assessment of the potential impact of the Proposed Development on health determinants including access to services and access to open space, recreation, and physical activity. Details of any significant health effects and mitigation measures are provided in **Section 13.9** and **Section 13.8**, respectively. This chapter includes a community assessment which appraises the potential impact of the Proposed Development on existing community, leisure and recreation facilities. Details of any significant community effects are provided in **Section 13.9.**
Luton Green Spaces Strategy Review, October 2015 (Ref. 13.18)	Potential effects on open spaces and recreational infrastructure are assessed as

Policy	How and where addressed in ES
The Luton Green Space Strategy Review provides a review of the previous strategy objectives which include "*local standards for green space provision, a strategy to ensure both the protection of green spaces and sustainable new provision, guidance on how management and maintenance of green space would meet the needs of existing and new communities, as well as visitors and an adopted Supplementary Planning Document for the Local Development Framework.*"	part of the health and community assessment in **Section 13.9**.
Luton Local Transport Plan 3 2011-2026, March 2011 (Ref. 13.19) Policy 20 aims to "*encourage the use of the Public Rights of Way network*." Policy 21 aims to "*reduce noise and vibration from traffic, with priority being given to those areas where these impacts are excessive and adversely impact on the greatest number of people; and reducing light pollution and nuisance at night where it is possible and safe to do so by designing new and replacement lighting schemes to minimise these impacts*."	An assessment of the potential effects on open spaces, PRoW and recreational routes likely to be affected by the Proposed Development have been assessed as part of the health and community assessment in **Section 13.14.** Details of the noise and light obtrusion assessment are provided in **Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]** and **Appendix 5.2** Light Obtrusion Assessment of this ES **[TR020001/APP/5.02]**, respectively. This chapter includes a health and community assessment which considers any significant residual noise and light effects under neighbourhood quality in **Section 13.9**. Details of mitigation measures identified by the noise and light obtrusion assessment relevant to the health and community assessment are summarised in **Section 13.8** of this chapter.
Hertfordshire County Council's Sustainable Hertfordshire Strategy 2022 (Ref. 13.20) The Strategy sets out initial policies and strategies needed to embed sustainability across all council operations and services throughout the county. It notes the need to link this to health and wellbeing and look at the impacts of climate change on Hertfordshire's health services.	**Section 13.12** looks at the predicted future conditions as a result of climate change and provides an assessment of any potential changes to the assessment of health effects associated with the Proposed Development as a result.

Policy	How and where addressed in ES
Dacorum Local Plan (2020-2038) Emerging Strategy for Growth, Nov 2020 (Ref. 13.21) Policy 22.1 states that "*The health and wellbeing of our communities is crucially important to delivering long term sustainable development and placemaking. This includes physical, mental and social wellbeing. Key to the Plan is ensuring access to good quality services and facilities exists and that people of all ages and backgrounds receive the access they need to live full, productive and prosperous lives*."	This chapter includes an assessment of the potential impact of the Proposed Development on health and wellbeing of the population, including impacts on vulnerable groups. Details of any significant health effects and mitigation measures are provided in **Section 13.9** and **Section 13.8**, respectively. This chapter includes an assessment of the potential impact of the Proposed Development on existing community, leisure, and recreation facilities. Details of any significant community effects are provided in **Section 13.9.**
Dacorum Borough Council's Equal Opportunity Policy Statement, September 2013 (Ref. 13.22) The policy statement states that "*Dacorum Borough Council is committed to creating a culture in which equality of opportunity is actively promoted in every aspect of service provision and the working environment*".	This health assessment considers the potential for an inequitable distribution of effects on 'vulnerable groups'. Vulnerable groups are identified in **Section 13.7.** Any disproportionate or differential effects on vulnerable groups are considered within the assessment in **Section 13.9**
Delivering for Dacorum, Corporate Plan (2020-2025) (Ref. 13.23) Priority 2 focuses on "*Building strong vibrant communities*".	This chapter includes an assessment of the potential impact of the Proposed Development on community, including loss or gain of community resources; displacement of community resources; changes to the amenity of a resource and isolation of communities from community services and facilities. This chapter also includes an assessment of the potential effects on health and wellbeing associated with changes in access to, or loss of, services and community facilities. Details of any significant community effects are provided in **Section 13.9**
Dacorum Borough Council Local Plan Policy Advice Note, 2013 (Ref. 13.24)	An assessment of the impacts on PRoWs, bridleways and recreational routes likely to be affected by the Proposed Development has been undertaken as part of the health

Policy	How and where addressed in ES
The policy advice note sets out the policies from the Dacorum Borough Council Local Plan (1991-2011) that have been 'saved' (i.e., will continue to inform planning policy until they are formally superseded or cancelled). 'Saved' policies that are relevant to the health and community assessment include: a. Policy 79: Footpath Network; and b. Policy 80: Bridleway Network. Both of these policies state that the footpath network and bridleway network will be protected, improved and promoted. Diversion of public footpaths or public bridleways as a result of development proposals will only be supported if the environmental character of the route is maintained, riders and walkers are not significantly inconvenienced and/or significant planning advantages accrue.	and community assessment in **Section 13.14.**

13.2.3 The Airports National Policy Statement (ANPS) (Ref. 13.25) does not have effect in relation to an application for development consent for an airport development not comprised of an application relating to the Heathrow North West Runway. Nevertheless, as set out within paragraph 1.41 of the ANPS, the Secretary of State considers that the contents of the ANPS will be both important and relevant considerations in the determination of such an application, particularly where it relates to London or the south east of England. In particular, the ANPS makes clear that, alongside the provision of a new Northwest Runway at Heathrow, the government supports other airports making best use of their existing runways as set out in 'Beyond the Horizon: Making best use of existing runways' (Ref: 13.26), which is the specific policy context for this application.

13.2.4 In addition, whilst the ANPS does not have effect in relation to the Proposed Development, it sets out a number of principles for environmental impact assessment and compliance and these will be an important and relevant consideration in the determination of the application for development consent. A summary of the relevant provisions for the health and community assessment and how these have been addressed in this ES is provided within **Table 13.3.**

Table 13.3: How relevant Health and community requirements of ANPS are addressed in the ES

ANPS Section	How and where addressed in ES
Paragraph 4.70-4.73 Health: *"The construction and use of airports infrastructure has the potential to affect people's health, wellbeing, and quality of life through direct and indirect health impacts, both negative and positive.* *New or enhanced airports infrastructure may also have indirect health impacts, for example if they affect access to key public services, local transport, opportunities for cycling and walking, or the use of open space for recreation and physical activity. It should also be noted, however, that the increased employment stemming from airport expansion may have indirect positive health impacts.* *Likely significant health impacts need to be assessed. Measures to avoid, reduce or compensate for adverse health impacts need to be identified."*	The assessment of likely health effects is provided in **Section 13.9**. Measures to mitigate any adverse health effects are described in **Section 13.8 and 13.10**. Any residual likely significant health effects, following mitigation, are described in **Section 13.11**.
Paragraph 5.23-5.24 and 5.42 Air quality: *"Increased emissions can contribute to adverse impacts on human health and on the natural environment.* *The European Union has established common, health-based and ecosystem based ambient concentration limit values for the main pollutants in the Ambient Air Quality Director (2008/50/EC) which member states are required to meet…* *The Secretary of State will consider air quality impacts over the wider area likely to be affected, as well as in the vicinity of the scheme… [the Secretary of State] will need to be satisfied that, with mitigation, the scheme would be compliant with legal obligations that provide for the protection of human health and the environment."*	Details of the air quality assessment are provided in **Chapter 7** Air Quality of this ES **[TR020001/APP/5.01]**. A quantitative assessment of health effects from changes in air quality is provided in **Section 13.9** of this health and community assessment. The community assessment considers any significant residual air quality effects in the in-combination assessment in **Section 13.9.**
Paragraphs 5.46-5.47, 5.56 and 5.68 Noise: *"...people's sensitivity to noise has increased in recent years, and there has been growing evidence that exposure to*	Details of the noise assessment are provided in **Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]**. The community assessment considers any significant residual noise effects in the in-

ANPS Section	How and where addressed in ES
high levels of aircraft noise can adversely affect people's health. *The Government wants to strike a fair balance between the negative impacts of noise (on health, amenity, quality of life and productivity) and the positive impacts of flights…* *The Government also recognises that predictable periods of relief from aircraft noise and important for communities affected, and that noise at night is widely regarded as the least acceptable aspect of aviation noise…with the costs on communities of aircraft noise during the night being higher.* *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."*	combination assessment in **Section 13.9**. Specific noise mitigation measures are set out in **Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]**. Details of mitigation measures identified by the noise assessment relevant to the health and community assessment are summarised in **Section 13.8** of this chapter. The effects of aircraft noise on health have been quantitatively assessed in **Section 13.9** using Government guidance. This includes an assessment of Disability Adjusted Life Years (DALYs) in relation to Annoyance, Sleep Disturbance and Acute Myocardial Infarction (AMI) arising from aircraft noise; and change on Quality Adjusted Life Years (QALYs) lost associated with stroke and dementia arising from aircraft noise.
Paragraph 5.106 Open space: *"Access to high quality open spaces and the countryside and opportunities for sport and recreation can be a means of providing necessary mitigation and/or compensation requirements…"*	Open spaces and recreational infrastructure are assessed as part of the health and community assessment in **Section 13.9**. A series of surveys of open spaces and recreational routes have been undertaken to ascertain quality and usage. The methodology and results of the surveys are included in **Appendix 13.1** and **13.2** of this ES **[TR020001/APP/5.02]**, respectively. The results of these surveys have informed any proposals for re-provision ensuring that the replacement open space is of equivalent or better provision in terms of size, usefulness, attractiveness, quality, and accessibility, as set out in **Section 13.9**.
Paragraph 5.112 Open space: *"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…* *Any exchange land should be at least as good in terms of size, usefulness, attractiveness, quality, and accessibility…"*	
Paragraph 5.120 Open space: "*Any exchange land should be at least as good in terms of size, usefulness, attractiveness, quality, and accessibility…"*	
Paragraph 5.123-5.124 Open space: *"The applicant is expected to take appropriate mitigation measures to address adverse effects on National Trails, other public rights of way and open access*	Open spaces and recreational routes (including National Trails and other public rights of way) likely to be affected by the Proposed Development have been assessed as part of the health and

ANPS Section	How and where addressed in ES
land and, where appropriate, to consider what opportunities there may be to improve access. *The Secretary of State should not grant consent for development on existing open space, sports and recreational buildings and land, including playing fields, unless…the Secretary of State determines that the benefits of the project 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."*	community assessment in **Section 13.9**. User count surveys have been undertaken along these routes likely to be directly affected by the Proposed Development and at Wigmore Valley Park. The result of these surveys, combined with the stakeholder engagement **(see Section 13.4)** have informed the mitigation proposals in terms of the replacement open space, as set out in **Section 13.8** and **Section 13.9**.
Paragraph 5.135 Resource and waste management: *"Government policy on hazardous and non-hazardous waste is intended to protect human health and the environment by producing less waste and by using it as a resource…waste management regulation ensures that waste is disposed of in a way that is least damaging to the environment and to human health."*	Waste disposal facilities are subject to regulatory requirements to protect public health therefore no direct health effects are likely to arise as a result of waste generated by the Proposed Development. Details of the waste and resources assessment are provided in **Chapter 19** Waste and Resources of this ES **[TR020001/APP/5.01]**.
Paragraph 5.172 Water quality and resources: *"Effects (on the water environment) could lead to adverse impacts on health or on protected and other species and habitats…"*	The water resources assessment (**Chapter 20** Water Resources and Flood Risk of this ES **[TR020001/APP/5.01]**) assesses the potential impacts of contaminants associated with the Proposed Development on groundwater receptors. This is informed by potential impacts on human health.
Paragraph 5.226 Land instability: *"The effects of land instability may result in landslides, subsidence, or ground heave. Failing to deal with this issue could cause harm to human health, local property and associated infrastructure, and the wider environment."*	Extensive geotechnical and earthworks investigations and assessments have been undertaken as part of the design development process. Details of the soils and geology assessment are provided in **Chapter 17** Soils and Geology of this ES **[TR020001/APP/5.01]**. The health assessment does not specifically consider the health impacts of land instability further. See scoping out text **Paragraph 13.3.19** for further justification.
Paragraph 5.239 Community compensation:	The findings of the health and community assessment including any likely

ANPS Section	How and where addressed in ES
"The Secretary of State recognises that, in addition to providing economic growth and employment opportunities, airport expansion will also have negative impacts upon local communities. This will include impacts through land take requiring the compulsory acquisition of houses that fall within the new boundary of the airport, exposure to air quality impacts, and aircraft noise, that is both an annoyance and can have an adverse impact on health and cognitive development."	significant effects and mitigation measures are provided in **Section 13.9** and **Section 13.8** of this chapter, respectively. This includes consideration of the following health determinants: economics and employment, housing market, neighbourhood quality and aircraft noise. A quantitative assessment of health effects from changes in air quality is provided in **Section 13.9** of this health and community assessment. **Chapter 16 [TR020001/APP/5.01]** reports the findings of the noise assessment, and a **Draft Compensation Policies, Measures and Community First** document has been submitted as part of the application for development consent **[TR020001/APP/7.10]** describing the proposed compensation policies.

Guidance

13.2.5 **Table 13.4** sets out the relevant guidance considered in undertaking this assessment. It is acknowledged that there is limited guidance which directly relates to community assessments therefore professional experience and best practice has informed this ES.

Table 13.4: Health and community guidance

Guidance	How and where addressed in ES
Institute of Environmental Management and Assessment (IEMA) Guide to: Determining Significance for Human Health in Environmental Impact Assessment (Ref. 13.27)	This guidance document has informed the health assessment methodology provided in **Section 13.5** in terms of significance impact.
IEMA Guide to: Effective Scoping of Human Health in Environmental Impact Assessment (Ref. 13.28)	This guidance document has informed the scope of the assessment in **Section 13.3** and the health determinants covered.
International Association of Impact Assessment (IAIA), 2021: Human Health: Ensuring a high level of protection (Ref. 13.29)	This guidance has informed the significance criteria for the health assessment provided in **Section 13.5** of this chapter.

Guidance	How and where addressed in ES
Public Health England, 2020, Health Impact Assessment in spatial planning: A guide for local authority public health and planning teams (Ref. 13.30)	This guidance document has informed the health assessment methodology provided in **Section 13.5** in terms of significance impact and likelihood impact.
Highways England, 2020, Design Manual for Roads and Bridges: LA112 – Population and Human Health (Ref: 13.31)	The section of this guidance document relating to likely effects on land-use and accessibility has informed the community assessment methodology provided in **Section 13.5**.
National Health Service (NHS) London Healthy Urban Development Unit (HUDU), 2019. Healthy Urban Planning Checklist and Rapid Health Impact Assessment Tool (Ref. 13.32)	This guidance document has informed the assessment methodology provided in **Section 13.5** including assessing the impact of the Proposed Development on health determinants.
Hertfordshire County Council Health Impact Assessment Position Statement, 2019 (Ref. 13.33)	In line with this position statement, the methodology for the assessment of health effects in this chapter (**Section 13.5**) is based on the wider model of health that looks at potential impacts on the social determinants of health. It includes an evidence review, and consideration of health inequalities/effects on vulnerable groups.
Central Bedfordshire and Luton Strategic Housing Market Assessment (SHMA), 2018 (Ref. 13.34)	This guidance document has informed the baseline housing conditions for the study area provided in **Section 13.7.**
Institute of Environmental Management and Assessment, 2017: Health in Environmental Assessment, a primer for a proportionate approach (Ref. 13.35)	This guidance document has informed the significance criteria for the health assessment provided in **Section 13.5** of this chapter.
Luton's Joint Strategic Needs Assessment, 2015 (Ref. 13.36) This guidance document highlights the current and future health needs of the local population and identifies priorities.	This chapter includes a health assessment which utilises this information to inform the baseline profile of the study area provided in **Section 13.7**.
Wales Health Impact Assessment Support Unit (WHIASU), 2012, Health Impact Assessment: A practical guide (Ref. 13.37)	This guidance document has informed the health baseline provided in **Section 13.7** in terms of identification of vulnerable groups.
National Mental Wellbeing Impact Assessment Collaborative 2011: Mental	This guidance document has informed the health assessment scope and methodology

Guidance	How and where addressed in ES
Wellbeing Impact Assessment Toolkit (Ref. 13.38)	provided in **Section 13.3** and **Section 13.5** of this chapter, respectively.
Health Scotland et al, 2007: Health Impact Assessment of Transport Initiatives: A Guide (Ref. 13.39)	This guidance document has informed the evidence review provided in **Appendix 13.5** of this ES **[TR020001/APP/5.02]**, scope provided in **Section 13.3** and methodology provided in **Section 13.5** from a transport initiative point of view.

13.3 Scope of the assessment

13.3.1 This section describes the scope of the health and community assessment, including how the assessment has responded to the Scoping Opinion. The temporal and spatial scope, the relevant receptors, and matters scoped in and out are identified. A description of engagement undertaken with relevant technical stakeholders to develop and agree this scope is provided in **Section 13.4**.

Scoping Opinion

13.3.2 The EIA Scoping Report set out the proposed scope and assessment methodologies to be employed in the EIA and is provided in **Appendices 1.1 and 1.2** of this ES **[TR020001/APP/5.05]**.

13.3.3 In response to the Scoping Report, a Scoping Opinion was received from the Planning Inspectorate on 9 May 2019 and is provided in **Appendix 1.3** of this ES **[TR020001/APP/5.05]**.

13.3.4 **Table 13.5** describes the main matters highlighted by the Planning Inspectorate in the Scoping Opinion and how these have been addressed in this ES. Responses to all comments received in the Scoping Opinion are proved in **Appendix 1.4** of this ES **[TR020001/APP/5.02]**.

Table 13.5: Health and community Scoping Opinion comments

Scoping Opinion ID	Scoping Opinion comment	How is this addressed
Paragraph 4.10.1	We are unconvinced that at this stage the health effects from increased population exposure to air pollutants can be scoped out. Dealing with localised impacts through the AQA only is likely to conceal differential impacts on different groups in the population. Moreover, adopting this approach negates the potentially wider impacts of PM.	The effects of the Proposed Development on air quality have been assessed in **Chapter 7** Air quality of this ES **[TR020001/APP/5.01]**. A quantitative assessment of the effects on population health outcomes associated with changes in air pollutant concentrations resulting from operational traffic, on-airport and aircraft emissions is provided in **Section 13.9.**
Paragraph 4.10.2	The Scoping Report states that the Proposed Development does not include any significant sources of EMI in proximity to sensitive receptors. The Scoping Report does not identify what these sensitive receptors would be and over what	The geographic extent of the detectable magnetic field from a substation typically extends to between 3 and 8 metres (and in rare cases up to 15 metres). Outside of the detectable magnetic field, there can be no health effect (Ref. 13.40). Sensitive receptors include anywhere that individuals spend a significant amount of time, such as residential properties and

Scoping Opinion ID	Scoping Opinion comment	How is this addressed
	geographical extent impacts could be expected to occur. There is no specific information presented on any significant EMI sources which form part of the Proposed Development. Without this information the Inspectorate cannot agree to scope this matter out and advises that it should be assessed in the ES where significant effects could arise.	businesses. The Proposed Development does not include any new substations or any other sources of EMI within 15m of sensitive receptors. In addition, the Proposed Development will comply with the relevant standards for electromagnetic compatibility (EMC) and personal protection, for example BS EN 50121-5:2017, BS EN 50122-1:2011 and EU Directive 2013/35/EU Electromagnetic Fields (EMF) limits (Ref. 13.41), enforced in the UK by the Control of Electromagnetic Fields at Work (CEMFAW) 2016 Regulations (Ref. 13.42). There are therefore no likely significant health effects from EMI and no further assessment is required.
Paragraph 4.10.3	The Scoping Report states that these matters will be assessed and mitigated through the relevant chapters of the ES; given in the Scoping Report as Chapter 11 Soils and Geology, Chapter 12 Water Resources, and Chapter 20 Major Accidents and Disasters, as well as the proposed Flood Risk Assessment, and are therefore proposed to be scoped out of the Health and Community aspect chapter of the ES. It is noted that Chapter 12 Water Resources of the Scoping Report does not contain any reference to assessment of effects on health, in particular any likely significant effects arising from water and groundwater contamination. The Inspectorate does note the reference to health in the Soils and Geology aspect chapter.	The water resources assessment (**Chapter 20** Water Resources and Flood Risk of this ES **[TR020001/APP/5.01]**) includes an assessment of impacts of the Proposed Development on water quantity and quality against standards that are based on preventing impacts to human health. The assessment concludes that during construction any potential impacts on groundwater and surface water quality will be mitigated through measures outlined in the Code of Construction Practice (CoCP) (**Appendix 4.2** of this ES **[TR020001/APP/5.02]**). During both construction and operation, it is assessed that there will be beneficial effects on both groundwater and surface water quality as result of the processing and treatment of the former landfill site and the addition of a capping layer that will close the pathway for contaminants into the underlying aquifer. Flood risk outside of the Main Application Site (as defined in **Chapter 2** of this ES **[TR020001/APP/5.01]**) is considered in **Chapter 20** Water Resources and Flood Risk of this ES **[TR020001/APP/5.01]** and the Flood Risk Assessment (FRA)

Scoping Opinion ID	Scoping Opinion comment	How is this addressed
	The Inspectorate does not agree to scope these matters out and advises that the ES should assess any likely significant effects to health associated with water and groundwater contamination. If the Applicant chooses to assess these matters in another relevant aspect chapter, it should be clearly referenced. The Inspectorate agrees to scope out health effects to receptors at the Main Application Site. However, the flood risk associated with Proposed Development outside of the Main Application Site is not clearly stated in the Scoping Report. Therefore, the Inspectorate does not agree to scope these matters out of the assessment and where significant effects are likely to occur, they should be assessed in the ES.	provided as **Appendix 20.1** of this ES **[TR020001/APP/5.02]**. The FRA concludes that it has not identified any increased flood risk related to the Proposed Development at the Main Application Site or the off-site works, in any of the three assessment phases that result in an impact that would result in a significant effect, when the normal standards of design (1% AEP + CC) are applied (1%AEP+CC = 1% Annual Exceedance Probability + Climate Change). There are therefore no likely significant health effects from water quality and flood risk, and no further assessment is required.
Paragraph 4.10.6	The Inspectorate notes the information sources listed in the Scoping Report and advises that the ES provides an explanation of the specific data to be gathered from these sources. It is not clear from the Scoping Report how mental health indicators will be determined from these sources, and the Inspectorate advises that both mental and physical health effects should be assessed in the ES.	Baseline conditions for health and community are provided in **Section 13.7** and include references which link the indicators to information sources. Mental health indicators have been obtained from the Mental Health and Wellbeing JSNA and Public Health England (now Office for Health Improvement and Disparities (OHID)) Local Authority Health Profile for the local and wider study area as indicated in **Section 13.7.** Both mental and physical health effects are assessed in **Section 13.9** and **Section 13.11.**
Paragraph 4.10.7	While it is understood from this paragraph that the ES will identify community resources	The approach to defining the community baseline is described in **Section 13.5.** Using the information sources described in

Scoping Opinion ID	Scoping Opinion comment	How is this addressed
	within the Study Area only if they may be affected by the Proposed Development, it will be necessary for the ES to provide an explanation of how the baseline has been established and therefore, it should explain what possible effects have been considered when identifying community resources.	**Section 13.5**, all community resources in the study area were identified. The matters listed in **Section 13.3** under 'Matters scoped in' explains the possible effects which have been considered as part of the community assessment. These possible effects were used to refine the community baseline.
Paragraph 4.10.8	With regard to the quality surveys to be undertaken, it should be clear in the ES how the locations/sites to be surveyed have been chosen, including how consultation has information the decision. The data for the assessment, for example the attribute table referred to in Paragraph 15.4.10, should be provided in the ES.	The methodology and results of the open space surveys are included in **Appendix 13.1** and **13.2** of this ES **[TR020001/APP/5.02]**. The methodology was shared with Luton Borough Council ahead of the first surveys taking place in Spring 2019. The number of visits were agreed, and the survey hours were extended to account for additional morning and evening users.
Paragraph 4.10.9	The ES should explain how future changes to the profile of the affected communities and wider relevant policy has been considered within the assessment. Any forecasts used must be explained and the methods used justified. The Applicant should make effort to verify the information used with relevant consultation bodies.	The approach to defining future baseline is described in **Section 5.4** of **Chapter 5** Approach to the Assessment of this ES **[TR020001/APP/5.01]**. The future baseline considered for health and community is described in **Section 13.7** of this chapter. The baseline was verified through engagement with Luton Borough Council, Public Health England (now OHID) and through a community workshop with various community groups, as discussed in **Section 13.4.**
Paragraph 4.10.10	The Inspectorate welcomes the 'Relationship to other EIA topics' section and would expect to see corresponding sections in the ES explaining how the other environmental aspect assessments have informed the assessment of health and community effects.	No elements of the Cultural Heritage assessment are considered relevant to health and wellbeing as the type of assets identified by the cultural heritage assessment (**Chapter 10** of this ES **[TR020001/APP/5.01]**) do not have the ability to influence health outcomes. Elements of the cultural heritage assessment may be relevant to the community assessment where they

Scoping Opinion ID	Scoping Opinion comment	How is this addressed
	The Inspectorate considers that elements of the Cultural Heritage assessment and assessment of Major Accidents and Disasters will also be relevant to the assessment of wellbeing and health. The ES should provide explanation and justification for the basis of the assessment and the Applicant should seek to agree with consultation bodies the approach taken.	constitute a community resource (for example, a church) and these have been considered in this assessment. Major Accidents and Disasters is scoped out of the health assessment. The justification for scoping out Major Accidents and Disasters is provided in **Section 13.3.** The scope and methodology for the assessment has been discussed and agreed with key stakeholders, as discussed in **Section 13.4.**
Paragraph 4.10.11	The Inspectorate acknowledges the information provided in the Scoping Report about the factors which will be considered when determining the magnitude of impacts and sensitivity of population (health effects) and receptor (community effects); however, Paragraph 15.5.10 refers to these judgements being based on 'defined assessment criteria'. These criteria are not presented in the Scoping Report and the ES should provide this information.	The assessment criteria and guidance used to determine the magnitude of impact has been applied using professional judgement and is provided in **Section 13.5** and **Table 13.7**. Further details can be seen in **Appendix 13.4** Methodology for Health and Community Assessment of this ES **[TR020001/APP/5.02]**.
Paragraph 4.10.12	The Scoping Report states that as a 'general rule' major and moderate effects will be considered significant. The ES should clearly define significant effects and any deviation from the defined method in the ES should be justified.	Significant effects are defined in **Section 6.2**, and the methodology for the assessment of effects for the health and community assessment is provided in **Section 6.6,** of **Appendix 13.4** of this ES **[TR020001/APP/5.02]**.

Scoping Opinion ID	Scoping Opinion comment	How is this addressed
Paragraph 4.10.13	Table 15 – 3 sets out the potential effects of the Proposed Development relevant to each Activity/Stage. However, these are sometimes conflated with the impacts set out in the preceding paragraphs, and some impacts are not represented in the Table at all, for example 'permanent loss or gain of community facilities due to construction'. The ES must clearly set out the anticipated effects of the Proposed Development having regard to all impacts identified and where significant effects are likely to occur.	An assessment is included in **Section 13.9.** Residual effects observed after mitigation are presented in **Section 13.11.** The summary of the assessment includes all identified impacts and is presented in **Section 13.14.**

Spatial scope

Study area and zone of influence

13.3.5 The study area for the health and community assessment is based on the spatial distribution of the environmental, social and economic impacts of the Proposed Development and the location of sensitive receptors. The study area for health and community is comprised of:

a. **local neighbourhood area** – this is comprised of four 'local neighbourhood' areas. These are the areas in which the majority of direct and indirect effects on health and community resources are likely to occur. Four local neighbourhood areas have been identified:

   i. ***Central Airport Area*** - containing the airport and the majority of the land within the Order limits. This neighbourhood area lies within Wigmore unitary authority ward and the Luton Borough Council administrative area;
   ii. ***North of the Airport*** – this area lies within Wigmore and Crawley unitary authority wards within the Luton Borough Council administrative area and includes the residential area on the eastern edge of Luton;
   iii. ***South and East of the Airport*** – this area lies within the Caddington and Hitchwood, Offa and Hoo unitary authority wards within the Central Bedfordshire and North Hertfordshire District Council (NHDC) administrative areas, respectively. It includes

agricultural land with small settlements and isolated rural properties; and

iv. ***West of the Airport*** – this area lies within the South and Farley unitary authority wards within the Luton Borough Council administrative area and includes residential areas on the southern edge of Luton.

b. These local neighbourhood areas are shown on **Figure 13.1** Health and Community Study Areas of this ES **[TR020001/APP/5.03]**.

c. **wider area** - in addition to these local neighbourhood areas, effects will occur across the wider area of ***Luton, Hertfordshire, Central Bedfordshire*** and ***Buckinghamshire***.

13.3.6 A figure of the wider study area has not been provided as it is defined by the location of impacts from other relevant topics and therefore varies with determinant.

13.3.7 **Table 13.6** below shows how the study area has been broken down for the purpose of the health and community assessment.

Table 13.6: Health and community assessment study area

Study Area	Health	Community
Local Neighbourhood Areas		
Local communities in Luton that are directly affected by the construction and operation of the Proposed Development (e.g. land take).	Y	Y
Areas within which there are likely to be some environmental impacts (e.g. noise and visual impacts of the airport; construction and surface access traffic routes).	Y	Y
Wider Area		
Areas within which there are likely to be environmental 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 affected by issues such as economic growth, employment and changes to the housing market resulting from the Proposed Development. This will include the Luton, Hertfordshire, Central Bedfordshire and Buckinghamshire areas.	Y	N

13.3.8 The study area for the assessment of the Proposed Development on economics and employment (**Chapter 11** of this ES **[TR020001/APP/5.01]**) varies slightly from the health and community study area. The economics and employment assessment focuses on the local Airport Employment Area (AEA) which covers much of the Central Airport Area but differs slightly as the boundary is based on businesses directly related to airport activity. **Chapter 11** Economics and Employment of this ES **[TR020001/APP/5.01]** also considers the effects on the

Luton economy and wider area of Hertfordshire, Bedfordshire and Buckinghamshire, in addition to the broader employment area.

13.3.9 The study area and zone of influence for the purposes of the cumulative assessment for health and community are the same. The cumulative effects assessment is provided in **Chapter 21** In-Combination and Cumulative Effects Assessment of this ES **[TR020001/APP/5.01]**.

13.3.10 The community resources within the existing baseline are described under each neighbourhood area. Community resources are only mentioned where they may be affected by the Proposed Development and therefore not all resources within the areas have been described in the baseline.

13.3.11 Data for the local neighbourhood areas was collected at the unitary authority ward level and data for the wider area baseline was collected at county level. Therefore, district level baseline data was not collected for Stevenage, Dacorum or North Hertfordshire District Council (NHDC) as they are present within Hertfordshire County, which is included in the wider area baseline. Hitchwood, Offa and Hoo ward, present within NHDC, is covered under the South and East of the Airport local neighbourhood area. Based on a review of **Chapter 7** Air Quality and **Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01],** no significant impacts or residual effects are observed in the Stevenage area therefore, this area is not included in the baseline. For NHDC present within Hertfordshire, significant noise impacts are observed for Breachwood Green and Bendish within the Hitchwood, Offa and Hoo ward, which is reported on under the South and East of the Airport local neighbourhood area.

Temporal Scope

13.3.12 The Proposed Development would be delivered incrementally, and construction and operation would take place simultaneously. For the purposes of assessment three assessment phases are considered as described in **Chapter 5** Approach to the Assessment of this ES **[TR020001/APP/5.01]**.

13.3.13 During both construction and operation, the health and community assessment generally considers the effects arising from three assessment phases (Phase 1, Phase 2a and Phase 2b) of the Proposed Development combined.

13.3.14 For those effects such as employment generation, where the level of activity varies at each stage, this detail is reported, but an overall assessment of the cumulative effect across all stages is reported for the health effect.

Receptors

13.3.15 The health assessment considers the impacts of the Proposed Development on the environmental, social, or economic factors that influence health and wellbeing (‘health determinants’). The receptors for the health assessment include communities in the local or wider study area who are exposed to changes in health determinants. These vary depending on the geographic extent of an impact and its nature, which may affect sub-groups such as users of particular facilities or people with certain characteristics that may make them

more vulnerable. The assessment of health effects is provided at a population, rather than individual, level.

13.3.16 The community assessment assesses the impacts on community resources, and the resultant effects on the people ('receptors') using those resources.

Matters scoped in

13.3.17 The following matters have been scoped into the Health and Community chapter:

Health:

a. effects on informal recreation and physical activity resulting from changes in access to public open space;
b. effects on levels of physical activity resulting from changes to footpaths;
c. effects on levels of physical activity resulting from changes in road traffic movements;
d. effects on health and wellbeing associated with changes in access to, or loss of, services and community facilities;
e. effects on health and wellbeing associated with employment, income and training including the impacts of:
f. displacement of businesses;
g. opportunities for construction employment, training and apprenticeships;
h. changes to the local economy arising from the construction supply chain and expenditure by the temporary workforce; and
i. increased opportunities for employment within the expanded airport.
j. the impact of the construction and operational workforce on housing supply and demand;
k. the impact of the construction and operational workforce on access to services, particularly healthcare supply and demand;
l. changes in population exposure to air pollutants;
m. change in exposure of the population to aircraft noise, resulting from changes in aircraft movements;
n. changes to the character and quality of neighbourhoods, due to combined environmental impacts (noise, air quality, traffic, light and visual effects);
o. public concern, perceptions and uncertainty about the effects of the Proposed Development; and
p. impacts on social cohesion resulting from the presence of the construction workforce within the local community.

Community:

a. loss or gain: a loss or gain of a resource or receptor;

b. displacement: the re-location of receptors and resources from one location to another;

c. in-combination effects: changes to the amenity of a resource due to combined environmental impacts (noise, air quality, traffic, visual effects), affecting enjoyment of a resource by a receptor; and

d. isolation effects: isolation of communities from services and facilities, measured by significant delay/disruption to routes from local communities to access services and facilities.

Matters scoped out

Electromagnetic interference (EMI)

13.3.18 There is a potential for health effects associated with the electric and magnetic fields around substations, power lines and cables. The field strength reduces rapidly with distance from such equipment. The geographic extent of the detectable magnetic field from a substation typically extends to between 3 and 8 metres (and in rare cases up to 15 metres). Outside of the detectable magnetic field, there can be no health effect (Ref.13.40). Sensitive receptors include anywhere that individuals spend a considerable amount of time, such as residential properties and businesses. The Proposed Development does include two new electrical substations. The first is located within the proposed surface car park (P9), to the south of Eaton Green Road, and lies approximately 35m from the nearest residential receptors. The second is located to the immediate west of the proposed T2 and lies approximately 600m from the nearest residential receptors. In addition, the Proposed Development will comply with the relevant standards for electromagnetic compatibility (EMC) and personal protection, for example BS EN 50121-5:2017, BS EN 50122-1:2011 and EU Directive 2013/35/EU Electromagnetic Fields (EMF) limits (Ref.13.41), enforced in the UK by the Control of Electromagnetic Fields at Work (CEMFAW) 2016 Regulations (Ref.13.42). There are therefore no likely significant health effects from EMI and no further assessment is required. Health effects associated with electromagnetic interference (EMI) have therefore been scoped out.

Ground and water contamination

13.3.19 Health effects associated with ground and water contamination have been scoped out of this chapter. These effects have been assessed in **Chapter 17** Soils and Geology and **Chapter 20** Water Resources and Flood Risk of this ES **[TR020001/APP/5.01]**. The risks to health have been 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 identify any source-pathway-receptor linkages and apply appropriate control and mitigation measures to ensure that health risks are avoided.

13.3.20 Health effects associated with increased flooding have been scoped out. A Flood Risk Assessment (FRA) is provided as **Appendix 20.1** of this ES **[TR020001/APP/5.02]**. This sets out how legal and policy requirements relating

to flood risk management would be met, 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.

Major accidents and disasters

13.3.21 Health effects associated with major accidents and disasters, such as air traffic accidents or major pollution incidents, are assessed in **Chapter 15** Major Accidents and Disasters of this ES **[TR020001/APP/5.01]**. This is a risk-based assessment which considers the potential consequences of events, which have a low probability of occurring but potentially major consequences. In contrast, the health assessment identifies the likely health and wellbeing effects resulting from the exposure of the population to impacts on health determinants that are predicted to result from the Proposed Development. There is no available method for assessing the potential health outcomes of a major accident or disaster which, while potentially wide-ranging and severe, are unlikely to occur.

Covid-19

13.3.22 Covid-19 and infectious diseases are covered under **Chapter 15** Major Accidents and Disasters of this ES **[TR020001/APP/5.01]**. Engagement with the Health Technical Working Group in July 2022 confirmed that this approach was acceptable and did not require duplication as part of this health assessment.

Unaccompanied minors

13.3.23 The potential impact on health and social care services associated with the issue of unaccompanied minors arriving at the airport has been scoped out of the assessment. The operator has confirmed that all airlines operating out of the airport do not accept unaccompanied minors on flights.

Individual businesses

13.3.24 Impacts on individual business owners or operators, or impacts on agricultural businesses, are scoped out of the health and community assessment. These impacts are addressed in **Chapters 11,** Economics and Employment, and **Chapter 6,** Agricultural Land Quality and Farm Holdings, of this ES **[TR020001/APP/5.01]** respectively.

13.4 Stakeholder engagement and consultation

13.4.1 Engagement in relation to health and community has been undertaken with a number of prescribed and non-prescribed stakeholders.

13.4.2 In 2018, a health and community technical stakeholder workshop was held to gain feedback on the scope of the assessment and obtain information on local issues and priorities. In 2019, a community workshop was held to gain further information on how local community resources are used, and the concerns and aspirations of local communities.

13.4.3 The methodology for conducting open space surveys was shared with Luton Borough Council ahead of the first surveys taking place in Spring 2019. Feedback was incorporated where appropriate and additional resources were identified by Luton Borough Council for consideration during the assessment process.

13.4.4 A meeting was held with the Director for Public Health for Luton Borough Council in December 2019 to discuss the health and community assessment within the Preliminary Environmental Information Report (PEIR) and obtain a perspective from Luton Borough Council on public health issues in Luton, the role of the airport in the community, and any health, community and equality issues associated with the Proposed Development. This has informed this ES.

13.4.5 The **Consultation Report [TR020001/APP/6.01]** and **[TR020001/APP/6.02]** contains a full account of the previous non-statutory consultation in 2018 and statutory consultation processes in 2019 and 2022, the issues raised, and how these have been responded to. Comments relevant to the health and community assessment were received as part of consultation responses by UK Health Security Agency (formerly Public Health England), East of England Ambulance Service (EEAST), and as part of the joint response issued by Luton Borough Council, Central Bedfordshire Council (CBC), North Hertfordshire District Council (NHDC) and Hertfordshire County Council (HCC).

13.4.6 Matters raised regarding the scope, method, mitigation or compensation being considered as part of the health and community assessment were then subject to further discussions directly with stakeholders during working group meetings. For health and community, a working group was formed comprising representatives from the following organisations:

a. Public Health Luton Borough Council;
b. Public Health Hertfordshire County Council;
c. North Herts Health and Communities;
d. Central Beds Health and Community;
e. Buckinghamshire County Council;
f. Bedfordshire Public Health;
g. Luton Clinical Commissioning Group (CCG); and
h. OHID – formerly Public Health England (PHE).

13.4.7 Workshops were convened in December 2020, July 2021, and July 2022 with this group to discuss and seek agreement on issues arising from consultation on both the 2019 and 2022 PEIR's.

13.4.8 **Table 13.7** provides a summary of engagement with relevant stakeholders, undertaken to inform the EIA, including the date and time of meetings and a summary of discussions to resolve matters raised.

Table 13.7: Stakeholder engagement relating to health and community

Meeting name and date	Attendees (organisation)	Summary of discussion
Health and community technical stakeholder workshop, 26 November 2018	Luton Borough Council (Engagement Officer, Service Manager, Parks Facilities Manager) Buckinghamshire County Council (Public Health Consultant) North Hertfordshire District Council (Policy Officers and Health Improvement Lead) Central Bedfordshire Council (Community Engagement Manager) Applicant's Health and Community Assessment Advisors	Purpose was to gain feedback on the scope of the assessment and obtain information on local issues and priorities. Issues covered included Wigmore Valley Park re-provision, vulnerable groups, and particular concerns such as isolation. Information obtained from the workshop fed back into the scope of the assessment and the development of the methodology provided in **Section 13.5**.
Discussion regarding open space survey methodology, April 2019	Luton Borough Council Applicant's Community Assessment Advisors	Purpose was to agree scope of assessment for open space surveys. The number of visits were agreed, and the survey hours were extended to account for additional morning and evening users. The results of the open space surveys have been used to determine significance and in particular receptor sensitivity in undertaking the assessment, as set out in the methodology provided in **Section 13.5**.
Community workshop, 9 July 2019	Representatives from Disability Resource Centre, Flying Start, Luton Borough Council Education, Link Centre, Luton All Women's Centre, Luton Irish Forum,	Purpose was to discuss the baseline and to gain further information on how local resources are used, and the concerns and aspirations of local communities. Information obtained from the workshop fed into the baseline provided in **Section 13.7** and

Meeting name and date	Attendees (organisation)	Summary of discussion
	Raynham Way Community Centre, Signposts, Team Beds and Luton (Active Luton), Wigmore church and Community Centre, East-Europeans Rights Organisation in UK (C.I.C), People Directorate, Education, Support, Challenge and Intervention, Luton, Farley Big Local (Age Concern) and TOKKO. Applicant's Health and Community Assessment Advisors The following organisations were invited but not in attendance: Friends of Wigmore Park, Council of Faiths, Citizens Advice Bureau, Near Neighbours, Grassroots, Our Mind Matters, Polska Szkola Luton and Bedfordshire Police.	was considered as part of the assessment.
Telecon review of PEIR Health and Community assessment with Director Public Health, Luton Borough Council, 7 December 2019	Director Public Health, Luton Borough Council and Corporate Responsibility Director, Luton Rising Applicant's Health Assessment Advisors	Purpose was to provide an overview of the health and community assessment within the 2019 PEIR (with a focus on the health assessment and reference to the Equalities Impact Assessment (EqIA), in order to understand the Luton Borough Council perspective on public health issues in Luton, the role of the airport in the community, and any health, community and equality issues associated with the Proposed Development.
Meeting with Public Health England (now OHID) on health and community,	OHID Representatives, Applicant's Representatives and Applicant's Health Assessment, Air Quality	Purpose was to provide an update since the 2019 PEIR publication. OHID raised comments and suggestions relating to monitoring, impact on housing, and healthcare services

Meeting name and date	Attendees (organisation)	Summary of discussion
15 December 2020	assessment and Major Accidents and Disasters assessment advisors.	during construction. OHID accepted that monitoring should be proportionate and should focus on determinants of health rather than actual changes in health outcomes. Monitoring of complaints data for health-related issues and concerns was also suggested by OHID. It was agreed that the Local Authorities Public Health Teams would be contacted to inform what health data is being monitored over the time period to link to the health assessment. OHID highlighted that social and private rented sector is dominated by vulnerable groups. It was agreed that more work would be done to inform the baseline for housing supply and demand. The housing baseline can be found in **Section 13.7.**
Health working group meeting, 15 July 2021	Luton Borough Council Public Health Representatives, Public Health England (now OHID) Representatives, North Herts Health and Communities Representatives, Applicant Representatives	Purpose was to discuss outstanding queries from the 2019 PEIR consultation on the methodology, approach, study area, receptors, Wigmore Valley Park, and monitoring. It was agreed with representatives from Public Health LBC that a health chapter in the EIA was an acceptable approach to health assessment as long as the methodology was akin to that used in a stand-alone Health Impact Assessment (HIA). The project team confirmed that the assessment approach was based on HIA guidance provided by HUDU, WHIASU and the IAIA. It was confirmed that it was based on a wider model of health that looked at potential impacts on the social determinants of health. It was also confirmed that the health assessment would include an evidence review, and consideration of health inequalities/effects on vulnerable groups. It was confirmed that data at a lower spatial scale would be looked into for health profiles to provide

Meeting name and date	Attendees (organisation)	Summary of discussion
		greater recognition of pockets of deprivation and health inequalities. In terms of monitoring, suggestions included using community engagement feedback and local monitoring via **Green Controlled Growth Framework [TR020001/APP/7.08],** Employment and Skills Strategy (Ref. 13.43), Health and Wellbeing Strategy (Ref. 13.13) and the Luton 2040 Vision (Ref. 13.44).
Health working group meeting, 4th July 2022	Luton Borough Council Public Health Representatives, Public Health England Representatives (now OHID), North Herts Health and Communities Representatives, Applicant Representatives	Health technical working group meeting agenda: scheme updates, outstanding issues from the 2022 statutory consultation including the quantification and monetisation of health effects, community engagement, monitoring, unaccompanied minors, and Covid-19.

13.4.9 In addition, Luton Rising has undertaken an extensive suite of engagement events with the local community to ensure that seldom heard groups have been made aware of, and actively engaged in, the consultation processes for the Proposed Development. Information on which community groups have been engaged with can be found in the **Consultation Report [TR020001/APP/6.01]** and **[TR020001/APP/6.02]** and includes faith groups, youth groups, and community groups representing hard to reach/seldom heard communities.

13.5 Methodology

Overview

13.5.1 This section outlines the methodologies employed for assessing the likely significant effects on health and community from the construction and operation of the Proposed Development. Further details of the methodology can be found in **Appendix 13.4** Methodology for Health and Community Assessments of this ES **[TR020001/APP/5.02].** The supporting evidence base for the assessment of health effects can be found in **Appendix 13.5** Evidence Review for Health Assessment of this ES **[TR020001/APP/5.02].**

13.5.2 The assessment identifies the impacts (beneficial and adverse, direct and indirect, during construction and operation) of the Proposed Development on health determinants, community resources and residential properties. The health and community effects resulting from these impacts of the Proposed Development are defined as follows:

a. Health effects have been 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 level. Further information on population health is available in the document The Kings Fund (Nov 2018) (Ref. 13.45).

b. Impacts on community resources, and the resultant effects on the people ('receptors') using those resources, have been identified as community effects.

13.5.3 The assessment methodology for health and community effects is applicable to both the construction and operational phases of the Proposed Development. The methodology for the health assessment is akin to that used in a stand-alone health impact assessment (HIA) and is based on HIA guidance provided by HUDU, WHIASU and the IAIA (see **Table 13.4** for references). It is based on the wider model of health that recognises that health is influenced by a wide range of factors.

Populations and individuals

13.5.4 The assessment of health effects is provided at a 'population', rather than an 'individual' level. The new IEMA Guidance on 'Determining Significance for Human Health in Environmental Impact Assessment' (Ref. 13.46) states that '*EIA analysis at the level of individuals would likely mean that all determinants of health conclusions, positive or negative, would be significant on all projects because of the effects to some particularly sensitive individuals. This would be contrary to supporting decision-makers in identifying the material issues. Assessment of EIA significance at the level of individuals is not proportionate'*.

Relationship of assessment to other EIA topics

13.5.5 The assessment methodology for health and community effects has drawn on significant residual effects identified in other EIA topic assessments to identify impacts on health determinants and community resources.

13.5.6 The health assessment assesses neighbourhood quality, which is determined by the physical character and attractiveness of the public realm within a neighbourhood. A neighbourhood quality effect occurs where there are two or more significant impacts on the physical environment i.e. noise, air quality, landscape, visual and light and traffic and transport impacts. When these environmental factors are altered, people's level of satisfaction with their living environment may change, which in turn may affect their wellbeing.

13.5.7 The community assessment contains an assessment of in-combination effects. The assessment of in-combination effects on community resources draws from the findings of other assessment topics, taking into account professional judgement about the sensitivity of the individual receptor to the predicted effect. An in-combination community effect occurs where two or more residual significant effects from air quality, traffic and transport, noise, and vibration, or visual or light impact occur on specific community resources.

Baseline methodology

Health baseline

13.5.8 To understand the current demographic, social and health characteristics of the population, baseline data for the health assessment has been obtained from the following principal sources of data and is summarised and referenced in **Section 13.7**:

a. 2011 Census, and 2021 Census where available;
b. The English Index of Multiple Deprivation 2019 (Ref. 13.47);
c. Office for National Statistics;
d. Public Health England (now OHID) Local Authority Health Profiles; and
e. information from engagement and consultation with technical and community stakeholders.

13.5.9 The health baseline for the local neighbourhood areas and wider area has been based on the same indicators where possible. However, in some instances data for indicators at the two spatial scales was not available so different indicators have been used. For local neighbourhood baseline conditions, mental health data at ward level was not available; however, corresponding NHS and CCG data has been used to provide an overview of mental health baseline within the local neighbourhood area.

Community baseline

13.5.10 The community assessment has considered effects arising from impacts on the following community resources and the receptors (people) that use them:

a. residential properties;
b. schools;
c. community facilities;
d. open spaces and PRoW; and

e. leisure and recreation facilities.

13.5.11 The baseline of community resources has been identified from the following principal sources of data:

a. OS Address Base Data which contains information about the type of property to which the address relates to (e.g., dwelling, school, place of worship);

b. search engine mapping features;

c. information from local strategies and policies; and

d. information from engagement with community stakeholders and relevant feedback received from public consultation on the Proposed Development.

13.5.12 A series of surveys of open spaces and recreational routes have been undertaken to verify the baseline of community resources, and to ascertain quality and usage. These were undertaken throughout 2019 (from April to November) prior to any changes in usage resulting from the Covid-19 lockdowns. Results of the open space surveys have been used to determine significance and in particular receptor sensitivity by providing further details on use of the space. Further details of the methodology for undertaking open space surveys and the results can be found in **Appendices 13.1** and **13.2** of this ES **[TR020001/APP/5.02]**.

Future baseline

13.5.13 The approach to defining future baseline is described in **Section 5.4** of **Chapter 5** Approach to the Assessment of this ES **[TR020001/APP/5.01]**. The future baseline considered for health and community is described in **Section 13.7** of this chapter.

Construction assessment methodology

13.5.14 The health and community assessment is largely qualitative in nature. For health effects arising from operational noise and air emissions, the effects have been quantified, as described in the operational assessment methodology at the end of this section.

Significance criteria

13.5.15 The approach for defining significance in the health and community assessment considers the magnitude of impact and the sensitivity of receptors.

Magnitude of impact

13.5.16 The magnitude of an impact on a health determinant and/or community resource has been assessed on a scale of high, medium, low and very low. **Table 13.8** provides guidance on the criteria used to determine the magnitude of impact. This guidance has been applied using professional judgement.

Table 13.8: Guidelines for the assessment of magnitude of health and community impacts

Magnitude	Guidelines for magnitude of impact on health determinants	Guidelines for magnitude of impact on community resources
High	A large change to a health determinant and/or outcome with two or more of the following characteristics: • assessed as 'major' by relevant environmental topics (where applicable); • likely to be perceived by the population as a substantial change; • has the potential to affect the occurrence of acute or chronic mental or physical illness; • change occurs over a wide geographical area and/or affects a large number of people (e.g. over 500) (judgements on exposure are dependent on nature of impact); • long-term duration or permanent (not reversible) (judgements on timescales are dependent on nature of impact).	An impact that has the potential to result in loss or be substantially disruptive (positively or negatively) to the way in which a resource or receptor is currently used. Usually has a long-term or permanent impact on the baseline conditions (judgements on timescales are dependent on nature of impact).
Medium	A moderate change to a health determinant and/or outcome with two or more of the following characteristics: • assessed as 'moderate' by relevant environmental topics (where applicable); • likely to be perceived by the population as a noticeable change; • has the potential to improve/reduce mental wellbeing or quality of life, or exacerbate/alleviate symptoms of existing illness; • change occurs over a relatively localised area and/or affects a moderate-large number of people (e.g. 100-500); • Medium to long-term duration or unlikely to be reversible.	An impact that has the potential to be considerably disruptive (positively or negatively) to the way in which a resource or receptor is currently used. Usually has a medium to long-term impact on the baseline conditions, but likely to be reversible
Low	A modest change to a health determinant and/or outcome with two or more of the following characteristics:	An impact that has the potential to noticeably change (positively or negatively) the way in which a

Magnitude	Guidelines for magnitude of impact on health determinants	Guidelines for magnitude of impact on community resources
	• assessed as 'minor' by relevant environmental topics (where applicable); • likely to be perceived by the population as a modest change; • has the potential to lower or raise wellbeing in terms of levels of comfort and contentment or give rise to a low level of change in physical or mental health outcomes; • change occurs over a small area and/or affects a small number of people (e.g. fewer than 100); • short to medium term duration, or likely to be reversible.	resource or receptor is currently used, but the overall purpose of the resource is unchanged. Usually has a short to medium term impact on the baseline conditions, but likely to be reversible.
Very Low	A minor change to a health determinant and/or outcome with two or more of the following characteristics: • likely to be perceived as a small change by some members of the population; • occurs over a localised area; • has the potential to lower or raise wellbeing in terms of levels of comfort and contentment; • affects a small number of individuals. • short-term in duration or completely reversible.	Anticipated to make little or no difference or no discernible change to the way a receptor can use a resource. An impact that is very short-term in nature and completely reversible.

Sensitivity of receptors

13.5.17 For the health assessment, sensitivity is defined by the vulnerability of the population to potential health and wellbeing impacts. This takes into account demographic, health and social factors as described in the baseline.

13.5.18 For the community assessment, sensitivity of receptors (people using community resources) has been determined by the extent to which the individuals have the capacity to experience the effect without a substantial loss or gain. Factors considered when assessing receptor sensitivity will include personal circumstances and ability to access alternatives.

13.5.19 **Table 13.9** sets out guidelines for defining the sensitivity of the population and receptors.

Table 13.9: Guidelines for the assessment of sensitivity

Sensitivity	Guidelines on sensitivity of population (for health assessment	Guidelines on sensitivity of receptors (for community assessment)
High	Affected population includes a higher than national average proportion of groups who are more likely to experience health effects as a result of the impact in question by virtue of their socio-demographic or health status.	Receptors who are at risk and have little or no resilience to the impact either through personal circumstance or an inability to access alternatives or no alternative resources provided locally.
Medium	Affected population includes an average or close to average proportion of groups who are more likely to experience health effects as a result of the impact in question by virtue of their socio-demographic or health status.	Receptors who have limited resilience to the impact either through personal circumstance or a restricted ability to access alternatives or a shortage of alternative resources provided locally.
Low	Affected population includes a below average proportion of groups who are more likely to experience health effects as a result of the impact in question by virtue of their socio-demographic or health status.	Receptors who have average resilience or some slight restrictions on resilience to the impact either through personal circumstance or a slightly restricted ability to access alternatives.
Very Low	Not applicable (no population is considered to have very low sensitivity to health effects).	Receptors that generally have adequate capacity to experience impacts without incurring a significant effect. Many comparable and accessible alternative options exist within the relevant catchment area.

Significant effects

13.5.20 The matrix used for the assessment of the significance of effects for the health and community assessment is provided in **Table 13.10**.

Table 13.10: Health and community effects matrix

Magnitude of impact	Guidelines on sensitivity of receptors/population			
	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

13.5.21 The matrix is a tool to assist with judgement and there are no clear cut-off points between categories. The point at which an effect changes category is a professional judgement and is supported by evidence and justification. As a general rule, major and moderate effects are considered to be significant, whilst minor and negligible effects are considered to be not significant.

13.5.22 Professional judgement has been applied in the application of the above significance criteria to draw reasoned conclusions on probable health outcomes. For example, another EIA topic's assessment of significance may not be directly relevant to the health assessment; a 'major' effect identified by a topic for an individual receptor would not constitute a major change to a health determinant at population level if related to an individual receptor. Likewise, the timescale or extent of exposure that would constitute a high, medium or low magnitude impact may vary depending on the nature of the health determinant.

13.5.23 Professional judgements of significance have taken account of scientific evidence linking changes in health determinants with health outcomes, as described in **Appendix 13.5** of this ES **[TR020001/APP/5.02]** to determine the likelihood of an effect on population health. Judgements also take into account the likely importance, desirability or acceptability of the effect and extent to which health inequalities may be increased or reduced.

Operational assessment methodology

13.5.24 The assessment methodology for health and community effects described above is applicable to both the construction and operational phases of the Proposed Development. The assessment is largely qualitative in nature, but health effects arising from operational air emissions and operational aircraft noise, the effects have been quantified in the ES, as described below.

Quantitative assessment of noise related health effects

13.5.25 It is possible to quantify the effects on health resulting from long-term exposure of a population to aircraft noise, using established exposure-response functions (ERFs) relationships for specific health outcomes including annoyance, self-reported sleep disturbance, acute myocardial infarction (AMI) [heart attacks] and hypertension (through stroke and dementia). Defra guidance published in in 2010 (Ref. 13.40) and 2014 (Ref. 13.41) has been used to quantitatively assess these health effects and the results presented in **Section 13.9**.

13.5.26 Since the publication of the Defra guidance, WHO have published the Environmental Noise Guidelines for the European Region (Ref. 13.48), which included specific guideline values for different environmental noise sources, including aircraft. The guidelines also recommended ERFs, these being informed by systematic reviews of research published since 2000, including for annoyance and self-reported sleep disturbance associated with aircraft noise. A sensitivity test of the quantitative assessment using these updated ERFs has been undertaken as agreed with HSA/OHID.

13.5.27 The full methodology for the quantitative assessment is presented in **Appendix 13.4** of this ES **[TR020001/APP/5.02]**.

Quantitative assessment of air quality related health effects

13.5.28 Evidence shows associations between exposure to air pollutants and adverse health outcomes, most notably premature mortality and hospital admissions linked to long-term exposure to PM_{10}, $PM_{2.5}$ and NO_2. Air quality dispersion modelling has been carried out to determine the change in air pollutant concentrations resulting from traffic-related, on-airport and aircraft emissions at all human receptor locations in the study area.

13.5.29 Defra guidance (Ref. 13.49) provides exposure-response coefficients that can be applied to calculate changes in health outcomes at population level. These exposure-response coefficients have been used to calculate changes in health outcomes across the population in the study area resulting from increased exposure to air pollutants. The following health outcomes have been assessed:

a. mortality attributable to air pollution[1];
b. respiratory hospital admissions attributable to $PM_{2.5}$[2]; and
c. cardiovascular hospital admissions attributable to $PM_{2.5}$.

13.5.30 The full methodology for the quantitative assessment is presented in **Appendix 13.4** of this ES **[TR020001/APP/5.02]**.

[1] Mortality rates for NO_2 and $PM_{2.5}$ has been calculated and the higher change is presented, since the results are not additive.
[2] Note that outcomes attributable to PM_{10} include $PM_{2.5}$ as a subset.

13.6 Assumptions and limitations

13.6.1 This section provides a description of the assumptions and limitations to the health and community assessment.

13.6.2 Assumptions underpinning the health and community assessment are as follows:

a. Over the timescale of the Proposed Development's delivery, the baseline profile of affected communities may change. Where forecasts are available, such as for population growth and age profile, this information has been taken into account in the assessment of population sensitivity. Where forecasts are not available the assessment is based on current information.

b. The community and health assessments have been based on the residual significant effects identified by other EIA topics i.e. after mitigation measures such as replacement open space, engine run-up bay acoustic screening, and landscape planting, have been taken into account.

c. Proposed enhancements to Wigmore Valley Park under the extant planning consent for Green Horizons Park (formerly known as New Century Park) (i.e. the improved skate park and play facilities, the improved Wigmore Pavilion and most of the proposed surfaced footpaths), alongside the removal of any existing vegetation necessary to facilitate these works, would be undertaken under that planning consent alongside or in advance of works to deliver the replacement open space during construction for assessment Phase 1.

d. All works to deliver the replacement open space would be undertaken during construction for assessment Phase 1, with areas made available for use by the public before the end of 2025.

d. The new Airport Access Road (AAR) providing access to the east of the airport (previously referred to as the Century Park Access Road) would not be required in full until the construction of the new terminal in assessment Phase 2a.

e. Luton Borough public footpaths FP29 and FP39 and public bridleways BW28 and BW37 would be stopped-up to facilitate the Proposed Development during assessment Phase 2a.

f. A surfaced path to be delivered within the replacement open space in assessment Phase 1, between Luton Borough footpath FP39 and the junction with public footpath Kings Walden 043 west of the mature hedgerow on the ridgeline of Winch Hill, would be formally adopted as a public footpath during construction for assessment Phase 2a.

g. A section of public footpath Kings Walden 041 would be upgraded to a multi-user track within the replacement open space during construction for assessment Phase 1, between the junction with public footpath Kings Walden 043 and the existing field entrance off Darley Road (south of Green Acres) and would be formally adopted as a public bridleway during construction for assessment Phase 2b. The section between Winch Hill

Road and the field entrance off Darley Road (south of Green Acres) remaining as a public footpath.

h. A surfaced path to be constructed as a multi-user track within the replacement open space during construction for assessment Phase 1, located east of the coniferous plantation woodland and leading south from public footpath Kings Walden 043 to the edge of the replacement open space, would be formally adopted as a public bridleway during construction for assessment Phase 2b.

i. A section of public footpath Kings Walden 043 within the replacement open space, between the junction with public footpath Kings Walden 041 and the proposed multi-user track to be delivered east of the coniferous plantation woodland would be upgraded to a multi-user track during construction for assessment Phase 1 and formally adopted as a public bridleway during construction for assessment Phase 2b.

j. A new multi-user track would be delivered between the replacement open space and Luton Borough bridleway BW37 during construction for assessment Phase 2b, to the east of the proposed Fuel Storage Facility (Work No. 4c.01) and Water Treatment Plant (Work No. 4d) and west of Winch Hill Wood and would be afforded bridleway status.

k. Connectivity along the retained section of Luton Borough bridleway BW37, leading west from the junction with Winch Hill Road (south of Winch Hill Wood) to junction with new multi-user track would be restored during construction for assessment Phase 2b.

13.6.3 Limitations relating to the health and community assessment are as follows:

a. The assessment of health effects is largely qualitative in nature since reliable exposure-response functions are not available in most cases to enable health outcomes to be quantified.

b. Likely health and community effects have been assessed based on information that is available, applying the assessment criteria set out in **Section 13.5.**

c. The health assessment is supported by a review of published research relating to each of the identified health determinants, using the most up to date and credible sources. This evidence review is provided in **Appendix 13.5** of this ES **[TR020001/APP/5.02]**. The evidence for health effects ranges from strong, where this is well supported by research evidence, to weak, where evidence is sparse or conflicting. Consequently, professional judgement is necessary to assess the likely health effects.

d. The health and community assessment is based on the findings of other topic assessments included in this ES such as **Chapter 7** Air Quality, **Chapter 11** Economics and Employment, **Chapter 14** Landscape and Visual, **Chapter 16** Noise**,** and **Chapter 18** Traffic and Transportation of this ES **[TR020001/APP/5.01]**. Therefore, the assumptions and limitations relevant to those topics may also apply.

e. The mitigation measures proposed include strategies and management plans to be further developed and implemented during the construction

and operational phases. As such, the outcomes resulting from these final strategies and plans are assumed to be as effective as described.

f. The baseline conditions (Section 13.7) use some data from the 2011 Census, which despite being ten years old at the time of this assessment, provides the most full and reliable dataset. Where available, data from the 2021 Census data has been used, however, most datasets are not currently available.

g. Baseline health data for local neighbourhood areas and the wider area has aimed to look at the same indicators; however, in some instances data for indicators at the two spatial scales was not available so different indicators have been used to provide context for the assessment.

h. Community effects resulting from impacts on individual residents or individual facility users, including equalities impacts or compensation measures have not been assessed in this chapter. Equality impacts are set out in the **Equality Impact Assessment [TR020001/APP/7.11]**. Compensation proposals are described in the **Draft Compensation Policies, Measures and Community First [TR020001/APP/7.10]** document submitted as part of the application for development consent.

Reasonable Worst Case

13.6.4 **Chapter 5** Approach to the Assessment of this ES **[TR020001/APP/5.01]** describes the general approach adopted to ensure that a reasonable worst case is considered in this assessment, including the use of parameters, accounting for uncertainty, and incorporating flexibility in design and demand forecasts.

13.6.5 Assumptions on a reasonable worst case as outlined under **Chapter 7** Air Quality, **Chapter 11** Economics and Employment, and **Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]** also apply to the assessment of health and community effects. It is worth noting that the parameters for a worst-case scenario may differ between the contributing topics.

13.7 Baseline conditions

13.7.1 This section provides a description of the existing baseline for the health and community assessment. Existing baseline conditions for health and community are provided for the local neighbourhood and wider study areas. This section also identifies vulnerable groups prevalent within the wider study area. Future baseline conditions resulting from identified trends and developments in proximity to the airport are discussed. **Figure 13.1** Health and Community Study Areas of this ES **[TR020001/APP/5.03]** shows the local neighbourhood areas included in the study area and may help visualise the existing conditions within this area.

Existing conditions

Local neighbourhood area - Central Airport Area

Health

13.7.2 There is no resident population within the Central Airport Area. Community resources used by the surrounding population are described below.

Community

13.7.3 The Central Airport Area contains the airport, London Luton Airport Business Park, a range of airport production and maintenance businesses, light commercial and industrial businesses, and a small number of community resources. The Central Airport Area contains most of the infrastructure works directly related to the operation of the Proposed Development. The Central Airport Area is within the Wigmore unitary authority ward and within the Luton Borough Council administrative area.

13.7.4 Wigmore Valley Park is located to the north east of the airport and within the boundary of the Main Application Site. Wigmore Valley Park is comprised of recreational facilities, large open spaces, and areas of mixed density woodland. Land further to the east of Wigmore Valley Park is currently in agricultural use and would be used for the replacement open space for Wigmore Valley Park.

13.7.5 Wigmore Valley Park is partly designated as a District Urban Park in the Luton Green Space Strategy Review (2014) (Ref. 13.50). Wigmore Valley Park is recognised to form part of the Luton Green Infrastructure Network. It is popular for dog walking and recreation, and includes mown open grassland, scrub grassland, woodland, allotments, a playpark, skate park, car park and a pavilion building. Wigmore Allotments are located within the north of the park and will not be directly impacted by the Proposed Development. The total existing area of open space at Wigmore Valley Park covers an area of 41.6ha (District Urban Park and Garden' (of 35.5ha) and 'Natural and Semi-Natural Greenspace').

13.7.6 There are five recreational routes within the Central Airport Area which would be affected by the Proposed Development as shown on **Figure 13.2** of this ES **[TR020001/APP/5.03]**:

a. Kings Walden 041 public footpath, which borders Darley Road and Eaton Green Road, and also partially serves as a section of the Chiltern Way long distance footpath;
b. Kings Walden 043 public footpath, which crosses the ridgeline of Winch Hill and connects between Eaton Green Road and Winch Hill Road;
c. King's Walden 052 public bridleway, which connects between Coleman's Road (near Breachwood Green) and Eaton Green Road, and partially serves as a section of the Chiltern Way long distance footpath;
d. undesignated footpath within Wigmore Valley Park, which follows the eastern edge of the existing airfield and south east boundary of Wigmore Valley Park; and
e. public footpaths FP29 and FP39 and public bridleways BW28 and BW37, which follow the mature hedgerow to the south east of Wigmore Valley Park and east of the airfield between Eaton Green Road and Winch Hill Road.

13.7.7 Prospect House Day Nursery is located on Prospect Way in proximity to the airport. The nursery caters for around 94 children with a maximum capacity of 114 young children aged between three months to four years and serves a catchment in the Luton and Harpenden area. The nursery caters for children from a diverse range of ethnic backgrounds with staff speaking a variety of languages. The facility is currently rated 'Good' by the Office for Standards in Education, Children's Services and Skills (OFSTED). The nursery is purpose built, offering indoor facilities and outdoor play areas. The nursery is open from 7:30 to 18:30 Monday to Friday. It opens all year round except for a week at Christmas and on all other bank holidays. The nursery is located within the north east of the Main Application Site, an area which is currently characterised by light industrial and commercial airport uses.

13.7.8 Ace Sandwich Bar is located on Percival Way in proximity to the airport. The café provides takeaway and dine in services. It is open from 07:00 to 14:00/15:00 on Monday to Friday and from 08:00 to 14:00 on Saturday and Sunday. It caters for local workers (airport workers and taxi drivers) as well as people using the airport.

Local Neighbourhood Area - North of the Airport

Health

13.7.9 The wards of Wigmore and Crawley, to the north of the airport, have a lower population density compared to the rest of Luton but not England (Ref. 13.51 – Ref 13.52). The 2019 age profile of the wards is young compared with the England average, with a higher proportion of the population aged under 18, and a lower proportion of population aged 65+ (Ref. 13.51 – 13.52). The proportion of the population from ethnic minorities in the wards is higher than the England average of 14.6%, at 28.8% in Crawley and 17.1% in Wigmore (Ref. 13.51 – 13.52).

13.7.10 Wigmore has low levels of overall deprivation compared to Luton and England (Ref. 13.53). It performs considerably better than the England average in terms of households experiencing income deprivation and has lower rates of

unemployment and economic inactivity when compared to the England rates (Ref. 13.51). This is not true for Crawley, which has medium levels of overall and income deprivation (Ref. 13.52). The rates of unemployment and economic inactivity in Crawley are in line with the England rates. The prevalence of depression within NHS Luton CCG is lower than in England (Ref. 13.54).

13.7.11 Within Wigmore and Crawley, 72% and 69% respectively of all property is privately owned, which is greater than the percentage for England (63%). The percentage of properties 'privately rented' within the wards is in line with the England average at 17%. However, the percentage of 'socially rented' properties within Wigmore (12%) and Crawley (14%) is below the English average (18%) (Ref. 13.55).

13.7.12 The PHE 2019 Health profile (Ref. 13.51) shows that the health of people in Wigmore is in line with England, and life expectancy is higher for both males and females. Rates of child poverty, older people in poverty, hospital stays for self-harm, and mortality rates for under 75, from all causes, are all better than the England average. The ward performed worse than England for emergency hospital admissions (all causes, all ages). According to the 2011 Census, the percentage of people who reported having a limiting long-term illness or disability was lower than in England (Ref. 13.51).

13.7.13 The PHE 2019 Health profile (Ref. 13.52) shows that the health of people in Crawley is broadly in line with England. Rates of child poverty[3], older people in poverty and life expectancy were in line with the England average. The ward performed worse than England in rates of mortality (under 75, from all causes), emergency hospital admissions (all causes, all ages), and child obesity. According to the 2011 Census, the percentage of people who reported having a limiting long-term illness or disability was lower than in England (Ref. 13.52).

Community

13.7.14 The area north of the airport is residential and suburban in nature. The north of the airport local neighbourhood area is within the Wigmore and Crawley unitary authority wards and within the Luton Borough Council administrative area. The wards are built up and suburban in nature, characterised by detached and semi-detached housing. The wards are served by a range of educational, medical, community, sport, and leisure facilities.

Local Neighbourhood Area - South and East of the Airport

Health

13.7.15 The wards (Caddington and Hitchwood, Offa and Hoo) which lie within this local neighbourhood area have a lower population density compared to the rest of England (Ref. 13.56 – Ref 13.57). The 2019 age profile of the wards indicates an older population compared with the England average, with a lower proportion of the population aged under 18, and a higher proportion of the population aged 65+ (Ref. 13.56 – 13.57). The proportion of the population from ethnic

[3] Poverty is both a cause and a consequence of poor health. Poverty increases the chances of poor health.

minorities, at 4% for both wards, is lower than the England average of 14.6% (Ref. 13.56 – 13.57).

13.7.16 Both wards have low levels of overall deprivation compared to England levels (Ref. 13.53). The wards perform considerably better than England in terms of households experiencing income deprivation and have lower rates of unemployment and economic inactivity when compared to the England rates (Ref. 13.56 – 13.57). The prevalence of depression within NHS Bedfordshire CCG is in line with England whereas the prevalence of depression within NHS East and North Hertfordshire CCG is lower than England (Ref. 13.58 – Ref. 13.59).

13.7.17 Within Caddington, 81% of properties are privately owned which is greater than the average for England (63%). The percentage of properties privately owned within Hitchwood, Offa and Hoo is in line with the average for England (63%). Within Caddington, 9% of properties are 'privately rented' which is below the English average (17%) whereas in Hitchwood, Offa and Hoo, 17% of properties are 'privately rented' which is in line with the English average (17%). Within Caddington, 9% of properties are 'socially rented' which is below the English average (18%). Within Hitchwood, Offa and Hoo 20% of properties are 'socially rented' which is greater than the English average (Ref. 13.55).

13.7.18 The PHE 2019 Health profile (Ref. 13.56) shows that the health of people in Caddington is broadly in line with England. For example, rates of mortality (all causes, under 75) and life expectancy are in line with England. The ward performs better than England in rates of child poverty, older people in poverty, and child obesity. Rates of emergency hospital admissions (all causes, all ages) are worse than rates in England. According to the 2011 Census, the percentage of people who reported having a limiting long-term illness or disability was on par with the England average (Ref. 13.56).

13.7.19 The PHE 2019 Health profile (Ref. 13.57) shows that the health of people in Hitchwood, Offa and Hoo is broadly in line with England. For example, rates of mortality (all causes, under 75), child obesity, and life expectancy are in line with England. However, rates of child poverty, older people in poverty, hospital stays for self-harm, mortality rates (under 75, from all causes), and emergency hospital admissions (all causes, all ages) are better than average. According to the 2011 Census, the percentage of people who reported having a limiting long-term illness or disability was lower than the England average (Ref. 13.57).

Community

13.7.20 The area south and east of the airport is largely agricultural and rural in nature. The south and east of the airport local neighbourhood area is within the Caddington and Hitchwood, Offa and Hoo unitary authority wards within the Central Bedfordshire Council and North Hertfordshire District Council administrative areas, respectively.

13.7.21 The area further east of Wigmore Valley Park is accessed via Darley Road to the north and Winch Hill Lane, a rural road running through the area of Winch Hill to the east. A small number of residential properties are located within the area including in Kings Walden and Darleyhall which contains the Fox Inn public

house. Two dwellings called ‘Old Winch Hill Cottages’ are adjacent to the Order limits, to the east of the Main Application Site. The dwellings are isolated and rural in setting, being surrounded by agricultural fields. The dwellings are served by Winch Hill Lane which runs between Darley Road to the north and Dane Street to the south. Winch Hill House is also located off the same lane.

13.7.22 A network of recreational routes is in the south and east of the airport local neighbourhood area which partially sits within the Order limits. Two public footpaths (King’s Walden 041 and King’s Walden 052) form part of the Chiltern Way which is a promoted long-distance footpath located to the north east of the Order limits. The Chiltern Way passes through agricultural fields to the east of the airport and is part of a 134-mile circular walking route which traverses from Hitchin in the north east through the Chilterns and Buckinghamshire to Henley in the south west. The North Chiltern Trail is another promoted long distance footpath, which follows the same route through the east of Luton.

13.7.23 The area south of the airport is accessed from Dane Street and Chiltern Green Road from the east and the B653 Lower Harpenden Road from the west. Someries Castle is located approximately 250m south of the Main Application Site boundary. The structure is designated as a Scheduled Monument and is regarded as one of the first brick buildings in England. Six residential properties are located in the immediate vicinity of Someries Castle: ‘The Lodge’, ’80 Someries Cottages’, ’81 Someries Cottages’, ‘No 1 Someries Farm House’, ‘No 2 Someries Farm House’ and ‘No 3 Someries Farm House’. A light industrial business premises is located adjacent to the dwellings. Four residential properties are located further to the east on Dane Street: ‘2 Dane Street Cottages’, ‘4 Dane Street Cottages’, ‘House East, Dane Street Farm’ and ‘Dane Street Farm West’. Two residential properties are located further to the west, off the B653: ’65 Someries Arch’ and ’66 Someries Arch’.

Local Neighbourhood Area - West of the Airport

Health

13.7.24 Farley ward has a lower population density, but South ward has a higher population density when compared to the Luton average, but not the England average (Ref. 13.60 – 13.61). The 2019 age profile of the ward indicates a younger population than the England average, with a higher proportion of the population aged under 18, and a lower proportion of population aged 65+ (Ref. 13.60 – 13.61). The proportion of population from ethnic minorities in the wards is much greater than the England average of 14.6%, at 37.7% for Farley and 39.7% for South ward (Ref. 13.60 – Ref 13.61).

13.7.25 Both wards have high levels of overall deprivation compared to Luton and England (Ref. 13.53). The wards perform considerably worse than England in terms of households experiencing income deprivation and have higher rates of unemployment and economic inactivity when compared to the England rates (Ref. 13.60 – 13.61). The prevalence of depression within NHS Luton CCG is lower than in England (Ref. 13.54).

13.7.26 The most common property tenure within the wards is ‘rented’. Within South ward and Farley ward, 71% and 52% respectively of all properties are ‘rented’,

which is greater than the England average (35%). Within South ward and Farley ward, 49% and 24% of properties are 'privately rented' which is greater than the English average at 17%. The number of 'socially rented' properties is also greater than the English average of 18%, at 23% and 28% for South and Farley respectively (Ref. 13.55).

13.7.27 The PHE 2019 Health profile (Ref. 13.60) shows that the health of people in South ward is generally worse than the England average. The ward performs worse than England in life expectancy for males, child poverty, older people in poverty, mortality (under 75, from all causes), emergency hospital admissions (all causes, all ages), incidence of lung cancer, hospital stays for self-harm, and child obesity. According to the 2011 Census, the percentage of people who reported having a limiting long-term illness or disability was lower than the England average (Ref. 13.60).

13.7.28 The PHE 2019 Health profile (Ref. 13.61) shows that the health of people in Farley is generally worse than in England. The ward performs worse than England in terms of life expectancy (both genders), child poverty, older people in poverty, mortality (under 75, from all causes), emergency hospital admissions (all causes, all ages), incidence of all cancers, and child obesity. According to the 2011 Census, the percentage of people who reported having a limiting long-term illness or disability was higher than in Luton but similar to the England average (Ref. 13.61).

Community

13.7.29 The area west of the airport is of mixed characteristics and comprises land uses including residential, commercial, retail and leisure. The west of the airport local neighbourhood area is within the South, and Farley, unitary authority wards and within the Luton Borough Council administrative area. Residential areas are a mix of purpose-built flats, terraced housing and semi-detached housing. The wards are served by a range of educational, medical, community, sport and leisure facilities.

13.7.30 The Lea Valley Walk is a PRoW located to the west of the airport. The Lea Valley Walk is a dedicated track for pedestrians and cyclists and is a well-used route between Luton and Harpenden. The Lea Valley Walk forms part of the Sustrans National Cycle Route 6.

Wider area health baseline

13.7.31 The wider area includes the town of Luton to the north east of the airport and the surrounding areas of Hertfordshire, Central Bedfordshire, and Buckinghamshire. Immediately west of Luton is the town of Dunstable. Luton and Dunstable are densely populated towns, surrounded by rural and predominantly agricultural areas including the Green Belt and the Chilterns Area of Outstanding Natural Beauty. Based on Office for National Statistics mid-2019 population estimates (Ref. 13.62), the Luton and Dunstable area has a combined total population of approximately 243,852. The areas to the west and south of the airport are rural and comprised of villages within the Central Bedfordshire Council administrative area. The areas further east are rural and comprised of villages within the North Hertfordshire District Council

administrative area including the town of Stevenage, located 14 miles to the east with a population of around 87,845 (Ref. 13.62).

13.7.32 The demographic, social and health characteristics of the population in the wider area are described below. For a description of the broad economic and employment conditions of Luton and the three counties of Central Bedfordshire, Hertfordshire and Buckinghamshire see **Chapter 11** Economics and Employment of this ES **[TR020001/APP/5.01]**.

Luton

13.7.33 The 2021 age profile of Luton is young compared to the England average, with a higher proportion of the population aged between 0-44, and a higher proportion of the population aged 45+ (Ref. 13.63). The proportion of the population from ethnic minorities in 2011 was also higher than the England average (Ref. 13.64).

13.7.34 Luton has high levels of overall deprivation and was ranked 41st most deprived out of 317 local authorities in 2019 (Ref. 13.53). Of the seven deprivation domains, Luton has highest deprivation in barriers to access and housing, income deprivation affecting older people and crime. It also performs worse than England in terms of households experiencing income deprivation and has high rates of unemployment and economic inactivity when compared to the England average (Ref. 13.64).

13.7.35 The rate of statutory homelessness is 4.5 per 1000 households in Luton which is higher than the rate in England (2.4 per 1000 households) (Ref. 13.64). Further, according to the Central Bedfordshire and Luton SHMA, lower quartile rent prices have increased across all property sizes in Luton since 2013/14, suggesting that demand exceeds supply (Ref. 13.65).

13.7.36 The PHE 2019 Health profile (Ref. 13.64) for Luton states that the health of people in Luton is generally worse than the England average. The health profile identifies Luton as performing worse than the England average in some key health indicators including life expectancy, mortality rate (under 75, from all causes), physically active adults, childhood and adult obesity, and smoking prevalence. Further, Luton has a higher rate of unemployment, violent crime, statutory homelessness, and children in low-income families compared to England suggesting it preforms poorly in these wider determinants of health. The borough performs better than the England average for the number of people killed or seriously injured on the roads and suicide rates. According to the 2011 Census, the percentage of people who reported having a limiting long-term illness or disability was lower than the England average (Ref. 13.64). The Mental Health and Wellbeing profile (Ref. 13.66) for Luton shows that the borough scores better than the English average for recorded prevalence of depression and anxiety (aged 18+, GP Patient Survey).

13.7.37 NHS digital (Ref. 13.67) was used to obtain data on the ratio of patients to General Practitioners (GPs) in Luton. As of October 2022, GP surgeries in Luton had an average of approximately 2,385 patients per GP. This is higher than the England average of 1,719 patients per GP across the UK. In the Luton area, just above half of the GP surgeries had above average numbers of

patients per GP. GP surgeries with the highest GP to registered patient ratio in Luton appear to be more common towards Luton town centre and north west alongside the line of the railway.

Central Bedfordshire

13.7.38 Central Bedfordshire is a unitary authority situated to the west and south of Luton and contains part of the South and East of the Airport local neighbourhood area. The 2021 age profile of Central Bedfordshire is broadly in line with the age profile of England apart from the proportion of individuals aged 15-24, which is 2% lower compared to the England average (Ref. 13.63). The proportion of population from ethnic minorities in 2011 was lower than in England (Ref. 13.68).

13.7.39 Central Bedfordshire has medium levels of overall deprivation and was ranked 138th most deprived out of 317 local authorities in England in 2019 (Ref. 13.53). It performs considerably better than England in terms of households experiencing income deprivation and has lower rates of unemployment and economic inactivity when compared to the England rates (Ref. 13.68).

13.7.40 The rate of statutory homelessness is 1.4 per 1000 households which is lower than the rate in England (2.4 per 1000 households) (Ref. 13.68). However, according to the Central Bedfordshire and Luton SHMA, lower quartile rent prices have increased across all property sizes in Central Bedfordshire since 2013/14, suggesting that demand exceeds supply (Ref. 13.65).

13.7.41 The PHE 2019 Health Profile (Ref. 13.68) shows that the health of people in Central Bedfordshire is generally better than the England average, and life expectancy is higher for both genders. Rates of statutory homelessness, children (under 16) in low-income families, violent crime, mortality (under 75, from all causes), adult and child obesity and the percentage of people in employment are better than average. The borough performs worse than the England average for the number of people killed or seriously injured on the roads and on rate of dementia diagnosis (aged 65 and over). According to the 2011 Census, the percentage of people who reported having a limiting long-term illness or disability was lower than in England (Ref. 13.68). The Mental Health and Wellbeing profile (Ref. 13.69) for Central Bedfordshire shows that the borough scores better than the English average for recorded prevalence of depression and anxiety (aged 18+, GP Patient Survey), which is similar to Luton.

Hertfordshire

13.7.42 Hertfordshire is a county situated to the east of Luton and contains part of the South and East of the Airport local neighbourhood area, as well as part of the wider area. The 2021 age profile of Hertfordshire is broadly in line with the age profile of England (Ref. 13.63). The proportion of population from ethnic minorities in 2011 was lower than in England (Ref. 13.70).

13.7.43 Hertfordshire has medium levels of overall deprivation and was ranked 135th most deprived out of 317 local authorities in 2019 (Ref. 13.53). It performs considerably better than England in terms of households experiencing income

deprivation and has lower rates of unemployment and economic inactivity when compared to the England rates (Ref. 13.70). The rate of statutory homelessness is in line with England (2.4 per 1000 households) (Ref. 13.70).

13.7.44 The PHE 2019 Health Profile (Ref. 13.70) shows that the health of people in Hertfordshire is generally better than the England average, and life expectancy is higher for both genders. Rates of statutory homelessness, children (under 16) in low-income families, violent crime, mortality (under 75, from all causes), physically active adults, adult and child obesity and the percentage of people in employment are all better than average. The borough performs considerably worse than the England average for rate of diabetes diagnosis. According to the 2011 Census, the percentage of people who reported having a limiting long-term illness or disability was lower than in England (Ref. 13.70). The Mental Health and Wellbeing profile (Ref. 13.71) for Hertfordshire shows that the borough scores better than the English average for recorded prevalence of depression and anxiety (aged 18+, GP Patient Survey), which is similar to Luton.

Buckinghamshire

13.7.45 Buckinghamshire is a county situated to the west of Central Bedfordshire and is included in the wider area. The 2021 age profile of Buckinghamshire is broadly in line with the age profile of England (Ref. 13.63). The proportion of population from ethnic minorities in 2011 is broadly in line with England (Ref. 13.72).

13.7.46 Buckinghamshire has medium levels of overall deprivation and was ranked 145th most deprived out of 317 local authorities in 2019 (Ref. 13.53). It performs considerably better than England in terms of households experiencing income deprivation and has lower rates of unemployment and average rates economic inactivity when compared to the England rates (Ref. 13.72). The rate of statutory homelessness is 1.8 per 1000 households which is lower than the rate in England (2.4 per 1000 households) (Ref. 13.72).

13.7.47 The PHE 2019 Health Profile (Ref. 13.72) shows that the health of people in Buckinghamshire is generally better than the England average and life expectancy is higher for both genders. Children (under 16) in low-income facilities, violent crime, mortality (under 75, from all causes), physically active adults, adult and child obesity and the percentage of people in employment are all better than average. According to the 2011 Census, the percentage of people who reported having a limiting long-term illness or disability was lower than in England (Ref. 13.72). The Mental Health and Wellbeing profile (Ref. 13.73) for Buckinghamshire shows that the borough scores better than the English average for prevalence of depression and anxiety (aged 18+, GP Patient Survey), which is similar to Luton.

Vulnerable Groups

13.7.48 Based on the characteristics of the communities described above, **Table 13.11** summarises the disadvantaged and/or vulnerable groups present. The most disadvantaged and/or vulnerable groups are those that exhibit a number of characteristics, for example, children living in poverty. The groups that have been identified as applicable to this assessment are those that are identified as

having the potential to be differentially affected by the Proposed Development. The prevalence of these groups in the wider area is described in relation to the England average. Where data is not available for the prevalence of a particular vulnerable group, unknown has been used throughout the table to indicate its absence.

Table 13.11: Vulnerable groups and subgroups in the wider study area

Vulnerable groups	Vulnerable sub-groups	Prevalence within Luton	Prevalence within Central Bedfordshire	Prevalence within Hertfordshire	Prevalence within Buckingham shire
Age related groups	Children and young people	Above average	Average	Average	Average
	Older people	Below average	Average	Average	Average
Income related groups	People on low income	Above average	Below average	Below average	Below average
	Economically inactive	Above average	Below average	Below average	Average
	Unemployed	Above average	Below average	Below average	Below average
Groups who suffer discrimination or other social disadvantage	People with physical or learning disabilities/ difficulties	Below average	Below average	Below average	Below average
	Refugee groups	Unknown	Unknown	Unknown	Unknown
	People seeking asylum	Unknown	Unknown	Unknown	Unknown
	Single parent families	Unknown	Unknown	Unknown	Unknown
	Religious groups	Unknown	Unknown	Unknown	Unknown
	Lesbian and gay and transgender people	Unknown	Unknown	Unknown	Unknown
	Black and minority ethnic groups	Above average	Below average	Below average	Average
Geographical groups	People living in areas	Above average	Average	Average	Average

Vulnerable groups	Vulnerable sub-groups	Prevalence within Luton	Prevalence within Central Bedfordshire	Prevalence within Hertfordshire	Prevalence within Buckingham shire
	known to exhibit poor economic and/or health indicators				

13.7.49 In summary, of the locations included in the wider area, Luton has the greatest prevalence of vulnerable groups. Compared to the England average, it has an above average prevalence of children and young people, people on low income, economically inactive and unemployed people. It also has an above average prevalence of black and minority ethnic groups and people living in areas known to exhibit poor economic and/or health indicators. Compared to the England average, all other locations included in the wider area (Central Bedfordshire, Hertfordshire, and Buckinghamshire) either have an average or below average prevalence of vulnerable groups.

Wider area community baseline

13.7.50 The wider area of Luton, Hertfordshire, Central Bedfordshire and Buckinghamshire is of mixed characteristics consisting of both suburban and rural areas and a wide range of land uses including residential, commercial, retail, and leisure.

13.7.51 The wider area to the north east of the airport includes the densely populated town of Luton. Immediately to the west of Luton is the town of Dunstable. These towns are served by a full range of educational, medical, community, sport, and leisure facilities. The wider area to the west and south of the airport are agricultural and rural in nature, comprising a number of villages and hamlets. These villages have more limited facilities with some including a pub, convenience store, café, and doctor surgery.

Future baseline

13.7.52 In the absence of the Proposed Development, there is likely to be a change to the future baseline conditions as a result of other factors and developments in proximity to the airport. These are the conditions that will prevail 'Without Development' in place. The 'Without Development' scenario is used, where appropriate, as a comparator for the assessed case, to show the effect of the Proposed Development against an appropriate reference point. The approach to defining future baseline and the developments identified for consideration are described in **Section 5.4** of **Chapter 5** Approach to the Assessment of this ES **[TR020001/APP/5.01]**.

Future population projections

13.7.53 High birth rates and levels of international migration have resulted in strong population growth in Luton, and it is likely that this growth will continue. For example, Luton's population is projected to rise by 10% over the next decade if pre-covid trends of migration and births continue into the future. Population forecasting models have predicted the largest increases to be in the older age groups (Ref.13.74). However, some uncertainty remains over these projections, with the pandemic, Brexit and wider demographic trends all potentially slowing down the rate of growth.

13.7.54 The overall age-standardised mortality rate in England has generally been declining (improving) in recent decades for both males and females. Overall population health in England is improving (Ref. 13.75). However, the population is increasing and ageing, so despite the population becoming healthier at every age group, the total burden of morbidity is increasing.

13.7.55 Inequalities in health exist in England, with higher mortality rates in more deprived areas from heart disease, lung cancer, and chronic lower respiratory diseases account for around a third of the total gap in life expectancy for both sexes (Ref. 13.76). Smoking and obesity are the main risk factors for these diseases.

Green Horizons Park

13.7.56 The land on which the Proposed Development would be constructed overlaps with the extant Green Horizons Park planning consent (formerly known as New Century Park, planning application ref. 17/02300/EIA) which was granted planning permission on 29 June 2021 following the signing of the Section 106 agreement. The Green Horizons Park development incorporates business, commercial, light industrial units, an access road and improvements to Wigmore Valley Park.

13.7.57 The Proposed Development supersedes much of the development consented at Green Horizons Park although the improvements to Wigmore Valley Park will continue to be delivered through the Green Horizons Park planning consent. This includes a number of improvements to the northern part of the Park, including:

a. a refurbished Wigmore Pavilion;

b. new junior and senior play areas; and

c. a new skate park.

13.7.58 These improvements are expected to be implemented before the Proposed Development commences and are therefore part of the future baseline for assessing Wigmore Valley Park. They would be retained as part of the Proposed Development.

13.7.59 The proposed provision of replacement open space consented through the Green Horizons Park planning consent would no longer be provided and would instead be excavated and occupied by works consented through the Development Consent Order (DCO). Replacement open space would be

provided as part of the Proposed Development to the east of the existing greenspace at Wigmore Valley Park and this will be implemented in assessment Phase 1, as described in **Chapter 4** The Proposed Development of this ES **[TR020001/APP/5.01]**. Further details of this are discussed in **Section 13.9.**

13.8 Embedded and good practice mitigation measures

13.8.1 This section describes the embedded and good practice mitigation for health and community that has been incorporated into the Proposed Development design or assumed to be in place before undertaking the assessment. A definition of these classifications of mitigation and how they are considered in the EIA is provided in **Chapter 5** Approach to the Assessment of this ES **[TR020001/APP/5.01]**.

13.8.2 All embedded and good practice mitigation measures identified by other topics have been taken into account in this assessment. Embedded and good practice mitigation measures of particular relevance to the health and community assessment are contained in the following chapters of this ES: **Chapter 7** Air Quality**, Chapter 11** Economics and Employment**, Chapter 14** Landscape and Visual**, Chapter 16** Noise and Vibration**, Chapter 18** Traffic and Transportation of this ES **[TR020001/APP/5.01]**, and **Appendix 5.2** Light Obtrusion Assessment, and **Appendix 4.2** CoCP of this ES **[TR020001/APP/5.02]**.

Embedded

13.8.3 Key measures particularly relevant to health and community effects are summarised below with the topic in which they are identified in brackets:

a. use of the new Airport Access Road (AAR) to provide routes for operational road traffic and construction traffic, away from sensitive receptors (**Chapter 7** Air Quality of this ES **[TR020001/APP/5.01]**);

b. the Proposed Development includes a fuel pipeline which would reduce any increase the number of heavy goods vehicles (HGVs) delivering fuel to Proposed Development, and the related emissions (**Chapter 7** Air Quality of this ES **[TR020001/APP/5.01]**);

c. mitigation measures in line with the ICAO Balanced Approach to Aircraft Noise Management and the London Luton Airport Noise Action Plan (LLNAP) 2019-2023 (Ref. 13.77) adopted to reduce aircraft noise as far as reasonably practicable (**Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]**);

d. measures to reduce ground noise impacts, including new building infrastructure to screen receptors to the north; minimising distances between the runway and Terminal 2 stands to minimise noise emissions from taxiing aircraft; repositioning of engine run-up bay and provision of enhanced noise screening; quieter power sources for aircrafts at stands; and a new acoustic barriers to screen receptors from ground noise (**Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]**);

e. operational management measures that are not covered in the LLNAP 2019-2023 (Ref. 13.77) would be adopted to control noise as far as reasonably practicable. These measures are covered in the Operational Noise Management (Explanatory Note) provided as **Appendix 16.2** of this ES **[TR020001/APP/5.02].**

f. a noise envelope would be established with the aim to protect communities whilst enabling the airport to operate efficiently and allow it

to grow in accordance with the limits defined by the Noise Envelope consented through the DCO. The Noise Envelope would provide certainty to the industry and communities about how noise will be managed to comply with government policy, balancing growth and noise reduction for the long-term (**Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]);**

g. planting of hedgerows, woodland, screening vegetation and grassland within replacement open space (**Chapter 14** Landscape and Visual of this ES **[TR020001/APP/5.01]**);

h. in setting out the replacement open space, circulation routes and street furniture elements are to be designed in consultation with relevant stakeholders and would make provision for a range of users (including cyclists, horse riders and pedestrians). Street furniture elements to have a coordinated appearance appropriate to the surroundings (**Chapter 14** Landscape and Visual of this ES **[TR020001/APP/5.01]**);

i. the design of the Proposed Development would retain the existing entrance and northern part of Wigmore Valley Park and integrates it into the proposed enhancements, to be provided in the retained northern part of the existing Park (**Chapter 14** Landscape and Visual of this ES **[TR020001/APP/5.01]**);

l. all landscape-based mitigation to be managed and maintained in accordance with the Outline Landscape and Biodiversity Management Plan provided as **Appendix 8.2** of this ES **[TR020001/APP/5.02]**;

m. the Code of Construction Practice in **Appendix 4.2** of this ES **[TR020001/APP/5.02]** seeks to minimise disruption to ongoing airport operations:

j. the design of the Proposed Development has been configured to minimise disruption to local businesses (**Chapter 11** Economics and Employment of this ES **[TR020001/APP/5.01]**);

k. development of the **Employment and Training Strategy (ETS) [TR020001/APP/7.05]** for the construction and operation to maximise employment opportunities and upskilling for hard-to-reach groups, the employed, young people and those in the local and wider study area. This commitment will be secured via a section 106 agreement as described in **section 6.8** of the **Planning Statement** submitted as part of the application for development consent **[TR020001/APP/7.01]**; and

l. where practicable, the Proposed Development would 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 modes of travel that have less environmental impact e.g. extending the Luton DART (this existing development is described in **Chapter 2** of this ES **[TR020001/APP/5.01]**) to the new terminal (**Chapter 18** Traffic and Transportation of this ES **[TR020001/APP/5.01]**).

Good Practice

13.8.4 Key measures particularly relevant to health and community effects during construction are summarised below. None have been identified for operation:

a. the lead contractor will prepare a construction-specific community engagement plan for the construction operations of the Proposed Development, as detailed in the CoCP provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**. The plan will provide the overall approach to community engagement and a detailed guide to the enquiries and complaints procedure; and

b. measures to minimise dust emissions (e.g. phased working), noise emissions (e.g. limiting the time equipment is used) and visual impacts (e.g. well designed and maintained temporary hoarding and fencing) and light impacts (e.g. confinement of task lighting and orientation of site floodlights away from dwellings) to both local businesses and residents would be implemented as detailed in **Chapter 7** Air Quality, **Chapter 14** Landscape and Visual, and **Chapter 16** Noise and Vibration of this ES **[TR020001/APP/5.01]**, and **Section 6.5** Site lighting of the CoCP (**Appendix 4.2** of this ES **[TR020001/APP/5.02]**).

c. implementation of the **Framework Travel Plan [TR020001/APP/7.13]** to minimise the impact of transport on the local roads and the environment. This would relate to staff working on-site and passengers, but the emphasis would be on encouraging the use of other modes of transport, such as walking, cycling and public transport for local journeys.

13.9 Assessment

13.9.1 This section presents the results of the assessment of likely significant effects with the embedded and good practice mitigation measures, described in the previous section, in place.

13.9.2 A summary of the assessment of effects is provided in **Table 13.20** and **Table 13.21** in **Section 13.14**. Significant effects, or other notable effects requiring further description, are discussed in detail in this section.

Planning, construction and operation

Planning, construction and operation – Health assessment

Perception and uncertainty

13.9.3 There is a significant health effect during all assessment phases relating to the health determinant of 'Perception and uncertainty'. This concerns uncertainty and negative perceptions about the potential adverse impacts resulting from the construction and operation of the Proposed Development.

13.9.4 Communities close to the airport, including in the local neighbourhood and wider area, have been and would continue to be affected by the planning, construction and operation of the Proposed Development. This includes effects on mental wellbeing arising from concern about potential adverse effects. Public concern is likely to be highest during the planning and construction stages, when there is most uncertainty about the impacts of the Proposed Development.

13.9.5 An analysis of public consultation feedback received during both the 2019 and 2022 Statutory Consultation revealed concerns about the Proposed Development which may give rise to a range of feelings such as stress, worry and uncertainty including:

a. concerns over existing and potential future increase in noise pollution, in particular night-time noise, impacts on noise levels in schools, and worsened mental health from proposed increases in 05:00 [early morning] and overnight flights;

b. concerns about expectations of increased traffic in the local area and impacts on journey times, safety and air quality (it is noted that the results of the traffic and transport assessment in **Chapter 18** Traffic and Transportation of this ES **[TR020001/APP/5.01]** show that there will be no significant adverse traffic impacts);

n. concerns about expectations of increased traffic through Stevenage, Hitching and Baldock to access the airport from the east of England (it is noted that the findings of **Chapter 18** Traffic and Transportation of this ES **[TR020001/APP/5.01]** report that there will be no significant adverse traffic impacts);

c. concerns over the potential health effects of air pollution (it is noted that the air quality assessment finds that the Proposed Development would

have no significant impact on air quality during construction and operation);

d. concerns that the proposals do not go far enough to mitigate impacts on communities in the surrounding areas and that inequalities within Luton are not meaningfully reflected in the proposal;

e. concern about greenhouse gas emissions as a direct threat to human health;

f. concerns about the release of carbon from ground that was historically used as a council tip;

g. monetary concerns regarding potential increases in car drop off and pick up prices, and potential reductions in the value of proximate homes; and

h. concerns about general disruption during construction, and whether this would deter people away from using the airport.

13.9.6 Ongoing engagement would provide information which may help to reduce uncertainty and stress relating to the potential effects of the Proposed Development. However, it is likely that people's mental wellbeing within the affected communities would continue to be impacted adversely by concerns related to the Proposed Development. This is considered to be an adverse impact of medium magnitude on a population of medium sensitivity, resulting in a **moderate adverse** temporary effect on mental wellbeing, which is **significant**. It is noted that the current evidence linking perception and uncertainty to health and wellbeing effects (see **Appendix 13.5** of this ES **[TR020001/APP/5.02]**) is considered to be weak.

13.9.7 Sensitivity is likely to be generally higher in the local neighbourhood/Luton area due to its proximity to the Proposed Development and its existing sociodemographic status including higher levels of deprivation, lower levels of income and poorer health outcomes, which may result in lower resilience and reduced access to financial and other resources that enable people to adapt to changes.

Construction Effects

Construction effects – Health assessment

Employment and income

13.9.8 A significant health effect has been identified during the construction of the Proposed Development, across all assessment phases, in relation to the health determinant of 'Employment and income' (construction related employment).

13.9.9 The Economics and Employment assessment presented in **Chapter 11** Economics and Employment of this ES **[TR020001/APP/5.01]** reports that, based on the estimated labour requirements to construct the Proposed Development, it is anticipated that the total direct employment requirement during construction would be 6,280 person years of employment, equivalent to 628 full time permanent jobs provided over the course of the construction programme. These are likely to range from unskilled and low skilled jobs to

technical and managerial roles. In addition to direct employment, a further estimated 3,140 person years of employment would be supported in industries supplying construction materials and services or benefitting from construction worker spend.

13.9.10 The extent of health effects will depend on who is able to, and chooses to, take up the opportunities for construction employment and training. As noted in the **ETS [TR020001/APP/7.05]**, there will be a contractual requirement that all jobs, including managerial jobs, must be advertised locally before being advertised at the regional / national level.

13.9.11 As noted in the **ETS [TR020001/APP/7.05]**, skills and qualifications in Luton Borough are relatively low, with only 31% of Luton residents holding an NVQ4+ qualification compared to 42% on average across the whole ETS Study Area (Bedfordshire, Buckinghamshire and Hertfordshire). The ETS also notes that, based on ONS data (Ref. 13.78), salaries for people who work in Luton Borough are higher than salaries of the people who live in Luton Borough, suggesting that higher paid jobs in Luton tend to be filled by people who commute in from further afield. Based on this information, it is considered likely that the majority of skilled workers and managers will commute from across the 'wider area' including from across the Three Counties (Bedfordshire, Buckinghamshire and Hertfordshire).

13.9.12 The **ETS [TR020001/APP/7.05]** includes objectives and initiatives to maximise construction related opportunities and upskilling for local people, including communities in need and those who are currently unemployed. Targets for local employment, training and apprenticeships will be included in the procurement process. Liaison will be undertaken with existing education bodies in advance of the construction programme to advise on future skills requirements. While the uptake of construction jobs by people living in the 'local neighbourhood areas' is expected to be predominantly in lower skilled roles, the measures set out in the ETS will increase the proportion of higher skilled opportunities available to local people.

13.9.13 There is strong evidence (see **Appendix 13.5** of this ES **[TR020001/APP/5.02]**) to suggest that improved employment status is linked to health and wellbeing benefits ranging from improved self-esteem and mental health to physical health benefits associated with access to healthier lifestyle choices.

13.9.14 The Economics and Employment chapter (**Chapter 11** of this ES **TR020001/APP/5.01])** assesses the effect on construction employment as high magnitude and major beneficial. It is expected that a proportion of these new employment opportunities will be taken up by people whose health is currently compromised by unemployment, insecure employment and/or low pay. This group will benefit from improved income, job security, skills and long-term employment prospects, leading to positive health effects. The overall increase in direct and indirect construction related employment opportunities across the 'local neighbourhood areas' and the 'wider area' is considered to represent a beneficial impact of medium magnitude on a population of medium sensitivity, resulting in a **moderate beneficial** temporary effect on health and wellbeing, which is **significant**.

13.9.15 Above average levels of unemployment in Luton mean that, subject to uptake of opportunities such as apprenticeships, these communities would have a high potential to gain from the employment and training opportunities and associated beneficial effects on health and wellbeing. Luton also has above average levels of young people. The health evidence indicates that young people are particularly vulnerable to the negative health effects resulting from unemployment, so new employment opportunities and a commitment to training and upskilling would disproportionately benefit this group.

Access to services

13.9.16 A significant effect has been identified as a result of the demolition of Prospect House Day Nursery to make way for the new AAR providing access to the east of the airport (previously referred to as the Century Park Access Road) during assessment Phase 2a. Data on where current users live is not available, but users are likely to be from both the local neighbourhood area and the wider area with the nursery particularly catering for airport workers.

13.9.17 The demolition would result in the loss of a purpose-built childcare facility that caters for around 94 children (with a maximum capacity of 114 children) between the ages of three months to four years. The facility is currently rated 'Good' by OFSTED and is open all year round. The nursery caters for children from a diverse range of ethnic backgrounds with staff speaking a variety of languages.

13.9.18 The nearest alternative childcare facilities are Crawley Green & Wenlock Pre-School, Eaton Green Pre-School, and Hart Hill Nursery School and Children's Centre. These are located approximately 700m, 762m and 1.22km away from Prospect House Day Nursery, respectively. However, these facilities only cater for children between the ages of two and four years old, and not those under two, and are only open during term. There are no spaces currently available at Crawley Green & Wenlock Pre-School.

13.9.19 The nearest comparable childcare facilities (in terms of age range and opening) are as follows:

a. Kinder City nursery – this is located approximately 1.59km away and caters for children between the ages of zero and four years. It is open all year round. There are currently no available spaces at the nursery.
b. Ashcroft and Ramridge Community nursery – this is located approximately 1.66km away and caters for children between the ages of zero and four years old. It is open 48 weeks of the year and currently has available spaces.
c. Bright Eyes Nursery Ltd – this is located approximately 1.95km away and caters for children between the ages of zero and four years. It is open 47 weeks of the year. It is not known whether the nursery has available spaces.
d. Oak Tree Kindergarten (Ashcroft Road) – this is located approximately 1.5km away and caters for children between the ages of one and four

years. It is open all year round. It is not known whether the nursery has available spaces.

13.9.20 Discussions are taking place with the nursery to find a suitable site for relocation. Based on current supply and demand for nursery places, the loss of the nursery, prior to any mitigation, would be considered to represent an adverse impact of medium magnitude on a population with high sensitivity due to the age of the user group comprised of babies and young children and the lack of alternative comparable facilities nearby. Without mitigation, this would result in a **major adverse** permanent effect on mental health and wellbeing, which is **significant**.

13.9.21 The applicant is continuing to engage with the owners and operators of Prospect House Day Nursery to identify reasonably practicable measures to mitigate this effect. Further detail on this is provided in **Section 13.10.**

Construction effects – Community assessment

Wigmore Valley Park

13.9.22 Although the impact on Wigmore Valley Park is not deemed to result in a significant effect, this has been considered in this section as it represents an important community resource.

13.9.23 As part of the Proposed Development, an area of Wigmore Valley Park would be lost and open space of a greater area would be provided to the east of the existing green space at Wigmore Valley Park, south of Darley Road (as shown on **Figure 14.11** of this ES **[TR020001/APP/5.03]**). The replacement open space would be delivered in assessment Phase 1, prior to the loss of the existing open space and prior to the main excavation works commencing. Excavation would take place to the south of the replacement open space. This would provide greater opportunity for the landscape mitigation proposed within the replacement open space to establish, improve habitat connectivity, frame people's views and help screen change beyond its limits. Residential and recreational receptors to the north of the Main Application Site would therefore be screened from the works.

13.9.24 The existing area of open space at Wigmore Valley Park covers an area of 41.6ha. This includes a mixture of land defined as 'District Urban Park and Garden' (of 35.5ha) and 'Natural and Semi-Natural Greenspace' (Ref. 13.16). The total area of open space (existing and replacement) provided as part of the Proposed Development would be at least 47.6ha in size.

13.9.25 The open space provision would retain the existing main entrance into Wigmore Valley Park, adjoining Wigmore Hall and Wigmore Pavilion, and would incorporate several of the enhanced facilities proposed in this area as part of Green Horizons Park planning consent (i.e. the improved skate park and play facilities and the refurbished Wigmore Pavilion).

13.9.26 The replacement open space would focus on the establishment of natural habitats, delivering areas of meadow grassland, native shrub planting, broadleaf woodland, and mixed-species hedgerows with hedgerow trees, as well as

several surfaced footpaths to upgrade connections to the surrounding rights of way network. The replacement open space would be located to be accessible to the adjoining communities it serves.

13.9.27 It is anticipated that a range of users would make use of the replacement open space. These users have been identified through the open space surveys[4] (further details can be found in **Appendices 13.1 to 13.3** of this ES **[TR020001/APP/5.02]**) which provide information on the number and types of usage which includes but is not limited to: families, teenagers, school groups, the elderly, walkers, joggers, plane-spotters, cyclists, dog walkers, skaters and horse riders. The proposals would accommodate appropriate signage and facilities to help support these various user groups. It is envisaged that the replacement open space would deliver additional opportunities for unstructured or natural play and would also include some additional recreational facilities, the specific nature of which is still to be determined at detailed design stage but could potentially include additional picnicking facilities, play equipment, gym equipment or trim-trail measures.

13.9.28 Once the replacement open space is open, part of the existing park would be taken for construction of the Proposed Development (as shown on **Figure 14.12** of this ES **[TR020001/APP/5.03]**). Several features would be retained but some of the semi-improved grassland, tall ruderal herb and scrub vegetation in the west of the park would be lost. The loss would be mitigated by:

a. the enhancement of existing facilities, such as the upgrading of existing footpaths and new signage;

b. the provision of a larger area of publicly accessible open space (as mentioned in **Table 13.12** and shown on **Figure 14.11** of this ES **[TR020001/APP/5.03]**); and

c. the continuation of accessibility to the park through the existing main entrance and within the replacement open space, through the resurfacing and in some instances upgrading of existing PRoW and through the creation of new surfaced paths.

13.9.29 Until the landscape matures it may not be as attractive for users (see **Chapter 14** Landscape and Visual of this ES **[TR020001/APP/5.01]**) and users may be subject to visual impacts associated with the construction of the Proposed Development, although from a community perspective no significant in-combination effects have been identified. The park would retain many of the mature trees and much of hedgerow vegetation that defines the east and south east boundary of the existing Wigmore Valley Park. It would encompass several other important landscape features within the surrounding area, including a section of mature hedgerow on Winch Hill.

13.9.30 In summary, the Proposed Development involves an enhancement of the parkland and open space with the provision of a larger area, which retains key facilities built as part of the extant Green Horizons Park planning consent to the

[4] User count surveys, user questionnaires and a quality assessment were undertaken as part of the community impact assessment at Wigmore Valley Park to inform the assessment of the impact of the Proposed Development on the park.

north and would remain fully accessible to the public throughout the construction period. The replacement open space would be delivered in assessment Phase 1, prior to the loss of the existing open space. The impact of the closure and re-provision of part of Wigmore Valley Park represents a low magnitude beneficial impact on a receptor of medium sensitivity which will result in a **minor beneficial** permanent effect for users of the park, which is **not significant**.

Prospect House Day Nursery

13.9.31 As part of the Proposed Development, the construction of the AAR in assessment Phase 2a would require the demolition of Prospect House Day Nursery on Prospect Way. The nearest alternative childcare facilities are Crawley Green & Wenlock Pre-School, Eaton Green Pre-School, and Hart Hill Nursery School and Children's Centre. These are located approximately 700m, 762m and 1.22km away from Prospect House Day Nursery, respectively. However, these facilities only cater for children between the ages of two and four years old, and not those under two, and are only open during term. There are no spaces currently available at Crawley Green & Wenlock Pre-School.

13.9.32 The nearest comparable childcare facilities (in terms of age range and opening) are as follows:

a. Kinder City nursery – this is located approximately 1.59km away and caters for children between the ages of zero and four years. It is open all year round. There are currently no available spaces at the nursery.

b. Ashcroft and Ramridge Community nursery – this is located approximately 1.66km away and caters for children between the ages of zero and four years old. It is open 48 weeks of the year and currently has available spaces.

c. Bright Eyes Nursery Ltd – this is located approximately 1.95km away and caters for children between the ages of zero and four years. It is open 47 weeks of the year. It is not known whether the nursery has available spaces.

d. Oak Tree Kindergarten (Ashcroft Road) – this is located approximately 1.5km away and caters for children between the ages of one and four years. It is open all year round. It is not known whether the nursery has available spaces.

13.9.33 Discussions are taking place with the nursery to find a suitable site for relocation. Based on current supply and demand for nursery places, the loss of the nursery, prior to any mitigation, would represent an impact of high magnitude on a community resource with high sensitivity due to the lack of nearby comparable alternative facilities. Without mitigation, this would result in a **major adverse** community effect which is **significant**.

13.9.34 The Applicant is continuing to engage with the owners and operators of Prospect House Day Nursery to identify reasonably practicable measures to help mitigate this effect. Further detail on this is provided in **Section 13.10.**

Operational effects

Operational effects – Health assessment

Employment and income

13.9.35 A significant health effect has been identified during the operation of the Proposed Development, across all assessment phases, in relation to the health determinant of 'Employment and income' (operational related employment).

13.9.36 The Economic and Employment assessment (**Chapter 11** of this ES **[TR020001/APP/5.01]**) reports the number of jobs which would be directly supported by the Proposed Development, as shown in **Table 13.12**. These jobs would have indirect and induced effects which would support a total of 22,600 jobs by 2043 for the Three Counties of Bedfordshire, Buckinghamshire and Hertfordshire and a total of 16,200 jobs by 2043 for Luton. Jobs range from air traffic control to aircraft cleaning and from hotel and tourist services sector to freight and warehousing.

Table 13.12: Total operational employment with the Proposed Development

Employment		2027 (jobs)	2039 (jobs)	2043 (jobs)
Direct Employment		11,700	13,200	15,100
Direct, Indirect and Induced Employment	Three Counties	17,500	19,700	22,600
	Luton	12,500	14,100	16,200

13.9.37 Beneficial effects are anticipated to affect both the local neighbourhood and wider area. The extent of beneficial health effects depends on who is able to, and chooses to, take up the opportunities for operationally related employment and training. People who are currently unemployed or in low paid or insecure employment, and/or with low skill levels would benefit the most, both in terms of employment and income prospects, and health and wellbeing. The Applicant has developed an **ETS [TR020001/APP/7.05]** for construction and operation, which includes objectives and initiatives to maximise operation related opportunities and upskilling for local people, including communities in need and those currently unemployed in the local and wider study area. For people whose wellbeing is currently compromised by their employment status, there is strong evidence (see **Appendix 13.5** of this ES **[TR020001/APP/5.02]**) to suggest that the employment opportunities presented by the Proposed Development may result in health and wellbeing benefits ranging from increased self-esteem to physical health benefits associated with improved access to healthier lifestyle choices. The extent of beneficial health effects may also depend on the type of employment opportunities provided. A number of studies have identified poorer health outcomes for shift workers, particularly those working night-time shifts (see **Appendix 13.5** of this ES **[TR020001/APP/5.02]**).

13.9.38 The economics and employment chapter (**Chapter 11** of this ES **[TR020001/APP/5.01])** assesses impacts on employment as highly beneficial. It is expected that a proportion of these new employment opportunities will be taken up by people whose health is currently compromised by unemployment, insecure employment and/or low pay. This group will benefit from improved income, job security, skills and long-term employment prospects, leading to positive health effects. The increase in operationally related opportunities, combined with the Applicant's commitment to developing the **ETS [TR020001/APP/7.05]**, are considered to represent a beneficial impact of medium magnitude on a population of medium sensitivity resulting in a **moderate beneficial** permanent health effect, which is **significant**.

13.9.39 Above average levels of unemployment in Luton mean that, subject to uptake of opportunities such as apprenticeships, these communities have the most to gain from the employment and training opportunities and associated beneficial effects on health and wellbeing. Luton also has above average levels of young people. The health evidence indicates that young people are particularly vulnerable to the negative health effects resulting from unemployment, so new employment opportunities and a commitment to training and upskilling are likely to disproportionately benefit this group.

13.9.40 Those employed in shift work at the airport, particularly night-time workers, may not experience such positive health effects as those employed during standard working hours. The health evidence presented in **Appendix 13.5** of this ES **[TR020001/APP/5.02]** indicates that shift work can have detrimental effects on health due to the disruption of circadian rhythms.

Air Quality

13.9.41 During the operation of the Proposed Development, changes in air pollutant concentrations resulting from traffic-related, on-airport and aircraft emissions have the potential to affect health. There is a strong body of evidence for associations between exposure to air pollutants and adverse health outcomes, most notably premature mortality and hospital admissions linked to long-term exposure to PM_{10}, $PM_{2.5}$ and NO_2, with no recognised thresholds below which there are no effects.

13.9.42 Air quality dispersion modelling has been undertaken as described in **Chapter 7** of this ES **[TR020001/APP/5.01]** to determine the change in air pollutant concentrations for NO_2, PM_{10} and $PM_{2.5}$ resulting from traffic-related, on-airport and aircraft emissions at all human receptor locations in the study area. Modelled concentrations have been multiplied by the average population at each residential property to derive population-weighted concentrations, as described in **Appendix 13.4** of this ES **[TR020001/APP/5.02]**.

13.9.43 Defra guidance (Ref. 13.79) provides exposure-response coefficients that can be applied to calculate changes in health outcomes at population level. These exposure-response coefficients have been used to calculate changes in health outcomes across the study population resulting from increased exposure to air pollutants.

13.9.44 The following health outcomes have been assessed:

a. mortality attributable to air pollution[5];
b. respiratory hospital admissions attributable to PM_{10}; and
c. cardiovascular hospital admissions attributable to PM_{10}.

13.9.45 The following baseline data on the relevant health outcomes has been obtained for the local authorities in the study area (see **Appendix 13.4** of this ES **[TR020001/APP/5.02]** for details):

a. annual all-cause mortality rate per hundred thousand people;
b. emergency hospital admissions for respiratory disease per hundred thousand people; and
c. emergency hospital admissions for cardiovascular conditions per hundred thousand people.

13.9.46 The methodology used to calculate changes in health outcomes is described in full in **Appendix 13.4** of this ES **[TR020001/APP/5.02]**).

13.9.47 The changes in health outcomes attributable to the Proposed Development are shown in **Table 13.13.**

Table 13.13: Health outcomes attributable to the Proposed Development

Health outcome	Pollutant	% Change resulting from the Proposed Development compared with baseline		
		2027	2039	2043
All-cause mortality	Air pollution (NO_2 and $PM_{2.5}$)	+ 0.0039%	+ 0.0343%	+ 0.0554%
Emergency hospital admissions for respiratory disease	PM_{10}	- 0.0004%	+ 0.0003%	+ 0.0005%
Emergency hospital admissions for cardio-vascular disease	PM_{10}	- 0.0004%	+ 0.0003%	+ 0.0005%

13.9.48 Mortality calculations have been carried out for NO_2 and $PM_{2.5}$. The percentage changes are greater for NO_2 than for $PM_{2.5}$, thus the results for NO_2 are presented, following Committee on the Medical Effects of Air Pollutants (COMEAP) advice (Ref. 13.80).

[5] Mortality rates for NO_2 and PM_{10} and $PM_{2.5}$ have been calculated and the higher change is presented, since the results are not additive.

13.9.49 The results show very small increases in mortality resulting from emissions associated with the operation of the Proposed Development. Based on these small percentage increases the magnitude of change is assessed as low. The receptor population includes a wide range of communities with varying levels of social deprivation and health status and is assessed as having overall medium sensitivity, resulting in a **minor adverse** effect on health, which is **not significant.**

13.9.50 The results show very small increases and decreases in hospital admissions for respiratory and cardiovascular disease resulting from changes in PM_{10} exposure associated with the operation of the Proposed Development. Due to the small scale of change in population exposure and the very small beneficial and adverse effects on hospital admissions, the health effect is assessed as **negligible,** which is **not significant**.

13.9.51 Changes in exposure would be experienced differently by individuals within the population and, while the total burden of disease can be calculated, the distribution of effects within the community cannot be determined. While the study area as a whole is considered to have medium sensitivity, it contains areas of high sensitivity, particularly in parts of Luton close to the Proposed Development. As concentrations of NO_2 and PM decrease steadily with distance from the source, the risk of adverse health outcomes reduces with increased distance from the airport and the affected road network (as defined in **Chapter 7** of this ES **[TR020001/APP/5.01]**). Those who are more likely to experience adverse effects include children and young people, older people and people with existing poor health, particularly respiratory or cardiovascular conditions.

Aircraft noise

13.9.52 There is a strong link between transport noise and health, with long-term exposure to higher levels of transport noise being associated with a number of adverse health outcomes including annoyance, sleep disturbance, Acute Myocardial Infarction (heart attacks) and hypertension (strokes and dementia).

13.9.53 The methodology used to evaluate the health outcomes associated with aircraft noise is described in full in **Appendix 13.4** of this ES **[TR020001/APP/5.02].** In summary, the methodology has been primarily informed by the guidance and exposure response functions published by Defra (the Department for the Environment, Food, and Rural Affairs) on behalf of the Interdepartmental Group on Costs and Benefits (Noise Subject Group) (IGCB(N)) in 2010 (Ref. 13.81) and 2014 (Ref. 13.82). The existing guidance covers the effects of aircraft noise on acute myocardial infarction (AMI - heart attacks), amenity (annoyance), hypertension (stroke and dementia outcomes) and self-reported sleep disturbance.

13.9.54 Research has also been carried out over many years into noise-induced sleep disturbance using objective techniques such as electroencephalograms (EEG). The ‘2018 WHO Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Effects on Sleep (Ref. 13.83)’ included an exposure-response relationship derived from the polysomnographic

field studies conducted by the German Aerospace Center (DLR). This relationship has been used to predict the additional awakenings due to aircraft noise both with and without the Proposed Development.

13.9.55 **Table 13.14** summarises the estimated population exposed to in excess of 45 dB L_{Aeq} 16hr (day) and 45 dB L_{Aeq} 8hr (night) in each assessment scenario. **Table 13.15** summarises the change in health outcomes associated with aircraft noise from the Proposed Development in terms of Disability Adjusted Life Years (DALYs). A DALY is a quantitative measure used to express the burden of disease on a population. A DALY is a sum of the potential years of life lost due to premature death and the equivalent years of 'healthy' life lost from being in a state of poor health or disability. The latter is calculated using a 'disability weight' associated with a particular health state such that a value of zero represents full health, and a value of one represents states equivalent to death. **Table 13.15** summarises the change in stroke and dementia outcomes resulting from air noise in terms of Quality Adjusted Life Years (QALYs). Like DALYs, a QALY is a measure of the value of health outcomes on a population. However, instead of using disability weights, QALYs use a quality-of-life weight associated to a particular health state such that a value of one represents full health, and a value of zero represents states equivalent to death. The amount of time spent in the particular health state is then multiplied by the quality-of-life weight. Further explanation of DALYs and QALYs are provided in **Appendix 13.4** of this ES **[TR020001/APP/5.02].**

13.9.56 The full set of awakening results at individual assessment locations are reported in **Section 6.17** of **Appendix 16.1** of this ES **[TR020001/APP/5.02]**.

Table 13.14: Estimates of number people exposed to air noise in each assessment scenario

Population scenario	2019 Actual	2027 DM	2027 DS	2039 DM	2039 DS	2042 DM	2042 DS
Estimated population exposed to in excess of 45 dB LAeq 16hr (day)	133,100	102,700	114,700	89,850	110,600	89,100	117,950
Estimated population exposed to in excess of 45 dB LAeq 8hr (night)	67,800	40,500	55,850	34,350	56,600	33,750	62,800

Table 13.15 DALYs[6] lost associated with aircraft noise from Proposed Development - Annoyance, Sleep Disturbance and Acute Myocardial Infarction (AMI)

	2019	2027			2039			2043		
Health Outcome	**Actuals Baseline**	**DM[7]**	**DS[8]**	**Change DS-DM**	**DM**	**DS**	**Change DS-DM**	**DM**	**DS**	**Change DS-DM**
Annoyance	189	131	152	21 (16%)	109	148	39 (36%)	108	162	54 (50%)
Sleep Disturbance	317	185	260	75 (41%)	155	257	102 (66%)	152	289	137 (90%)
Acute Myocardial Infarction	1.2	0.5	0.7	0.2(40%)	0.3	0.6	0.3(100%)	0.3	0.7	0.4(133%)

[6] DALY = Disability Adjusted Life Years values. Positive values of change in DALYs between DS and DM are associated with a worsening of health outcomes due to the Proposed Development
[7] DM = Do minimum (without Proposed Development)
[8] DS = Do something (with Proposed Development)

Table 13.16 Change in QALYs[9] lost associated with aircraft noise from Proposed Development – stroke and dementia

Health Outcome	2027 DS-2019 Actuals Baseline	2027 DS-2027 DM	2039 DS-2019 Actuals Baseline	2039 DS-2039 DM	2042 DS-2019 Actuals Baseline	2042 DS-2042 DM
Stroke	4.6	-2.3	4.9	-4.1	3.3	-5.8
Dementia	7.0	-3.4	7.4	-6.2	5.0	-8.8

Health Outcomes

13.9.57 There are a number of trends which are common to all heath impacts which have been assessed. The Proposed Development is predicted to result in a potential reduction in DALYs for all health outcomes when compared to the situation in 2019. This is demonstrated by the lower number of DALYs lost/increase in QALYs predicted due to the Proposed Development in all assessment years, when compared to the situation in 2019. This improvement reflects the effect of quieter aircraft on air noise levels and the resulting health effects, which offsets the increases in growth of predicted air traffic over this period.

13.9.58 The assessment has also identified that the Proposed Development in each individual assessment year results in an increase in DALYs lost for all health outcomes, when compared to the Do Minimum situation in the same year. This increase in DALYs lost demonstrates the potential for the Proposed Development to increase sleep disturbance, annoyance, AMI, stroke and dementia.

13.9.59 The extent to which different groups within the community would be affected by the physical and mental health outcomes associated with aircraft noise will vary. Noise sensitive individuals, shift workers, socio-economically disadvantaged individuals, people with existing ill health, children and the elderly are particularly vulnerable to noise and may be disproportionately affected by changes in aircraft noise.

13.9.60 Further discussion of the individual health outcomes is presented in subsequent paragraphs.

[9] QALY = Quality Adjusted Life Year. Values presented as a change between DS and DM in the individual assessment year. Negative values of change are associated with a worsening of health outcomes due to Proposed Development

Sleep disturbance

13.9.61 The impact on sleep disturbance due to aircraft noise from the Proposed Development has been assessed both in terms of DALYs lost and additional awakenings in the individual years associated with the different assessment phases.

13.9.62 In summary, the assessment of self-reported sleep disturbance has identified the Proposed Development in each assessment year results in an increase in DALYs lost compared to the Do Minimum situation in the same year. This increase in DALYs lost demonstrates the potential for the Proposed Development to increase sleep disturbance. Between the years 2027 and 2043, approximately 1,500 additional DALYs are predicted to be lost in total due to the Proposed Development when compared to without it, which is equivalent to approximately one additional day on average per person in the affected population. As aircraft noise decreases with distance from the source, the changes in DALYs lost across the population will be proportionally smaller with increasing distance from the airport.

13.9.63 The assessment has also identified that aircraft noise induced awakenings are predicted to be greater with the Proposed Development when compared to the Do Minimum situation in all assessment years. This outcome further demonstrates the potential for the Proposed Development to result in increased sleep disturbance in the surrounding population. However, both the predicted absolute and change in the number of aircraft noise induced awakenings due to the Proposed Development is less than one for many within the surrounding population in all assessment years.

13.9.64 The exceptions are the populations in the vicinity of Someries Castle (AR1), Breachwood Green (AR2 and AR4), Bendish AR5), and St Paul's Walden (AR37), which are predicted to experience at least one additional awakening due to the Proposed Development when compared to the Do Minimum situation in the same year. Populations in Bendish and the Lye Hill area of Breachwood Green are likely to be the worst affected, with at least one additional awakening being predicted in 2042 at these properties even assuming windows are fully closed.

13.9.65 These populations are currently affected by both the aircraft departures and arrivals, which will increase in all assessment phases of the Proposed Development. However, all of these locations, except for St Pauls Walden, are predicted to meet one or more of the qualifying criteria set in the proposed noise insulation scheme referenced in **paragraph 13.10.4 c)** and in **Chapter 16** of this ES **[TR020001/APP/5.01].** Noise insulation measures, if installed at these affected properties, are likely to mitigate the adverse effects on sleep from the Proposed Development predicted for these residents. With regard to the properties in the vicinity of St Paul's Walden, although additional awakenings are predicted to increase by at least one with the Proposed Development when compared to the Do Minimum situation in the same year, this is restricted to assessment Phase 2a only, with change in additional awakenings in all other assessment phases predicted to be less than one for this location. However, a technical review undertaken by University of Salford in 2021 (Ref. 13.83)

suggests that the one additional awakening is likely to concur with an $L_{Aeq,8hr}$ level close to the night-time Lowest Observed Adverse Effect level of 45dB(A). As a result, it is considered that the predicted one additional awakening is not likely to result in a significant effect at properties in this location.

Annoyance

13.9.66 The impact on annoyance due to aviation noise from the Proposed Development has been assessed in terms of DALYs lost associated with each assessment phase.

13.9.67 In common with self-reported sleep disturbance, the assessment has identified that each assessment year shows in an increase in DALYs lost compared to the Do Minimum situation in the same year. This increase in DALYs lost demonstrates the potential for the Proposed Development to increase annoyance. Between the years 2027 and 2043, approximately 537 additional DALYs are predicted to be lost in total due to the Proposed Development when compared to without it, which is equivalent to less than 1 additional day per person in the affected population. As aircraft noise decreases with distance from the source, the changes in DALYs lost across the population will be proportionally smaller with increasing distance from the airport.

Strokes and Dementia

13.9.68 The impact on strokes and dementia due to aircraft noise from the Proposed Development has been assessed in terms of change in QALYs lost associated with each assessment phase.

13.9.69 In summary, the assessment has identified that the Proposed Development will result in an increase in the QALYs lost, compared to the Do Minimum situation in all assessment years, with the increase rising in each assessment phase. This increase in QALYs lost demonstrates the potential for the Proposed Development to increase the risk of strokes and dementia for those in the population where air noise levels are predicted to be above 50 dB $L_{Aeq, 16h}$. However, the evidence is that each decibel change in noise would change the risk of hypertension by less than 1% for population exposed in excess of this level, a very small amount. Based on this, the assessed consequential health impact due to aircraft noise from the Proposed Development due to stroke and dementia due to aircraft noise is relatively small.

Acute Myocardial Infarctions (AMI)

13.9.70 The health impact of AMI due to aircraft noise from the Proposed Development has been assessed in terms of DALYs lost associated with each assessment phase.

13.9.71 In common with other health outcomes, the assessment has identified that each assessment phase the Proposed Development results in an increase in DALYs lost compared to the Do Minimum situation in the same year. This increase in DALYs lost demonstrates the potential for the Proposed Development to increase the risk of AMI where air noise levels are predicted to be above 55 $L_{Aeq, 16hr}$. However, the absolute value of DALYs is low compared to other health

outcomes. Between the years 2027 and 2043, approximately two DALYs are predicted to be lost in total across an affected population due to the Proposed Development. As aircraft noise decreases with distance from the source, the changes in DALYs lost across the population will be proportionally smaller with increasing distance from the airport.

13.9.72 In addition, the evidence suggests that each decibel change in noise would change the risk of AMI by less than 0.01% for people living in these dwellings. Where it occurs, the severity of effect of AMI on health is high; however, relatively high noise levels are required to change the risk of incidence of AMI and overall only a small effect on a small population has the potential to occur as a result of the Proposed Development.

Significance of effect

13.9.73 The assessment has identified an increase in adverse health outcomes attributable to the aircraft noise from the operation of the Proposed Development in all assessment phases. Without the provision of additional mitigation in the form of noise insulation, it is considered that these adverse health outcomes represent an adverse impact of medium magnitude. The receptor population includes a wide range of communities with varying levels of social deprivation and health status and is assessed as having overall medium sensitivity. As a consequence, a **moderate adverse** permanent health effect is likely to occur, which is **significant**. However, the provision of additional compensatory mitigation measures in the form of noise insulation to qualifying properties, where accepted, could help reduce the significant adverse health effect inside properties due to air noise from the Proposed Development (see **Section 13.10** and **Section 13.11**).

Sensitivity tests - Annoyance and self-reported sleep disturbance

13.9.74 Since the publication of the Defra guidance, WHO have published the Environmental Noise Guidelines for the European Region (2018), which included specific guideline values for different environmental noise sources, including aircraft. The guidelines also recommended updated exposure response functions which were underpinned by systematic reviews of research published since 2000, including for annoyance and self-reported sleep disturbance associated with aircraft noise.

13.9.75 Although these exposure-response relationships are not currently adopted in UK policy, a sensitivity test has been undertaken to predict DALYs lost using these relationships and the results summarised in **Table 13.17**.

13.9.76 **Table 13.17** shows that the same trends in DALYs lost due to annoyance are predicted using the WHO ERF as were observed in the main assessment. However, the predicted number of DALYs lost from each relationship vary, with WHO ERF predicting in excess of twice the number of DALYs lost compared to those reported in the main assessment. This difference can be explained by the WHO ERF suggesting that there is a higher percentage of highly annoyed (%HA) throughout the noise exposure range. Further discussion of the differences between these ERFs is provided in **Appendix 13.4** of this ES **[TR020001/APP/5.02].**

13.9.77 **Table 13.17** shows a similar trend as identified for sleep disturbance. Although both ERFs predict the potential for the Proposed Development to increase annoyance, the number of DALYs lost predicted from each relationship vary, with WHO ERF predicting in excess of twice the number of DALYs lost compared to those reported in the main assessment. This difference can be explained by the WHO ERF suggesting that there is a higher percentage of self-reported highly sleep disturbed (%HSD). Further discussion of the differences between these ERFs is provided in **Appendix 13.4** of this ES **[TR020001/APP/5.02].**

Table 13.17: Sensitivity Test - DALYs lost associated with Aircraft Noise from Proposed Development - Annoyance and Sleep Disturbance using WHO 2018 ERFs

Health Outcome	2019	2027			2039			2043		
	DN	DM	DS	Change DS-DM	DM	DS	Change DS-DM	DM	DS	Change DS-DM
Annoyance (WHO 2018)	557	409	466	57	350	452	102	346	489	143
Sleep Disturbance (WHO 2018)	867	508	711	203	427	708	281	419	794	375

Operational effects – Community assessment

13.9.76 There are no significant effects on community resources during operation. The assessment has explored whether there are any in-combination effects during operation however as no community resources experience two or more residual significant effects, there are no significant effects on community resources during operation.

Sensitivity Analysis

13.9.77 There are certain known scenarios or risks that may occur that could influence the conclusions of the core assessment. These scenarios and the general approach to considering them in this assessment are described in **Section 5.4** of **Chapter 5** Approach to the Assessment of this ES **[TR020001/APP/5.01]**.

13.9.78 **Table 13.18** provides a qualitative assessment of any likely changes to the conclusions of the assessment reported in this chapter, in the event that that scenario or risk is realised.

Table 13.18: Qualitative Sensitivity Analysis

Sensitivity scenario	Potential impact and change (in the health determinant)	Likely effect
19 mppa application	The increase in capacity from 18 mppa (currently assessed) to 19 mppa would result in a small positive change to the assessment of impacts on air quality; a proportionate reduction in the net forecast additional GDP and Employment; and no change to the assessment of noise impacts.	The changes in potential impacts are small, and overall there would be no change to the assessment of health and community effects arising from any changes in the determinants of health.
Faster Growth	Faster growth would increase noise effects in assessment Phase 1 due to minor/moderate changes above the daytime SOAEL that would not occur in the Core Planning Case and the slightly increased population experiencing a significant effect due to minor changes above the night-time SOAEL than reported in the Core Planning Case. These significant effects would be avoided with noise insulation.	The changes in potential impacts are small and overall, there would be no change to the assessment of health and community effects arising from any changes in the determinants of health.

Sensitivity scenario	Potential impact and change (in the health determinant)	Likely effect
	For assessment Phases 2a and 2b the effects would remain as reported in the Core Planning Case. There would be no changes to the significance of impacts for air quality. There would be small changes in potential impacts in the economics and employment assessment, with earlier than anticipated increases in net GDP and employment, but overall there would be no change to the assessment of effects.	
Slower Growth	There would be a reduced impact on air quality from the traffic generated by the Proposed Development and a likely reduced noise impact. Changes to employment would be small. The potential impacts assessed would be delayed as a result. However, the potential impacts would still be realised and therefore there would be no change to the assessment of effects.	No change to assessment of health and community effects as a result of no significant changes in the determinants of health.
Next generation aircraft	The alternative long term fleet mix which takes into account the next generation of aircraft which would have better environmental performance would result in a reduced impact on air quality but would likely not change the assessment of aircraft noise effects.	No change to assessment of health and community effects as a result of no significant changes in the determinants of health.
J10 without National Highways Smart Motorway upgrade (hard shoulder running scheme)	All lane running not being delivered and the M1 continuing to operate as predicted is considered not to	No change to assessment of health and community effects as a result of no significant changes in the determinants of health.

Sensitivity scenario	Potential impact and change (in the health determinant)	Likely effect
	change the assessed impacts on air quality or noise	
Changes to airspace	As the airspace change process is still ongoing and will provide an assessment of potential noise impacts as part of the separate Airspace Change process, an analysis of noise effects due to airspace change has not been undertaken. Airspace changes are assessed not to change the likely impact on air quality. Changes to airspace would not impact the overall headline passenger numbers predicted. As a result there would be no change to potential economic and employment impacts and therefore there would be no change to the assessment of effects.	No change to assessment of health and community effects as a result of no significant changes in the determinants of health.

13.10 Additional mitigation

13.10.1 This section describes the mitigation measures identified as a result of the assessment process, that are proposed in addition to those already considered to be in place as described in **Section 13.8** Embedded and good practice mitigation measures. These are proposed to reduce or mitigate the effects on health and community as a result of the construction and operation of the Proposed Development.

Design

13.10.2 There are no effects related to the design of relevance to health and community and therefore no additional mitigation is required.

Planning, construction and operation

13.10.3 No further mitigation beyond that proposed as embedded mitigation.

Planning, construction and operation

13.10.4 No further mitigation beyond that proposed as embedded mitigation.

Construction

Prospect House Day Nursery

13.10.5 The Applicant is continuing to engage with owners and operators of a number of facilities, including Prospect House Day Nursery to identify reasonably practicable measures to help mitigate the likely effects identified in this assessment.

13.10.6 Prospect House Day Nursery is not anticipated to be demolished until assessment Phase 2a, therefore after 2032. A potential alternative property has been identified and the Applicant has committed to ensure that alternative facilities are provided, and agreements are in place, with adequate prior notice, to accommodate these services prior to the existing building being required for the Proposed Development. A further assessment to confirm replacement capacity requirements will be conducted closer to the time of closure. This commitment will be secured via a section 106 agreement as described in **Paragraph 6.8** of the **Planning Statement** submitted as part of the application for development consent **[TR020001/APP/7.01].**

13.10.7 The current operator of the nursery has not raised objection to this timeline and does not require formal agreement at this early stage, given the time available within the existing lease and new premises being required.

Operation

Aircraft noise

13.10.8 As outlined in **Chapter 16** Noise and vibration of this ES **[TR020001/APP/5.01]**, the following additional mitigation would be applied to reduce noise effects on receptors:

a. As part of the Proposed Development, the current noise insulation scheme administered by LLAOL will be updated if development consent is granted. Compensation proposals are described in the **Draft Compensation Policies, Measures and Community First [TR020001/APP/7.10]** document submitted as part of the application for development consent.

13.11 Residual effects

13.11.1 This section provides an assessment of the significant effects reported in **Section 13.9** after the additional mitigation measures described in **Section 13.10** are in place. The additional mitigation measures identified in **Section 13.10** cover both significant and not significant effects identified in **Section 13.14.** Therefore, the assessment of residual effects relating to the effects which are not significant are reported in **Section 13.14**.

Planning, construction and operation

Perception and uncertainty

13.11.2 Ongoing engagement would provide information which may help to reduce uncertainty and stress relating to the potential effects of the Proposed Development. However, it is likely that people's mental wellbeing within the affected communities would continue to be impacted adversely by concerns related to the Proposed Development. Effects remain as reported in **Section 13.9** as a **moderate adverse** temporary effect on mental wellbeing, which is **significant**.

Construction

Construction effects – Health assessment

Employment and income

13.11.3 No mitigation required. Effects remain as **moderate beneficial**, as reported in **Section 13.9**.

Access to Services

13.11.4 As described in **Section 13.10**, the Applicant has had positive engagement with Prospect House Day Nursery to identify reasonably practicable measures to help mitigate the likely effects identified in this assessment.

13.11.5 With a commitment, secured via a Section 106 agreement, to provide a replacement facility for Prospect House Nursery, of a comparable size, quality, and accessibility, to meet future capacity requirements as ascertained by confirmatory assessment prior to closure, then effects would reduce to **minor adverse**, and **not significant**.

Construction effects – Community assessment

Wigmore Valley Park

13.11.6 No mitigation required. Effects remain as **minor beneficial**, as reported in **Section 13.9**.

Prospect House Day Nursery

13.11.7 As described in **Section 13.10**, the Applicant has had positive engagement with Prospect House Day Nursery to identify reasonably practicable measures to help mitigate the likely effects identified in this assessment.

13.11.8 With a commitment, secured via a Section 106 agreement, to provide a replacement facility for Prospect House Nursery, of a comparable size, quality, and accessibility, to meet future capacity requirements as ascertained by confirmatory assessment prior to closure, then effects would reduce to **minor adverse**, and **not significant.**

Operational

Operational effects – Health assessment

Employment and income

13.11.9 No mitigation required. Health effects remain as **moderate beneficial**, as reported in **Section 13.9**

Air Quality

13.11.10 No mitigation required. Effects remain as **minor adverse**, as reported in **Section 13.9.**

Aircraft noise

13.11.11 The provision of additional compensatory mitigation measures as set out in **Section 13.10.5**, in the form of noise insulation measures to qualifying properties, where accepted, could help reduce the significant adverse health effect inside properties due to air noise from the Proposed Scheme identified in **Section 13.9**. Such measures, where provided, would result in the adverse health outcomes reducing to **minor adverse**, resulting in an effect that would be **not significant**.

Operational effects – Community assessment

13.11.12 There are no significant effects on community resources reported in **Section 13.9**.

13.12 In-combination climate change effects

13.12.1 This section provides an assessment of potential changes to the findings of the health and community assessment, taking into account the predicted future conditions as a result of climate change, known as In-combination Climate Change Impacts (ICCI).

13.12.2 This assessment has been undertaken using the methodology and climate change predictions described in **Chapter 9** Climate Change Resilience of this ES **[TR020001/APP/5.01]**. The results are provided in **Table 13.19**.

13.12.3 The only ICCI relevant to the health and community assessment is the potential for increased heat risk amongst vulnerable members of the population and users of Wigmore Valley Park. This is due to the combination of a possible likely increase in high summer temperatures, humid weather and heatwaves during the assessment phases, the closure of part of Wigmore Valley Park due to construction works required for the Proposed Development, and the replacement open space as part of Wigmore Valley Park. This has been assessed to lead to a potential loss of shade provision and cooling effect from the existing mature trees and vegetation for users of the park. Vulnerable members of the population such as young children, elderly people and those with existing health conditions are more likely to be at risk. However, given the transient nature of users and the element of choice in using Wigmore Valley Park, it is considered that users requiring more shade will not use the park during those hottest periods or will seek out shadier spots within the park.

13.12.4 This likelihood of the ICCI has been assessed as ‘improbable’ and of low consequence and therefore it is assessed to be negligible and not significant. Given this, no additional mitigation measures have been proposed, but it reinforces the need for the replacement open space and planting to be of high quality and to be provided as soon as possible.

Table 13.19: Health and community in-combination climate change impacts

Climate hazard	Likelihood of climate hazard occurring	ICCI identified	Embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance of ICCI effects
Increased occurrence of high summer temperatures, humidity and heatwaves	Frequent	Potential increase in heat risk for vulnerable members of population due to partial loss of Wigmore Valley Park, and the consequent decrease in shade provision and cooling effect from the existing mature trees and vegetation.	The replacement open space would provide a greater area of open green space, but it would take time for the new trees and planting to mature and provide comparable levels of shade and cooling to the existing area of open space.	Improbable	Low - users requiring more shade will not use the park during those hottest periods or will seek out shadier spots within the park.	Negligible Not significant

13.13 Monitoring

13.13.1 Monitoring of health outcomes is not proposed due to practical difficulties in obtaining accurate health data for the population in the study area and attributing any changes in observed health outcomes to the Proposed Development. Accurately identifying changes in the health status of a population resulting from a specific intervention requires a large-scale study that is not proportionate in the context of an EIA. However, precursors to health effects will be monitored, including air quality, noise, local employment and apprenticeships. These monitoring measures are described within the relevant aspect chapters in this ES.

Construction monitoring

13.13.2 Precursors to health effects including changes to air quality, noise, local employment and apprenticeships will be monitored during construction as part of the CoCP. Monitoring procedures are set out in the CoCP provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**.

13.13.3 Community insights and perceptions will be monitored through a review of any feedback and complaints received during construction as part of the procedures outlined in the CoCP around 'enquiries and complaints' in **Appendix 4.2** of this ES **[TR020001/APP/5.02]**. These reviews will be used to inform the ongoing community engagement and any initiatives to address concerns identified.

Operational monitoring

13.13.4 Procedures to monitor the precursors to health effects are set out in **Chapter 7** Air Quality, **Chapter 11** Economics and Employment, and **Chapter 16** Noise and vibration of this ES **[TR020001/APP/5.01]**.

13.13.5 The **Green Controlled Growth Framework** document submitted as part of the application for development consent **[TR020001/APP/7.08]** describes limits on key environmental effects such as air quality, noise and carbon. It will still however, not be possible to accurately identify changes in the health status of the populations arising from these changes.

13.14 Assessment summary

13.14.1 **Table 13.20, Table 13.21, Table 13.20** and **Table 13.21** provide a summary of the identified impacts, mitigation and likely effects of the Proposed Development on health and community. Additional mitigation and how it will be secured is described and its efficacy shown by the reported residual effect.

Table 13.20: Health assessment summary

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
Planning, construction and operation							
All assessment phases (2025-2041) Planning and construction of the Proposed Development (Local neighbourhood area and Wider Area)	Best practice construction management measures in the CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**). Community engagement strategy as set out in the CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**).	Adverse impact on **'Perception and uncertainty'.** Public concern and uncertainty during the planning and construction stages about the construction and operational effects of the Proposed Development.	Medium (all assessment phases). Likely to have a perceivable impact on mental health or wellbeing.	Medium (all assessment phases). Consultation feedback has identified concerns related to the potential effects of the Proposed Development on the lives of people in the community. Sensitivity is likely to be higher in the local/Luton area due to higher levels of deprivation and poorer	Moderate adverse temporary effect (all assessment phases) on mental wellbeing associated with increased stress and anxiety. Significant.	None proposed.	Moderate adverse (all assessment phases). **Significant** (detailed assessment is provided in **Section 13.9; Paragraph 13.9.3-13.9.7**)

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
				health outcomes.			
Construction							
All assessment phases (2025-2041) Closure and reprovision of Wigmore Valley Park (Central Airport Area)	Enhancement of existing facilities. Functionality and access to open space will be maintained. Provision of a larger area of publicly accessible open space.	Change to the character of the Park. Accessibility and function will not change. The Park will continue to provide access to green space, recreation and physical activity for the Wigmore population. No impact on health determinant of '**Access to open space, recreation and physical activity'.**	No impact.	N/A	No health effects identified, not significant.	None proposed.	No health effects identified. **Not significant**
All assessment phases (2025-2041)	Best practice construction management measures in the	Beneficial impact on '**Access to open space,**	Low	Low The local communities	Minor beneficial permanent effect from	None proposed.	Minor beneficial.

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
Impact on users of undesignated footpath within Wigmore Valley Park and public footpaths FP29 and FP39 and public bridleways BW28 and BW37. (Central Airport Area and South and East of Airport)	CoCP for landscape and noise (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**). Community engagement strategy as set out in CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**). Creation of informal surfaced paths and upgrading of existing PROW, included in design and Outline Landscape and Biodiversity Management Plan (**Appendix 8.2** of this ES **[TR020001/APP/5.02]**).	**recreation and physical activity'**. The undesignated footpath will be permanently stopped up to facilitate the Proposed Development and there will be no direct replacement of this route. Public footpaths FP29 and FP39 and public bridleways BW28 and BW37 will remain accessible during assessment Phase 1 and will be stopped-up to facilitate the	Assessed as low by Community.	most likely to use these footpaths experience low levels of deprivation and good access to alternative footpaths and areas of open space.	assessment Phase 2a as a result of a higher quality park improving access to open space recreation and physical activity. Not significant. Greatest benefits would be to those with mobility issues including the elderly, those with disabilities and parents with buggies who would benefit from the higher quality routes.		**Not significant**

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
		Proposed Development during construction for assessment Phase 2a. Additional footpaths and bridleways will be provided as part of the replacement open space during assessment Phase 1. There are considered to be no adverse effects during assessment Phase 2a because higher quality, accessible alternatives will be available for users. At assessment					

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
		Phase 2b, connectivity between FP39 and BW37 through the replacement open space will be restored and there will be a number of higher quality, accessible alternative recreational routes for users to access in the area.					
All assessment phases (2025-2041) Direct employment of 6,280 person years	An **ETS** has been developed to maximise opportunities and upskilling for local people, including hard to reach groups and those currently unemployed	Beneficial impact on **'Employment and income'.** Construction related employment opportunities have the potential to	Medium The economics and employment chapter assesses impacts on employment as high. It is expected that a proportion of these new employment	Medium Levels of economic inactivity are higher than the England average in Luton, but lower than average at	Moderate beneficial temporary effect (all assessment phases) on mental and physical health associated with increased	None proposed.	Moderate beneficial (all assessment phases) **Significant** (detailed assessm

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
Indirect employment of 3,140 person years. (local neighbourhood area and Wider Area)	**[TR020001/APP/7.05]**.	improve income and employment status of some people from the study area.	opportunities will be taken up by people whose health is currently compromised by unemployment, insecure employment and/or low pay. Direct employment of 6,280 person years. Assessment Phase 1: 2025-2027: 210 person years of employment per annum. Assessment Phase 2a: 2033-2036: 940 person years of employment per annum. Assessment Phase 2b: 2037-2040: 470 person years of employment per annum.	the wider study area level.	income, skills and/or job security for those local people securing construction related employment. Significant.		ent is provided in **Section 13.9; paragraph 13.9.8-13.9.15**)

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
All assessment phases (2025-2041) Direct displacement of businesses within Green Horizons Park and President and Percival Way. (Local neighbourhood area and Wider Area)	None proposed.	Adverse impact on **'Employment and income'.** Potential long-term impacts on employment status for some individuals.	Low (all assessment phases). Displacement of businesses is assessed as minor adverse in **Chapter 11** Economics and Employment of this ES **[TR020001/APP/5.01]**. It is estimated that around 350 jobs may be displaced.	Low (all assessment phases). These businesses are considered to be adaptable to change and able to find alternative accommodation locally, therefore unlikely to result in the local loss of employment.	Minor adverse permanent effect on mental and physical wellbeing. Not significant.	Compensation to be provided to enable businesses to relocate.	Minor adverse. **Not significant**
All assessment Phases (2025-2041) Environmental impacts resulting from the construction of the	Best practice construction management measures in the CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**). Community engagement	Impacts on '**Neighbourhood quality'.** Changes to environmental conditions affecting the perceived quality of the living environment	No impact Any construction impacts from noise, air quality, landscape, visual and light and traffic and transport to be mitigated through CoCP measures.	Medium Residential receptors exist along the northern edge of Eaton Green Road.	No effect, not significant.	N/A	No effect **Not significant**

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
Proposed Development (North of the Airport area)	strategy as set out in the CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**).	and sense of place.					
All assessment phases (2025-2041) Presence of the construction workforce within the local community. 1,410 workers estimated to be on-site at the peak in 2035. (local neighbourhood area and Wider Area)	Best practice construction management measures in CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**). Community engagement strategy as set out in CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**).	Adverse impact on **'Social capital'.** The introduction of the temporary construction workforce into the community may affect levels of community cohesion and trust and influence behaviours such as the use of local community facilities.	Low (All assessment phases) Assumed that approx. 48% of construction workers would be home based and live within commuting distance (60-minute drive), so would not need to use services and facilities in the area.	Low Luton is a diverse urban area with a high population turnover and therefore its population is unlikely to be sensitive to the introduction of new people into the area.	Minor adverse temporary effect on mental wellbeing (2025-2041). Not significant.	None proposed.	Minor adverse (2025-2041) **Not significant**

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
All assessment phases (2025-2041) Presence of construction workforce within the local community. 1,410 workers estimated to be on-site at the peak in 2035. (Local neighbourhood area and Wider Area)	By developing local training and skills and focusing on target groups such as those out of work, the **ETS [TR020001/APP/7.05]** will also act as a mitigation to the effects on housing need. It will increase the ability of existing economically active and inactive populations in Luton and the Three Counties to engage with airport-related construction employment thus reducing, the increase in housing need or in commuting that may result.	Adverse impact on **'Housing market'.** The introduction of a temporary construction workforce may increase demand within the local housing rental market, potentially affecting prices and reducing access to affordable housing for local people.	Low (all assessment phases) Assumed that approx. 48% of construction workers would be home based and live within commuting distance (60-minute drive), so would not require local accommodation. Some demand would also be met by other types of accommodation such as Bed and Breakfast.	Medium across the study area, but sensitivity may be higher in the Luton area as the proportion of people in private rented accommodation is above average and levels of homelessness are high. In the Central Beds area, lower quartile rent prices have increased across all property sizes since 2013/14, suggesting that demand exceeds supply.	Minor adverse temporary effect (all assessment phases) on mental wellbeing. Not significant. The greatest impact is likely to be on tenants in receipt of housing benefits and those on the lowest pay who may find increased competition for private rented accommodation.	None proposed.	Minor adverse (all assessment phases) **Not Significant**

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
All assessment phases (2025-2041) Additional demand for healthcare services due to the presence of construction workforce. (Local neighbourhood area and Wider Area)	Best practice construction management measures in the CoCP including occupational healthcare facilities at the construction site as set out in the CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**).	Impact on '**access to services.** The construction workforce has the potential to increase the demand for local primary care and A&E, placing additional pressure on these services and affecting access for the local population. 1,410 workers estimated to be on-site at the peak in 2035. Assumed that approx. 48% of construction	Very low (all assessment phases) Workers in rented housing will be accounted for in existing funding, based on population size. Any increase in population will be limited by the availability of additional accommodation such as B&Bs. Appropriate health surveillance will also be provided. Temporary workers are unlikely to register with local GPs It is assumed that additional demand for A&E and minor injury services will be reduced by occupational healthcare facilities	High The baseline data indicates that numbers of patients per GP in Luton are already high. Baseline data indicates that residents within Luton experience worse health than the England average.	Minor adverse temporary impact on access to healthcare services, not significant.	None proposed.	Minor adverse (all assessment phases) **Not Significant**

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
		workers would be home based and live within commuting distance.	either on-site or in appropriate locations, as set out in the CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**).				
All assessment phases (2025-2041) Increased traffic generated by the expanded airport and changes to highway network (Local neighbourhood area and Wider Area)	Proposed Off-site Highways Intervention works (as described in **Chapter 4** of this ES **[TR020001/APP/5.01])** Outline Construction Traffic Management Plan (as described in **Appendix 18.3** of this ES **[TR020001/APP/5.02]**.	Adverse impacts on '**Social capital'** and **'Access to services'** Increased journey times may deter people from travelling to access services and facilities, or to visit friends and family.	Very low (all assessment phases) Traffic and transport assessment assesses all impacts as minor.	Low (all assessment phases) Certain sectors of the community may be more sensitive to increased traffic, including the young, the elderly and those with mobility impairments.	Negligible effect (all assessment phases), not significant.	None proposed	Negligible (all assessment phases) **Not significant**

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
All assessment phases (2025-2041) Changes in traffic movements, including increased HGVs. (Local neighbourhood area and Wider area)	Proposed Off-site Highways Interventions. Construction Traffic Management Plan.	Adverse impact on '**physical activity'** with changes deterring active travel and reducing levels of physical activity.	Very low (all assessment phases) Traffic and transport assessment assesses all impacts as minor.	Medium Existing levels of physical activity are above average for all areas except Luton where they are worse.	Minor adverse (all assessment phases). Not significant,	None proposed.	Negligible (all assessment phases) **Not significant**
Assessment Phase 2a onwards Demolition of Prospect House Day Nursery to make way for the new AAR. (Local neighbourho	None practicable	Adverse impact on **'Access to Services'** resulting from loss of an OFSTED 'Good' rated, purpose built childcare facility.	Medium The facility could be permanently lost.	High Due to the nature of the users being babies and young children who will find it more difficult to respond to change; and the lack of alternative	Major adverse permanent effect on a vulnerable group (young people) with potential effects on wellbeing. Significant.	The Applicant has committed to ensure that alternative facilities are provided, and agreements are in place, with adequate prior notice, to accommodate these services prior to the existing building being required for the Proposed	Minor Adverse **Not Significant** (detailed assessment is provided in **Section 13.9;**

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
od area and Wider area)				comparable facilities within 1.5km of the existing facility.		Development. This commitment will be secured via a section 106 agreement as described in section 6.8 of the **Planning Statement** submitted as part of the application for development consent **[TR020001/APP/7.01]**.	**paragraph 13.9.6-13.9.21**)
Operation							
All assessment phases (2025-2041) Increased aircraft movements (Local neighbourhood area and Wider Area)	Best practice measures for managing aircraft noise effects of Proposed Development e.g., ICAO Balanced Approach, London Luton Airport Noise Action Plan 2019-2023 and an acoustically screened engine run-up bay.	Adverse impact on **'Access to open space, recreation and physical activity'** due to increase in aircraft noise on users of Wigmore Valley Park. Reduction in the amenity value of the	Low	Low – as Wigmore Valley Park is an area where the users are more transient and therefore considered less sensitive as a receptor than occupants of	Minor adverse permanent effect on physical and mental health (amenity/ annoyance). Not significant.	None proposed	Minor adverse **Not significant**

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
		park, potentially deterring people from using the park for recreation and physical activity.		a residential property.			
Increased aircraft movements and changes in aircraft noise exposure in the population	Best practice measures for managing aircraft noise effects of Proposed Development e.g., ICAO Balanced Approach, London Luton Airport Noise Action Plan 2019-2023 Measures covered in the Operational Noise Management (Explanatory Note) Noise envelope with defined limits consented through the DCO.	Assessment Phase 1: Negligible to minor increases in air noise exposure during the day and night resulting from the Proposed Development. Assessment Phase 2a + 2b: Minor to moderate increases in air noise exposure	All assessment phases Medium Magnitude of change is judged as medium as changes in air noise and resulting health outcomes predicted to affect a moderate-large number of people and occur over the long-term duration.	All assessment phases: Medium Receptors are judged as medium sensitivity as areas will include an average prevalence of children and young people, and people living in areas known to exhibit poor economic	All assessment phases: Moderate adverse permanent effect on health outcomes across the study population. Significant.	Updates to the current noise insulation scheme. Compensation proposals are described in the **Draft Compensation Policies, Measures and Community First [TR020001/APP/7.10]**	All assessment phases: Minor adverse **Not significant** (assuming noise insulation measures accepted by qualifying residents) (detailed assessm

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
		during the day and night resulting from the development		and/or health indicators.			ent is provided in **Section 13.9; paragraph 13.9.52-13.9.77**)
Emissions of air pollutants from sources on and off the airport, including aircraft engines, ground support equipment and road traffic.	Embedded mitigation includes use of the Airport Access Road to route road traffic away from sensitive receptors and a new fuel pipeline reducing HGV movements. Good practice will reduce road transport movements, incentivise electric vehicles and monitor air quality.	Very small increase in exposure to NO_2 resulting from the operation of the Proposed Development. Very small increases and decreases in exposure to PM10 and PM2.5 resulting from the operation of the Proposed Development.	Low magnitude effect on exposure to NO_2. Very low (negligible) effect on exposure to PM_{10} and $PM_{2.5}$.	Moderate sensitivity across study population as a whole. Vulnerable communities and groups present within the study area.	Minor adverse effect on all-cause mortality rate across the study population in 2027, 2039 and 2043. Not significant. Negligible effect on hospital admissions for respiratory and cardio-vascular	None	All assessment phases: Minor adverse **Not significant** (detailed assessment is provided in **Section 13.9; paragraph 13.9.41-13.9.51**)

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
					disease across the study area in 2027, 2039 and 2042.		
All assessment phases (2025-2041) 15,100 direct jobs by 2043. 16,200 indirect and induced jobs in Luton by 2043 22,700 indirect and induced jobs in the Three Counties by 2043. (Local Neighbourhood and Wider Area)	An **ETS** has been developed to maximise opportunities and upskilling for local people, including hard to reach groups and those currently unemployed **[TR020001/APP/7.05]**.	Beneficial impact on '**Employment and income'.** Operation related employment opportunities have the potential to improve the income of local people with relevant skills.	Medium (all assessment phases) The economics and employment assessment **Chapter 11** Economics and Employment of this ES **[TR020001/APP/5.01]** assesses impacts on employment as high. It is expected that a proportion of these new employment opportunities will be taken up by people whose health is currently compromised by unemployment, insecure	Medium Levels of economic inactivity are higher than the England average in Luton, but lower than average at the wider study area level.	Moderate beneficial permanent effect (all assessment phases) on mental and physical health associated with increased income, skills and/or job security for those local people securing operation related employment. Significant. Those employed in shift work at	None proposed	Moderate beneficial (all assessment phases) **Significant** (detailed assessment is provided in **Section 13.9; paragraph 13.9.35-13.9.40**)

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
			employment and/or low pay.		the airport, particularly night-time workers, may not experience such positive health effects as those employed during standard working hours.		
All assessment phases (2025-2041) Increased traffic generated by the expanded airport and changes to highway network. (Local neighbourhood area and Wider Area)	Extension of the Luton DART system to serve the new terminal. Proposed off-site Highways Intervention works. **Framework Travel Plan** (for the airport operations) **[TR020001/APP/7.13]**.	Adverse impacts on '**Social capital'** and **'Access to services.** Any potential changes to journey times may deter people from travelling.	Very low (assessment Phases 1 and 2a) and low for Phase 2b.	Very low (all assessment phases) as traffic is mainly routed away from the densely populated urban areas of Luton.	Negligible effect, not significant.	None proposed	Negligible (all assessment phases) **Not significant**

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
All assessment Phases (2025-2041) Changes to the physical environment resulting from operation of the Proposed development (North of the Airport area).	None identified	Impacts on '**Neighbourhood quality'.** Potential changes to environmental conditions affecting the perceived quality of the living environment and sense of place.	No impact Topic assessments for noise, air quality, landscape and visual, light, and traffic and transport have not identified a combination of two or more significant impacts on the physical environment.	Medium	No effect, not significant.	N/A	No effect **Not significant**
All assessment phases (2025-2041) Increase in operational workforce. (Local neighbourho	By developing local training and skills and focusing on target groups such as those out of work, the **ETS [TR020001/APP/7.05]** will also act as a mitigation to the effects on housing need. It will increase the ability	Impact on **'Housing market'.** The increase in the operational workforce may increase demand within the	Low It is estimated that approximately 4,400 new dwellings will be required within the 'wider area by 2043, as a result of individuals and their dependants	Medium across the study area, but sensitivity may be higher in the Luton area due to existing high deprivation in terms of	Minor adverse. Not significant. Potential for effect on mental wellbeing resulting from increased	None proposed	Minor adverse **Not significant**

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
od area and Wider Area)	of existing economically active and inactive populations in Luton and the Three Counties to engage with airport-related operational employment thus reducing any increase in housing need or in commuting that may result.	local housing market, potentially affecting prices and reducing access to affordable housing for local people.	moving to the area to fill additional jobs created at the airport. The economics and employment assessment (**Chapter 11** of this ES **[TR020001/APP/5.01]**) concludes that following a review of relevant local plans the local housing market is considered to have the capacity to meet potential demand for accommodation.	barriers to housing, and high rates of homelessness. Sensitivity may vary between private owned and private rental sectors with the baseline indicating possible supply and demand issues in the rented sector.	pressure on housing supply. The greatest impact is likely to be on those tenants in receipt of housing benefits and those on the lowest pay who may find it harder to afford housing.		
All assessment phases (2025-2041) Increase in operational workforce	None identified	Impact on '**access to healthcare services**' The increase in the operational workforce has the potential	No impact Any increase in population, will be limited by the availability of housing.	N/A	No effect. Not significant. Any increase in population, and associated impacts on healthcare	N/A	No effect **Not significant**

Impact	Embedded/ Good Practice Mitigation	Impact on health determinant(s)	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
(Local neighbourhood area and Wider Area)		to increase the demand for local primary care and A&E, placing additional pressure on these services.			provision will be limited by the availability of housing.		

Table 13.21: Community assessment summary

Impact	Embedded/Good Practice Mitigation	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
Construction						
All assessment Phases Closure and re-provision of Wigmore Valley Park and impact on users (Central Airport Area)	Access maintained to existing park during construction of replacement open space and parkland. Replacement open space and facilities to be delivered in assessment Phase 1. Best practice construction management measures e.g. community liaison personnel to communicate timings of changes to access to park, as set out in the CoCP (provided as **Appendix 4.2** of this ES	Low Enhancement of facilities with overall gain in parkland provision.	Medium User count surveys from 2019 indicate that the park is well used for a variety of outdoor sports and recreational activities (see **Appendix 13.2** of this ES **[TR020001/APP/5.02]**). The Park is well maintained and there are no comparable and accessible alternatives nearby.	Minor beneficial permanent effect, not significant Access maintained throughout construction with overall gain in parkland provided and enhancement of facilities. Works to deliver the replacement area of open space will be undertaken in assessment Phase 1.	None proposed	Minor beneficial – Replacement parkland. **Not significant** (detailed assessment is provided in **Section 13.9: paragraph 13.9.22-13.9.30**)

Impact	Embedded/Good Practice Mitigation	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
	[TR020001/APP/5.02]). Community engagement strategy as set out in the CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**). Informal footpaths and upgrading of recreational routes.					
Assessment Phase 2a Demolition of Prospect House Day Nursery due to the AAR (Central Airport Area)	None practicable	High Permanent loss	High The nursery is well used and there are no alternative comparable childcare facilities within 1.5km of the existing facility. Users of the facility will find it more difficult to	Major adverse effect, significant.	The Applicant has committed to ensure that alternative facilities are provided, and agreements are in place, with adequate prior notice, to accommodate these services prior to the existing building being required for	Minor adverse **Not Significant** (detailed assessment is provided in **Section 13.9: paragraph 13.9.31-13.9.34**)

Impact	Embedded/Good Practice Mitigation	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
			respond to change.		the Proposed Development. This commitment will be secured via a section 106 agreement as described in section 6.8 of the **Planning Statement** submitted as part of the application for development consent **[TR020001/APP/7.01]**.	
Assessment Phase 2a Demolition of Ace Sandwich Bar due to the AAR (Central Airport Area)	None practicable	High Permanent loss	Very low Many comparable and accessible alternatives within the area. Users of the facility can easily respond to change.	Minor adverse effect, not significant.	Provision for an alternative location has been made within the project's capital allowances and discussions with business tenants remain ongoing.	Minor adverse **Not significant** If agreement is reached on a suitable alternative premises, then effect would reduce to negligible provided that the alternative facility is of a comparable size,

Impact	Embedded/Good Practice Mitigation	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
						quality, and accessibility.
All assessment Phases Impact on users of PRoW Kings Walden 043 (Central Airport Area)	Works in accordance with CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**). Redirection and upgrading of footpath Kings Walden 043 to a bridleway. Additional proposed footpaths with improved signage within replacement open space (see mitigation proposed in **Chapter 14** Landscape and Visual of this ES **[TR020001/APP/5.01])**. Best practice construction management measures will be	Low Redirection and upgrading of footpath to a bridleway.	Very low There are a number of comparable alternative routes nearby. User count surveys from 2019 indicate low usage of the route (see **Appendix 13.2** of this ES **[TR020001/APP/5.02]**).	Negligible permanent effect – within the Order limits for Proposed Development (replacement open space). Diverted and upgraded to a multi-user track in assessment Phase 1 to ensure it remains accessible to the public and connected to the wider network of PRoW east of the airport (access will be maintained along the existing alignment until the diversion is operational). Footpath to be upgraded to bridleway during assessment Phase 2b.	None proposed	Negligible **Not significant**

Impact	Embedded/Good Practice Mitigation	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
	in place, including community liaison personnel to communicate timings of changes to access to ProW, as set out in the CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**).					
All assessment Phases Impacts on users of undesignated footpath within Wigmore Valley Park and public footpaths FP29 and FP39 and public bridleways BW28 and BW37 (Central Airport Area and South and East of Airport)	Works in accordance with CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**). Additional proposed footpaths with improved signage within replacement open space (see mitigation proposed in **Chapter 14** Landscape and Visual of this ES **[TR020001/APP/5.01]**. Users will	Low Additional footpaths provided within replacement open space.	Low There are a number of comparable alternative routes nearby. User count surveys from 2019 indicate higher usage compared to nearby surrounding routes (see **Appendix 13.2** of this ES **[TR020001/APP/5.02]**).	Minor beneficial permanent effect - within the Order limits for Proposed Development. Undesignated footpath will be permanently stopped up to facilitate the Proposed Development and there will be no direct replacement of this route. Public footpaths FP29 and FP39 and public	None proposed	Minor beneficial **Not significant**

Impact	Embedded/Good Practice Mitigation	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
	be able to access the diverted and upgraded Kings Walden 043 and Kings Walden 041. Best practice construction management measures will be in place, including community liaison personnel to communicate timings of changes to access to PRoW, as set out in the CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**).			bridleways BW28 and BW37 will remain accessible during assessment Phase 1 and will be stopped-up to facilitate the Proposed Development during construction for assessment Phase 2a. Additional footpaths and bridleways will be provided as part of the replacement open space during assessment Phase 1. There are considered to be no effects during assessment Phase 2a because higher quality, accessible alternatives will		

Impact	Embedded/Good Practice Mitigation	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
				be available for users. At assessment Phase 2b, connectivity between FP39 and BW37 through the replacement open space will be restored and there will be a number of higher quality accessible alternative recreational routes for users to access in the area.		
All assessment Phases Impact on users of PRoW Kings Walden 041 (between Eaton Green Road and Darley Road, section not part of Chiltern Way long distance footpath) and bridleway Kings	Works in accordance with the CoCP (provided as **Appendix 4.2** of this ES **[TR020001/APP/5.02]**). Upgrading of Kings Walden 041 to bridleway and incorporated into replacement open space. Updating of bridleway Kings	Low Redirection and upgrading of footpath to a bridleway and bridleway to a multi-user track.	Very low There are a number of comparable alternative routes nearby. User count surveys from 2019 indicate low usage of these routes (see **Appendix 13.2** of this ES	Negligible permanent effect - Within land take for Proposed Development (replacement open space). Footpath Kings Walden 041 to be diverted and upgraded to a multi-user track in assessment Phase 1 to	None proposed	Negligible **Not significant**

Impact	Embedded/Good Practice Mitigation	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
Walden 052 (between Darley Road and Colmore Road). (Central Airport Area)	Walden 052 to a multi-user track between Darley Road and Colmore Road. Additional proposed footpaths with improved signage within replacement open space (see mitigation proposed in **Chapter 14** Landscape and Visual of this ES **[TR020001/APP/5.01]**. Best practice construction management measures will be in place, including community liaison personnel to communicate timings of changes to access to PRoW, as set out in the CoCP (provided as **Appendix 4.2**		**[TR020001/APP/5.02]**).	ensure it remains accessible to the public and connected to the wider network of PRoW east of the airport. Access will be maintained along the existing alignment until the diversion is operational. The footpath will then be formally adopted as a bridleway during construction for assessment Phase 2b. Bridleway Kings Walden 052 to be upgraded to a multi-user track during assessment Phase 1.		

Impact	Embedded/Good Practice Mitigation	Magnitude	Receptor Sensitivity	Description of effect and significance	Additional Mitigation	Residual Effect
	of this ES **[TR020001/APP/5.02]**).					

COMPETENT EXPERTS

Topic	Role	Company	Qualifications/competencies/experience of author
Health	Technical Reviewer	Ove Arup & Partners	BSc (Hons) Environmental Conservation and Management, Nottingham Trent University PG Dip Environmental Monitoring and Assessment, London Southbank University Member of the Institute of Environmental Management and Assessment (MIEMA) Chartered Environmentalist (CEnv) Over 20 years of experience project managing Environmental Impact Assessments (EIAs) and Health Impact Assessments (HIAs).
Health	Topic Lead and Author	Ove Arup & Partners	MSc Environmental Assessment and Management – Oxford Brookes University BSc (Hons) Geography – Royal Holloway College, University of London Full Member, Institute of Environmental Science (MIEnvSc) Over 19 years of experience project managing EIAs and HIAs.
Health	Sub-author	Ove Arup & Partners	MPH BSc (Hons) Associate Member, Institute of Environmental Science Consultant, 2.5 years of experience
Community	Technical Reviewer	Ove Arup & Partners	BA(Hons) Town Planning – University of Manchester RTPI Chartered Town Planner Over 25 years of experience managing infrastructure projects including EIAs and community impact assessments.
Community	Topic Lead and Author	Ove Arup & Partners	MSc Spatial Planning – University College London LLB(Hons) Law – University of Leeds RTPI Chartered Town Planner Ten years' experience undertaking and managing the preparation of EIAs and community impact assessments.
Community	Sub-author	Ove Arup & Partners	MSc Urban and Regional Planning - University of Birmingham

Topic	Role	Company	Qualifications/competencies/experience of author
			BA Geography - University College London RTPI Chartered Town Planner Three years' experience.

GLOSSARY AND ABBREVIATIONS

Term	Definition
A321neo	A specific type of aircraft. A member of the Airbus A320 family of short to medium range, narrow-body, commercial passenger twin engine jet airliners
AAR	Airport Access Road - previously referred to as the Century Park Access road
AMI	Acute Myocardial Infarction (Heart attack)
ANPS	Airports National Policy Statement
AOA	Airports Operations Area
AQA	Air Quality Assessment
CCA	Civil Aviation Authority
CCG	Clinical Commissioning Group
CoCP	Code of Construction Practice
COMEAP	Committee on the Medical Effects of Air Pollutants
CRF's	Concentration response functions
CSR	Corporate social responsibility
DALYs	Disability Adjusted Life Years. A DALY is a quantitative measure used to express the burden of disease on a population. A DALY is a sum of the potential years of life lost due to premature death and the equivalent years of 'healthy' life lost from being in a state of poor health or disability. The latter is calculated using a 'disability weight' associated with a particular health state such that a value of zero represents full health, and a value of one represents states equivalent to death.
Luton DART	Direct Air-Rail Transit - A double-shuttle fully-automated people mover system to connect travellers from Luton Airport Parkway station to the terminal at London Luton Airport
DCO	Development Consent Order
DFT	Department for Transport
DoPH	Director of Public Health
DM	Do Minimum
DS	Do Something
EEG	Electroencephalograms
EIA	Environmental Impact Assessment
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
ERF	Exposure Response Function
ES	Environmental Statement

Term	Definition
ETS	Employment and Training Strategy
EqIA	Equality Impact Assessment
EU	European Union
FEGP	Fixed electrical ground power
FRA	Flood Risk Assessment
FTE	Full time equivalent
GP	General Practitioner
HA	Highly annoyed
Ha	Hectares
Health Determinant	The economic and social conditions that influence individual and group differences in health status.
HGV	Heavy Goods Vehicles
HIA	Health Impact Assessment
HSD	Highly Sleep Disturbed
HUDU	Healthy Urban Development Unit
IAIA	International Association of Impact Assessment
ICAO	International Civil Aviation Organisation
ICCI	In-combination Climate Change Impacts
Index of Multiple Deprivation	Indices of multiple deprivation (IMD) are widely used datasets within the UK to classify the relative deprivation (essentially a measure of poverty) of small areas. Multiple components of deprivation are weighted with different strengths and compiled into a single score of deprivation.
LAeq	Equivalent Continuous Sound Pressure Level. The constant noise level that would result in the same total sound energy being produced over a given period. LAeq is a fundamental measurement parameter designed to represent a varying sound source over a given time as a single number
LBC	Luton Borough Council
Outline LBMP	Outline Landscape and Biodiversity Management Plan
Luton Rising	A trading name for London Luton Airport Limited
LLNAP	Luton Airport Noise Action Plan 2019-2023
LOAEL	Lowest observed adverse effect level
mppa	Million passengers per annum
NHDC	North Hertfordshire District Council
NO_2	Nitrogen Dioxide
NHS	National Health Service
NPPF	National Planning Policy Framework

Term	Definition
NSIP	Nationally Significant Infrastructure Project
OFSTED	Office for Standards in Education, Children's Services and Skills
OS	Ordnance Survey
PEIR	Preliminary Environmental Information Report
PHE	Public Health England now known as UK Health Security Agency and Office for Health Improvement and Disparities
PM_{10} and PM $_{2.5}$	Particulate Matter with diameters less than 10 micrometres; and PM 2.5 respectively.
PRoW	Public Right of Way
QALY	Quality Adjusted Life Year. A QALY is a measure of the value of health outcomes on a population. However, instead of using disability weights, QALYs use a quality-of-life weight associated to a particular health state such that a value of one represents full health, and a value of zero represents states equivalent to death. The amount of time spent in the particular health state is then multiplied by the quality-of-life weight.
SHMA	Strategic Housing Market Assessment
SOAEL	Significant Observed Adverse Effect Level - this is the level above which significant adverse effects on health and quality of life occur.
SoNA	Survey of Noise Attitudes
TAG	Transport Analysis Guidance
the airport	London Luton Airport
Three Counties	Bedfordshire, Buckinghamshire and Hertfordshire
TOKKO	Luton based youth charity
µg/m3	Micrograms per cubic metre
Vulnerable groups	Individuals who are made vulnerable by the situations and environments they are exposed to (as opposed to any inherent weakness or lack of capacity). This includes groups of people who may be more likely to be exposed to a change in a health determinant, or to experience health effects as a result of exposure.
Ward	A ward is a primary unit of English electoral geography for borough and district councils. It is also a geographical scale at which demographic and health data is collected.
WebTAG	Web-based Transport Analysis Guidance
Wellbeing	Wellbeing refers to positive psychological health
WHIASU	Wales Health Impact Assessment Support Unit
WHO	World Health Organisation

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