Volume 1, Chapter 12

Health
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Appendix 12.2: Health baseline
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Appendix 12.4: Health priorities
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12. HEALTH

12.1 Introduction

12.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the preliminary results of the assessment of the likely significant effects of the DCO Project with respect to health, including physical and mental health and wellbeing. It should be read in conjunction with the DCO Project description provided in Chapter 6: DCO Project description, Volume 1 and the relevant parts of the following chapters:

1. Chapter 7: Air quality and odour, Volume 1
2. Chapter 10: Climate change, Volume 1
3. Chapter 11: Community, Volume 1
4. Chapter 14: Land quality, Volume 1
5. Chapter 15: Landscape and visual amenity, Volume 1
6. Chapter 16: Major accidents and disasters, Volume 1
7. Chapter 17: Noise and vibration, Volume 1
8. Chapter 18: Socio-economics and employment, Volume 1
9. Chapter 19: Transport network users, Volume 1
10. Chapter 20: Waste, Volume 1

12.1.2 The relationship between these aspect chapters and the health assessment is described in Section 12.4: Scope of the assessment.

12.1.3 This chapter describes:

1. The relevant legislation, planning policy and other documentation that has informed the assessment (Section 12.2: Relevant legislation, policy and other important and relevant matters)
2. The outcome of external engagement that has been undertaken, including how matters on health within the Scoping Opinion adopted in July 2018 have been addressed (Section 12.3: Scoping and engagement)
3. The scope of the assessment for health (Section 12.4)
4. Embedded environmental measures relevant to health (Section 12.5: Embedded environmental measures)
5. The methods used for the baseline data gathering (Section 12.6: Methodology for baseline data gathering)

6. The assessment methods used for the PEIR (Section 12.7: Assessment methodology for PEIR)

7. The assumptions and limitations of the PEIR assessment (Section 12.8: Assumptions and limitations of this PEIR)

8. The overall baseline (Section 12.9: Overall baseline)

9. The assessment of health effects (Section 12.10: Assessment of effects)

10. A summary of significance of positive and negative health effects identified in the PEIR (Section 12.11: Preliminary assessment of significance)

11. The assessment of cumulative health effects (Section 12.12: Assessment of cumulative effects)

12. Consideration of any additional environmental measures or compensation required (Section 12.13: Consideration of additional environmental measures or compensation)

13. An outline of further work to be undertaken for the Environmental Statement (ES) (Section 12.14: Next steps).

12.1.4 In-combination effects are addressed in Chapter 22: In-combination effects, Volume 1 where the combined health effects reported in this chapter (for instance in-combination health effects affecting resources, communities or locations simultaneously) are considered alongside other non-health effects of the DCO Project.

12.1.5 Reference should also be made to Chapter 23: Bibliography, Volume 1 and Glossary of terms of list of abbreviations.

12.1.6 The requirement to consider health within the Environmental Impact Assessment (EIA) process was made explicit in The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the ‘EIA Regulations’). There is no statutory guidance on considering health within the context of EIA.

12.1.7 The Airports National Policy Statement (ANPS) (Department for Transport, 2018a) also requires health impacts of the DCO Project to be assessed. These requirements are set out in Section 12.2.

12.1.8 On this project there is a statutory requirement for EIA (including consideration of health) and there is also a policy requirement for health impact assessment (HIA).

12.1.9 HIA is a combination of tools and methods that helps to judge the potential health effects of a policy, plan, programme or project on the health of the population and...
the distribution of those effects within the population. For this project, the requirement for HIA is being delivered through the application of EIA methodology in considering the health effects of the DCO Project. The NHS Healthy Urban Development Unit (HUDU) states that HIAs can be done as stand-alone assessments or as part of a wider Sustainability Appraisal, Environmental Impact Assessment, or Integrated Impact Assessment (NHS Healthy Urban Development Unit, no date). Therefore, this chapter serves the dual role of preparing a HIA and reporting the likely significant environmental effects for the purposes of EIA.

Appendix 12.1: Health Impact Assessment route map, Volume 3 sets out the typical elements of the HIA process and provides signposting to where these can be found within this document.

12.1.10 This chapter uses the World Health Organization’s (WHO) definition of health, which states that health is:

‘a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity.’

12.1.11 Wellbeing is implicit in any reference to health. The terms ‘health’ and ‘health and wellbeing’ are used interchangeably. This chapter also uses a WHO definition for wellbeing which is an integral aspect of mental health. The WHO state that mental health is more than the absence of mental disorders and that mental health is a state of wellbeing defined as:

‘a state in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community.’

12.1.12 Graphic 12.1 shows how the factors that influence health and wellbeing apply at the individual level, for example, smoking, use of alcohol and diet. It also shows how these factors apply at the level of local community (for example, the level of support that people enjoy in their local community), and at the wider society level (for example, whether employment is available and whether steps are taken to protect the environment).

12.1.13 These influences are known as the ‘determinants of health and wellbeing’. These determinants can improve and protect health and wellbeing or they can be harmful. The effects might be on physical health and/or on mental health. Health and wellbeing are thus determined by a wide range of issues, many outside the control of individual choices.

12.1.14 The assessment of human health presented here has examined the ways in which the DCO Project potentially affects these determinants of health and wellbeing.
12.1.15 Not all of the determinants of health in **Graphic 12.1** are relevant to the activities associated with the DCO Project. Within **Section 12.4, Table 12.4** sets out the health effects that have the potential to give rise to likely significant effects and are assessed in this chapter. **Section 12.4, Table 12.5** identifies potential effects that are no longer considered in this chapter, principally as they relate to potential effects that are addressed by other aspects of the PEIR.

12.1.16 The chapter also has regard to health inequalities. The effects of the DCO Project may be experienced differently by different population groups; population groups can be identified by factors including (but not limited to) age, gender, ethnicity, socio-economic status, place of residence or pre-existing health status. Public health initiatives seek to reduce inequalities in health between population groups (Department of Health, 2016).

12.1.17 A project-level Equality Impact Assessment (EqIA) is also being prepared to accompany the application for development consent, the initial findings of which
are being consulted on as part of the Airport Expansion Consultation (June 2019). The EqIA focuses on assessing effects on the groups with protected characteristics defined in the Equality Act 2010. The EqIA also considers issues that extend beyond health and wellbeing. The assessments share inputs such as demography, evidence-based relationships and inputs from stakeholder engagement. The health assessment will only identify health effects on groups with protected characteristics in cases where the effects experienced by those groups are different to the general population.

12.1.18 The assessments are complementary and there are shared elements of the methods, assessment conclusions and mitigations common to both the Health chapter of the PEIR and the *Equality Impact Assessment: Initial Findings* report.

### 12.2 Relevant legislation, policy and other important and relevant matters

#### Introduction

12.2.1 This section identifies the legislation, planning policy and other important or relevant matters that set the context for health effects relevant to the DCO Project. Further information on how the policies and legislation inform the assessment of health effects is set out in Section 12.10. Additionally, further information on policies relevant to the wider EIA and their status is provided in Chapter 2: Legislative and policy overview, Volume 1.

12.2.2 Provisions to protect human health are subject of many separate statutory regimes covering issues such as environmental protection and occupational health and safety. The application of the EIA Regulations does not seek to duplicate the provisions of this legislation.

#### Legislation and national planning policy

12.2.3 Table 12.1 lists the legislation relevant to the assessment of the effects on health for the DCO Project.

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<thead>
<tr>
<th>Legislation description</th>
<th>Relevance to assessment</th>
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<tbody>
<tr>
<td>Control of Major Accident Hazards Regulations 2015 (HM Government of Great Britain, 2015)</td>
<td>The health assessment has regard to the fact that the regulations apply to sites that hold threshold quantities of substances identified in the regulations, including jet fuel, described further in Section 12.10.</td>
</tr>
<tr>
<td>The regulations create general duties on operators to take all measures necessary to prevent major accidents and to limit their consequences for human health and the environment.</td>
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### Legislation description

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<tr>
<th>Legislation</th>
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<tr>
<td><strong>Health and Social Care Act 2012</strong>&lt;br&gt;(HM Government of Great Britain &amp; Northern Ireland, 2012a)</td>
<td>The Health chapter will assist relevant health bodies in discharging their duties in relation to health inequalities.</td>
</tr>
<tr>
<td>The Act introduced legal duties about health inequalities. It included specific duties for health bodies including the Department of Health, Public Health England, Clinical Commissioning Groups, and NHS England which require the bodies to have due regard to reducing health inequalities between the people of England. The Act also creates duties on local planning authorities (LPAs) to take such steps as they consider appropriate for improving the health of the people in their area.</td>
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<tr>
<td><strong>The Social Value Act 2012</strong>&lt;br&gt;(HM Government of Great Britain &amp; Northern Ireland, 2012b)</td>
<td>The Health chapter will assist public sector commissioners in identifying relevant wellbeing considerations linked to any service implications of the changes associated with the DCO Project.</td>
</tr>
<tr>
<td>The Act requires public sector commissioners – including LPAs and health sector bodies – to consider economic, social and environmental wellbeing in procurement of services or contracts. Creating social value has connections with reducing health inequalities and can in the longer term reduce the demand on health services and other services.</td>
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<tr>
<td><strong>Equality Act 2010</strong>&lt;br&gt;(HM Government of Great Britain &amp; Northern Ireland, 2010a)</td>
<td>The Health chapter identifies health effects on groups with protected characteristics (set out in the Equality Act 2010) in cases where the effects experienced by those groups are different to the general population. All health effects are considered in terms of the general population and vulnerable groups (refer to Section 12.4).</td>
</tr>
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<td>The Act established equality duties for all public sector bodies which aim to integrate consideration of the advancement of equality into the day-to-day business of all bodies subject to the duty.</td>
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<tr>
<td><strong>Sustainable Communities Act 2007</strong>&lt;br&gt;(HM Government of Great Britain &amp; Northern Ireland, 2007b)</td>
<td>The Health chapter will assist LPAs in promoting community sustainability within the context of the changes associated with the DCO Project.</td>
</tr>
<tr>
<td>The Act aims to promote the sustainability of local communities through work between the Secretary of State and LPAs by encouraging the improvement of the economic, social or environmental well-being of the area. This includes measures designed to increase community health and well-being and the provision of local services (which include health facilities, including hospitals and pharmacies, social housing, schools, sports facilities and open spaces). The Act defines ‘community health and well-being’ as the degree to which persons resident in an area identify with that area and receive an increased quality of life as a result of the nature and the environment of the area. Under this act the Secretary of State invites local authorities to make proposals which they consider would contribute to promoting the sustainability of local communities.</td>
<td></td>
</tr>
<tr>
<td><strong>Environmental Protection Act 1990</strong>&lt;br&gt;(HM Government of Great Britain &amp; Northern Ireland, 1990)</td>
<td>The Health chapter considers the potential for emissions or disturbance (where they are applicable as defined by EPA 1990) due to the DCO Project to be prejudicial to health or</td>
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Heathrow Expansion
PRELIMINARY ENVIRONMENTAL INFORMATION REPORT: Chapter 12: Health

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The Health and Safety at Work Act 1974 places duties on employers to ensure, so far as is reasonably practicable: the health, safety and welfare at work of all their employees; and that persons not in their employment are not exposed to risks to their health or safety as a result of the activities undertaken. In both cases, the requirement for risks to be reduced to As Low As Reasonably Practicable is fundamental and applies to all activities within the scope of the Health and Safety at Work Act 1974.

The health assessment has regard to the fact that, as with other industries, construction contractors and airport operators are required to comply with the Health and Safety at Work Act 1974 and its relevant statutory provisions.

12.2.4 **Table 12.2** lists the national planning policy relevant to the assessment of the effects on health.

### Table 12.2: National planning policy relevant to health

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<thead>
<tr>
<th>Policy description</th>
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<td><strong>Airports National Policy Statement (ANPS) (Department for Transport, 2018a)</strong></td>
<td>The ANPS sets the national policy context for airport development, including expectations for how development and planning decisions should take health into account.</td>
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<tr>
<td></td>
<td>The ANPS requires a project level assessment of any likely significant health impacts, including through health impact assessment and within the ES.</td>
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<td></td>
<td>The PEIR complies with this requirement. The PEIR considers a range of potential health issues relevant to the DCO Project (Section 12.10), cumulative effects (Section 12.12) and signposts to where health issues are covered by other aspects (Section 12.4). Measures to avoid, reduce or compensate for negative health effects as appropriate, as well as propose measures to maximise the health...</td>
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12.7 © Heathrow Airport Limited 2019

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**Legislation description**


The Health and Safety at Work Act 1974 places duties on employers to ensure, so far as is reasonably practicable: the health, safety and welfare at work of all their employees; and that persons not in their employment are not exposed to risks to their health or safety as a result of the activities undertaken. In both cases, the requirement for risks to be reduced to As Low As Reasonably Practicable is fundamental and applies to all activities within the scope of the Health and Safety at Work Act 1974.

**Relevance to assessment**

a nuisance.

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**Table 12.2** lists the national planning policy relevant to the assessment of the effects on health.

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Paragraph 4.72: ‘As described elsewhere in the Airports NPS, where the proposed project has likely significant environmental impacts that would have an effect on human beings, any environmental statement should identify and set out the assessment of any likely significant health impacts.’

Paragraph 4.73: ‘The applicant should identify measures to avoid, reduce or compensate for adverse health impacts as appropriate. These impacts may affect people simultaneously, so the applicant, the Examining Authority and the Secretary of State (in determining an application for development consent) should consider the cumulative impact on health.’

The ANPS also acknowledges that air quality (paragraph 5.23), noise (paragraphs 5.44 to 5.68 and 5.239), night flights (paragraph 5.56), waste management (paragraphs 5.135 to 5.140), discharges to water (paragraph 5.172) and land instability (paragraph 5.226), can also affect health. Benefits are also identified (Section 12.5 and Section 12.13).

The health assessment considers the likely significant health effects associated with air quality, discharges to water, waste management and land instability (see Tables 12.4 and 12.5).

The health effects of Noise are assessed in Section 17.10 of Chapter 17: Noise and vibration.

**National Policy Statement for National Networks (NN NPS) (Department for Transport, 2014)**

The nature of the DCO Project means that the National Policy Statement for National Networks could apply to parts of the scheme.

The ANPS states at paragraph 4.8 that ‘The Secretary of State will consider any relevant nationally significant road and rail elements of the applicant’s proposals in accordance with the National Networks NPS and with the Airports NPS. If there is conflict between the Airports NPS and other NPSs, the conflict should be resolved in favour of the NPS that has been most recently designated.’

The policy outlines how decisions will be made relating to development consent orders for nationally significant rail and road infrastructure projects.

Paragraph 4.79: ‘National road …networks… have the potential to affect the health, well-being and quality of life of the population. They can have direct impacts on health because of traffic, noise, vibration, air quality and emissions, light pollution, community severance, dust, odour, polluting water, hazardous waste and pests.’

Paragraph 4.80: ‘New or enhanced national network infrastructure may 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.’

Paragraph 4.81: ‘...where the proposed project has likely significant environmental impacts that would have an effect on human beings, any environmental statement should identify and set out the assessment of any likely significant adverse health impacts.’

Paragraph 4.82: ‘The applicant should identify measures to avoid, reduce or compensate for adverse health impacts as appropriate …[and]… should consider the cumulative impact on health.’

The NN NPS also acknowledges that air quality (paragraph 5.3), noise,
### Policy description
(paragraph 5.186), waste management (paragraph 5.39), discharges to water (paragraph 5.219) and land instability (paragraph 5.116), can also affect health.

### National Planning Policy Framework (Ministry of Housing Communities & Local Government, 2019)

The National Planning Policy Framework (NPPF) includes statements that frame planning policy and planning determinations with regard to health, specifically:

**Paragraph 91:** ‘Planning policies and decisions should aim to achieve healthy, inclusive and safe places which… promote social interaction… are safe and accessible… and enable and support healthy lifestyles, especially where this would address identified local health and well-being needs…’.

**Paragraph 92:** ‘To provide the social, recreational and cultural facilities and services the community needs, planning policies and decisions should: … take into account and support the delivery of local strategies to improve health, social and cultural well-being for all sections of the community… [and] guard against the unnecessary loss of valued facilities and services, particularly where this would reduce the community’s ability to meet its day-to-day needs…’.

**Paragraph 96:** ‘Access to a network of high quality open spaces and opportunities for sport and physical activity is important for the health and well-being of communities.’

**Paragraph 98:** ‘Planning policies and decisions should protect and enhance public rights of way and access, including taking opportunities to provide better facilities for users…’.

**Paragraph 102:** ‘Transport issues should be considered from the earliest stages of plan-making and development proposals, so that: … opportunities to promote walking, cycling and public transport use are identified and pursued; … and patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places.’

**Paragraph 103:** ‘Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions and improve air quality and public health.’

**Paragraph 127:** ‘Planning policies and decisions should ensure that developments: are visually attractive as a result of good architecture, layout and appropriate and effective landscaping… create attractive, welcoming and distinctive places to live, work and visit… and create places that are safe, inclusive and accessible and which promote health and well-being, with a high standard of amenity for existing and future users’.

**Paragraph 180:** ‘Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment… In doing so they should: avoid noise giving rise to significant adverse impacts on health and the quality of life; identify and protect tranquil areas which have remained

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**Relevance to assessment**
The NPPF sets the national policy context for planning in general, including expectations for how development and planning decisions should take health into account.

The NPPF sets out a range of potential health issues relevant to planning generally. These are considered in this Health chapter (Section 12.10).
Paragraph 181: ‘Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants… Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications.’

### Regional and local planning policy

12.2.5 **Appendix 2.1: Regional and local planning policy and other important and relevant matters, Volume 3** presents the full list of the regional and local planning policy relevant to the assessment of the effects on health receptors (based on the spatial scope and study areas set out in Section 12.4). The local planning policies from the following Local Planning Authorities (LPAs) have been considered where the geographic extent of each health effect interacts with the LPA area:

1. London Borough of Hillingdon
2. London Borough of Hounslow
3. South Bucks District Council
4. Slough Borough Council
5. Spelthorne Borough Council
6. The Royal Borough of Windsor and Maidenhead
7. London Borough of Ealing
8. Runnymede Borough Council
9. Elmbridge Borough Council
10. London Borough of Richmond Upon Thames

12.2.6 The policy of the Greater London Authority (GLA) is also considered.

### Other important and relevant matters

12.2.1 A summary of other technical documentation relevant to the assessment undertaken in health is provided within Appendix 2.1.
12.3 Scoping and engagement

Overview

12.3.1 This section describes the outcome of, and response to, the Scoping Opinion in relation to the health assessment and also provides details of the ongoing technical engagement that has been undertaken with stakeholders and individuals. An overview of engagement undertaken can be found in Section 1.5 of Chapter 1: Introduction, Volume 1.

12.3.2 Engagement has taken the form of meetings as well as letter communications and is summarised in the following sections.

Scoping Opinion

12.3.3 A Scoping Report requesting a Scoping Opinion was submitted to the Secretary of State, administered by the Planning Inspectorate (PINS) on behalf of the Secretary of State, on 21 May 2018. The Scoping Report set out the proposed health assessment methodologies, outlined the baseline data collected to date and proposed for the ES and set out the scope of the assessment.

12.3.4 A Scoping Opinion was adopted by PINS on 2 July 2018. Table 12.3 sets out the comments received in Section 4 of the Scoping Opinion (‘Aspect based scoping tables’) for health (see Section 4.8 of the Scoping Opinion) and how they have been addressed in this PEIR. A full list of the Scoping Opinion comments and responses is provided in Appendix 5.1: Response to the Scoping Opinion, Volume 3. While Appendix 5.1 does not include responses to each of the comments raised in consultation bodies’ individual responses to the Secretary of State as part of the scoping exercise (appended to the Scoping Opinion), regard has been had to those responses in the preparation of the PEIR.

Table 12.3: PINS Scoping Opinion

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<thead>
<tr>
<th>PINS ID number</th>
<th>Scoping Opinion comment</th>
<th>Response to Scoping Opinion comment</th>
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<tbody>
<tr>
<td>74</td>
<td>Rivers and flood storage</td>
<td>In response to the Scoping Opinion, the health effects from rivers and flood storage remain included in the scope of the health assessment and are addressed in Section 12.10.</td>
</tr>
<tr>
<td>75</td>
<td>Aviation fuel storage facilities</td>
<td>In response to the Scoping Opinion, the risk to human health from aviation fuel remain</td>
</tr>
<tr>
<td>PINS ID number</td>
<td>Scoping Opinion comment</td>
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<tr>
<td>76</td>
<td><strong>Health impacts associated with a changing global climate</strong>&lt;br&gt;The Scoping Report proposes to scope this matter out of the health assessment as a climate change assessment will be undertaken to consider resilience to global climate change and the measures that will need to be taken to adapt to climate change. The Inspectorate is satisfied that health impacts associated with changes to the global climate (as a result of the Proposed Development only) can be scoped out of the health assessment but would expect to see adequate cross-referencing and signposting to the matter within the health chapter of the ES.</td>
<td>In response to the Scoping Opinion, no assessment is included in the Health chapter. Cross-referencing to the Chapter 10: Climate change is provided in Table 12.5 which confirms that the potential effects of changing climate patterns are assessed in Chapter 10.</td>
</tr>
<tr>
<td>77</td>
<td><strong>Risks to construction workers from exposure to contamination in soil</strong>&lt;br&gt;The Scoping Report proposes to scope this matter out of the health assessment as this will be addressed in the land quality assessment. The Inspectorate is satisfied with this approach but would expect to see adequate cross-referencing and signposting to the matter within the health chapter of the ES.</td>
<td>In response to the Scoping Opinion, no assessment is included in the health chapter. Cross-referencing to Chapter 14: Land quality is provided in Table 12.5 which confirms that industry standard practices for managing risks are covered in Chapter 14.</td>
</tr>
<tr>
<td>78</td>
<td><strong>Outbreaks of communicable diseases</strong>&lt;br&gt;The Scoping Report proposes to scope this matter out of the health assessment as the operational control measures that are currently in place are expected to continue to apply to the Proposed Development. The Inspectorate does not consider that sufficient information has been provided to justify the scoping out of these matters at this stage. The Applicant must provide an in-depth justification for such scoping out, including an explanation of the current systems, controls, procedures and requirements that are currently in place to address these matters. Where significant effects are likely to occur, this should be assessed within the ES.</td>
<td>In response to the Scoping Opinion, the risks to health from communicable diseases remain included in the scope of the health assessment and are addressed in Section 12.10.</td>
</tr>
<tr>
<td>79</td>
<td><strong>Emergency response measures to potential man-made and natural disasters</strong>&lt;br&gt;In response to the Scoping Opinion, no assessment is included in the Health chapter.</td>
<td></td>
</tr>
</tbody>
</table>
### Scoping Opinion comment

The Scoping Report proposes to scope this matter out of the health assessment as this is to be reported in the Major Accidents and Disasters section of the ES. The Inspectorate is satisfied with this approach but would expect to see adequate cross-referencing and signposting to the matter within the health chapter of the ES.

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<tr>
<th>PINS ID number</th>
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<tr>
<td>80</td>
<td><strong>Effects to population health from water quality due to the Proposed Development</strong>&lt;br&gt;The Scoping Report proposes to scope this matter out of the health assessment as this is to be regulated by the Environment Agency as part of the consenting process. The Inspectorate is satisfied with this approach but would expect to see adequate cross-referencing and signposting to the assessment of water quality within the health chapter of the ES.</td>
<td>In response to the Scoping Opinion, no assessment is included in the health chapter. Cross-referencing to Chapter 16: Major accidents and disasters is provided in Table 12.5 which confirms that emergency response measures are detailed in Chapter 16.</td>
</tr>
<tr>
<td>81</td>
<td><strong>Effects to population health from flooding due to the Proposed Development</strong>&lt;br&gt;The Scoping Report proposes to scope this matter out of the health assessment as this is to be regulated by the Environment Agency as part of the consenting process. As flooding could create a public health emergency in the area, and a perceptual risk of flooding along local communities could lead to impacts on health, the Inspectorate does not consider that enough information has been provided at this stage to demonstrate that there are no likely significant effects in this regard. Where significant effects are likely to occur, this should be assessed within the ES and mitigation proposals such as a flood risk management plan and the interaction of the Applicant with emergency services should be presented.</td>
<td>In response to the Scoping Opinion, the effects of flooding that could affect human health remain included in the scope of the health assessment and are addressed in Section 12.10.</td>
</tr>
<tr>
<td>82</td>
<td><strong>Effects to population health from hazardous waste due to the Proposed Development</strong>&lt;br&gt;The Scoping Report proposes to scope this matter out of the health assessment as this is to be regulated by the Environment Agency as part of the consenting process. The Inspectorate is satisfied with this approach but would expect to see adequate cross-referencing and signposting to the waste assessment and land quality within the health chapter of the ES.</td>
<td>In response to the Scoping Opinion, no assessment is included in the health chapter. Cross-referencing to Chapter 20: Waste is provided in Table 12.5 which confirms that potential effects associated with hazardous waste are detailed in Chapter 20.</td>
</tr>
<tr>
<td>83</td>
<td><strong>Pest control measures</strong>&lt;br&gt;The Scoping Report proposes to scope this</td>
<td>In response to the Scoping Opinion, the health effects from pests remain included in</td>
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<tr>
<td>84</td>
<td><strong>Determinants of health and wellbeing</strong>&lt;br&gt;The Inspectorate welcomes the Applicant’s intention to examine the ecological determinants of health and well-being shown in Graphic 12.1 of the Scoping Report in its assessment of human health. The Applicant should ensure that the ES also examines the social determinants of health and well-being, to include living and working conditions, social and community networks, and individual lifestyle factors.</td>
<td>Social determinants of health are already in the scope of the health assessment – refer to Table 12.4.</td>
</tr>
<tr>
<td>85</td>
<td><strong>Stakeholder engagement</strong>&lt;br&gt;The Inspectorate welcomes the Applicant’s engagement with Health and Wellbeing Boards, Clinical Commissioning Groups and health trusts, as set out in Table 12.2 of the Scoping Report. The ES should clearly set out which specific trusts, board and clinical commissioning groups the Applicant has engaged with, and the outcome of such engagement.</td>
<td>This chapter describes the organisations that have been engaged to date and the outcomes of that engagement within this Section 12.3.&lt;br&gt;Stakeholder engagement is ongoing and will be reported in the ES.</td>
</tr>
<tr>
<td>86</td>
<td><strong>Stakeholder engagement</strong>&lt;br&gt;Table 12.2 of the Scoping Report states that the Applicant has engaged with owners and operators of ‘specific facilities that are impacted by the project’. The ES should clearly set out which facilities this refers to and the outcome of such engagement.</td>
<td>Stakeholder engagement with owners and operators of ‘specific facilities that are impacted by the project’ has been conducted through the Community assessment (refer to Chapter 11: Community). Stakeholder engagement is ongoing and will be reported in the ES.</td>
</tr>
<tr>
<td>87</td>
<td><strong>Study area</strong>&lt;br&gt;The Applicant states that the study area will vary depending on which determinant is being assessed. It should be clear in the text of the ES which study area is being applied to each determinant and effect in the assessment of health impacts. This should include a clear cross-reference to the scope of the health assessment and are addressed in Section 12.10.</td>
<td>Sections 12.4 and 12.10 set out the study areas used for each of the health effects assessed and where relevant, how this relates to other aspects with appropriate cross-referencing. The study areas used for the assessment of health impacts. This should include a clear cross-reference to the scope of the health assessment and are addressed in Section 12.10.</td>
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<td>reference to the relevant sections of other chapters and, where relevant, the supporting plans in order to assist the reader.</td>
<td>health effects will be kept under review as the design of the DCO Project progresses.</td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>The Scoping Report states that baseline data collection is ongoing. The ES should clearly set out all studies and surveys undertaken to inform the final baseline dataset, including a description of the current health and community facilities within the study area. The Applicant should seek to agree its approach with the relevant consultation bodies. The ES should present the likely changes in health facilities and infrastructure within the relevant study area in the future baseline scenario, outlined in the Scoping Report as the full year of operations prior to the opening of a third runway.</td>
<td>Section 12.9 and Appendix 12.2: Health baseline, Volume 3 provide baseline data on current health and community facilities and include information on likely changes on future health facilities and infrastructure.</td>
</tr>
<tr>
<td>Likely significant health effects – light pollution</td>
<td>Table 12.3 of the Scoping Report only identifies light pollution from the Proposed Development as a potentially significant effect during construction. The Inspectorate does not consider that enough information has been provided to demonstrate that there are no likely significant effects in relation to light pollution during operation. Where significant effects are likely to occur, this should be assessed within the ES.</td>
<td>In response to the Scoping Opinion, health effects from lighting during operation are within the scope of the health assessment and are addressed in Section 12.10.</td>
</tr>
<tr>
<td>Likely community health impacts – electromagnetic fields</td>
<td>The Scoping Report does not assess the health impact associated with electromagnetic fields around elements of the Proposed Development such as cabling. The Inspectorate does not consider that enough information has been provided to demonstrate that there are no likely significant effects in relation to electromagnetic fields at this stage. Where significant effects are likely to occur, this should be assessed within the ES.</td>
<td>In response to the Scoping Opinion, health effects from electromagnetic field are within the scope of the health assessment and are addressed in Section 12.10.</td>
</tr>
<tr>
<td>Receptors</td>
<td>The Scoping Report outlines that the general population scope of the health assessment considers residents of, and visitors to-, local communities, the workforce and passengers of the Airport, and construction workers for the Proposed Development. It then states that the</td>
<td>Table 12.6 sets out the approach and receptors considered in the assessment. This confirms that the health assessment considers the workforce and passengers of Heathrow (current and future) and construction workers for the DCO Project, as well as local community receptors.</td>
</tr>
<tr>
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<td>focus of the health assessment is on “community effects”. It is therefore unclear whether the assessment of health impacts will in practice be limited to local communities. The ES should contain an in-depth explanation of the approach to identifying the receptors forming part of the assessment, taking into account the various study areas applicable to the assessment of health impacts. Where this information is set out in another ES chapter, the Applicant should ensure there is adequate cross referencing and signposting to aid the reader.</td>
<td>Section 12.10 provides detail on the receptors that are assessed under each health topic.</td>
</tr>
</tbody>
</table>
| 92             | **Study area**  
The Scoping Report states that the various study areas to be used in the assessment of health impacts are to be kept under review as the design of the Proposed Development progresses. The ES should clearly evidence and justify the final extent of the study area used in the assessment of health impacts. Where this information is set out in another ES chapter, there should be adequate cross referencing and signposting to aid the reader. | Sections 12.4 and 12.10 set out the study areas used for each of the health effects assessed (with justifications) and where relevant, how this relates to other aspects with appropriate cross-referencing.  
The study areas used for the assessment of health effects will be kept under review as the design of the DCO Project progresses.                                                                                                                                 |
| 93             | **Baseline**  
The Scoping Report states that the baseline to be used for most matters considered in the health assessment will be 2016. The ES should include justification for the selected baseline year. | Section 12.9 and Appendix 12.2 provides baseline data with justification for the year provided. This data informs the production of the future baseline used in the assessment.  
The availability of baseline data will be kept under review and if more recent data becomes available this will be used (or justification provided if it is not used).                                                                                                                                 |
| 94             | **Assessment years**  
The Scoping Report states that construction effects will be assessed at the point where “maximum environmental effects” are experienced. The ES should ensure that the assessment takes account of the different phases of the Proposed Development and the different impacts each phase could have on different receptors, including the early release of ATMs. For the purposes of the health assessment, the Inspectorate recommends that the assessment years mirror those in the air quality, noise and traffic and transport assessments as closely as possible. The ES should thoroughly justify the assessment years chosen and ensure that the | The assessment presented in Section 12.10 mirrors the assessment years which are used in the air quality and transport assessments, where information is available. The assessment years reflect the different phases of the DCO Project.  
For the PEIR, these assessment years are considered to represent a reasonable worst-case in order to enable likely significant effects to be identified; these are set out in Table 12.7.  
The assessment years will be reviewed to inform the approach to the ES.                                                                                                                                 |

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12.16 © Heathrow Airport Limited 2019
### Scoping Opinion comment

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</table>
| 95             | **Assessment methodology**  
The assessment methodology should be based on up to date and relevant information including tools prepared by the NHS London Healthy Urban Development Unit where applicable. The Applicant’s attention is drawn to the Hillingdon Clinical Commissioning Group consultation response in this regard. | Assessment tools and information for assessment have been discussed with stakeholders. The tools prepared by the NHS London Healthy Urban Development Unit (HUDU) have been reviewed. The PEIR assessment of health has been checked against the Healthy Urban Planning Checklist (NHS Healthy Urban Development Unit, 2017) and this approach has been discussed with Hillingdon CCG. |
| 96             | **Health pathways**  
The Scoping Report states that the source-pathway-receptor model establishes the plausibility of a potential effect, and once a plausible association is established, a conclusion on the likelihood of an impact occurring is made. The Applicant should ensure that the ES sets out in detail the plausibility and likelihood for each potential effect. Where an effect is plausible but the Applicant concludes that an impact is not likely to result in a significant effect, this should be clearly presented and justified as part of the health assessment. | Section 12.10 sets out detail relating to the assessment method. This includes consideration of the plausibility and likelihood of each potential health effect with justification for judgements made. Section 12.4 provides more general approach to the assessment method and use of evidence. |
| 97             | **Scientific evidence and literature**  
The Scoping Report refers in numerous places to the use of scientific evidence and literature as part of the assessment methodology. The ES should clearly reference the evidence and literature relied upon to inform the assessment. If necessary, in order to inform understanding of the assessment this information should be provided in Appendices to the ES. | Appendix 12.3: Health evidence review, Volume 3 provides a summary of the evidence base and literature used in the assessment. The evidence base will continue to be updated to reflect any new information. |
| 98             | **Health effects subject to qualitative analysis**  
Table 12.6 details potential health effects from different sources. However, certain sources have been identified as having an impact on “wellbeing” only rather than “physical health and wellbeing”. The Inspectorate considers that sources such as living conditions, environment and economy have the potential to impact on physical health in addition to wellbeing and should be assessed in the ES accordingly. | Section 12.10 presents the assessment of physical health, mental health and wellbeing based on the strength of relationship between project activities and the evidence base detailed in Appendix 12.3. |
| 99             | **CoCP and Health Management Plan**  
The Scoping Report refers to the drafting of a CoCP and Health Management Plan as part of its | The measures proposed to address the likely significant health effects will be set out in the health chapter of the ES. This includes |
Technical engagement

12.3.5 Technical engagement has been ongoing with a number of prescribed and non-prescribed consultation bodies and LPAs in relation to health. A summary of engagement undertaken up to finalisation of this PEIR is outlined in this section.

Heathrow Community Engagement Board

12.3.6 Heathrow met with the Heathrow Community Engagement Board (HCEB) in June 2018 and discussed the role of the HCEB and the process of assessment for human health, community and equalities. Heathrow’s engagement with HCEB is ongoing which will include further engagement on the health assessment, in particular around elements involving community engagement.

Heathrow Strategic Planning Group

12.3.7 Engagement with the Heathrow Strategic Planning Group (HSPG) has been ongoing since January 2018. Meetings have been held that focus on health issues and documents have been shared. Focussed areas of engagement with the HSPG Health Group are described below.

12.3.8 January 2018: meeting held to discuss the approach to assessment and mitigation. Topics included: introductions and agenda for HSPG Health Group session; definition of health; objectives of HSPG Health Group; health assessment process.

12.3.9 June 2018: meeting held to discuss the approach to assessment and mitigation. Topics included: HIA/EIA interface and definition of health; DCO Project description and study area; scope of assessment; topics not considered in health assessment; approach to assessment/methodology; reporting; mitigation.

12.3.10 September 2018: meeting held to discuss the approach to assessment and mitigation. Topics included: Scoping Opinion feedback; mitigation; stakeholder engagement update.
December 2018: meeting to discuss the approach to mitigation and capture ideas from participants. Topics included approaches to mitigation in three parts: mitigation arising from the requirement for land; the construction activity; and, finally, the operation of the Airport. Suggestions will continue to inform the development of mitigation measures through the impact assessment process.

February 2019: meeting to present, and to seek comment on, the assessment methods that will be used in the PEIR. There was a recap of stakeholder engagement and of the scope for the assessment.

June 2019: meeting to present the findings from the PEIR assessment.

NHS Clinical Commissioning Groups

NHS Hillingdon, Hounslow and Ealing Clinical Commissioning Groups

NHS Hounslow Clinical Commissioning Group (CCG), NHS Hillingdon CCG and NHS Ealing CCG are co-ordinating their response to the Heathrow Expansion Project.

Heathrow sent each CCG the Airport Expansion Consultation One materials and notification of the submission to PINS of the EIA Scoping Report.

Heathrow met with NHS Hillingdon CCG in June and September 2018 to discuss issues raised in the Scoping Report and to discuss the current and projected demand for health services.

Heathrow also contacted the CCGs by letter in October 2018 with an offer of a further meeting to discuss engagement of all relevant CCGs and health partners in process; use of HUDU tools; infrastructure and services for health care; NHS representatives involvement in the HSPG Health Group; to ensure baseline is up to date and that it takes account of future population; and travel times for ambulances and services generally.

Heathrow met NHS Hounslow CCG in December 2018. The topics discussed were engagement of health stakeholders; the approach to assessing the current and likely future demands for health services, including changes in demand for services during construction and as a result of the DCO Project.

NHS Hillingdon CCG was represented at the February 2019 HSPG Health Group meeting.

Heathrow met with NHS Hillingdon CCG in April 2019 to discuss the approach to assessment and the use of HUDU tools.
NHS Buckinghamshire, East Berkshire, North West Surrey, Richmond, Wandsworth Clinical Commissioning Groups

12.3.21 These CCGs were sent Airport Expansion Consultation One materials and sent notification of the submission to PINS of the EIA Scoping Report.

12.3.22 Heathrow contacted the CCGs in October 2018 to offer a meeting. The suggested topics for engagement were current and likely future demands for health services, including changes in demand for services during construction and as a result of the DCO Project. No meetings have been held with these CCGs so far.

Ambulance Service NHS Trusts

12.3.23 The London Ambulance Service (LAS), South East Coast Ambulance Service and South Central Ambulance Service NHS Trusts were invited to provide consultation feedback on the EIA Scoping Report by PINS.

12.3.24 Heathrow contacted the Ambulance Service NHS Trusts in October 2018 to identify if they wished to contribute to the development of the assessment and with an offer to meet during the assessment period.

12.3.25 The topics proposed for engagement were current and likely future demands (for example, a change in demand for healthcare services); changes in demand for services during construction, for example ambulance callouts; changes in access to services as a result of construction for example temporary diversion or closure/relocation of facilities (for public and for ambulance services); and changes in demand for services as a result of the DCO Project. No meetings have been held with the Ambulance Service NHS Trusts so far.

Directors of Public Health: LPAs; County and District Councils

12.3.26 The Directors of Public Health for Buckinghamshire County Council, London Borough of Ealing, London Borough of Hammersmith and Fulham, London Borough of Hillingdon, London Borough of Hounslow, Royal Borough of Windsor and Maidenhead Council, Runnymede Borough Council, Slough Borough Council, South Bucks District Council and Surrey County Council were sent Airport Expansion Consultation One materials and notification of the issue of the EIA Scoping Report to PINS.

12.3.27 These Directors of Public Health were also contacted in October 2018 to offer a meeting. The suggested topics for engagement were potential health impacts of safety and disturbance during construction and operation; key health outcomes of interest; mental health and wellbeing; population groups as receptors; health assessment methods; and quantification of health outcomes. The offer of a meeting has not been taken up so far by the Directors of Public Health, apart from
the London Borough of Hillingdon. Many of the local authorities are represented on the HSPG Health Group.

12.3.28 The London Borough of Hillingdon were also invited to engage on the potential impact of the expansion on facilities. Heathrow met with the Director of Public Health for the London Borough of Hillingdon in January 2019. The meeting opened with a DCO Project update. The topics discussed were approach to the assessment; engagement; and the potential impact of the proposed expansion on health services.

**Health and Wellbeing Boards**

12.3.29 Heathrow contacted Health and Wellbeing Boards for Buckinghamshire, Ealing, Hillingdon, Hounslow, Slough, Surrey and Windsor and Maidenhead in October 2018 to identify if they wished to contribute to the development of the assessment and with an offer to meet during the assessment period.

12.3.30 The topics suggested for engagement were current and likely future demands for health services and social care, including changes in demand for services during construction and as a result of the DCO Project. The offer of a meeting has not been taken up so far by the Health and Wellbeing Boards.

**Healthwatch**

12.3.31 Heathrow contacted Healthwatch Ealing; Hillingdon; Hounslow; Slough; Surrey; and Windsor, Ascot and Maidenhead in October 2018 to identify if they wished to contribute to the development of the assessment and with an offer to meet during the assessment period.

12.3.32 The topics suggested for engagement were current and likely future demands for health services and social care, including changes in demand for services during construction and as a result of the DCO Project. The offer of a meeting has not been taken up so far by Healthwatch.

**NHS Mental Health Trusts**

12.3.33 Heathrow contacted the NHS Foundation Trusts for Berkshire Healthcare; Central and North West London Healthcare; South West London and St George’s Mental Health; Surrey and Borders Partnership; and West London Mental Health in October 2018 to identify if they wished to contribute to the development of the assessment and with an offer to meet during the assessment period.

12.3.34 The topics suggested for engagement were current and likely future demands for health services, including changes in demand for mental health services during construction and as a result of the DCO Project, as well as views on wider assessment methods and health priorities.
In November 2018, the Central and North West London NHS Foundation Trust contacted Heathrow. After discussion of the DCO Project and the approach to the assessment, the Central and North West London NHS Foundation Trust explained that it delivered services based on the demand from the CCG and advised Heathrow that discussions should be directed through NHS Hillingdon CCG. The offer of a meeting has not been taken up so far by other Mental Health Trusts.

**NHS England, South East and London**

- NHS England, NHS England (London) and NHS England (South East) were sent notification of the issue of the EIA Scoping Report to PINS.
- Heathrow contacted NHS England in October 2018 to identify if they wished to contribute to the assessment and with an offer to meet during the assessment period.
- The topics suggested for engagement were current and likely future demands, for example changes in demand for services during construction; changes in access to services as a result of construction; and changes in demand for services as a result of the DCO Project. The offer of a meeting has not been taken up so far by the NHS.

**Public Health England**

- Heathrow contacted Public Health England (PHE) in November 2017 and May 2018 to invite PHE to be a member of HSPG Health Group.
- PHE was sent Airport Expansion Consultation One materials and sent notification of the issue of the EIA Scoping Report to PINS and offered a meeting.
- Heathrow met with PHE in September 2018 to discuss noise issues.
- Heathrow then subsequently contacted PHE with the offer of a meeting to discuss health issues and a meeting was held in November 2018. This covered issues relevant to environmental public health and health and wellbeing. The meeting included an update on the DCO Project; the approach to engagement; the comments made in the Scoping Opinion and the ways that the comments will be addressed in the ongoing assessment.
- Heathrow met with PHE in March 2019 to discuss assessment methods. The topics discussed included the scope of, and the method for, the assessment of human health. Other matters discussed included linking PHE with the teams working on the topics of noise, air quality and in-combination climate change; stakeholder engagement and matters for future meetings, for example Port Health.
Greater London Authority

12.3.44 Heathrow contacted the Greater London Authority (GLA) in October 2018 to inquire if they wished to contribute to the development of the assessment and to extend an offer to meet during the assessment period.

12.3.45 Heathrow met with the GLA Head of Health in March 2019. Topics covered include DCO Project update; approach to assessment and engagement. No follow-up meetings were arranged but an open offer for further meetings was made by Heathrow.

Transport for London (Public Health)

12.3.46 Heathrow contacted Transport for London (TfL) in November 2017 and May 2018 to invite TfL to be a member of HSPG Health Group.

12.3.47 TfL was sent Airport Expansion Consultation One materials; sent notification of the issue of the EIA Scoping Report to PINS and offered a meeting as a prescribed consultee.

12.3.48 Heathrow contacted TfL in October 2018 to identify if they wished to contribute to the development of the assessment and with an offer to meet during the assessment period. The offer of a meeting has not been taken up so far by TfL.

Heathrow Travel Care

12.3.49 Heathrow contacted Heathrow Travel Care (HTC) to discuss the work conducted by HTC and the role it plays in caring for vulnerable adults and children who pass through the Airport.

12.3.50 Further dialogue will take place with HTC as part of the demand that the Airport places on the local health and social care economy.

Heathrow Police Service

12.3.51 Heathrow contacted Heathrow Police Service in January 2019 to discuss their work and the role the service has for security and interactions with health such as emergency planning and mental health. Discussions identified care pathways such as caring for the homeless arriving at Heathrow Airport. Further dialogue will take place to inform the Airport demand for local services.

Heathrow Chaplaincy

12.3.52 Heathrow met with the Chaplaincy in January 2019. Topics covered included the roles of the Chaplaincy within the Airport and the links that the Chaplaincy is building to strengthen the support it is able to provide to passengers, Heathrow colleagues and Airport visitors. These links are with other faith communities and
also with service providers such as hospitals and mortuaries. Further dialogue will take place to inform the baseline for the demand that the Airport places on local services.

**Community engagement**

12.3.53 Community engagement is being undertaken with communities that surround the Airport. The opinions of local people are important in identifying the aspirations and the concerns of people who may be affected by the DCO Project. The aim of the stakeholder engagement for health is to ensure that the assessment is informed by a dialogue with stakeholders, internal and external to Heathrow.

**Heathrow listening events**

12.3.54 In April 2018 and May 2018 Heathrow ran community listening events. The main aim of these was to give people who live and work in villages most affected by current operations and by the proposed expansion the opportunity to share their priorities/concerns about the place where they live or work. This could be anything from great open spaces to better public transport connections or support for community organisations/events etc. The views shared at these events did not form part of the Airport Expansion Consultation One process.

12.3.55 These listening events were part of the wider community engagement approach and Heathrow’s commitment to being a better neighbour. The discussions will help Heathrow to understand what is important to residents in the villages and to understand what opportunities there are to help improve the area and minimise negative effects from current and future operations.

12.3.56 The listening events were not explicitly related to the DCO Project but they were a helpful way to engage with residents and to develop an understanding of the communities that will be affected by the DCO Project.

**Heathrow information sessions**

12.3.57 Heathrow ran a series of drop-in information sessions in the villages surrounding the Airport following the Parliamentary vote on the ANPS. These were open to everyone and were an opportunity to meet members of the community relations team and to ask questions regarding Heathrow expansion.

**Community events**

12.3.58 Heathrow ran a series of drop-in sessions in the LPA areas surrounding the Airport following the publication of the Equality Impact Assessment: Engagement on scope and progress report in April 2019. Invitations for these sessions were sent to identified stakeholder groups with Protected Characteristics (as defined by the
Equality Act 2010). The output of these sessions provides additional material to inform the assessment of health effects on vulnerable groups.

Community facilities

12.3.59 Heathrow has engaged with the owners/operators of a number of community facilities including primary schools, Heathrow Special Needs Centre, Green Corridor, Harmondsworth Community Hall, Wonderland Day Nursery, Sport England and various sport/recreation clubs and organisations. Chapter 11: Community sets out the engagement progress to date.

12.4 Scope of the assessment

Overview

12.4.1 This section describes the potential effects, the likely receptors, and the spatial and temporal scope for the assessment as it applies to health.

12.4.2 This scope has been developed as the DCO Project has evolved and responds to feedback received to date as detailed in Section 12.3. The information presented in the PEIR is by its nature preliminary and should not be considered a ‘draft’ ES (in accordance with PINS Advice Note Seven). Further scope refinement may be required to take full account of the preferred DCO Project design and subsequent engagement.

Identification of potential effects

12.4.3 Potential effects on health receptors that have been scoped in for assessment are summarised in Table 12.4.

<table>
<thead>
<tr>
<th>Receptors</th>
<th>Activity</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residents directly affected by relocation</td>
<td>Requirement for land (temporary and permanent) to construct and operate the DCO Project, including displacement of existing land uses and changes to local traffic routes</td>
<td>Residential relocation: Population required to relocate. Potential effect on the health of residents required to relocate.</td>
</tr>
<tr>
<td>Residents indirectly affected by relocation</td>
<td></td>
<td>Community cohesion: Relocation affecting the remaining communities. Potential effect of the reduction in the number of residential properties on the social networks for those that remain.</td>
</tr>
<tr>
<td>Residents Users of community facilities Operators of community</td>
<td></td>
<td>Access to services and healthcare: Changes to access to public services. Potential effect of</td>
</tr>
<tr>
<td>Receptors</td>
<td>Activity</td>
<td>Effect</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>facilities</td>
<td>dislocation or change in access affecting public services (including health and social care, educational and recreational amenities) and effect on those requiring access to those services.</td>
<td></td>
</tr>
</tbody>
</table>
| Residents
Users of open space and sports facilities                            |                                               | **Healthy lifestyles: Open spaces and active lifestyles.** Potential effect of displacement of, or change in access to, formal and informal open spaces affecting opportunities for physical activity and active lifestyles. |
| Residents
Those working at the Airport (Heathrow colleagues)
Visitors to communities                                                   |                                               | **Healthy lifestyles: Active travel.** Potential effect of changes to local traffic and transport (including community severance) and changes in the use of active travel modes (cycling and walking) affecting opportunities for healthy lifestyles. |
| Residents                                                               |                                               | **Flood risk: Flood risk management.** Potential effect of land requirement leading to increased risk of flooding which could have human health consequences. |
| Residents
Users of schools and medical and social care facilities                | Construction activity, traffic and workforce  | **Environment: Construction effects.** Potential effect of construction activity (including use of construction plant and traffic) resulting in changes in noise and vibration, emissions to air (including dust and odour) and changes to visual amenity (such as light pollution) which may affect health and wellbeing. |
| Those working at the Airport (Heathrow colleagues)
Residents                                                          |                                               | **Healthy lifestyles: Construction workforce.** Potential effects of the presence of the construction workforce and possible concerns for the local community. |
| Residents
Those working at the Airport (Heathrow colleagues)                    |                                               | **Healthy lifestyles: Presence of pests due to construction facilities and activities.** Possible health effects on the local community. |
| Working age population                                                    |                                               | **Employment, training and economy: Displacement of business and commercial activity.** Potential effects from displacement of commercial properties affecting the health consequences of changes to employment. |
### Receptors

| Operators of local amenities | Employment, training and economy: Procuring goods and services and the local economy. Potential effects of demand created by the construction workforce and procurement of local goods and services affecting the health consequences of changes to local economic conditions. |
| Working age population | Employment, training and economy: Demand for construction workforce and employment. Potential effects from the requirement for a construction workforce affecting the health consequences of access to employment. |

### Operation

<p>| Residents | Noise: Potential effects from changes in aircraft noise exposure as a result of additional ATMs (and other noise and vibration sources), different operating regimes and changes to aircraft fleet mix. Noise (unwanted sound) is a pathway for health effects relating to annoyance; sleep disturbance; cardiovascular impacts and cognitive development of children. Noise health effects are described in Chapter 17: Noise and vibration to meet requirements of the ANPS. Where noise effects influence health in-combination effects, these are reported in Section 12.10. |
| Operators and users of community facilities | Changes in sound exposure |
| Schools | Air quality: Potential effects from changes to emissions to air from aircraft, airside plant and vehicles, combustion plant (for example energy centre) and road traffic vehicles (oxides of nitrogen, nitrogen dioxide and particulate matter). Potential to cause health effects, principally affecting respiratory and cardiovascular health. |
| Healthcare facilities | Changes in emissions to air |
| Road users | Transport: Road safety. Potential effects from changes in the road layout and road traffic may result in a change in road traffic incidents (effects associated with road safety). |
| Those working at the Airport | Electromagnetic field exposure: Change in electromagnetic fields. |</p>
<table>
<thead>
<tr>
<th>Receptors</th>
<th>Activity</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Heathrow colleagues)</td>
<td></td>
<td>Potentially affecting health due to new and relocated power distribution exposure to electromagnetic field effects.</td>
</tr>
<tr>
<td>Working age population</td>
<td>Existence of an expanded airport</td>
<td>Employment, training and economy: Demand for operational workforce and employment. Potential effects from the requirement for an operational workforce affecting the health consequences of access to employment.</td>
</tr>
<tr>
<td>Residents</td>
<td></td>
<td>Access to services and healthcare: Change in demand for local healthcare. Potential effects from a change in the population accessing and demanding public healthcare services (for instance additional passengers and Heathrow colleagues).</td>
</tr>
<tr>
<td>Those working at the Airport</td>
<td></td>
<td>Communicable diseases: Potential for additional cases of communicable diseases. Potential effects on the health of those affected by disease and the provision of services to manage and treat those affected by disease.</td>
</tr>
<tr>
<td>(Heathrow colleagues)</td>
<td></td>
<td>Transport: Leisure travel opportunities. Potential effects from changes in opportunities to access leisure travel and the impacts on lifestyle benefits for passengers.</td>
</tr>
<tr>
<td>Healthcare operators</td>
<td></td>
<td>Aviation fuel storage emergency. Potential for harm from aviation fuel spill, fire or explosion. Potential effects on the health of those directly affected by an emergency.</td>
</tr>
<tr>
<td>Residents</td>
<td></td>
<td>Flood risk: Flood risk management. Potential effect of land requirement leading to increased risk of flooding which could have human health consequences.</td>
</tr>
<tr>
<td>Residents</td>
<td></td>
<td>Community cohesion: Community identity. Potential effects from changes in how people feel about their local community, sense of place and wellbeing.</td>
</tr>
</tbody>
</table>
Effects no longer considered in this chapter

12.4.4 The following effects may give rise to health effects, however, if this is the case, any health effects are assessed in other aspect chapters, as indicated in Table 12.5.

Table 12.5: Effects considered in other aspect chapters

<table>
<thead>
<tr>
<th>Effect</th>
<th>Chapter addressing effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential effects associated with a changing global climate</td>
<td>The potential effects of changing climate patterns are assessed and measures proposed in Chapter 10: Climate change.</td>
</tr>
<tr>
<td>Potential effects associated with of exposure to contamination in soil</td>
<td>Industry standard practices for managing risks are covered in Chapter 14: Land quality.</td>
</tr>
<tr>
<td>Potential effects relating to emergency response measures to potential man-made and natural disasters</td>
<td>Effects are detailed in Chapter 16: Major accidents and disasters.</td>
</tr>
<tr>
<td>Potential effects on health associated with changes in sound exposure</td>
<td>Effects from noise on health and quality of life are detailed in Chapter 17: Noise and vibration.</td>
</tr>
<tr>
<td>Potential effects on population health from hazardous waste</td>
<td>Potential effects are detailed in Chapter 20: Waste.</td>
</tr>
<tr>
<td>Potential effects on population health from unsafe water quality (polluting water)</td>
<td>Potential effects are detailed in Chapter 21: Water environment.</td>
</tr>
</tbody>
</table>

Receptors

12.4.5 The receptors identified that may experience likely significant effects in relation to health are outlined in Table 12.6.

12.4.6 For each health topic the assessment considers the potential effects on two types of population. The first is the general population and the second is vulnerable groups within the general population. This ensures that the assessment takes account of the ways in which the DCO Project may affect health inequalities. Table 12.6 sets out further details on the definitions of these two types of receptor.

Table 12.6: Receptors requiring assessment for health

<table>
<thead>
<tr>
<th>Receptor group</th>
<th>Characteristics included within group</th>
</tr>
</thead>
<tbody>
<tr>
<td>General population</td>
<td>1. Residents</td>
</tr>
<tr>
<td></td>
<td>2. Passengers</td>
</tr>
<tr>
<td></td>
<td>3. Those working at the Airport (includes the construction workforce)</td>
</tr>
<tr>
<td></td>
<td>4. Owners, operators and users of community and amenity facilities (including healthcare services and schools)</td>
</tr>
<tr>
<td></td>
<td>5. Visitors to, or workers in or passing, the communities, open spaces and sports facilities around Heathrow</td>
</tr>
</tbody>
</table>
12.4.7 The list of vulnerable groups are not mutually exclusive; an individual may fit into several of these categories. The list of receptor characteristics will be kept under review during the EIA as more detailed information is obtained during baseline surveys and other forms of data collection by other aspects and will be reflected in the ES.

12.4.8 In addition to considering where changes may have a different effect on vulnerable groups, the assessment also reports health effects that occur in-combination, affecting resources, communities, or locations simultaneously (or in series over a long period), for instance combined health effects.

12.4.9 The combined health effects are further considered in Chapter 22: In-combination effects where they are considered alongside other non-health related effects of the DCO Project.

Spatial scope and study areas

12.4.10 This section sets out the proposed study areas for the health assessment.

12.4.11 The determinants of health (defined as ‘… social, economic and environmental factors which determine the health status of individuals or populations’, (World Health Organization, 1998)) are varied and the range of activities associated with the phases of the DCO Project will differ in their effect and therefore influence on health determinants. It is possible for each health effect to affect people living in different locations; people living in the same location may also experience the same health effect differently.
12.4.12 The determination of the study areas is driven by the location of the population who may experience health effects due to the DCO Project.

12.4.13 The DCO Project activities that influence the geographic extent of likely health impacts are:

1. Land and property required permanently for Airport and surface access infrastructure (including airport supporting development)
2. Land and property required temporarily for construction of the new Airport infrastructure
3. Temporary and permanent changes to surface access infrastructure affecting communities
4. Changes to the scale and distribution of traffic movements influencing changes in local air quality pollutants and road safety risks
5. Changes in sound and air quality exposure from aircraft and other on-airport sources and surface access sources

12.4.14 The overall study area for health is defined by the amalgam of the study areas described in this section.

12.4.15 Chapter 7: Air quality and odour. Changes to emissions to air from aircraft, airside plant and vehicles, combustion plant (for example, energy centre) and road traffic vehicles (oxides of nitrogen, nitrogen dioxide and particulate matter) have the potential to cause health effects. The study area for considering the health effects of air quality is set out in Figure 12.1. For construction dust, the study area is 350m from any particular boundary of each relevant DCO Project site and 50m from routes used by construction vehicles on the public highway/haul roads up to 500m from the site entrance(s) (refer to Chapter 7: Air quality and odour).

12.4.16 Chapter 11: Community. The requirement for land and the effects associated with construction are expected to be experienced by those living in the communities around the existing Airport and land being considered for the DCO Project. For example, relocation of residents and effects on remaining communities (including social cohesion), effects on community (public and private) facilities and public recreational spaces (for physical activity) and routes (community severance, cycling and walking). The area is defined in Section 11.4: Scope of the assessment (Spatial scope and study area) (refer to Chapter 11: Community).

12.4.17 Chapter 15: Landscape and visual amenity. DCO Project construction and operational activities may affect light pollution. The study area defined by
landscape and visual amenity informs the health assessment and is described in Section 15.4: Scope of the assessment (Spatial scope and study area) (refer to Chapter 15: Landscape and visual amenity).

12.4.18 Chapter 17: Noise and vibration. Changes in sound exposure from aircraft (in the air and on the ground) and other sources such as road noise and rail noise have the potential to cause health effects. Noise emissions from aircraft cover an area that extends several kilometres around the Site. The study area for noise is described in Section 17.4: Scope of the assessment (Study areas) (refer to Chapter 17: Noise and vibration).

12.4.19 Chapter 18: Socio-economics and employment. The benefits of employment generated by the DCO Project are predominantly experienced by those living around the Airport. In addition, wider effects of new economic activity in the labour market are experienced over a larger area. The study areas for this aspect are described in Section 18.4: Scope of the assessment (Spatial scope and study area subsection) (refer to Chapter 18: Socio-economics and employment).

12.4.20 Chapter 19: Transport network users. Changes to traffic levels have the potential to result in a change in the number of road traffic accidents. The study area for road traffic is provided in Section 19.4: Scope of the assessment (Spatial scope and study area) (refer to Chapter 19: Transport network users).

12.4.21 Chapter 21: Water environment. Changes to flood risk has the potential to affect people and property and therefore could affect health. The study area for considering the health effects associated with a change in flood risk are set out in Section 21.4: Scope of the assessment (Spatial scope and study area) (refer to Chapter 21: Water environment).

12.4.22 The following LPAs cover areas where health effects are considered likely: London Borough of Hillingdon, London Borough of Hounslow, South Bucks District, Slough Borough, Spelthorne Borough, Royal Borough of Windsor and Maidenhead, London Borough of Ealing, Runnymede Borough, Elmbridge Borough, London Borough of Richmond upon Thames and London Borough of Wandsworth. These LPAs define the ‘baseline data collection study area’ across the different determinants of health.

12.4.23 The overall baseline covering this baseline study area is set out in Section 12.9.

12.4.24 The study area for each health effect that is subject to assessment is provided in Section 12.10. This sets out the geographical scope of each health effect. Baseline data for each study area has been collected to inform the assessment of that health effect.
As design and engagement processes progress and the DCO Project is refined, the study areas may evolve to accommodate changes. Final study areas will be reported in the ES.

**Temporal scope**

The DCO Project will be developed in a phased approach meaning that in some periods and/or some locations both construction and operational activities will take place in parallel. Three phases have been identified to broadly correspond with the most prevalent activities that will arise as a result of the DCO Project.

Chapter 5: Approach to the EIA sets out the DCO Project phases and identifies ‘core’ assessment years considered in the PEIR; these core assessment years are referenced where appropriate. The assessment year for health effects reflects the point at which the activities that drive the greatest health effect occur (with the health effect arising either straight away or over a period of time). The assessment takes into account a build up from activities prior to this year that also contribute to the health effect (so an assessment year in Phase 2 takes account of effects leading up to it in Phase 1, as well as those that follow after in Phase 3). The assessment year is the point from which significance rankings are made for short, medium and long term health effects. Any health effects prior to the assessment year are judged to be smaller than those that follow from the assessment year. This focuses the assessment to the greatest health effects and the most relevant associated activities. Table 12.7 sets out the relevant assessment years and assumptions (and key activities where appropriate) for each health effect.

**Table 12.7: Assessment years for health effects**

<table>
<thead>
<tr>
<th>Health effect</th>
<th>Assessment years and assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential relocation: population required to relocate</td>
<td>Relevant DCO Project activities in Phase 1 relate to 2022 as the year of vacant possession of residential properties. This is the year to which the greatest health effects are anticipated to relate is therefore the assessment year from which significance rankings are made for short, medium and long term health effects. Phases 2 and Phase 3 are not associated with DCO Project activities that would introduce new health effects on this issue, although there may be ongoing health effects from Phase 1.</td>
</tr>
<tr>
<td>Community cohesion: relocation affecting the remaining communities</td>
<td>Relevant DCO Project activities in Phase 1 relate to 2022 as the year of vacant possession of residential properties and reprovision of Harmondsworth Community Hall and Heathrow Special Needs Centre. This is the year to which the greatest health effects are anticipated to relate and is therefore the assessment year from which significance rankings are made for short, medium and long term health effects.</td>
</tr>
</tbody>
</table>
### Health effect

<table>
<thead>
<tr>
<th>Access to services and healthcare: change in access to public services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 2 and Phase 3 are not associated with DCO Project activities that would introduce new health effects on this issue, although there may be ongoing health effects from Phase 1.</td>
</tr>
</tbody>
</table>

| Service planning considerations would occur pre-Phase 1. |
| Relevant DCO Project activities in Phase 1 relate to residential relocation related population change (including CPZ and WPOZ), Harmondsworth Primary School closure (summer 2022) and reprovision, construction activity, road network changes and additional surface access for maximum Phase 1 ATMs. By 2025 there would be vacant possession of all homes in the CPZ and phased uptake of WPO. The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2025 (Phase 1). This is the assessment year from which significance rankings are made for short, medium and long term health effects. |
| During Phases 2 and 3 there would be ongoing local road changes including due to construction activities and the surface access implications of full opening of the North West Runway. These changes are considered as part of the medium and long term effects from the assessment year. |

<table>
<thead>
<tr>
<th>Healthy lifestyles: open spaces and active lifestyles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevant DCO Project activities in Phase 1 relate to: vacant possession of open space and sports facilities; and potentially reduced access to alternatives as a result of intensive construction activity, road network changes and additional surface access for maximum Phase 1 ATMs. The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2022 (Phase 1). This is the assessment year from which significance rankings are made for short, medium and long term health effects.</td>
</tr>
<tr>
<td>During Phases 2 and 3 ongoing local road changes may affect access to reprovided open space and sports facilities, including due to construction activities and the surface access implications of full opening of the North West Runway. These changes are considered as part of the medium and long term effects from the assessment year.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Healthy lifestyles: active travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2022 (Phase 1). This is the assessment year from which significance rankings are made for short, medium and long term health effects.</td>
</tr>
<tr>
<td>Relevant DCO Project activities in Phase 1 relate to public rights of way diversions, construction traffic on the road network, as well as modifications to local roads and junctions, modifications to retained roads, M25 modifications, changes to numbers and routings of vehicles using the public highway and changes to pedestrian and cyclist routings. Phase 1 also includes the potential for reduced pedestrian and cyclist amenity on roads as a result of construction related transport and additional surface access for maximum Phase 1 ATMs.</td>
</tr>
<tr>
<td>During Phase 2 there would be ongoing local road changes, new pedestrian and cyclist infrastructure, as well as construction related transport and the surface access implications (including via public transport) of full opening of the North West Runway.</td>
</tr>
</tbody>
</table>
### Health effect | Assessment years and assumptions
--- | ---
**Health effect** | **Assessment years and assumptions**
| | During Phase 3 there would be ongoing local road changes, as well as construction related transport and the surface access implications (including via public transport) of North West Runway year of minimum ANPS capacity. These changes are considered as part of the medium and long term effects from the assessment year.

**Flood risk: flood risk management** | In considering the potential for likely significant health effects consideration was given to the DCO Project activities across Phases 1, 2 and 3.

Relevant DCO Project activities in Phase 1 relate to construction land requirements, dewatering, excavations, infilling and stockpiling; as well as operational changes, such as flood storage areas, hardstanding (including runway and taxiways), buildings, sub-surface structures, new road layouts, green infrastructure corridors, watercourse diversions and new drainage networks.

During Phase 2 there would be ongoing construction and road network related activity and the water runoff implications of full opening of the third runway.

Phase 3 includes the final flood risk management position given completion of all infrastructure that affects surface water runoff and infiltration.

**Environment: construction effects** | Relevant DCO Project activities in Phase 1 relate to 2023 as the year of peak construction activity. 2023 is considered to appropriately reflect the greatest level of change in environmental conditions as well as being indicative of the largest construction related effects discussed by the air quality, noise and vibration and landscape and visual amenity aspects. The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2023 (Phase 1). This is the assessment year from which significance rankings are made for short, medium and long term health effects.

During Phases 2 and 3 there would be ongoing construction activity, which is considered as part of the medium and long term effects from the assessment year.

**Healthy lifestyles: construction workforce** | Relevant DCO Project activities in Phase 1 relate to 2023 as the year of peak construction activity with 2,700 workers across different types of non home based accommodation. The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2023 (Phase 1). This is the assessment year from which significance rankings are made for short, medium and long term health effects.

During Phases 2 and 3 there would be ongoing construction activity, though with a reduced construction workforce size. This workforce is considered as part of the medium and long term effects from the assessment year.

**Healthy lifestyles: presence of pests** | In considering the potential for likely significant health effects consideration was given to the DCO Project activities across Phases 1, 2 and 3.

Relevant DCO Project activities in Phase 1 relate to construction activity when demolition, excavation, infilling and stockpiling may expose disused pipe networks, landfill or other substrate that give pests harbourage.
### Heathrow Expansion
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<table>
<thead>
<tr>
<th>Health effect</th>
<th>Assessment years and assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Employment, training and economy: displacement of business and commercial activity</strong></td>
<td>During Phases 2 and 3 there would be ongoing construction activity and pest management.</td>
</tr>
<tr>
<td></td>
<td>Relevant DCO Project activities in Phase 1 relate to 2022 as the assumed year in which businesses are expected to be displaced. The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2022 (Phase 1). This is the assessment year from which significance rankings are made for short, medium and long term health effects. Phases 2 and Phase 3 are not associated with DCO Project activities that would introduce new health effects on this issue, although there may be ongoing health effects from Phase 1.</td>
</tr>
<tr>
<td><strong>Employment, training and economy: procuring goods and services and the local economy</strong></td>
<td>During Phases 2 and 3 there would be ongoing construction activity, though with a reduced scale of procurement opportunity. These effects are considered as part of the medium and long term effects from the assessment year.</td>
</tr>
<tr>
<td></td>
<td>Relevant DCO Project activities in Phase 1 relate to 2023 as the year of peak construction activity (and associated procurement opportunities). The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2023 (Phase 1). This is the assessment year from which significance rankings are made for short, medium and long term health effects.</td>
</tr>
<tr>
<td><strong>Employment, training and economy: demand for construction workforce and employment</strong></td>
<td>During Phases 2 and 3 there would be ongoing construction activity, though with a reduced workforce size. These effects are considered as part of the medium and long term effects from the assessment year.</td>
</tr>
<tr>
<td></td>
<td>Relevant DCO Project activities Phase in 1 relate to 2023 as the year of peak construction activity (and associated construction employment and upskilling). The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2023 (Phase 1). This is the assessment year from which significance rankings are made for short, medium and long term health effects.</td>
</tr>
<tr>
<td><strong>Employment, training and economy: demand for operational workforce and employment</strong></td>
<td>During Phase 2, 2027 is the first full year of North West Runway operations.</td>
</tr>
<tr>
<td></td>
<td>Relevant DCO Project activities in Phase 1 relate to 2025 as the year of maximum release of first phase of capacity.</td>
</tr>
<tr>
<td></td>
<td>During Phase 3, 2035 is the year of minimum ANPS capacity and 2050 is the year of maximum air transport movement (ATM) capacity. The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2035 (Phase 3). This is the assessment year from which significance rankings are made for short, medium and long term health effects.</td>
</tr>
<tr>
<td><strong>Environment: air quality</strong></td>
<td>During Phase 1, 2022 includes the release of additional ATMs on the existing runways, together with additional traffic due to the construction works for the DCO Project, and the removal of the Energy from Waste plant.</td>
</tr>
<tr>
<td></td>
<td>During Phase 2, 2027 is the first full year of North West Runway operations.</td>
</tr>
<tr>
<td></td>
<td>During Phase 3, 2035 is the year of minimum ANPS capacity. Road traffic emission</td>
</tr>
</tbody>
</table>
### Health effect | Assessment years and assumptions
--- | ---
Factors and background pollutant concentrations are only available up to 2030 (used in the Phase 3 assessment) and this (2035) is likely to represent a reasonable worst-case assessment for Phase 3 in terms of pollutant concentrations at receptors as emissions and background are expected to decline further after 2030. No quantitative data is available for 2050 at PEIR. Short, medium and long term effects are assessed for 2022, 2027, 2030 and 2035.

**Transport: road safety**

Relevant DCO Project activities in Phase 1 relate to construction traffic on the road network (2022), as well as modifications to local roads and junctions, modifications to retained roads, M25 modifications, changes to numbers and routings of vehicles using the public highway and changes to pedestrian and cyclist routings. Phase 1 also includes traffic flow changes as a result of construction related transport and additional surface access for maximum Phase 1 ATMs.

During Phase 2 there would be ongoing local road changes and traffic flow changes associated with full opening of the North West Runway, as well as ongoing construction related transport and the surface access implications.

Relevant DCO Project activities in Phase 3 relate to 2035 as the year of additional local road changes, as well as construction related transport and the surface access implications (including via public transport) of North West Runway year of minimum ANPS capacity. In Chapter 19: Transport network users, 2035 is the assessment year with the greatest changes in accidents and safety (negative and positive).

Short, medium and long term health effects are assessed for 2022 and 2035.

**Electromagnetic field effects**

In considering the potential for likely significant health effects consideration was given to the activities across Phases 1, 2 and 3.

Relevant DCO Project activities in Phase 1 construction activity when relocation or new provision of electrical infrastructure is expected to be greatest.

During Phases 2 and 3 there would be ongoing relocation or new provision of electrical infrastructure.

**Access to services and healthcare: change in demand for local healthcare**

Relevant DCO Project activities in Phase 1 relate to construction activity (non home based workers) and increased passengers and Heathrow colleagues (associated increased ATM capacity).

During Phases 2 and 3 there would be ongoing construction activity (though with fewer non home based workers) and increased passengers and Heathrow colleagues (associated with opening the North West Runway).

As the effect is primarily driven by passenger numbers, 2035 (year of minimum ANPS capacity) is the year where the change for healthcare services is expected to be greatest. This is the assessment year from which significance rankings are made for short, medium and long term health effects. Passenger and Heathrow colleague increases up to the year of maximum ATM capacity (2050) are considered as part of the medium and long term effects from the assessment year.
### Health effect | Assessment years and assumptions
--- | ---
**Access to services and healthcare: Communicable diseases** | In considering the potential for likely significant health effects consideration was given to the activities across Phases 1, 2 and 3. During Phases 1, 2 and 3 passenger numbers would increase with additional ATM capacity.

**Transport: Leisure travel opportunities** | During Phases 1, 2 and 3 passenger numbers would increase with additional ATM capacity. Phase 3 (2050 - year of maximum ATM capacity) is the year when most passengers are expected. This is the assessment year from which significance rankings are made for short, medium and long term health effects.

**Aviation fuel storage** | In considering the potential for likely significant health effects consideration was given to the activities across Phases 1, 2 and 3. During Phases 1, 2 and 3 aviation fuel storage and distribution capacity would increase with additional ATM capacity.

**Community cohesion: community identity** | Relevant DCO Project activities in Phase 1 relate to construction activity and the release of the first phase of ATM capacity, including surface access implications. During Phase 2, 2027 is the first full year of North West Runway operations capacity including surface access implications and ongoing construction activities. This assessment year has been selected as indicative of the overall greatest level of change for neighbouring communities in relation to construction activities, landscape change and airport activity increases (it is acknowledged that these different components that influence community identity individually peak at different years). This is the assessment year from which significance rankings are made for short, medium and long term health effects. During Phase 3 there would be ongoing construction and further increases in ATMs. These effects are considered as part of the medium and long term effects from the assessment year.

### 12.5 Embedded environmental measures

#### 12.5.1 The DCO Project will consider a number of environmental measures to avoid or minimise likely significant effects. This approach is described in Chapter 5: Approach to the EIA. Some of these environmental measures have been embedded into the DCO Project design. Those embedded environmental measures that influence the assessment of health are set out in Table 12.8.

#### 12.5.2 Good practice environmental measures would occur with or without input from the EIA feeding into the design process. They include actions that would be undertaken to meet other existing legislative requirements, or that are considered to be standard practices. Those good practice environmental measures that influence the assessment of health are set out in Table 12.9.
Table 12.8: Summary of the embedded environmental measures in the design and how these influence the health assessment

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Changes and effects</th>
<th>Embedded measures and influence on assessment</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential properties, schools, medical facilities</td>
<td>Increased emissions from vehicles on public highways that may increase concentrations of pollutants and thereby have an effect on human health (NO₂ and PM)</td>
<td>The Surface Access Proposals (SAP) document submitted as part of the Airport Expansion Consultation (June 2019) sets out how access to the Airport by all travel modes will be managed to meet targets set out in the ANPS (Department for Transport, 2018a), as well as fulfilling Heathrow’s pledge not to increase airport-related traffic through expansion. The targets set out in the ANPS are: 1. To increase the proportion of journeys made to the airport by public transport, cycling and walking to achieve a public transport mode share of at least 50% by 2030 and at least 55% by 2040 for passengers 2. From a 2013 baseline level, achieve a 25% reduction of all staff car trips by 2030, and a reduction of 50% by 2040.</td>
<td>Chapter 7: Air quality and odour, Section 7.5.</td>
</tr>
<tr>
<td>Residential properties, schools, medical facilities</td>
<td>Increased emissions from vehicles on public highways that may increase concentrations of pollutants and thereby have an effect on human health (NO₂ and PM)</td>
<td>The SAP document includes proposals for a road user charging strategy which sets out: 1. Proposals for a Heathrow Ultra Low Emissions Zone (HULEZ), to be introduced following the grant of a DCO. This would broadly mirror the standards of the current London Ultra Low Emissions Zone and would levy a charge on any passenger cars, taxis and private hire vehicles that do not comply with emissions standards (Euro 4 for petrol cars and Euro 6 for diesel) 2. Proposals for the introduction of a vehicle access charge as the North West Runway is opened, to encourage passengers to travel by other modes.</td>
<td>Chapter 7: Air quality and odour, Section 7.5.</td>
</tr>
<tr>
<td>Residential properties, schools, medical facilities</td>
<td>Increased emissions from vehicles on public highways that may increase concentrations of pollutants and thereby have an effect on human health (NO₂ and PM)</td>
<td>The SAP document includes public transport proposals which set out how the usage of existing and committed public transport to the airport will be increased through measures such as: 1. Improved ticketing 2. Cheaper fares on the Heathrow Express and earlier and later services 3. The new bus and coach services Heathrow is proposing to support 4. Bus and coach priority measures 5. Support to the DIT and Network Rail to bring forward the proposed Western and Southern rail schemes and provision of additional infrastructure at both the Terminal 5 and the CTA rail stations to support this</td>
<td>Chapter 7: Air quality and odour, Section 7.5.</td>
</tr>
<tr>
<td>Receptor</td>
<td>Changes and effects</td>
<td>Embedded measures and influence on assessment</td>
<td>Reference</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Residential properties, schools, medical facilities</td>
<td>Increased emissions from vehicles on public highways that may increase concentrations of pollutants and thereby have an effect on human health (NO₂ and PM)</td>
<td>6. Provision of additional capacity at both the Heathrow Central Bus Station and Terminal 5 Bus Station to support new bus and coach routes.</td>
<td>Chapter 7: Air quality and odour, Section 7.5.</td>
</tr>
<tr>
<td>Residential properties, schools, medical facilities</td>
<td>Increased emissions from vehicles on public highways that may increase concentrations of pollutants and thereby have an effect on human health (NO₂ and PM)</td>
<td>The SAP document includes proposals in relation to Heathrow colleague travel which set out the measures that will be introduced to encourage increased pedestrian and cycle access and use of public transport by colleagues, such as: 1. Proposals to develop a ‘hub and spoke’ network of cycle routes 2. Improvements to cycling facilities at the Airport and on key routes from the Airport to the surrounding area 3. The introduction of a needs-based framework for allocation of colleague car parking spaces, in the context of colleague car parking provision being reduced.</td>
<td>Chapter 7: Air quality and odour, Section 7.5.</td>
</tr>
<tr>
<td>Residential properties, schools, medical facilities</td>
<td>Increased emissions from aircraft through fuel combustion that could increase concentrations of pollutants that could affect human health (NO₂, PM and SO₂) and emissions of aviation fuel odour</td>
<td>As far as reasonably practicable, the alignments of diverted roads outside the Airport boundary seek to maximise separation between the highway and receptors. This reduces the risk of adverse impacts of road traffic emissions on pollutant concentrations.</td>
<td>Chapter 7: Air quality and odour, Section 7.5.</td>
</tr>
<tr>
<td>Residential properties, schools, medical facilities</td>
<td>Increased emission from aircraft through fuel combustion that could increase concentrations of pollutants that could affect human health (NO₂, PM and SO₂) and emissions of aviation fuel odour</td>
<td>Measures relating to on-airport design and operation include: 1. The taxiway system serving the new North West Runway and expanded airport has been designed to facilitate efficient airfield operations. Wherever practicable, and consistent with airspace operations, arrivals and departures will be allocated to use the runway closest to the terminal they are using to minimise taxi distances and associated emissions. 2. Fuel farms located within the airfield, either downwind or a significant distance from receptors. This reduces the risk of adverse impacts on the amenity of receptors due to associated odour. 3. Heathrow will provide Fixed Electrical Ground Power (FEGP) for parked aircraft on new pier-served and remove stands. This will minimise the need for aircraft to use their Auxiliary Power Units (APU) whilst on stand. 4. Heathrow will provide Pre-Conditioned Air (PCA) for new aircraft stands, where there is a clear business case and environmental benefit, given the intended</td>
<td>Chapter 7: Air quality and odour, Section 7.5.</td>
</tr>
</tbody>
</table>
### Changes and effects

1. Increased emission from aircraft through fuel combustion that could increase concentrations of pollutants that could affect human health (NO₂, PM and SO₂).

2. Heathrow will provide infrastructure to facilitate the use of low emission airside equipment, such as electric vehicles.

3. Heathrow will develop and implement an ultra-low emissions zone for airside vehicles by 2025, to improve the emissions performance of the airside vehicle fleet.

4. Heathrow will review the tariff structure (including landing charges) to ensure that airlines are encouraged to use lower emitting aircraft. Charges relate to kg of NOₓ emitted per flight. Heathrow will implement further operational measures to reduce aircraft emissions on the ground. Heathrow will work with NATS and airlines to increase the application of reduced engine taxiing and reduced APU use where practicable and ensure that the airfield operates efficiently.

### Embedded measures and influence on assessment

- Occupancy of the stand.
- Potential effects on people and homes.
- Enable the reprovision of Harmondsworth Primary School; Reprovision of Heathrow Special Needs Centre; Reprovision of Green Corridor; Provision of a ‘community hub’ in Harmondsworth to include space for a community hall to replace Harmondsworth Community Hall, and some capacity for displaced nursery places; Reprovision of displaced allotment plots (Moor Lane allotments, Pinglestone Close allotments and Vineries allotments); and Reprovision of displaced sports facilities (Harmondsworth Recreation Ground, Little Harlington Playing Fields and Townmead Recreation Ground).

### Reference

- Chapter 7: Air quality and odour, Section 7.5.
- Chapter 11: Community, Section 11.5
### Chapter 12: Health

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Changes and effects</th>
<th>Embedded measures and influence on assessment</th>
<th>Reference</th>
</tr>
</thead>
</table>
| Users of recreational spaces | Potential effects on recreational spaces and users of recreational spaces | The following embedded mitigation is associated with potential effects on recreational routes and users of recreational routes:  
1. The provision of adequate alternative diversion of recreational routes  
2. The reprovision of any Public Rights of Way where such Public Rights of Way would continue to serve a recreational function  
3. To minimise the duration of any severance or loss of connectivity of any Public Rights of Way, permissive route or nationally, regionally or locally promoted recreational route. | Chapter 11: Community, Section 11.5 |
| Residents | Community cohesion | Heathrow will continue to develop a suite of mitigation – physical and non-physical – specific to each community where the DCO Project may lead to potential effects on community sustainability, viability, cohesion and integration. Example measures for Harmondsworth comprise reproviding green space that is displaced including local recreation space and providing a replacement community hall and nursery space and to support new commercial activity in the village in a new ‘community hub’. | Chapter 11: Community, Section 11.5 |
| Residents | Potential effects on residents associated with lighting | Environmental principles will be embedded into the DCO Project design for construction and operation relating to lighting installation: (i) Heathrow will ensure that suitable colour temperatures are selected for light sources where required to mitigate impacts on wildlife, reduce sky glow and minimise risk of human response to lighting where legally compliant, practicable and safe to do so; (ii) Heathrow will take measures to reduce obtrusive light, taking into account the safety requirements of the airfield, including considering sensitive receptors and areas during the lighting design process with a view to reducing obtrusive light; and (iii) Heathrow will monitor the effectiveness of lighting mitigation measures for the DCO Project. | Appendix 5.2: Lighting assessment methodology statement, Volume 3 |
| Residents and community facilities | Potential effects associated with changes in noise | Measures to manage and control noise are set out in Chapter 17: Noise and vibration, Section 17.5. | Chapter 17: Noise and vibration, Section 17.5 |
| Local businesses, | Potential temporary or permanent displacement | Heathrow will seek to minimise the effects on businesses through its Property & Land Acquisition and Compensation Policies. The interim policy for | Chapter 18: Socio- |
### Receptor

<table>
<thead>
<tr>
<th>Changes and effects</th>
<th>Embedded measures and influence on assessment</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>commercial interests and property likely to be acquired or experience changes in the environment or surface access</td>
<td><strong>Commercial Property</strong> sets out the approach for larger commercial interests as well as our offer for those with small business interests. The <strong>interim Property Hardship Scheme</strong> operates in relation to agricultural and small business categories, where owners have a compelling need to sell their properties before they would be able to do so under one of the Interim Property Policies but have been unable to do so on the open market. There is a separate interim policy about <strong>Professional Fees</strong> incurred in association with the compulsory acquisition process.</td>
<td>economics and employment, Section 18.5</td>
</tr>
<tr>
<td>People and the labour market</td>
<td><strong>Potential temporary or permanent displacement of businesses or commercial activity including property, land and minerals</strong></td>
<td>Chapter 18: Socio-economics and employment, Section 18.5</td>
</tr>
<tr>
<td></td>
<td><strong>Potential effects of new employment and business generated by the DCO Project on the labour market, skills and training in or related to the construction phase</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Potential wider effects on employment and the economy through direct influence, indirect influence and induced influence of the DCO Project</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Potential effects of new employment and business</strong></td>
<td></td>
</tr>
</tbody>
</table>
### Table: Receptor, Changes and effects, Embedded measures and influence on assessment, Reference

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Changes and effects</th>
<th>Embedded measures and influence on assessment</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrians, cyclists, vehicle drivers and passengers</td>
<td>New or replacement highway infrastructure, with potential adverse effects on transport network users</td>
<td>Heathrow will ensure that all new roads and junctions will be designed in such a way to take cognisance of all travellers including non-motorised users (NMU) and improvements for NMUs such as cycle lanes, wayfinding, controlled crossing points and footway improvements will be included where appropriate.</td>
<td>Chapter 19: Transport network users, Section 19.5</td>
</tr>
</tbody>
</table>
| Pedestrians, cyclists | Temporary closure, alteration or diversion of pedestrian and cyclist routes associated with construction activities, with likely adverse impacts to transport network users. | Contractors will ensure that pedestrians must be allowed access to their properties which abut the affected streets.  

The closure of pedestrian and cyclist routes will be minimised where reasonably practicable and adequate alternate diversion routes will be provided.  

Heathrow/ the main contractors will provide alternative, routes for pedestrians and non-motorised users that are affected by construction works where reasonably practicable to do so.  

The content in the Construction Traffic Management Plans (CTMPs) relating to traffic management layouts, signing and apparatus will include details of any temporary measures or signing necessary to maintain access to and signing of National Cycle Network routes and other existing routes designated for, or commonly used by, pedestrians, equestrians or cyclists.  

Where new routes for pedestrians and other non-motorised users are developed as part of the DCO Project, Heathrow/ the main contractors will ensure the availability and suitability of these routes for use and will signpost them appropriately when they are constructed to a condition and approved as safe for use. | Chapter 19: Transport network users, Section 19.5 |
| Pedestrians, cyclists | Increased traffic associated with | Consideration will be given to the management of vehicle movements near schools or routes to school. | Chapter 19: Transport |
### Table 12.4: Embedded measures and influence on assessment

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Changes and effects</th>
<th>Embedded measures and influence on assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>vehicle drivers and passengers</strong></td>
<td>construction activities, with likely adverse effects to transport network users.</td>
<td>On-site construction traffic routes will be provided across the construction works for use by construction vehicles, where appropriate, to minimise the need to use the public highway. To maximise the use of such routes, site access points will be positioned accordingly, accounting for any essential safety considerations in the design and construction of appropriate access points. Access routes for construction traffic will be limited, as far as reasonably achievable, to the trunk road network and main roads on the local road network. For other local roads, such as town/village centres and high streets, access will be restricted but may at times be necessary; for instance, to enable transport or delivery of locally sourced materials. Generally, access along residential roads will be prohibited. In instances where access on lower class local roads and roads within residential areas is required, the Heathrow/ the main contractors will implement measures to manage access.</td>
</tr>
</tbody>
</table>

| **All receptors** | Changes in land use that could affect flooding | Off-airfield development will satisfy the requirements of the National Planning Policy Framework Sequential Test. If any off-airfield development is required within the floodplain (as discussed in Appendix 21.4: Flood Risk Assessment, Volume 3), it will satisfy the Exception Test and provide any necessary compensatory flood storage requirements. |

### Table 12.9: Summary of other environmental measures and how these influence the health assessment

<table>
<thead>
<tr>
<th>Receptors</th>
<th>Changes and effects</th>
<th>Environmental measure and influence on assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Residents</strong></td>
<td>Construction effects on local communities</td>
<td><strong>Draft CoCP</strong> - Community communications commitments that influence the assessment of construction impacts on local communities.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Residents</th>
<th>Construction effects on</th>
<th><strong>Draft CoCP</strong> - Enquiries and complaints procedure that influences the assessment of</th>
</tr>
</thead>
</table>

Reference:
- network users, Section 19.5
- Chapter 21: Water environment, Section 21.5

Draft CoCP: Community communications commitments that influence the assessment of construction impacts on local communities.
<table>
<thead>
<tr>
<th>Receptors</th>
<th>Changes and effects</th>
<th>Environmental measure and influence on assessment</th>
<th>Section reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residents</td>
<td>Construction effects on local communities</td>
<td>Draft CoCP - Construction site layout: avoid visual intrusion to residential property; emission containment measures; provision of staff welfare facilities; pollution storage; maintenance of public rights of way.</td>
<td>Draft CoCP: Section 3.4</td>
</tr>
<tr>
<td>Residents, airport construction workers</td>
<td>Measures to prevent health effects from pests</td>
<td>Draft CoCP - Preventative pest and vermin control and prompt treatment of any pest and vermin infestation, including arrangements for disposal of food waste or other attractive material. If infestation occurs, the main contractor will seek to eliminate the infestation and prevent further occurrence.</td>
<td>Draft CoCP: Section 4.2</td>
</tr>
<tr>
<td>Residents</td>
<td>Measures to avoid light pollution</td>
<td>Draft CoCP - Lighting will be designed, positioned and directed to account for environmental conditions and will seek to avoid intrusion on sensitive receptors</td>
<td>Draft CoCP: Section 4.3</td>
</tr>
<tr>
<td>Airport construction workers, residents</td>
<td>Management of construction workers</td>
<td>Draft CoCP - Construction workers will be required to sign up to a Worker Code of Conduct. This will cover behaviour, use of temporary living accommodation, car parking, use of local community facilities, anti-social behaviour and communicable diseases.</td>
<td>Draft CoCP: Section 4.9</td>
</tr>
<tr>
<td>Airports construction workers, residents</td>
<td>Management of construction workers (and their accommodation)</td>
<td>Draft CoCP - To prevent the use of unlicensed caravan sites, dedicated areas of hardstanding will be provided within the boundary of the construction support sites.</td>
<td>Draft CoCP: Section 4.10</td>
</tr>
<tr>
<td>Airport construction workers, operators of healthcare facilities</td>
<td>Healthcare demand during construction</td>
<td>Draft CoCP - Occupational healthcare will be available to all construction workers during working hours. Outside working areas, contact details will be provided to direct to appropriate health/social care providers. Additional requirements for occupational healthcare will be determined based on systematic identification of the risks arising from construction activities. Appropriate health surveillance will be provided.</td>
<td>Draft CoCP: Section 4.11</td>
</tr>
<tr>
<td>Operators of healthcare and community facilities</td>
<td>Measures to respond to emergencies</td>
<td>Draft CoCP - Arrangement will be put in place with the objectives of containing and controlling major accidents / disasters. This includes communication with the public and emergency services.</td>
<td>Draft CoCP: Section 4.13</td>
</tr>
<tr>
<td>Receptors</td>
<td>Changes and effects</td>
<td>Environmental measure and influence on assessment</td>
<td>Section reference</td>
</tr>
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<td>-----------</td>
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<td>-----------------------------------------------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Residents</td>
<td>Health effects influenced by changes in air quality</td>
<td>Draft CoCP - Measures to avoid, manage and monitor air quality effects influencing health during the construction phase.</td>
<td>Draft CoCP: Section 5</td>
</tr>
<tr>
<td>Residents</td>
<td>Health effects influenced by changes in visual amenity</td>
<td>Draft CoCP - Measures to avoid, manage and monitor visual effects (including site lighting) influencing health during the construction phase.</td>
<td>Draft CoCP: Section 10</td>
</tr>
<tr>
<td>Residents</td>
<td>Health effects influenced by changes in noise</td>
<td>Draft CoCP - Measures to avoid, manage and monitor noise effects influencing health during the construction phase.</td>
<td>Draft CoCP: Section 11</td>
</tr>
<tr>
<td>Residents, construction workers</td>
<td>Health effects resulting from changes in access and the movement of the construction workforce</td>
<td>Draft CoCP - Measures to maintain access and transport construction workers influencing the assessment of the construction workforce on local communities.</td>
<td>Draft CoCP: Section 13</td>
</tr>
<tr>
<td>Residents, owners and operators of community facilities</td>
<td>Health effects resulting from changes in the water environment</td>
<td>Draft CoCP - Measures to manage and prevent flooding and water contamination influencing the assessment of health effects of flood risk.</td>
<td>Draft CoCP: Section 14</td>
</tr>
<tr>
<td>Health service users</td>
<td>Health effects associated with health service provision</td>
<td>Heathrow will provide the necessary support with regard to healthcare services and emergency service planning and ensure that Port Health functions are delivered in line with statutory requirements.</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
12.6 Methodology for baseline data gathering

Overview

12.6.1 Baseline data collection has been undertaken to obtain information over the study areas described in Section 12.4. This section provides the approach to collecting baseline data.

12.6.2 Baseline data has been collected over the relevant baseline data collection study area for each health topic for several purposes:

1. To understand the health status of the population
2. To understand the demographic composition of the population
3. To understand the deprivation issues affecting the population
4. To understand the health priorities of local healthcare providers
5. To understand the healthcare services currently available.

12.6.3 Baseline data collection for the health assessment is desk-based. No surveys specific to the health aspect have informed the PEIR.

Desk study

12.6.4 A summary of the organisations that have supplied data, together with the nature of that data is outlined in Table 12.10. In addition to these data sources, the health assessment also draws on environmental baseline data collated for other PEIR aspects, specifically, baseline data presented in Chapter 11: Community and Chapter 18: Socio-economics and employment.

Table 12.10: Data sources used to inform the health assessment

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Data provided (available via websites)</th>
<th>Data time period</th>
<th>Date received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office for National Statistics</td>
<td>Census</td>
<td>2011</td>
<td>December 2018</td>
</tr>
<tr>
<td>PHE</td>
<td>The Public Health Outcomes Framework</td>
<td>2018</td>
<td>September 2018</td>
</tr>
<tr>
<td></td>
<td>LPA Health Profiles</td>
<td>2018</td>
<td>September 2018</td>
</tr>
<tr>
<td></td>
<td>Health Assets Profiles</td>
<td>2015-2017</td>
<td>September 2018</td>
</tr>
<tr>
<td></td>
<td>Wider determinants of health profiles</td>
<td>2017</td>
<td>September 2018</td>
</tr>
<tr>
<td>NHS</td>
<td>Quality and Outcomes Framework (QOF)</td>
<td>2017-2018</td>
<td>September 2018</td>
</tr>
</tbody>
</table>
12.7 Assessment methodology for PEIR

Assessment methodology evolution

12.7.1 At this stage in the development of the EIA, the DCO Project is still under development and is the subject of statutory consultation. The likely significant environmental effects are presented at this preliminary stage. Further, more detailed assessment work will be undertaken between PEIR and preparation of the ES on the final DCO Project.

12.7.2 The methodology for the ES may therefore develop further from that used for the PEIR. Anticipated changes in the assessment methodology are summarised in Table 12.11, with reasons for any likely amendments detailed.

Table 12.11: Differences in assessment methodology between the PEIR and ES

<table>
<thead>
<tr>
<th>Effect</th>
<th>Assessment methodology used for this PEIR</th>
<th>Assessment methodology to be used for the EIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health effects deriving from information in other EIA aspect assessments (air quality, community, landscape and visual amenity (light pollution), noise and vibration and socio-economics).</td>
<td>Assessment years used for the PEIR health assessment mirror those used for the assessments of air quality and road traffic. For the PEIR, these assessment years are considered to represent a reasonable worst-case in order to enable likely significant effects to be identified for health.</td>
<td>The assessment years will be reviewed to inform the approach to the ES. The aim is for the assessment years to mirror the main assessment years for related aspects. Where additional worst-case years/scenarios are identified for health, these will also be considered.</td>
</tr>
<tr>
<td>Health effects which are influenced by draft Heathrow policies (residential relocation, displacement of commercial property, displacement of</td>
<td>Assessment is based on the implementation of the interim Property Policies as presented at Airport Expansion Consultation (June 2019).</td>
<td>Assessment will be based on the implementation of final Property Policies as submitted with the application for development consent.</td>
</tr>
</tbody>
</table>
### Effect

<table>
<thead>
<tr>
<th>Effect</th>
<th>Assessment methodology used for this PEIR</th>
<th>Assessment methodology to be used for the EIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>community facilities, noise insulation schemes)</td>
<td>Assessment considerations are informed by the level of detail of feedback from Airport Expansion Consultation One.</td>
<td>Assessment methodology will be informed by consultation and engagement feedback on draft health effects thus informing the way ratings are assigned in the assessment.</td>
</tr>
<tr>
<td>Overall assessment rating for all health effects</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Assessment methodology framework

12.7.3 The generic project-wide approach to the assessment methodology is set out in Chapter 5: Approach to the EIA. This has informed the approach used in this health assessment.

12.7.4 There is no formal guidance that specifies the detailed content required to assess health within the context of EIA or appropriate standards and thresholds for the assessment of significance of effects. The Institute for Environmental Management and Assessment (IEMA) have published ‘Health in Environmental Impact Assessment: A Primer for a Proportionate Approach’ (Cave et al., 2017) which provides a high-level introduction to considering public health in EIA but this does not constitute formal guidance. In relation to meeting HIA requirements, regard has been had to the Wales Health Impact Assessment Support Unit Health Impact Assessment: a practical guide (WHIASU, 2012), as recommended by the GLA Supplementary Planning Guidance (Greater London Authority, 2015).

12.7.5 This section sets out a framework by which the health effects that are considered ‘likely’ and have the potential to be ‘significant’ (for instance those set out in Table 12.4) are assessed at PEIR. It is important to establish credible health pathways: these trace the relationships between project activities and potential health effects. Given the potential range of health determinants, a source-pathway-receptor model has been applied. The model requires all three aspects to be in place for a plausible effect to be considered. In addition, if it is improbable that the effect would occur (for example, as it would require breaking the law to do it), then the potential effect is not considered to be ‘likely’; therefore it would not give rise to a ‘likely significant effect’.

12.7.6 The framework comprises three steps to determine whether effects are considered to be ‘likely significant effects’ in EIA terms. Additional detail on the specific methodologies and evidences sources used for each potential health effect are set out in Section 12.10.
12.7.7 The evaluation of whether effects of the DCO Project on human health are significant is a professional judgement and has been presented as a narrative that follows three steps.

1. The health effect is described including establishing plausible and probable relationships

2. A set of questions are used to frame the judgement as to the significance of a particular effect on human health

3. The effects on health are categorised on a scale of major, moderate, minor and negligible over time, and from this it is determined whether the effect on human health is significant or not.

12.7.8 Each of these steps is described further in the following sections.

**Step 1: Describing the potential effects on health**

12.7.9 For each of the potential health effects, the following factors have been considered:

1. Direction: Whether the effect is positive, negative or neutral

2. Relationship: Whether the effect is a direct relationship (for example, exposure) or an indirect relationship (for example, access to services), affecting physical and/or mental health and wellbeing

3. Severity: the type of health outcome affected (for example, affecting mortality, disease, nuisance, wellbeing), the type of effect (for example, onset of new conditions, affecting existing conditions, change to day-to-day functioning) relative to the baseline conditions

4. Exposure: the degree of exposure (for example, low concentrations over a long period, high concentrations over a short period), variation in exposure based on their proximity to the source and existence of existing regulatory standards

5. Extent: the size of the population\(^1\) likely to experience the health effect or the extent of usage of a particular facility or service

6. Frequency, duration and permanence: the time period over which the effect will occur\(^2\), how often the population would be affected and how that may change over time, and the extent to which the health effect is reversible

\(^1\) (large = over 500 people; moderate = 100 to 500 people; small = under 100 people). This scale has been selected to be consistent with that used by the Department for Transport. Health Impact Analysis. Shortlisted Schemes for Airports National Policy Statement. June 2018.
7. Health status: the existing health status and deprivation of the population, including conditions that would make the population more susceptible to the change

8. Resilience: the ability to absorb the effect, as influenced by the population’s adaptability, outlook (views about the DCO Project), life stage and ability to access alternatives

9. Vulnerable groups and inequalities: considering the general population and the vulnerable groups detailed in Table 12.6 and how these groups may experience effects differently.

**Step 2: Framing judgement on significance**

12.7.10 Using the information from Step 1, Step 2 considers the questions in Table 12.12 to guide and inform the characterisation of the health effect.

**Table 12.12: Guide questions framing the professional judgement on health significance**

<table>
<thead>
<tr>
<th>Evidence sources</th>
<th>Guide questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific literature</td>
<td>Is there a sufficient strength of evidence from sufficiently high quality studies to support an association between the DCO Project change, a relevant determinant of health and a relevant health outcome?</td>
</tr>
<tr>
<td></td>
<td>Does the literature indicate thresholds or conditions for effects to occur?</td>
</tr>
<tr>
<td></td>
<td>Are specific population groups identified as being particularly susceptible?</td>
</tr>
<tr>
<td>Baseline conditions</td>
<td>Are relevant sensitivities or inequalities identified in the scientific literature present?</td>
</tr>
<tr>
<td></td>
<td>Does the baseline indicate that conditions differ from relevant local, regional or national comparators?</td>
</tr>
<tr>
<td></td>
<td>Are there geographic or population features of the baseline that indicate effects could be amplified?</td>
</tr>
<tr>
<td>Health priorities</td>
<td>Have local, regional or national health priorities been set for the relevant determinant of health or health outcome?</td>
</tr>
<tr>
<td>Consultation responses</td>
<td>Has a theme of local, regional or national consultation responses related to the relevant determinant of health or health outcome?</td>
</tr>
<tr>
<td>Standards</td>
<td>Is the change one that would be formally monitored by regulators?</td>
</tr>
</tbody>
</table>

2 (short term = 0-5 years; medium term = 5-10 years; long term = over 10 years). This scale has been selected to be consistent with that used by the Department for Transport. Health Impact Analysis. Shortlisted Schemes for Airports National Policy Statement. June 2018.
### Evidence sources and controls

<table>
<thead>
<tr>
<th>Evidence sources and controls</th>
<th>Guide questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are there regulatory or statutory limit values set for the relevant context?</td>
<td></td>
</tr>
<tr>
<td>Has EIA modelling predicted change that exceed thresholds from the scientific literature or set by regulators?</td>
<td></td>
</tr>
<tr>
<td>Are there relevant international advisory guideline limit values?</td>
<td></td>
</tr>
</tbody>
</table>

### Policy context

<table>
<thead>
<tr>
<th>Policy context</th>
<th>Guide questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does local, regional or national government policy raise particular expectations for the relevant DCO Project change, determinant of health or health outcome?</td>
<td></td>
</tr>
<tr>
<td>Is there a relevant international policy context?</td>
<td></td>
</tr>
</tbody>
</table>

### Step 3: Categorising effects on human health

12.7.11 Based on the considerations at Step 2, Step 3 makes a professional judgement that categorises the effect as being of major, moderate, minor or negligible using the framework set out in Table 12.13.

12.7.1 It is important to note that a health effect does not need to meet all of the characteristics to be assigned to a specific category. The assessment reported in Section 12.10 provides the justification as to why a health effect has been assessed to be in a particular category; this is principally based on the majority of shared characteristics, the interrelationships of characteristics and applying professional judgement.

### Table 12.13: Categorising the significance of effects on human health

<table>
<thead>
<tr>
<th>Category</th>
<th>Typical characteristics relevant to health effects in this category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major (positive or negative)</td>
<td>1. A strong evidence base (sufficient strength of evidence from sufficiently high quality studies) that risk factors for a permanent, progressive or irreversible health condition (including health-related states or events) would be affected (positively or negatively)</td>
</tr>
<tr>
<td></td>
<td>2. Permanent sustained or irreversible exposure</td>
</tr>
<tr>
<td></td>
<td>3. A substantial change (positive or negative) from the baseline position</td>
</tr>
<tr>
<td></td>
<td>4. A change in whether regulatory standards are met or exceeded</td>
</tr>
<tr>
<td></td>
<td>5. Majority of the communities affected have high levels of deprivation</td>
</tr>
<tr>
<td></td>
<td>6. A large widening or narrowing of inequalities</td>
</tr>
<tr>
<td></td>
<td>7. Most people in a community affected (positively or negatively)</td>
</tr>
<tr>
<td></td>
<td>8. A direct and large contribution (positive or negative) to a recognised health priority</td>
</tr>
<tr>
<td></td>
<td>9. A strong and consistent theme of engagement by both health</td>
</tr>
</tbody>
</table>
### Category

<table>
<thead>
<tr>
<th>Typical characteristics relevant to health effects in this category</th>
</tr>
</thead>
<tbody>
<tr>
<td>stakeholders and the public on the issue (positive (support) or negative (concern or uncertainty))</td>
</tr>
<tr>
<td>Whether published national or local government policy expectations are met or not-met</td>
</tr>
</tbody>
</table>

### Moderate (positive or negative)

1. A strong evidence base that risk factors for a non-permanent, reversible, non-progressive health condition would be affected (positively or negatively)
2. Permanent or reversible exposure
3. A notable change (positive or negative) from the baseline position
4. Majority of communities affected have average or above average levels of deprivation
5. A widening or narrowing of inequalities
6. Most people in a community affected (positively or negatively)
7. A direct or large indirect contribution (positive or negative) to a recognised health priority
8. A theme of engagement or with inconsistent views between health stakeholders and the public on the issue (positive (support) or negative (concern or uncertainty))

### Minor (positive or negative)

1. A strong evidence base that risk factors for transient, temporary symptoms (for example, irritation, nausea or headache) would be affected (positively or negatively)
2. Infrequent or reversible exposure
3. A slight change (positive or negative) from the baseline position with evidence available to demonstrate change
4. Majority of communities affected have low levels of deprivation
5. A slight widening or narrowing of inequalities with evidence available to demonstrate change
6. Few people in a community affected (positively or negatively)
7. An indirect or minor contribution (positive or negative) to a recognised health priority
8. A few individual consultation responses on the issues, but not a theme of engagement for health stakeholders or the public on the issue (positive (support) or negative (concern or uncertainty))

### Negligible

1. No discernible change in health or wellbeing within normal variations
2. No discernible change in exposure levels or reversible changes
3. No discernible change (positive or negative) from the baseline position
4. Majority of communities affected are not deprived
5. No discernible widening or narrowing of inequalities
6. No links to a recognised health priority
7. No consultation responses on the issues.

12.7.2 Based on the categorisation of the health effects using the categories in Table 12.13, those health effects rated as ‘major’ (positive or negative) have been rated as ‘significant’ for the purposes of compliance with EIA Regulations.
12.7.3 All ratings (major, moderate, minor and negligible) for the health topics set out in Table 12.13 are reported in Section 12.10 and all these ratings inform the assessment of cumulative effects. Where significant effects are identified for the vulnerable group receptors, this rating shows the range of potential effects across the different vulnerable group receptors; details are presented for the most adversely affected vulnerable groups. Additional detail on assessment findings is contained within Appendix 12.5: Health supporting analysis, Volume 3.

12.8 Assumptions and limitations of this PEIR

12.8.1 While it is possible to identify past trends in the incidence and prevalence of health conditions, there is no accepted method for predicting health into the future for all of the health effects considered in this assessment. Where information is available to inform the assessment of health effects, this is referenced and incorporated into the assessment. Where information is not available, it is assumed that the population affected in the future assessment years have the same health status as the population in the baseline. This limitation does not affect the robustness of the PEIR assessment.

12.8.2 Where data from other EIA aspects has informed the assessment of health effects, the same assumptions and limitations reported for those aspects apply to this aspect.

12.8.3 The assessment of health effects at PEIR stage is based on the level of detail available for relevant environmental measures. As the content and detail of the environmental measures are developed, these will inform assessment of health effects and therefore categorisations of the level of effects may change when presented in the ES.

12.9 Overall baseline

Current baseline

12.9.1 This section sets out a summary baseline of health indicators for each of the LPA areas within the baseline data collection study area.

12.9.2 Detailed baseline information relevant to individual health effects for the relevant LPAs is set out in Appendix 12.2 as part of the assessment in Section 12.10, for example when answering the guide questions on baseline set out in Table 12.12.

12.9.3 In addition, data on demography, housing, economy and community facilities in the communities around the Airport and the health baseline data collection study area is contained in Appendix 11.1: People, place and community baseline, Volume 3.
Furthermore, the environmental baseline set out in other PEIR chapters is also of relevance, specifically, baseline data for Air quality and odour (Chapter 7), Community (Chapter 11), Noise and vibration (Chapter 17) and Socio-economics and employment (Chapter 18).

PHE prepare Local Authority Health Profiles to provide an overview of health, expressed through data on a range of indicators for local populations, highlighting issues that can affect health. These health summaries for the LPAs set out below include a graphical summary of routine health statistics in Graphic 12.2. The area’s value for each indicator is shown as a circle\(^3\). The England average is shown by the red line, which is always at the centre of the chart. The range of results for all local areas in England is shown as a grey bar for comparative purposes. The data is drawn from the 2018 PHE profiles.

Detailed baseline information relevant to individual health effects is set out in Appendix 12.2.

\(^3\) Red circles are significantly worse than the England average. Yellow circles are not significantly different from the England average. Green circles are significantly better than the England average. Grey circles indicate where data is not compared. Grey diamonds represent the regional average. Light grey bars represent 0-100 percentile. Dark grey bars represent 25\(^{th}\)-75\(^{th}\) percentile.
Graphic 12.2: Summary health profile for each LPA, based on Public Health England 2018
### Chapter 12: Health

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Ealing</th>
<th>Runnymede</th>
<th>Elmbridge</th>
<th>Richmond upon Thames</th>
<th>Wandsworth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life expectancy at birth (Male)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Life expectancy at birth (Female)</td>
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<tr>
<td>Under 75 mortality rate: all causes</td>
<td></td>
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<tr>
<td>Under 75 mortality rate: cardiovascular</td>
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<tr>
<td>Under 75 mortality rate: cancer</td>
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<tr>
<td>Suicide rate</td>
<td></td>
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</tr>
<tr>
<td>Killed and seriously injured on roads</td>
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<tr>
<td>Hospital stays for self-harm</td>
<td></td>
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<tr>
<td>Hip fractures in older people (aged 65+)</td>
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<tr>
<td>Cancer diagnosed at early stage</td>
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<tr>
<td>Diabetes diagnoses (aged 17+)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dementia diagnoses (aged 65+)</td>
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<td></td>
<td></td>
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<tr>
<td>Alcohol-specific hospital stays (under 16s)</td>
<td></td>
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<tr>
<td>Alcohol-related harm hospital stays</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Smoking prevalence in adults (aged 18+)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Physically active adults (aged 16+)</td>
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<tr>
<td>Excess weight in adults (aged 18+)</td>
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<tr>
<td>Under 18 conceptions</td>
<td></td>
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<tr>
<td>Smoking status at time of delivery</td>
<td></td>
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<tr>
<td>Breastfeeding initiation</td>
<td></td>
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<tr>
<td>Infant mortality rate</td>
<td></td>
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<tr>
<td>Obese children (aged 10-11)</td>
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<tr>
<td>Deprivation score (IMD 2015)</td>
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<tr>
<td>Smoking prevalence: routine and manual occupations</td>
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<tr>
<td>Children in low income families (under 16s)</td>
<td></td>
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<tr>
<td>GCSEs achieved</td>
<td></td>
<td></td>
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<tr>
<td>Employment rate (aged 16-64)</td>
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<tr>
<td>Statutory homelessness</td>
<td></td>
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<tr>
<td>Violent crime (violence offences)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excess winter deaths</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New sexually transmitted infections</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New cases of tuberculosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Compared with benchmark:**
- **Better**
- **Similar**
- **Worse**
- **Not compared**
- **Regional average**
Future baseline

12.9.7 This section sets out the major trends in public health that cut across the scope of the PEIR health chapter. National trends are discussed qualitatively to show the main directions of change.

12.9.8 The following national trends are drawn primarily from the annual public health profile of England (Public Health England, 2018b). Where appropriate these are supplemented with further sources on specific issues.

Population change and trends in life expectancy

12.9.9 The population of England has increased steadily over recent decades. The number of people aged 85 years and over has also increased and is expected to continue to increase in the future.

12.9.10 People are living longer than at the start of the century, but since 2011 the rate of increase in life expectancy has slowed for both sexes. Future life expectancy trends are therefore uncertain.

12.9.11 With England’s population both increasing and ageing, it is inevitable that the mortality rates (number of deaths per year) will increase in the future.

12.9.12 Since 2011 the trend has been for life expectancy at birth to increase more than healthy life expectancy and therefore the number of years lived in poor health is increasing, as is the proportion of life spent in poor health.

Trends in mortality

12.9.13 The most common cause of death in males is heart disease. The most common cause of death in females is dementia and Alzheimer’s disease. Mortality rates from dementia and Alzheimer’s are expected to continue to increase for both males and females. For males, it is estimated that the rate may overtake heart disease as early as 2020 if heart disease mortality rates continue to fall.

12.9.14 The overall age-standardised mortality rate in England has generally been declining (improving) in recent decades for both males and females. However, the rate of improvement was much smaller between 2011 and 2017 than in earlier periods. Within this, the slowdown in improvement in mortality rates for heart disease and stroke is a key reason for uncertainty in the trend in life expectancy. Research supports stepping up efforts to reduce the risk of heart disease and stroke by addressing the underlying wider determinants of health and by reducing risk factors such as smoking, high blood pressure and obesity (Public Health England, 2018c).
Trends in morbidity and risk factors

12.9.15 Overall population health in England is improving. However, the population is increasing and ageing; so despite the population becoming healthier at every age group, the total burden of morbidity is increasing.

12.9.16 As older people experience higher rates of morbidity than younger people and as the population continues to age, the number of people with many chronic conditions is expected to increase, for example, diabetes.

12.9.17 Obesity and smoking are the leading risk factors for morbidity. These are associated with many of the common causes of morbidity including cardiovascular disease, musculoskeletal conditions, respiratory diseases, diabetes and most cancers. The prevalence of many risk factors among adults, including smoking, illicit drug use, high blood pressure and high cholesterol are declining. However, the trend for both adult and child obesity is increasing.

Health of children in the early years

12.9.18 The first few years of life influences physical, cognitive and emotional development. Overall child health and development indicators in England show a trend of sustained improvement. For example, an increasing percentage of children are reaching a good level of development at age 5 years, though inequalities between population groups remain.

Inequalities in health

12.9.19 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. Smoking and obesity are the main risk factors for these diseases. Although smoking prevalence in England has declined, people in the more deprived areas are still more likely to smoke than people in the least deprived areas.

12.9.20 Inequalities in child excess weight between the most and least deprived areas, and between ethnic groups, is widening, for instance the difference is getting greater.

Wider determinants of health

12.9.21 The quality of the built and natural environment such as air quality and housing quality affect health. While the proportion of homes meeting the Decent Homes Standard is increasing, homelessness continues to rise, and housing continues to become less affordable. Despite these changes, child poverty measures from analysis of ‘households below average income’ show no significant trend change.
Concentrations of PM$_{2.5}$ vary from year to year due to a number of factors including changes in emissions and changes in weather. Variation due to weather is generally greater than the year to year variation due to changes in emissions.

In England, it is estimated that new cases of disease attributable to PM$_{2.5}$ and NO$_2$ will continue over the next 15 years (Public Health England, 2018a).

A trend of shifting from motorised to active forms of transport, such as walking and cycling, would reduce the levels of PM$_{2.5}$ and NO$_2$ while also contributing to reducing the burden of obesity and non-communicable diseases – known as ‘co-benefits’. Such a trend would also reduce healthcare costs with substantial benefits for public health.

**Approach to assessment**

In considering how the DCO Project activities are likely to affect the health of the population, a baseline of data on health in 2018 has been used. Comparison with this current baseline represents the primary assessment for the PEIR.

These future trends have been considered in the assessment in two ways. Firstly, through considering how the baseline could change either in advance of a health effect occurring or through the duration of the health effect. Secondly, through informing the sensitivity of populations to future health conditions, for example where an increase in new cases of disease are expected, this may affect the sensitivity of populations who are more likely to experience that disease.

Planned on-airport development, specifically two developments within the existing airport boundary are assumed to form part of the future baseline. These are: (a) Kilobox Apron Development which involves the construction of passenger and baggage tunnels and delivery of additional stands on terminals T2 and T2B; and (b) Runway Access Taxiway which involves taxiway improvements to facilitate full easterly alternation of air movements.

**12.10 Assessment of health effects**

**Overview**

The assessment of the effects of the DCO Project on health is described by each potential health effect. For each effect, the assessment identifies the DCO Project phase(s) where the potential health effect is predicted to occur. Where no health effect is expected, this is also stated.

The potential health effects set out in Table 12.4 (Potential effects on health receptors scoped in for further assessment) are presented here in terms of effects on the general population as a receptor and vulnerable groups as a receptor, following the methodology set out in Section 12.7.
12.10.3 The assessment in this section summarises and draws on supporting information contained in Appendix 12.2 (provides baseline information on indicators relevant to health), Appendix 12.3 (scientific literature), Appendix 12.4 (identified priorities for health protection and improvement) and Appendix 2.1 (reference to relevant planning policies). There is also further detail regarding the assessment of each health effect (for instance the information taken into account at each methodological step and additional detail on the assessment for each vulnerable group) contained in Appendix 12.5.

Residential relocation: population required to relocate

Introduction

12.10.4 The DCO Project requires land and there will be people who are required to move. This can be expected to have an effect on the health and wellbeing of people who are required to move. There is a plausible link between source-pathway-receptor that supports a change in health outcomes.

1. Source: homes that will be vacated due to the DCO Project
2. Pathway: quality of housing and neighbourhood, disruption of social networks and access to existing schools or employment
3. Receptors: residents who are required to leave their homes. Their health may be affected by anxiety due to the move and a change in living conditions for instance difference between the residence and area they are moving from and the residence and the area to which they are moving.

12.10.5 The potential effect is both plausible and probable and is therefore considered to be likely.

12.10.6 This issue informs, and has been informed by, Chapter 11: Community. The community assessment identifies the change in population and issues around compulsory purchase orders. This section considers the health consequences of the relocations.

Project activities and temporal scope

12.10.7 The construction of the DCO Project will result in the displacement of 756 homes identified across the Compulsory Purchase Zone (CPZ). The requirement for land occupied by residential properties occurs at the time of site preparation and earthworks activities being undertaken in Phase 1.

12.10.8 The activities that influence the potential effects on health are:

1. Pre-Phase 1: uncertainty around whether the Heathrow expansion will occur, and when, will continue to influence decisions made by, and the wellbeing of,
residents who own or occupy properties within the CPZ. This has been a factor since approximately 2003 (Department for Transport, 2003).

2. Phase 1 (c. 2022 - 2026) site mobilisation and start of full construction works: by the end of 2022, Heathrow will acquire all property within the CPZ in vacant possession and will require all residents of those properties to move.

3. During Phase 2 (c. late 2026 - 2033) and Phase 3 (c. 2034 – 2050), no new effects are expected, but there may be ongoing effects to health from the activities that occurred pre-Phase 1 and in Phase 1.

The health effects associated with relocation will occur over different timescales. There may be short-term effects (which may be considered reversible) linked to the experience of moving (for instance the relocation) and medium- or long-term effects relating to changes in living conditions (which may extend over longer periods and, for a small number of people at a later stage in life, be permanent). The transition arrangements will influence the community level experience of properties becoming vacant.

Prior to the 2022 Phase 1 assessment year health effects may arise in anticipation of the change. Whilst these are not effects of the DCO Project commencing, these activities influence the health effects associated with Phase 1 and so are taken into account as part of that assessment. The assessment year reflects the point at which the activities that drive the greatest health effect occur (with the health effect arising either straight away or over a period of time). Any health effect prior to the assessment year has and will continue to be considered (in terms of assessment and development of environmental measures).

The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2022 as the year of vacant possession (this is the assessment year from which significance rankings are made for short, medium and long term health effects).

In categorising significance for health, the embedded measures set out in Section 12.5 of this chapter have been taken into account.

**Geographic scope**

The study area for this issue is defined by the CPZ. The CPZ includes Longford, and parts of Harmondsworth, Sipson and Poyle.

Routine information has been taken into account from the LPAs of the London Borough of Hillingdon and Slough Borough Council, in which the above community areas are located.
Receptors (population scope)

12.10.15 General population receptor: The population of the study area defined in the geographic scope.

12.10.16 Vulnerable group receptor: Relevant characteristics of the study area population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. Children and young people (including pregnant women and unborn children)
2. Older people (particularly frail elderly)
3. People (and their carers) with existing poor health (physical and mental health), including where this is due to disabilities
4. People who are unemployed, on low incomes, have regular shift worker, have low job stability, or have few progression prospects (including those unable to work due to ill health)
5. People living in areas known to exhibit poor economic and/or health indicators
6. People who may experiencing social isolation, discrimination or social disadvantage (including tenants of properties in the CPZ and people with relevant protected characteristics)
7. People experiencing barriers in access to services, amenities and facilities (including barriers experienced by service providers).

Step 1: Describing the potential effects on health

12.10.17 Residential relocations offer the opportunity for both positive and negative influences on health outcomes. The direction of health effect is best categorised as negative although moving may provide welcome opportunities for some, which may improve wellbeing. The relationship between the DCO Project change and health effect will be indirect.

12.10.18 A mix of physical and mental health and wellbeing outcomes will be affected. These will predominantly relate to changes in the burden of disease within the population. This includes the onset of new health conditions or health related states, changes in existing health conditions and changes to day-to-day functioning. Most people in communities experiencing relocations will be affected to varying degrees.

12.10.19 Effects may occur over a range of time periods, from very short term through to long term. The influence on the population can be characterised as continuous.
The influence on health outcomes will likely be reversible or non-progressive health outcomes.

12.10.20 Inequalities could reduce if relocation provides an opportunity for people to move to areas where socio-economic conditions are better. Overall the change is likely to increase social and health inequalities as the effects are likely to be greatest for those already experiencing difficulty. For example, older age is associated with social isolation and with physical frailty and so older residents are likely to require additional assistance during the relocation. The needs of the households that are not owner occupied must be considered as they will not be eligible for the property package.

Step 2: Framing judgments on significance

12.10.21 The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.

Scientific literature

12.10.22 The scientific literature indicates there is an association between residential relocations due to the DCO Project, and health and wellbeing outcomes. The evidence is mixed as to the health effects of compulsory relocation of people to new homes:

1. The experience of moving to new housing (for example, as part of a regeneration project) tends to be associated with a mix of:
   a. positive physical health outcomes (for example, associated with better living conditions)
   b. negative social and mental health outcomes (for example, from disrupted social networks).

2. Negative outcomes are reported particularly where those affected have a low sense of control, where the relocation is unexpected or where relocation is accompanied by financial distress

3. Once relocation has taken place the literature does not indicate a strong trend of long-term health effects unless the change reduces security of tenure or is due to poorer living conditions.

12.10.23 The type of health outcomes relating to housing that are identified in the scientific literature include: general health (particularly for low income groups); mental health and wellbeing; asthma outcomes; mortality; fall-related injuries among older adults; health inequalities (particularly for those on low incomes, older adults and those living with chronic pre-existing conditions). However, effects due to
relocations are likely to relate to changes in quality of life, as the expectation is that relocations will be to dwellings of similar condition / quality.

**Baseline conditions**

12.10.24 The baseline indicates that the affected population may include those who are particularly vulnerable to negative effects of change. Characteristics that may increase sensitivity include factors such as being young or old, having existing poor health, being a carer, levels of social contact, experiencing multiple deprivation, self-reported wellbeing (including anxiety, happiness and satisfaction), depression. The ability to commute following relocations to existing established places of education, work, leisure or worship and housing affordability and housing conditions or circumstances may also influence sensitivity to change. The tenure of any given household is also of interest.

12.10.25 Whilst much of the population is in good health, the following are illustrative of the potential sensitivities for the population within the CPZ (based on an amalgam of relevant 2011 Census statistics by Chapter 11: Community where in 2011 there were approximately 1,800 residents in the CPZ):

1. In relation to age groups that may find relocations most disruptive to wellbeing and care arrangements, 13% of the population are aged 0 to 15 years old (approximately 230 people) and 5% of the population are aged 75 and over (approximately 80 people)

2. In relation to vulnerability linked to existing health status, 5% of the population rate their health as bad or very bad (approximately 90 people) and 6% of the population report their day-to-day activities as limited a lot (approximately 108 people)

3. In relation to vulnerabilities that may arise from tenure, 58% are owner occupied and 42% are rented; the majority are private rented (approximately 80% of the rented stock) with some social rented (approximately 15% of the rented stock)

4. In relation to income related vulnerabilities: within the economically active population (approximately 1,050 people), 7% are unemployed; within the economically inactive population (approximately 500 people), 27% are retired, 9% are looking after home or family and 9% are long-term sick or disabled

5. In relation to social isolation, 33% of households have one occupant (and approximately 33% of these households are occupants aged 65 years old and over) and 49% of households are occupied by a single family (of which approximately 15% are lone parent families)
6. In relation to the ability to commute following relocations to existing established places of education, work, leisure or worship, 22% of households have no cars or vans.

12.10.26 The health baseline, as measured by routine LPA level indicators, may change in response to the DCO Project activities described above. The following are illustrative of health baseline indicators for the LPAs in which the study area is located that may be influenced over time by residential relocations (though it is unlikely that such cross-sectional measures could apportion and attribute a particular level of change to the DCO Project):

1. In London Borough of Hillingdon: 84% of the population report their general state of health as good or very good (84% for London and 81% for England); 7% of the population report their day-to-day activities as limited a lot (7% for London and 8% for England); the housing affordability ratio is 13 (14 for London and 7 for England); and the proportion of overcrowded households is 10% (12% for London and 5% for England)

2. In Slough Borough: 84% of the population report their general state of health as good or very good (84% for the south-east); 6% of the population report their day-to-day activities as limited a lot (7% for the south-east); the housing affordability ratio is 10 (10 for the south-east); and the proportion of overcrowded households is 13% (4% for the south-east).

12.10.27 The existing health status of the population in the London Borough of Hillingdon and Slough Borough can be characterised as good to average levels of self-reported health. Existing levels of deprivation are between the 4th and 6th Index of Multiple Deprivation (IMD) decile with higher levels of deprivation in some LSOAs. Varying degrees of adaptation are expected within the population (some low others up to high). All ages and life stages are likely to be influenced by the change (including as dependants). Given existing housing pressures, some people may find it challenging to meet their specific needs and therefore a high degree of adaptive behaviour may be required on their part.

12.10.28 The change in Airport boundaries may increase inequalities: for example, people who are not owner occupiers are not eligible for compensation as part of the residential property policies.

Health priorities

12.10.29 LPA health priorities have been set that identify housing as a determinant of health. Having the right housing is a health priority for the LPAs within the geographic scope. This includes additional support for people who: have special care needs; experience social disadvantage; are at risk of becoming homeless; or are key workers (supporting health). This includes there being an appropriate
availability of different housing types, including affordable housing. Appropriate housing is a priority to improve health and wellbeing and alleviate pressure on health and social care services.

Consultation responses

12.10.30 At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

Standards / controls

12.10.31 Relevant standards relate to the process for Compulsory Purchase Order. The assessment has had regard to the Government’s guidance on the application of Compulsory Purchase Orders (Ministry of Housing Communities & Local Government, 2018), including the role that community wellbeing plays in the Compulsory Purchase Order decision making process (see section 103 and section 106 of the guidance). Regard has also been had to the guidance’s discussion of the application of the Equality Act 2010 (HM Government of Great Britain & Northern Ireland, 2010a) (see section 6 of the guidance) and the Human Rights Act 1998 (HM Government of Great Britain & Northern Ireland, 1988) (see section 2 and section 12 of the guidance). The latter discussion refers out to The Equality and Human Rights Commission statement on Protocol 1, Article 1 of The Human Rights Act (the right to peaceful enjoyment of property) in the context of compulsory purchase orders (Equality and Human Rights Commission, 2018). The Equality and Human Rights Commission statement acknowledges that compulsory purchase orders may override the right to peaceful enjoyment of property (for an individual or company) provided that a fair balance has been struck between the general interests of society as a whole and the interests of the property owner (usually through compensation reflecting the value of the property). The provisions of these frameworks have been considered in drafting the residential Property Policies.

Policy context

12.10.32 At a national level the Government supports the DCO Project, acknowledging the compulsory acquisition of houses on the basis that an appropriate compensation package will be provided. The ANPS confirms the applicability of Heathrow’s housing compensation commitments.

12.10.33 The health policy themes summarised from relevant LPAs are as follows: resisting development that results in a loss of housing; and ensuring targets for new housing provision in regional plans are met.
Step 3: Categorising effects on human health

12.10.34 There are processes in place for Compulsory Acquisition of residential properties and the ANPS acknowledges the role of Heathrow’s residential Property Policies in helping people to move house.

12.10.35 The effect for the general population across the study area is major negative (significant) in the short term (0-5 years) from the 2022 assessment year, when the greatest health effect is expected. Whilst some people are likely to be accepting of the change, or even find opportunities to improve their living conditions, on a precautionary basis the effect is considered to be negative across the population of the CPZ. For most people negative effects would reduce to moderate negative (not significant) in the medium term (5-10 years) as a sense of control is re-established having moved to new homes. In the long-term (10+ years) a negligible (not significant) effect would be expected for most people.

12.10.36 The effect for the vulnerable groups (a judgement of the greatest expected effect due to characteristics that increase sensitivity) ranges between negligible (not significant) and major negative (significant) depending on the timeframe and relevant vulnerable group characteristics. Issues such as older age, existing poor health, variable security of tenure and social isolation are likely to be particular risk factors for the relocation having health implications. Whilst measures, such as the draft residential property policies (including hardship schemes) make provisions for some groups with specific needs the residual effect, at PEIR, is negative as the details regarding relocation are not yet developed. The effects within this group will vary in severity and duration. Some effects may be short-term, for example in relation to establishing new care or support. Other effects may not manifest immediately or may not be easily mitigated, for example displacement from a familiar context (including to improved housing) may reduce mobility and access to social networks and may exacerbate pre-existing conditions.

12.10.37 In the short term (0-5 years) (from the 2022 assessment year) the greatest effect on vulnerable groups is major negative (significant). The effect is driven by loss of homes and reduced sense of control for a large population (estimated at over 500 people). Effects are likely to range between major negative (significant) and moderate negative (not significant), reflecting that whilst there would be disruption, for many people the embedded measures offered would avoid significant effects.

12.10.38 In the medium term (5-10 years), for most people negative effects would reduce to a minor negative (not significant) as a sense of control is re-established having moved to new homes. A moderate negative (not significant) effect over this timeframe may be experienced if relocations are accompanied by reduced security of tenure or to poorer living conditions. The latter may be the case for a medium population (estimated at 100-500 people).
In the long-term (10+ years) a negligible (not significant) effect would be expected for most people. A sustained moderate negative (not significant) effect may be experienced if there is long-term housing instability (frequently moving home) or a persistent move to poorer living conditions. The latter may be the case for a small population (currently estimated at less than 100 people). The score reflects that whilst this group may experience increasing adverse health effects from persistent housing instability or long-term poorer housing (and whilst the ES will consider the potential for targeted development of environmental measures); the expectation is that only a very few people would be affected in this way. Consequently, there would not be a population level effect (even at the community level) that was significant in EIA terms.

Community cohesion: relocation affecting the remaining communities

Introduction

The DCO Project requires land and there will be people who are required to move. This section considers the effect on the health of people who do not move and who continue to live in the communities that are affected by residential relocations. It considers effects on health of changes in social networks and changes in the way people feel about their community.

There is a plausible link between source-pathway-receptor that supports a change in health outcomes.

1. Source: changes in the community due to residential relocations required for the DCO Project
2. Pathway: community cohesion including social networks and social support
3. Receptors: residents indirectly affected by residential relocations.

The potential effect is both plausible and probable and is therefore considered to be likely.

This issue informs and has been informed by Chapter 11: Community in relation to the identification of the affected communities.

Project activities and temporal scope

To construct the DCO Project residential relocations will take place in the CPZ. As discussed in the previous section, this will reduce the local population. As well as potentially losing people who are influential in local social networks, changes to community facilities could also affect community cohesion.

The activities that drive the potential effect are:
1. Pre-Phase 1: uncertainty around whether Heathrow expansion will occur, and when, is an influence on the social cohesion of residents in the Wider Property Offer Zone (WPOZ)

2. Phase 1 (c. 2022 – 2026): the commencement of full construction works will include vacation and demolition of the properties within the CPZ (for instance the loss of some members of the community). It will also be the time when access is restricted to amenities previously in community use (for example displacement of Littlebrook Day Nursery in the second half of 2023) and local road networks linking communities (such as the A4 and A3044). During Phase 1 Harmondsworth Community Hall will close (2022), but with the concurrent opening of a replacement Community Hub for the community (including for use by nursery care). Heathrow Special Needs Centre will also close in 2022, but with the concurrent opening of a replacement facility for the charity to continue providing contact with animals and plants for people with disabilities and special needs. As well as the closures themselves, the transitional arrangements (including site establishment works and security regimes) are also likely to be influential to the health effects (as road and building closures occur over a number of years rather than all at the start of Phase 1)

3. Phase 2 (c. late 2026 – 2033) and Phase 3 (c.2034 – 2050): no new effects are expected, but there may be ongoing effects to health from the activities that occurred in pre-Phase 1 and Phase 1.

12.10.46 The prospect of community change may increase community cohesion prior to the relocations. In the long-term it is likely that new social networks will develop (including potential benefits from improved replacement community facilities). Over time, feelings and perceptions about the community are also likely to establish new norms. There may be short-term effects linked to the relocations and medium- or long-term effects relating to the consequence of such change on community cohesion.

12.10.47 Prior to the 2022 Phase 1 assessment year health effects may arise in anticipation of the change. Whilst these are not effects of the DCO Project commencing, these activities influence the health effects associated with Phase 1 and so are taken into account as part of that assessment and development of environmental measures.

12.10.48 The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2022 (this is the assessment year from which significance rankings are made for short, medium and long term health effects).

12.10.49 In categorising EIA significance for health, the embedded measures set out in Section 12.5 of this chapter have been taken into account. This includes
measures in the draft Code of Construction Practice (CoCP) to reduce construction impacts on the community and environment.

**Geographic scope**

12.10.50 The study area for this issue is defined by the LPAs of the London Borough of Hillingdon and Slough Borough.

12.10.51 Effects focus around the maximum extent of locations affected by the requirement for residential properties is shown by the DCO Project’s WPOZ (where voluntary relocations from areas beyond the DCO Project’s land requirements may also affects remaining communities). This includes the community areas of Harmondsworth and Sipson (being the community areas where some, but not all, dwellings are affected), as well as effects on Harlington, Cranford Cross, Poyle, Colnbrook and Brands Hill.

**Receptors (population scope)**

12.10.52 General population receptor: The population of the study area defined in the geographic scope.

12.10.53 Vulnerable group receptor: Relevant characteristics of the study area population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. The population adjacent to the Site (site-specific effects relating to social, environmental and economic change) are considered to be more sensitive to this change. This includes the DCO Project’s WPOZ

2. Children and young people (including pregnant women and unborn children)

3. Older people (particularly frail elderly)

4. People (and their carers) with existing poor health (physical and mental health), including where this is due to disabilities

5. People who are: unemployed, on low incomes, have regular shift worker, have low job stability, or have few progression prospects (including those unable to work due to ill health)

6. People living in areas known to exhibit high deprivation or poor economic and/or health indicators

7. People who may experiencing social isolation, discrimination or social disadvantage (including relevant protected characteristics, for example where health effects may be greater due to ethnicity, noting the local baseline context of a high proportion of BAME groups)
8. People experiencing barriers in access to services, amenities and facilities (including barriers experienced by service providers).

12.10.54 The offer of voluntary relocation in the WPOZ is likely to mean that those who remain do so by choice or are not able to relocate. This could reflect socio-economic inequalities as well as age (young and old being reliant on local carers), disability (barriers to alternative suitable accommodation) or faith groups (strong ties to an existing congregation).

12.10.55 The Residential Property Policies will be important in overcoming barriers for those wishing to move, or in providing appropriate support for people to stay. On this basis it is likely that the remaining community will predominantly be people who wish to remain in the area. This community may therefore have strong social cohesion and a high degree of attachment to the area.

12.10.56 The remaining community may include a higher proportion of older people: those who have lived longest in the community are expected to have the strongest ties and therefore be more likely to choose to remain. New residents joining the remaining community may have a higher proportion of young adults on low income attracted by low property prices or rental values.

12.10.57 If a higher proportion of older people remain and if new residents have a high proportion of people with low socio-economic status then the health status of the remaining population may be more sensitive, reflecting that these groups tend to have more long-term (and multiple) health conditions/risk factors.

Step 1: Describing the potential effects on health

12.10.58 For remaining communities, the health effect is best categorised as indirect and negative. Physical and mental health and wellbeing outcomes are expected to be affected. This includes changes in existing health conditions and changes to day-to-day functioning. Many of the people remaining in communities experiencing relocations will be affected to varying degrees. Effects are expected in the short, medium and long term. During this period the influence on the population can be characterised as continuous (as opposed to infrequent or rare). The influence on health outcomes will likely be reversible or non-progressive.

Step 2: Framing judgments on significance

12.10.59 The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.

Scientific literature

12.10.60 The scientific literature indicates that there is an association between the types of changes in community cohesion that are expected due to the DCO Project and to
changes in health and wellbeing outcomes. Key findings are that there is a growing body of evidence indicating that social networks play an important role in physical and mental health. Broadly the literature indicates that the availability of, and access to, social networks influences the degree of social cooperation and support. People’s views about the quality and safety of their community also influences the degree to which social relationships are made and maintained. The literature provides an indication of the potential effects on social networks either through changes to population (for example relocations) or changes to the built environment (for example housing/neighbourhood renewal).

12.10.61 The type of health outcomes relating to community cohesion that are identified in the scientific literature include: general health; mental health and wellbeing; mortality; cardiovascular outcomes; cancer outcomes; and diabetes outcomes. However, effects for remaining communities are likely to relate to changes in quality of life (changes in social networks), day-to-day functioning (for example changes in support) and inequalities. Widespread onset of new clinical conditions or widespread exacerbation of existing clinical conditions are considered less likely as social networks and support are likely to adapt (for example new meeting places or ways of staying in touch). Furthermore, new networks are expected to develop over time. The potential for widespread long-term social isolation is therefore limited.

12.10.62 Based on the literature reviewed, the strength of evidence is weak for a direct causal relationship between social cohesion and health outcomes. This reflects the difficulty in tracing social changes that may be experienced in different ways through a broad range of health determinants to specific health outcomes. However, the evidence is considered to indicate a more general association of sufficient strength to warrant assessment and development of environmental measures on this issue. The evidence is stronger for self-reported changes in health outcomes, compared to clinical measures. There are indications that better quality and larger social networks can be positive to physical and mental health. There are also indications that environmental and population change can negatively affect social cohesion.

Baseline conditions

12.10.63 The baseline considers the same indicators discussed in relation to residential relocations. The community cohesion assessment considers the baseline in relation to the population remaining, whilst the residential relocation assessment considers the same indictors from the perspective of the population moving.

12.10.64 The health baseline, as measured by routine LPA level indicators, may change in response to the DCO Project activities described above. The following are illustrative of health baseline indicators that may be influenced over time due to
changes in community cohesion (though it is unlikely that such cross-sectional measures could apportion and attribute a particular level of change to the DCO Project).

1. In London Borough of Hillingdon: 9% of the population report providing unpaid care (7% for London and 10% for England); 32% of adult carers report having as much social contact as they would like (36% for London and 36% for England); 21% of people report high anxiety (20% for London and 19% for England); and 10% report a low happiness score (8% for London and 9% for England).

2. In Slough Borough: 8% of the population report providing unpaid care (10% for the south-east); 23% of adult carers report having as much social contact as they would like (33% for the south-east); 23% of people report high anxiety (19% for the south-east); and 10% report a low happiness score (8% for the south-east).

The current health status of the population in the study area can be characterised as good-average levels of self-reported health. Existing deprivation in the study area is between the 4th and 6th IMD decile. There are LSOAs with higher deprivation in West Drayton, Pinkwell and Heston West. Varying degrees of adaptation are expected within the population (some low others up to high). Influence are considered less likely for those in early development or adult life stages, with greater influence likely in childhood, adolescence and older age. Given the loss of some social support networks, some of the population may not have good access to alternatives that meet their specific needs and therefore a high degree of adaptive behaviour may be required on their part.

Health priorities

LPA health priorities have been set for building stronger, cohesive communities where people and communities are able to support each other.

Consultation responses

At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

Standards / controls

No relevant standards have been identified.
Policy context

12.10.69 At a national level the Government supports the DCO Project, acknowledging the potential for local communities to be negatively affected by the expansion and the consequent need for appropriate mitigation and compensation.

12.10.70 The health policy themes summarised from the main adopted and emerging planning documents of LPAs within the geographic scope are as follows: ensuring development delivers safe, accessible and attractive buildings, spaces and inclusive communities.

Step 3: Categorising effects on human health

12.10.71 There is evidence of association between health outcomes and community cohesion relevant to the remaining community. Furthermore, there is the potential for a change from the baseline position; a widening of inequalities; and an indirect contribution to recognised health priorities. As the consultation for the DCO Project continues, it is expected that factors relating to community cohesion in the remaining community will be raised. In policy terms the effect aligns with published national policy.

12.10.72 The effect for the general population in the short term (0-5 years) from the 2022 assessment year is minor negative (not significant), when health effects are expected to be greatest. This negative effect is expected as granting of the DCO will be the trigger and driver for changes in the WPOZ. The effect is likely to decrease over time with a negligible (not significant) effect in the medium term (5-10 years) and long term (10+ year) as the remaining community establishes new norms and social networks. Those remaining may form a more close-knit group due to a shared experience of change and a shared decision to remain. There may also be though an enduring sense of loss. Whilst a shared identity for those remaining may support community cohesion, it may also reduce the speed at which new community members (who have not experienced the change) integrate.

12.10.73 The effect for the vulnerable group (a judgement of the greatest expected effect due to relevant characteristics that increase sensitivity) ranges between negligible (not significant) and moderate negative (not significant) depending on the timeframe and vulnerable group characteristics. The effect is driven by loss of social networks and support. The groups particularly likely to experience a significant effect are those on the boundary of the CPZ (for instance losing their closest neighbours); older people; people with existing poor health; and people who may be or become socially isolated.

12.10.74 For those vulnerable only due to being on the CPZ boundary (for instance proximity alone) the effects are likely to improve over time as new norms, social networks and means of social support are established. For those also vulnerable
due to older age, existing poor health or social isolation effects are likely to be more negative and more persistent (compared to those for whom proximity alone was the only vulnerability characteristic). This reflects that the social changes for these groups may not so easily be replaced with alternative social support or social networks. For some there may be a permanent decline in support or social contact, with negative consequences for their health. Whilst varying levels of community cohesion are likely to be re-established (particularly should the remaining community come together in response to the change), for the most vulnerable (particularly those not able to easily or quickly establish new social networks) effects may be more persistent. Despite a persistent negative effect, improvement (for instance a reduced degree of effect) would be expected over time.

12.10.75 Whilst typically more reliant on community cohesion related support than the general population (particularly in relation to mental health), groups vulnerable to change in community cohesion due to young age, economic instability or reasons of deprivation (including poor access to services), are likely to show a tendency towards less negative and less permanent effects.

12.10.76 In the short term (0-5 years) (from the 2022 assessment year) effects on health of those in vulnerable groups are expected to initially be moderate negative (not significant) for a large population (estimated at over 500 people). Effects are likely to range between moderate negative (not significant) and minor negative (not significant), reflecting varying degrees of social network disruption and reliance.

12.10.77 In the medium term (5-10 years), for most a reducing negative effect to negligible or minor negative (both not significant) would be expected as new social networks establish. A sustained moderate negative (not significant) effect may continue during this timeframe where social isolation increases. The latter may be the case for a medium population (estimated at 100-500 people).

12.10.78 In the long-term (10+ years) effects would become negligible (not significant) for most people. However, a sustained moderate negative (not significant) effect may occur where social isolation persists long-term. The latter may be the case for a small population (currently estimated at less than 100 people, likely towards the lower end). The score reflects that whilst this group may experience increasing adverse health effects from long-term social isolation (and whilst the ES will consider the potential for targeted development of environmental measures); the expectation is that only a very few people would be affected in this way. Consequently there would not be a population level effect (even at the community level) that was significant in EIA terms.
Access to services and healthcare: change in access to public services

Introduction

12.10.79 The land requirements of the DCO Project may alter access to (or the viability of) public services or amenities. There is a plausible link between source-pathway-receptor that supports a change in health outcomes.

1. Source: population change or commercial displacements due to the DCO Project

2. Pathway: relocation or withdrawal of public services and subsequent change in access to public services including use of, or attendance at, social care, healthcare and education

3. Receptors: residents neighbouring the Airport and the Site.

12.10.80 The potential effect is both plausible and probable and is therefore considered to be likely.

12.10.81 This issue informs, and has been informed by, Chapter 11: Community and Chapter 19: Transport network users.

1. Community chapter identifies the change in facilities (and their reprovision)

2. Transport network users chapter identifies changes in journey time and access

3. Health chapter focuses on qualitative discussion of the health consequences of changes to community facilities and access to those facilities.

Project activities and temporal scope

12.10.82 For healthcare, social care and education there will be a continuity of services, but also a mix of temporary and permanent changes in the ways in which services will be accessed.

12.10.83 The DCO Project’s activities may affect access to public services in a number of ways. Directly: the construction activities of the DCO Project will require changes to public service estates and infrastructure, for example the closure of Harmondsworth Primary School. Indirectly: changes to the population within the CPZ and the WPOZ will affect both staffing and the numbers of people who will use the services. The former may affect quality of services, the latter may affect per capita funding or viability. The road reconfigurations and surface access associated with increases in operational activities may also affect journey times to public services.

12.10.84 The activities that drive the potential effect are:
1. Pre-Phase 1: uncertainty around whether Heathrow expansion will occur, and when, is an influence on routine service planning decisions for public services.

2. Phase 1 (c. 2022 – 2026) – the vacation and demolition of the properties within the CPZ and the implementation of the property offer across the WPOZ has the potential to indirectly affect public services through changes to the number of people living in the area

   a. During Phase 1 local primary school education services will be affected. Due to the DCO Project’s land requirements Harmondsworth Primary School will close (summer 2022). A temporary replacement facility will be opened at the same time, within the school’s existing catchment and offering the same level of provision in terms of capacity. A permanent facility would then be developed on that site to ensure ongoing provision. The provision of public health and social care services are not expected to be directly affected by the DCO Project

   b. Local NHS primary healthcare services may be affected in terms of staff and patient list size: the closest GP surgeries to Longford, Harmondsworth, Sipson and Harlington are the Glendale Medical Centre (UB3 5DA) and the Heathrow Medical Centre both in Harlington (UB3 5AB). These providers may be most affected by the DCO Project activities.4

   c. Social care: Services at purpose-built locations are not expected to be affected due to their wider catchment areas. Social care provided at community locations may be affected by a decline in resident population, for example, dementia-friendly coffee mornings held at Harlington Library (UB3 1PB) and adult social care events hosted by Yiewsley and West Drayton Community Centre (UB7 9JL). The same may apply to social care services for children and their parents or carers, for example outreach support with child care, speech and language, obesity, dental health, adult education, accident prevention and return-to-work. The nearest venue is the Cherry Lane Children’s Centre (UB7 9DL), West Drayton. Older people’s care near Heathrow is typically provided by the private or third sector, for example: Franklin House (UB7 7PW); Drayton Village Care Centre (UB7 9GL); and Harlington Hospice (UB3 5AB)

4 Other GP surgeries within approximately 3 miles are: Shakespeare Health Centre (UB3 1NY), the Medical Centre (UB7 7PJ), Bedwell Medical Practice (UB3 4JE), the High Street Practice and Yiewsley Family Practice (UB7 7DP) and the Hayes Medical Centre (UB3 4NA). Pharmacies: Orchards Pharmacy (UB7 7TU) and R&P Business Ltd (UB3 5DS). Dentists: Village Dental Practice (UB3 5DA); West Drayton Dental Practice (UB7 7BT); Armitage Dental Practice (TW5 9TY); Berkeley Dental Practice (TW4 6LE).
d. The upgrading of M4 Junction 4 and associated new roads running north-south in the corridor between Sipson and Harlington may affect access to the Glendale Medical Centre and the Heathrow Medical Centre both in Harlington, as well as social care services for the community neighbouring the CPZ, which tends to be offered from, or within, areas to the north of the M4.

e. Public sports facilities are discussed under this chapter’s section on Healthy lifestyles: opens spaces and active lifestyles. However, it is acknowledged within this section that these are a type of public service that may be more discretionary (rather than being a service to which people are entitled, such as the NHS).

f. Other services not provided as a ‘public service’, for instance other than by the LPA or NHS, are discussed in this chapter’s section on Community cohesion: relocation affecting the remaining communities. This includes Harmondsworth Community Hall and Heathrow Special Needs Centre.

3. Phase 2 (c. late 2026 - 2033) and Phase 3 (c. 2034 - 2050), include additional local road changes, including surface access implications of full opening of the North West Runway. These changes are characterised as being ongoing effects from the activities that occurred pre-Phase 1 and in Phase 1 (rather than new effects). The new road infrastructure could improve access to services north of the M4, for example in West Drayton.

12.10.85 The advance knowledge of change means that service planning can take place to appropriately adapt services so effects may commence prior to relocations. In the long-term it is likely that changing community needs will establish new service access norms. There may be short-term effects linked to the relocations and medium- or long-term effects relating to the consequence of such change on the viability of services (for instance fewer / reduced services for the remaining community).

12.10.86 For some, effects may commence pre-Phase 1 from the uncertainty in how they will access public services on which they have a high reliance. This will particularly be the case for people with a reliance on locally based social care or support services. These are also the groups who may experience more sustained negative effects from the changes, either due to issues of continuity or if replacement services are not able to provide the previous level of service. Whilst these are not effects of the DCO Project commencing, these activities influence the health effects associated with Phase 1 and so are taken into account as part of that assessment and development of environmental measures.

12.10.87 During Phase 1 the health effects prior to the 2025 assessment year (for instance 2022 to 2025) have and will continue to be considered in terms of assessment and
development of environmental measures. Prior to the assessment year service changes and a build-up in DCO Project activities will start to affect health outcomes, but for that time period are considered not significant. However, those activities do influence the health effects associated with the 2025 assessment year and so are taken into account as part of that assessment (for instance they are part of the build up to the year of peak DCO Project activity related to this issue). This includes potential for educational disruption (commencing in 2022) and any changes in health and social care access, influences that tend to affect population health over time, rather than instantaneously.

12.10.88 The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2025 (this is the assessment year from which significance rankings are made for short, medium and long term health effects). This Phase 1 year reflects the emerging effects of educational changes and service changes in response to residential relocations, as well as access changes associated with highway works and construction traffic.

12.10.89 In categorising EIA significance for health the embedded measures set out in Section 12.5 of this chapter have been taken into account. This includes: support to reprovide school(s) and early reprovision of displaced community facilities.

Geographic scope

12.10.90 The study area for this issue is defined by the LPAs of London Borough of Hillingdon; Slough Borough; London Borough of Hounslow; Spelthorne Borough; and South Bucks District (to reflect public service catchment areas).

12.10.91 This study area reflects a focus on access to public services (notably healthcare, social care and education) close to the Airport following land requirements of the DCO Project and population changes associated with residential relocations. Chapter 11: Community discusses potential effects on public services and users of public services across a wider study area. That assessment considers the overall capacity of public services in relation to economic growth and demand from the temporary non home based construction workforce. The demand on health services from the non home based construction workforce is discussed in the section Access to services and healthcare: change in demand for local healthcare.

Receptors (population scope)

12.10.92 General population receptor: The population of the study area defined in the geographic scope.

12.10.93 Vulnerable group receptor: Relevant characteristics of the study area population that may increase sensitivity for a variety of reasons collectively define the
vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. The population adjacent to the Site (site-specific effects relating to access to public services, for example Harmondsworth Primary School catchment)
2. Children and young people (including pregnant women and unborn children)
3. Older people (particularly frail elderly)
4. People (and their carers) with existing poor health (physical and mental health), including where this is due to disabilities
5. People who are: unemployed, on low incomes, have regular shift worker, have low job stability, or have few progression prospects (including those unable to work due to ill health)
6. People experiencing existing barriers in access to services, amenities and facilities, such as lack of car ownership (including barriers experienced by service providers).

12.10.94 Communities in Sipson and Harlington may currently face barriers in accessing public services making them sensitive to the loss, or relocation, of services. Furthermore, older people, those on low incomes and those with existing poor health may be less able to adapt to changes in access, such as greater travel distances.

12.10.95 The service needs of the population in Sipson and Harlington will change. The community may have a higher proportion of older people: as noted in the previous section people with stronger ties to their community are more likely to remain and these ties can include dependence on existing services and support. New residents moving to the area will probably be younger.

12.10.96 Transition arrangements will be important to ensure that access to public services is not interrupted for Sipson and Harlington.

**Step 1: Describing the potential effects on health**

12.10.97 Loss of, or reduced access to, public services is categorised as an indirect negative effect on health outcomes. Physical and mental health and wellbeing outcomes will be affected. These will predominantly relate to changes in the burden of disease within the population. This includes the onset of new health conditions or health related states, changes in existing health conditions and changes to day-to-day functioning. Many people in communities whose public services are affected will experience effects to varying degrees. Effects may operate over a range of time periods, from short term through to long term. The influence on the population from public service changes is continuous. The
influence on health outcomes will likely be reversible or non-progressive health outcomes.

**Step 2: Framing judgments on significance**

12.10.98 The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.

**Scientific literature**

12.10.99 The scientific literature indicates that there is evidence to support an association between changes in access to public services due to the DCO Project and health and wellbeing outcomes. Key findings are that there is a reasonable body of evidence indicating that access to public services, particularly healthcare, plays an important role in physical and mental health. Broadly the literature indicates that proximity and transport options influence service use and accessibility. The availability of a sufficient supply of appropriately trained staff is also an important influence on service quality and viability.

12.10.100 The type of health outcomes relating to access to public services that are identified in the scientific literature include: general health; mental health and wellbeing (including for service users and staff); hospitalization rates, medication adherence and treatment outcomes (in relation to healthcare service access); and chronic disease risk (in relation to educational outcomes). Effects due to public service access are likely to relate to changes in quality of life (for example waiting times), day-to-day functioning (for example in accessing more distant or unfamiliar services) and inequalities. Widespread onset of new clinical conditions or widespread exacerbation of existing clinical conditions are considered less likely as services to which people are entitled (for example health, social care and education) are not expected to cease to be available. However, if the remaining population is too small to keep publicly provided recreational amenities open (for instance viability issues of public services that are discretionary), there may be changes in population risk factors and/or symptoms associated with mental wellbeing and obesity.

12.10.101 Based on the literature reviewed, the strength of evidence is moderate for a direct causal relationship between public service access and health outcomes. The evidence is strongest for healthcare services, particularly primary care access and adequate staffing. The evidence for other types of public services is more limited, but there is a general association of sufficient strength to warrant assessment and development of environmental measures on issues such as social care, education and recreational amenities.
Baseline conditions

12.10.102 The baseline relates to barriers to services, ability to commute to alternative locations to access public services, the availability of health and social care professionals and quality indicators of NHS services such as how easy it is to make a GP appointment.

12.10.103 Aspects of the health baseline, as measured by routine LPA level indicators, may change in response to the DCO Project activities described above. The following borough-level summaries illustrate indicators that may be influenced over time by changes in access to public services.

1. London Borough of Hillingdon: ranked in the 6th decile for deprivation relating to the barriers to services (where one is the most deprived and ten the least deprived); 4% of the working age population describe themselves as health professionals (4% for London and 4% for England); and 60% of the population achieved five or more A* to C grade GCSEs including English & Maths (61% for London and 58% for England)

2. Slough Borough: ranked in the 8th decile for deprivation relating to the barriers to services; 3% of the working age population describe themselves as health professionals (4% for the south-east); and 59% of the population achieved five or more A* to C grade GCSEs including English & Maths (60% for the south-east)

3. London Borough of Hounslow: ranked in the 9th decile for deprivation relating to the barriers to services (where one is the most deprived and ten the least deprived); 3% of the working age population describe themselves as health professionals; and 60% of the population achieved five or more A* to C grade GCSEs including English & Maths

4. Spelthorne Borough: ranked in the 5th decile for deprivation relating to the barriers to services (where one is the most deprived and ten the least deprived); 3% of the working age population describe themselves as health professionals; and 66% of the population achieved five or more A* to C grade GCSEs including English & Maths

5. South Bucks District: ranked in the 6th decile for deprivation relating to the barriers to services (where one is the most deprived and ten the least deprived); 4% of the working age population describe themselves as health professionals; and 67% of the population achieved five or more A* to C grade GCSEs including English & Maths.

12.10.104 The existing health status of the population across the study area can be characterised as good-average levels of self-reported health. Existing deprivation can be characterised as average, for instance between the 4th and 6th IMD decile.
There are LSOAs with higher deprivation in West Drayton, Pinkwell and Heston West. Varying degrees of adaptation are expected within the population (some low others up to high). All life stages will be more likely to be influenced by the change (including as dependants). Given DCO Project proposals to reprovide public services where appropriate the population are expected to have good access to alternatives at most times, though there may be some periods of reduced access requiring a degree of adaptive behaviour on their part.

**Health priorities**

12.10.105 LPA and CCG health priorities cover access to public services as a determinant of health. The health priority themes summarised from the LPAs within the geographic scope are as follows: a focus on preventative services; providing community services; improved integration of services across health and social care; addressing the effects of high population turnover; improving access to education, jobs, leisure, health, and housing; and addressing the needs of vulnerable groups including disabled children, people with long term conditions, older people and carers.

12.10.106 NHS Hillingdon CCG (2017) seeks to develop primary care hubs across the borough with one hub being located in Hayes and Harlington. The strategic intention is to use existing estate and to target new investment to meet the predicted demand for Out of Hours services and to improve access to high quality care in high quality facilities. NHS Hillingdon CCG states that the population of Harlington is expected to increase over the next 10 years. Capacity in Harlington for primary care, for access to primary care and for reduced health inequalities, is a local focus (NHS Hillingdon CCG, 2017). NHS Hillingdon CCG and the London Borough of Hillingdon (2018) note the need to improve access to healthcare for people living in Heathrow Villages and to secure long-term premises for the Shakespeare Medical Centre (a planning application has been submitted for new premises at UB4 0RE).

**Consultation responses**

12.10.107 At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

**Standards / controls**

12.10.108 As per the Health and Social Care Act 2012 (HM Government of Great Britain & Northern Ireland, 2012a) and the National Health Service Act 2006 (HM Government of Great Britain, 2006) the Clinical Commissioning Groups have the function of arranging for the provision of services for the purposes of the health service.
Policy context

12.10.109 At a national level the Government supports the DCO Project, acknowledging the expansion will result in the loss of (or changes to) some community facilities and services, requiring appropriate mitigation.

12.10.110 Health and social care organisations are required to work together as a system to take joint responsibility for local populations within a geographic area (NHS England, 2014). The policy context requires organisations to recognise their strategic role as central hubs in place-based systems of care (NHS Hillingdon CCG, 2018).

12.10.111 The health policy themes summarised from the main adopted and emerging planning documents of LPAs within the geographic scope are as follows: ensuring development retains community facilities/services; requiring developers to supply on-site and off-site infrastructure improvements where necessary; improve access to local services and facilities through transport infrastructure; encourage shared facilities and co-location; and ensuring new facilities should serve the diverse needs of local communities.

Step 3: Categorising effects on human health

12.10.112 There is an association between access to public services and health outcomes. Furthermore, there is the potential for a small change from the baseline position; a slight widening of inequalities; and a direct and large contribution to recognised health priorities. As the consultation for the DCO Project continues, it is expected that changes in access to public services will emerge as a strong and consistent theme of consultation by both health stakeholders and the public. In policy terms the mitigated effect aligns with published national and local government policy expectations.

12.10.113 The effect for the general population across the study area in the short term (0-5 years) from the 2025 assessment year is moderate negative (not significant). This is when the greatest health effects are expected. The influences on health for the general population are likely to be at their greatest when services close, relocate or experience resource pressures. This is considered to be a short term effect as the public services, staff and users, will adapt to the changes. This will limit the potential for permanent influences on the health of the general population with effects likely to become negligible (not significant) in the medium term (5-10 years) and long term (10+ years). This takes account of embedded DCO Project measures and it also reflects routine service planning in responses to changing demand and resources.

12.10.114 Whilst the focus here is on the potential negative effects inherent to disruption and unsolicited change, it is acknowledged that there will be a range of responses
within the population, including the potential for benefits due to public service improvements due to the DCO Project’s embedded measures. At the PEIR stage information on potential service improvements is still developing, the assessment is therefore worst case in that it only considers potential negative effects. The Surface Access Proposals (SAP) aims to improve connectivity for local communities and further consideration of relevant measures will be included in the ES.

12.10.115 The effect for the vulnerable groups (a judgement of the greatest expected effect due to characteristics that increase sensitivity) ranges between negligible and major negative (significant) depending on the timeframe and relevant vulnerable group characteristics. The groups most likely to experience such effects are those that are less able to adapt to changing services, including where services are reprovided or expanded at a greater distance. Such groups include those affected by school changes, older people, people with existing poor health, people less able to afford travel and those who may experience existing or new barriers in accessing services.

12.10.116 In many cases the reprovision of public services (supported by the DCO Project’s embedded measures) will mean that, barring relatively short term disruption, the health benefits derived from public services will continue to be available. On this basis many of those with increased sensitivity (for example relating to educational access for young people or local sports facility access for those less able to travel further afield) will only experience short term negative effects (0-5 years), with improving effects thereafter. There is some uncertainty about the longer-term effects of educational disruption. It is plausible that a negative effect may persist due to reduced educational attainment.

12.10.117 Service providers may also experience challenges from a reduced catchment population (affecting funding) or relocations affecting staff. Where service quality is affected this may be associated with a negative effect (for both staff and service users), which although likely to improve may persist if services remain below their baseline standard.

12.10.118 In the short term (0-5 years) (from the 2025 assessment year) the greatest effect on vulnerable groups is major negative (significant), driven by direct disruption of education for a medium population (estimated at 100-500 people). A moderate negative (not significant) would be expected for the indirect strain on other public services for a large population (estimated at over 500 people).

12.10.119 In the medium term (5-10 years), for most people the health effect would be expected to reduce to minor negative (not significant). A sustained moderate negative (not significant) effect may occur during this timeframe if public service
quality continues to be adversely affected. The latter may be the case for a medium population (estimated at 100-500 people).

12.10.120 In the long-term (10+ years) a sustained moderate negative (not significant) effect would only be expected if school disruption affects long-term educational attainment. This may be the case for a small population (currently estimated at less than 100 people). The score reflects that whilst this group may experience increasing adverse health effects associated with poorer educational attainment (and whilst the ES will consider the potential for targeted development of environmental measures); the expectation is that only a very few people would be affected in this way. Consequently, there would not be a population level effect (even at the community level) that was significant in EIA terms. For other services, a reducing and ultimately negligible effect would be expected due to adaptation through routine service planning.

Healthy lifestyles: open spaces and active lifestyles

Introduction

12.10.121 The land requirements of the DCO Project may affect the health of residents who continue to live in communities partially or indirectly affected by changes in access to, or the availability and/or quality of, open spaces.

12.10.122 There is a plausible link between source-pathway-receptor that supports a change in health outcomes:

1. Source: loss or relocation of open space or sports facilities (including loss of access) due to the DCO Project
2. Pathway: healthy lifestyle related determinants of health, including physical activity and play
3. Receptors: residents; and visitors to, or workers in, open spaces and sports facilities around Heathrow.

12.10.123 The potential effect is both plausible and probable and is therefore considered to be likely.

12.10.124 This issue informs, and has been informed by, Chapter 11: Community. The Community chapter identifies the change in open spaces and sports facilities (and their reprovision). The Health chapter focuses on qualitative discussion of the health consequences of changes to open spaces and sports facilities due to the DCO Project.
Project activities and temporal scope

12.10.125 For formal open space appropriate local reprovision will be made (suitable to the remaining population's needs), such changes will therefore be temporary and be unlikely to change health outcomes (though potentially the accessibility, range, scale and quality of facilities offered may be permanently changed). For informal open space, for example use of field margins for dog walking etc. there may not be suitable reprovision opportunities that are conveniently located for those remaining, in such cases effects on physical activity opportunity and associated health outcomes may arise. Active travel along public rights of way, including those across and between open spaces, is discussed in the section of this chapter on Healthy lifestyles: active travel.

12.10.126 The activities that drive the potential effect are:

1. Phase 1 (c. 2022 – 2026) – Demolitions and earthworks will require vacant possession of open space and sports facilities within the draft DCO limits. This will include:
   a. Those that are reprovided, such as: Harmondsworth Recreation Ground (both with possible temporary and permanent reprovision); Harmondsworth Moor (sufficient to maintain its status as a metropolitan park); Longford Moor; North (and West) of The Great Barn at Harmondsworth; Public open space south-east of Harmondsworth Moor; Oaks Road Biodiversity Site; Townmead Recreation Ground; and Allotments (Pinglestone, Moor Lane, Vineries)
   b. Those that are not reprovided as the community they serve will be displaced, such as: Longford Pocket Park; and Play Area off Heathrow Close.

2. In relation to the reprovision there may be some periods before some of the reprovided public open spaces are available (or when temporarily unavailable public open spaces become available again, such as at Thorney Country Park). Chapter 11: Community (Table 11.37) notes expectations for improvements through reprovision, for example reprovision at Longford Moor will be greater both in terms of quality and quantity (with potential for positive health effects). However, negative health effects may also arise from the lack of continuity in physical activity opportunity prior to reprovision, with potentially lasting behavioural change related effects

3. The reprovision will comprise land located: to the north and east of Harmondsworth; between Sipson and Harlington; to the west and south-west of Cranford Park; and to the south of Colnbrook and Poyle. A key feature of the improved physical activity and leisure offer of the replacement public open space is their connectivity via the Green Link. This will be an accessible
network of spaces, ensuring recreation opportunities for people and incorporating environmental measures (noise management)

4. Phase 2 (late 2026 – 2033) and Phase 3 (2034 – 2050): ongoing local road changes may affect access to reprovided open space and sports facilities, including due to construction activities and the surface access implications of full opening of the North West Runway.

12.10.127 The advanced knowledge of the DCO Project activities is an opportunity for formal sports, play or sports facilities to be relocated (appropriately supported), effects may therefore commence prior to relocations. In the long-term a change in the availability of formal and informal open space may have an indirect effect on health outcomes such as levels of obesity, including for future generations. There may be short-term effects linked to the open space displacements and reprovision and medium- or long-term effects relating to the consequence of such change on the community physical and social activity.

12.10.128 The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2022 (this is the assessment year from which significance rankings are made for short, medium and long term health effects).

12.10.129 In categorising EIA significance for health the embedded measures set out in Section 12.5 of this chapter have been taken into account. This includes reprovision of displaced recreational space.

Geographic scope

12.10.130 The study area for this issue is defined by the LPAs of the London Borough of Hillingdon; Slough Borough Council; London Borough of Hounslow; Spelthorne Borough Council; South Bucks District Council; and the Royal Borough of Windsor and Maidenhead.

12.10.131 Effects focus around the community areas of Longford, Harmondsworth, Sipson, Harlington, Cranford Cross, Colnbrook, Poyle, Stanwell and Stanwell Moor which are the community areas where open space is lost due to the DCO Project’s land requirements, including for construction related uses. In addition, West Drayton and Iver and Richings Park are locations where flood storage areas are planned.

Receptors (population scope)

12.10.132 General population receptor: The population of the study area defined in the geographic scope. Where both the open space and the users of that open space are lost (for example potentially in Longford) this has been taken into account by the assessment.
Vulnerable group receptor: Relevant characteristics of the study area population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. The population adjacent to the Site (site-specific effects relating to access to open spaces and other opportunities linked to active lifestyles)
2. Children and young people (including pregnant women)
3. Older people (particularly frail elderly)
4. People (and their carers) with existing poor health (physical and mental health), including where this is due to disabilities
5. People living in areas known to exhibit high deprivation or poor economic and/or health indicators
6. People experiencing barriers in access to services, amenities and facilities.

People with lower incomes are more reliant on publicly accessible formal and informal open space for physical activity and active lifestyles (for instance compared to gym or private leisure/club membership).

People with reduced mobility and people on low incomes have lower car/van ownership and will therefore be less able to access open space that is reprovided further from the remaining community.

If a higher proportion of older people remain (and if new residents have a high proportion of people with low socio-economic status) then the health status of the remain population may be even more sensitive, reflecting that these groups tend to have more long-term (and multiple) health conditions/risk factors. Maintaining and improving physical activity and active lifestyle opportunities for such a population will be important.

**Step 1: Describing the potential effects on health**

The loss and then the subsequent reprovision of open spaces and sports facilities could have both positive and negative influences on health outcomes. The overall direction of health effect is best categorised as negative.

The relationship between the DCO Project change and health outcome will be indirect. There will be a change in both physical and mental health and wellbeing outcomes. These will predominantly relate to changes in the burden of disease within the population. This includes the onset of new health conditions or health related states, changes in existing health conditions and changes to day-to-day functioning. Many people in communities experiencing changes in access to open spaces or sports facilities will be affected to varying degrees.
12.10.139 Effects are likely in the short, medium and long term, reflecting that health outcomes are linked to patterns of physical activity, and the enjoyment (use) of open spaces, including over an extended period.

12.10.140 The influence on the population can be characterised as continuous (as opposed to infrequent or rare). The influence from changes in physical activity on health outcomes will likely include those that are permanent, progressive or irreversible as well as those that are more transitory or reversible.

**Step 2: Framing judgments on significance**

12.10.141 The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.

**Scientific literature**

12.10.142 The scientific literature indicates that there is an association between health and wellbeing outcomes and the types of changes due to the DCO Project for open spaces and active lifestyles. Key findings are that there is good evidence that access to opportunities to be physically active is positive for physical and mental health. The literature indicates benefits for all ages and the importance of spatial planning in providing appropriate opportunities.

12.10.143 The type of health outcomes relating to physical activity that are identified in the scientific literature include: general health; mental health and wellbeing; cardiovascular health; obesity and BMI levels; type-2-diabetes risk; some cancer risks; and musculoskeletal conditions. Effects associated with active lifestyles are likely to relate to changes in risk factors, quality of life and inequalities. A population level reduction in active lifestyles may be associated with the widespread onset of new clinical conditions or widespread exacerbation of existing clinical conditions.

12.10.144 Based on the literature reviewed, the strength of evidence is strong for a direct causal relationship between availability of open spaces and health outcomes. The evidence is strongest for open spaces and connectivity that promotes safe physical activity. The evidence for natural environments having a specific influence on mental wellbeing is more limited, but there is a general association of sufficient strength to warrant assessment and development of environmental measures to retain and enhance such spaces and views.

**Baseline conditions**

12.10.145 The baseline relates to: resident population and age structure; ethnicity; household car or van ownership; self-reported wellbeing; including anxiety, happiness and satisfaction; average distance travelled to work; obesity rates; rates of physical
activity; use of outdoor space for physical activity; and mortality rate from all cardiovascular diseases.

12.10.146 The health baseline, as measured by routine LPA level indicators, may change in response to the DCO Project activities described above. The following are illustrative of health baseline indicators that may be influenced over time due to change in recreational opportunities (though it is unlikely that such cross-sectional measures could apportion and attribute a particular level of change to the DCO Project).

1. London Borough of Hillingdon: 62% of adults are classified as overweight or obese (59% for London and 65% for England); 31% of adults are inactive (not achieving recommended levels of physical activity) (28% for London and 29% for England); and 15% of residents use outdoor space for health or exercise purposes (18% for London and 18% for England).

2. Slough Borough: 62% of adults are classified as overweight or obese (63% for the south-east); 31% of adults are inactive (25% for the south-east); and 17% of residents use outdoor space for health or exercise purposes (18% for the south-east).

3. London Borough of Hounslow: 63% of adults are classified as overweight or obese; 30% of adults are inactive; and 18% of residents use outdoor space for health or exercise purposes.

4. Spelthorne Borough: 64% of adults are classified as overweight or obese; 28% of adults are inactive; and in the county of Surrey 20% of residents use outdoor space for health or exercise purposes.

5. South Bucks District: 61% of adults are classified as overweight or obese; 23% of adults are inactive; and in the county of Buckinghamshire 17% of residents use outdoor space for health or exercise purposes.

6. The Royal Borough of Windsor and Maidenhead: 62% of adults are classified as overweight or obese; 22% of adults are inactive; and data on the percentage of residents using outdoor space for health or exercise purposes is not published.

12.10.147 The existing health status of the population in the study area can be characterised as good-average levels of self-reported health. The recorded prevalence of long-term conditions are taken from the Quality & Outcomes Framework (QOF) 2017/18, at GP practice level:

1. The prevalence of coronary heart disease within Heathrow Villages is 2.10%.

2. The prevalence of cardiovascular disease within Heathrow Villages is 1.08%.
3. The prevalence of diabetes in Heathrow Villages is 9.01%  

4. The prevalence of obesity in Heathrow Villages is 9.58%  

5. The prevalence of mental health in Heathrow Villages is 0.62%.  

12.10.148 Existing deprivation in the study area can be characterised as average (between the 4th and 6th IMD decile, but acknowledging potential for pockets of deprivation and higher deprivation in some wider area LSOAs in West Drayton, Pinkwell and Heston West). Varying degrees of adaptation are expected within the population (some low others up to high). All life stages are likely to be influenced by the change (including as dependants). Given proposals to reprovide open space and sports facilities where appropriate, the population are expected to have good access to alternatives most of the time, during periods prior to reprovision some adaptive behaviour may be required on their part.  

Health priorities  
12.10.149 LPA health priorities identify physical activity as a determinant of health. The health priority themes summarised from the LPAs within the geographic scope are as follows: promote healthier lifestyles including increasing rates of physical activity; maintain the quality of parks and open spaces to encourage more residents to use them; ensure public open spaces and public paths can be reached on foot; tackle obesity in children and adults.  

Consultation responses  
12.10.150 At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.  

Standards / controls  
12.10.151 No relevant standards have been identified.  

Policy context  
12.10.152 At a national level the Government supports the DCO Project, acknowledging the loss of sports facilities, including open space, provided due regard is given to local need and appropriate reprovision. Local need is in part expressed through local policy.  

12.10.153 The health policy themes summarised from the main adopted and emerging planning documents of LPAs within the geographic scope are as follows: facilitate active lifestyles by providing spaces within walking distance of homes; preserve and improve open spaces as areas for sports and recreation; expect larger developments to create places that foster active healthy lifestyles; contribute to the
Health and wellbeing of the local community through guidelines such as Active Design (Design Council, 2014).

**Step 3: Categorising effects on human health**

12.10.154 There is evidence of a relationship between access to open space, active lifestyles and improved outcomes for physical and mental health. Furthermore, due to the DCO Project, there is the potential for: a substantial change from the baseline position; a slight widening of inequalities; and a direct and large contribution to recognised health priorities. As the consultation for the DCO Project continues, it is expected that changes in open space and sports facilities will emerge as a strong and consistent theme of consultation by both health stakeholders and the public. In policy terms the effect aligns with published national policy expectations.

12.10.155 The effect for the general population across the study area in the short term (0-5 years) from the 2022 assessment year, when the greatest effects are expected, is moderate negative (not significant). The effect is driven by a gap in reprovision of formal open space and loss of informal open space. The conclusion for the general population reflects the important role that open space, including informal open space without specific sports use, plays in active lifestyles. Easy access to open space influences levels of physical activity, which is a key determinant of physical and mental health. Formal sports opportunities will be reprovided, however, even relatively short periods of disruption, or gaps in provision or differences in aspects of quality can change behaviour away from active leisure pursuits. In the medium (5-10 years) and long term (10+ years) a minor positive effect would be expected from the quality and maintenance of the reprovided open spaces and sports facilities.

12.10.156 The effect for the vulnerable group (a judgement of the greatest expected effect due to characteristics that increase sensitivity) ranges between negligible (not significant) and major negative (significant) depending on the timeframe and relevant vulnerable group characteristics. Sensitivities within this group include: living next to areas of open space that are lost (for example people accessing local sports pitches); having an existing health condition that is improved by physical activity; and having low income or access barriers that restrict access to alternative open spaces or sports facilities that are further afield. A reduction in opportunities to be physically active may particularly affect the longer-term health of young people and older people.

12.10.157 Given that the DCO Project will ensure that open spaces and leisure activities are reprovided, where appropriate, any negative effects are likely to improve as these and other alternatives are taken up. However, the effect of disruption on behavioural change away from physical activity and the overall loss of informal use
of open spaces may mean that, for the vulnerable groups identified above, a negative health effect persists.

12.10.158 In the short term (0-5 years) (from the 2022 assessment year) the greatest health effect for affected vulnerable groups is expected to be major negative (significant). The effect is driven by a gap in reprovision of formal open space and loss of informal open space for a large population (estimated at over 500 people). The effect is likely to range between moderate negative (not significant) and major negative (significant) depending on the extent of reliance on the open space and sport facilities.

12.10.159 In the medium term (5-10 years), many people may experience a negligible (not significant) effect with the reprovision being equivalent to the open space and sports facilities lost. There may also be a minor positive (not significant) effect where people benefit from improved formal sports facilities. However during this period there may also be a continuing minor negative (not significant) effect if the overall loss of open space and the lag in reprovision reduces physical activity behaviour (even following reprovision). In both cases effects may be for a large population (estimated at over 500 people).

12.10.160 In the long term (10+ years) effects may continue to be negligible for many people. A moderate positive effect would be expected from sustained use of improved formal sports facilities for a large population (estimated at over 500 people). There is also potential for a moderate negative effect if the overall reduction in open space and the lag in reprovision causes a long-term reduction in physical activity behaviour. The latter may be the case for a small population (currently estimated at less than 100 people). The score reflects that whilst this group may experience increasing adverse health effects from persistent physical inactivity (and whilst the ES will consider the potential for targeted development of environmental measures); the expectation is that only a very few people would be affected in this way. Consequently, there would not be a population level effect (even at the community level) that was significant in EIA terms.

Healthy lifestyles: active travel

Introduction

12.10.161 The land requirements of the DCO Project will lead to changes to roads and routes and construction traffic. This may affect the health of residents who live in communities near the Airport (as well as wider area commuters) through changes in access to, or the availability and/or quality of, active travel routes. These factors have the potential to contribute to severance between communities located around the Airport. This is particularly the case given that the existing Airport’s size prevents direct lines of travel between some communities. Given that road links
would be maintained for all communities at all times, this section focuses on the ease of active travel between communities and to/from the Airport.

12.10.162 There is a plausible link between source-pathway-receptor that supports a change in health outcomes:

1. Source: changes to traffic conditions and to pedestrian and cycle routes due to the DCO Project

2. Pathway: physical activity and factors affecting active travel behaviour, such as route conditions, safety and journey time

3. Receptors: residents; visitors to the area (as commuters on active travel routes); airport passengers and visitors (commuting to the Airport); Heathrow colleagues (commuting to the Airport); the construction workforce (commuting to work); and road users for other reasons (including non-motorised users (NMUs), particularly as pedestrians and cyclists).

12.10.163 The potential effect is both plausible and probable and is therefore considered to be likely.

12.10.164 This issue informs, and has been informed by, Chapter 11: Community, Chapter 19: Transport network users and Volume 4: Active Travel of the Preliminary Transport Information Report (PTIR), published as part of the Airport Expansion Consultation (June 2019).

1. The Community chapter provides information on public rights of way that are not adjacent to the highway and the assessment of community effects on local residents

2. The Transport network users chapter identifies the changes in routes (motorised and non-motorised), shift in modal share and changes to journey times / severance

3. The PTIR assesses active travel to and from Heathrow, predominantly by Heathrow colleagues

4. The Health chapter focuses on qualitative discussion of the health consequences of changes in routes and modal share. The Health chapter takes a broader community focus than the PTIR, through it is acknowledged that there will be overlap between Heathrow colleagues walking or cycling to the Airport as a receptor group and the resident community as a receptor group.
Project activities and temporal scope

12.10.165 The DCO Project results in temporary and permanent changes to local routes. While these routes are well-used, the routes are generally being reprovided to maintain existing connections between communities.

12.10.166 Effects are expected to be temporary for diversions (though the length of time that diversions operate may in practical terms mean that they are permanent changes for many people). For new routes effects will be permanent (and represent an opportunity to increase active travel).

12.10.167 The activities that drive the potential effect are:

1. Phase 1 (c. 2022 – 2026):
   a. Modification of local roads and junctions (including the relocation of the A4, and works to the A3133, A3044, A408, Bath Road and Simpson Lane) will affect use of these routes by cyclists and pedestrians. Table 6.4 in Chapter 6: DCO Project description sets out the details of the non-motorway related infrastructure works that would form part of the DCO Project
   b. Construction related transport effects on public highways will be at their greatest during Phase 1. For example, prior to the establishment of internal construction routes there will be increased earthworks (and other DCO Project related) vehicle movements on the public highways (including the existing A4). However, Chapter 19: Transport network users concludes that during Phase 1 there will not be significant effects relating to severance or pedestrian and cyclist amenity or delay
   c. For active travel along routes other than public highways Chapter 11: Community acknowledges the potential for significant adverse effects to some public rights of way during Phase 1 including: Slough PRoW 6 (Resource ID R0064); Slough PRoW 6a (Resource ID R0065); Slough PRoW 2 (Resource ID R0066); Hillingdon PRoW Y13 (Resource ID R0220); Hillingdon PRoW Y8 (Resource ID R0229); Slough PRoW 2a (Resource ID R0063); and Slough PRoW 3 (Resource ID R0063)
   d. The SAP sets out how access to the Airport by all travel modes will be managed to meet targets set out in the ANPS, as well as fulfilling Heathrow’s pledge not to increase airport-related traffic through expansion. However, during Phase 1 the release of 25,000 additional air transport movements (ATMs) over four years (2022-2025) will be associated with a consequent increase in surface access activity that will affect pedestrian and cyclist amenity
   e. Balancing such anticipated increase in passenger vehicle movements, modification or demolition of existing car parks during Phase 1 will
contributes to the phased reduction in airport worker parking that will continue during Phase 2 and Phase 3 (from 25,000 spaces to around 17,000 spaces by 2030 and to approximately 12,000 spaces by 2040 as outlined in Chapter 6: DCO Project description). This reduction in Heathrow colleague parking will occur in combination with measures to enhance and promote public transport and active travel modes as well as increasing car sharing.

4. Phase 2 (late 2026 – 2033)
   a. Modification of local roads and junctions will continue (with health-related effects as discussion for Phase 1). During this time there will also be an ongoing phased reduction in Heathrow colleague parking and accompanying promotion of active travel. During Phase 2 the volume of construction related vehicle movements on public highways will decline, improving pedestrian and cyclist amenity. However, Chapter 19: Transport network users concludes that during Phase 2 there would be significant effects relating to severance on localised sections of Sipson Road and Sipson Lane. Furthermore, whilst there will be increases in pedestrian and cyclist amenity, there will also be decreases (for example on localised stretches of Sipson Road and the Northern Perimeter Road). Pedestrian and cyclist travel time may also increase in some places (for example on stretches of Sipson Road, East Ramp and Nene Road).

   b. The further increase in capacity up to at least 740,000 ATMs and 130 million passengers per annum (MPPA) in 2035 in response to the North West Runway opening will continue to be in accordance with the Heathrow’s pledge not to increase airport-related traffic through expansion. No effect on pedestrian and cyclist amenity is expected from such increases.

5. Phase 3 (2034 – 2050)
   a. The completion of all road works is expected to leave a legacy of improved active travel routes. Furthermore, the measures to promote active travel to the Airport by both Heathrow colleagues and passengers are expected to have become established with positive effects for health from such physical activity. Chapter 19: Transport network users concludes that whilst during Phase 3 some beneficial effects on severance would be expected, there would also be localised negative effects for some sections of Sipson Road, Holloway Lane and Sipson Lane. Furthermore, there will also be potential decreases in pedestrian and cyclist amenity on localised stretches of Sipson Road and Holloway Lane. Pedestrian and cyclist travel time may also increase on stretches of Holloway Lane.

   b. Public transport, whilst not active travel, does promote active travel through multi-modal travel (for instance walking or cycling to / from the public
transport hub). The design approach to the DCO Project has sought to concentrate jobs in areas that can easily be accessed by public transport. Heathrow also plans to enhance existing and committed rail links into central London including the Piccadilly and Elizabeth lines and Heathrow Express\(^5\). In addition, Heathrow is looking to expand and improve bus and coach services to the Airport to ensure a choice of public transport options.

12.10.168 Transitionary arrangements are important to avoid closures of existing roads and active travel routes before the opening of any new or diverted active travel routes.

12.10.169 The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2022 (this is the assessment year from which significance rankings are made for short, medium and long term health effects). This reflects that whilst Chapter 19: Transport network users indicates that the potential for significant effects of active travel routes along roads occurs predominantly in Phases 2 and 3, Chapter 11: Community identifies the potential for significant adverse effects to some public rights of way during Phase 1.

12.10.170 The embedded measures set out in Section 12.5 of this chapter include: cyclist routes and public transport infrastructure; diversions where appropriate; a Construction Traffic Management Plan (CTMP); and improvements to cycle lanes, crossing points and footways.

**Geographic scope**

12.10.171 The study area for this issue is defined by the LPAs of the London Borough of Hillingdon; Slough Borough; London Borough of Hounslow; Spelthorne Borough; South Bucks District; and the Royal Borough of Windsor and Maidenhead.

12.10.172 Effects focus around the community areas of Longford, Harmondsworth, Sipson, Harlington, Poyle, Stanwell and Stanwell Moor (being the community areas where active travel routes are affected by the DCO Project’s land requirements or changes to routes).

12.10.173 The assessment seeks to take account of occasions where both the active travel routes are lost, and the users of those routes may relocate (for example potentially in Longford).

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\(^5\) For the purposes of the PEIR, and to ensure that the assessment considers a worst case, it has been assumed that no new rail schemes (other than those such as the Elizabeth line which are already committed) will be delivered.
Receptors (population scope)

12.10.174 General population receptor: The population of the study area defined in the geographic scope.

12.10.175 Vulnerable group receptor: Relevant characteristics of the study area population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. The population adjacent to the Site in close proximity to the site-specific effects relating to access to active travel routes
2. Children and young people
3. Older people (particularly with restricted mobility, limited active travel range; and with concerns about safety and/or surface quality)
4. People (and their carers) with existing poor health (physical and mental health), including where this is due to disabilities
5. People who are: unemployed, on low incomes, have regular shift worker, have low job stability, or have few progression prospects
6. People living in areas known to exhibit high deprivation or poor economic and/or health indicators
7. People experiencing barriers in access to services, amenities and facilities.

12.10.176 People with lower incomes may be more reliant on active travel due to the cost of car/van ownership. This includes households with a single vehicle that leaves part of a household (for example, a parent with young children) reliant on active travel routes for much of the day. Young people who are not eligible or able to afford a vehicle may also be more reliant on active travel routes to commute to education/training, employment (young adults), social gatherings, recreational/leisure clubs or shops and services. People with reduced mobility (for example, due to disability or older age) may also have lower car/van ownership and therefore be more reliant on active travel routes (particularly over short distances), including those suitable for mobility scooters.

12.10.177 Sensitivity may be increased where active travel routes, including diversions, are associated with actual and/or perceived crime risks (including seasonal variation in daytime lighting). Sensitivity may also be higher where access deprivation indicates poor connectivity to key services or amenities.

12.10.178 Obesity levels and associated health outcomes are important in relation to any disruption of, or improvement in, the opportunities to be physically active through active travel. Quality as well as connectivity of routes can also be important, for
example, separation of cycle lanes from vehicle traffic, particularly for young people cycling to school, and quality of pavement surfaces for older people.

12.10.179 The construction of the DCO Project requires changes to a number of local routes, including re-routing the A4 and A3044. In addition, peak construction traffic using local roads may also influence modes and patterns of travel. More information on specific routes and usage is set out in Chapter 19: Transport network users.

**Step 1: Describing the potential effects on health**

12.10.180 There is a range of changes to active travel routes as a result of the DCO Project: some will be lost, some will be reprovided and some new routes will be developed. This offers the potential for both positive and negative influences on health outcomes. The health effect is best categorised as negative as existing patterns of use will be disrupted causing potentially lasting changes to active travel behaviour. New patterns are less certain and taking time to establish.

12.10.181 The relationship between the DCO Project change and health effect will be indirect. Physical and mental health and wellbeing outcomes will be affected. These will predominantly relate to changes in the burden of disease within the population. This includes the onset of new health conditions or health related states, changes in existing health conditions and changes to day-to-day functioning.

12.10.182 Many people in communities experiencing changes to active travel routes (as well as more distant active travel commuters using those routes) will be affected to varying degrees. Effects are likely in the short, medium and long term, reflecting that health outcomes are linked to patterns of physical activity, including over an extended period. The influence on the population can be characterised as continuous (as opposed to infrequent or rare). The influence from changes in physical activity on health outcomes will likely include those that are permanent, progressive or irreversible (for example long-term conditions) as well as those that are more transitory or reversible (for example exercise associated wellbeing).

**Step 2: Framing judgments on significance**

12.10.183 The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.

**Scientific literature**

12.10.184 The scientific literature indicates that there is evidence to support an association between changes in active travel and health and wellbeing outcomes. Key findings are that there is good evidence that active travel opportunities are positive for physical and mental health. The literature indicates benefits for all ages and the
importance of spatial planning in not only providing appropriate opportunities, but also in avoiding actual and perceived road related hazards.

12.10.185 The type of health outcomes relating to physical activity that are identified in the scientific literature include: general health; mental health and wellbeing; cardiovascular health; obesity and BMI levels; type-2-diabetes risk; some cancer risks; and musculoskeletal conditions. Road safety outcomes are assessed under the section of this chapter on Transport: road safety. Effects associated with active travel are likely to relate to changes in risk factors, quality of life and inequalities. A population level reduction in active travel may be associated with the widespread onset of new clinical conditions or widespread exacerbation of existing clinical conditions.

12.10.186 Based on the literature reviewed, the strength of evidence is strong for a direct causal relationship between use of active travel and health outcomes. The evidence is strongest for benefits to physical health. The evidence for traffic volumes directly influencing active travel decision making is more limited, but there is a general association of sufficient strength to warrant assessment and development of environmental measures to improve active travel opportunities and road safety where traffic increases due to the DCO Project.

Baseline conditions

12.10.187 The baseline relates to: resident population and age structure; household car or van ownership; reported wellbeing, including anxiety, happiness and satisfaction; average distance travelled to work; obesity rates; rates of physical activity; use of outdoor space for physical activity; and mortality rate from all cardiovascular diseases.

12.10.188 The health baseline, as measured by routine LPA level indicators, may change in response to the DCO Project activities described above. The following are illustrative of health baseline indicators that may be influenced over time due to changes in active travel opportunities (though it is unlikely that such cross-sectional measures could apportion and attribute a particular level of change to the DCO Project).

1. London Borough of Hillingdon: The average distance travelled to work is 12km. This compares with 11km for London and 15km for England; and the under 75 mortality rate from all cardiovascular diseases is 81 per 100,000 population (77 per 100,000 population for London and 75 per 100,000 population for England)

2. Slough Borough: The average distance travelled to work is 12km (17 km for the south-east); and the under 75 mortality rate from all cardiovascular diseases is 105 per 100,000 population (77 per 100,000 population for the south-east)
3. London Borough of Hounslow: The average distance travelled to work is 11km; and the under 75 mortality rate from all cardiovascular diseases is 84 per 100,000 population.

4. Spelthorne Borough: The average distance travelled to work is 12km; and the under 75 mortality rate from all cardiovascular diseases is 65 per 100,000 population.

5. South Bucks District: The average distance travelled to work is 16km; and the under 75 mortality rate from all cardiovascular diseases is 58 per 100,000 population.

6. The Royal Borough of Windsor and Maidenhead: The average distance travelled to work is 15km; and the under 75 mortality rate from all cardiovascular diseases is 59 per 100,000 population.

The existing health status of the population in the study area can be characterised as good-average levels of self-reported health. Current levels of deprivation are between the 4th and 6th IMD decile. There are LSOAs with higher deprivation in West Drayton, Pinkwell and Heston West. On this issue the population is expected to be capable of adaptive behaviour, making use of alternative routes available rather than forgoing active travel. With the exception of those in an early developmental stage, all other life stages are likely to be influenced by the change (as active travel network users). Given embedded measures to reprovide active travel routes where appropriate (and provide new ones), the population will have access to alternatives most of the time.

Health priorities

LPA health priorities have been set that link with active travel as a determinant of health. The health priority themes summarised from the LPAs within the geographic scope are as follows: support active travel; provide safe green spaces, play areas, cycle and walking routes; improve transport, reduce traffic congestion.

Consultation responses

At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

Standards / controls

Not applicable for this issue.
Policy context

12.10.193 At a national level the Government supports the DCO Project, acknowledging there is a need to maximise access to the Airport by sustainable modes of transport (including public transport and active transport), as well as reduce any issues of community severance.

12.10.194 The health policy themes summarised from the main adopted and emerging planning documents of LPAs within the geographic scope are as follows: facilitate active lifestyles by providing spaces within walking distance of homes; reduce the reliance on the use of the car by promoting safe and sustainable forms of transport, such as improved walking and cycling routes and encouraging travel plans; secure a more sustainable local travel network that maximises opportunities for walking, cycling, and using public transport; actively encouraging walking and cycling through the provision of an attractive public realm; secure more sustainable travel patterns by improving facilities for non-car based travel; avoid negative effects to the recreational and amenity value of the existing rights of way network.

12.10.195 There is an alignment between the intentions of both national and local policy to improve active and sustainable travel. Such alignment of national and local policy drivers is likely to enhance positive effects linked to physical activity (as well as co-benefits linked to surface access emission reductions).

Step 3: Categorising effects on human health

12.10.196 There is a relationship between active travel and health outcome. Furthermore, there is the potential for: a small change from the baseline position; a slight widening of inequalities; and a direct and large contribution to recognised health priorities. As the consultation for the DCO Project continues, it is expected that changes in active travel opportunities will emerge as a theme of consultation by both health stakeholders and the public. The effect aligns with published national policy expectations.

12.10.197 Although diversions are expected, based on increases in construction related traffic flow, effects are likely to be greatest and most widespread during Phases 1 and 2. This includes diversion to some public rights of way during Phase 1. During Phase 3 there will be comparatively lower levels of construction traffic and also the potential for more localised highway network effects, as the majority of road layouts will be complete. Longer-term, active travel may increase, and Heathrow colleagues and some passengers may take advantage of the improve infrastructure to commute to and from the Airport (with benefits to health). Levels of active travel within surrounding communities will also be expected to improve, though for some the behavioural change away from active travel could have a lasting effect on their mobility or levels of physical activity.
The effect for the general population across the study area in the short term (0-5 years) from the 2022 assessment year is minor negative (not significant). This is when the greatest health effect is expected. This conclusion reflects that whilst the DCO Project’s embedded measures will maintain or reprovide active travel opportunities where appropriate throughout construction and operation, for many active travel users of affected routes (particularly public rights of way) there will be disruption which may discourage active travel use. The minor negative (not significant) effect may persist into the medium term (5-10 years) and the long term (10+ years) related to increases in traffic flows on active travel routes along public highways. However, in the medium term (5-10 years) and the long term (10+ years) a minor positive (not significant) effect would also be expected from the improved active travel infrastructure and active commuting promotion activities.

The effect for the vulnerable group (a judgement of the greatest expected effect due to characteristics that increase sensitivity) ranges between moderate negative (not significant) though negligible to minor positive (not significant) depending on the timeframe and relevant vulnerable group characteristics. The groups whose active travel decision making may be most affected include children and young people; older people and people with existing poor health, for whom risk of falls may be greater; and people with low income or access deprivation, who may have limited alternatives to active travel. For these groups changes in routes or road conditions (including large increases in traffic flows) may discourage active travel, foregoing benefits of physical activity and potentially restricting their ability to access public services, amenities or employment.

In the short term (0-5 years) (from the 2022 assessment year) the greatest effect on affected vulnerable groups is expected to be moderate negative (not significant). The negative effect is driven by changes to affected public rights of way, as well as DCO Project vehicle movements and road works on active travel routes along public highways for a large population (estimated at over 500 people). The effect is expected to range from minor negative (not significant) to moderate negative (not significant) depending on the degree to which active travel is discouraged.

In the medium term (5-10 years), adaptive behaviour by most people (using diversions or alternative routes) would be expected resulting in a negligible or minor negative effect (both not significant). A sustained minor negative to moderate negative (both not significant) effect may however occur during this timeframe if disrupted active travel reduces physical activity behaviour. This may particularly be the case for a localised population along roads with increased traffic flows that do not have separate cycle paths. The latter may be the case for a medium population (estimated at 100-500 people). Where the DCO Project improved active travel routes, particularly public rights of way, a sustained minor
positive (not significant) effect would be expected for a large population (estimated at over 500 people).

12.10.202 In the long term (10+ years) many people would experience a negligible (not significant) effect, with the final active travel route network offering equivalent walking and cycling opportunity. However, where the DCO Project improved active travel routes, a sustained minor positive (not significant) effect would be expected. Such benefits may extend to a large population (estimated at over 500 people). This may be accompanied by a sustained minor negative (not significant) effect if disrupted active travel results in persistent behavioural change to being less physically active, including due to continuing higher traffic flows on active travel routes along public highways. The latter may be the case for a medium population (estimated at 100-500 people).

**Flood risk: flood risk management**

**Introduction**

12.10.203 The land required for the construction of the DCO Project would disrupt existing water features and add new features to the existing floodplain. The presence of the expanded Airport may also influence the risk to flooding elsewhere in the catchment. The change in the risk of flooding as a result of the DCO Project is assessed in Chapter 21: Water environment which is supported by a draft Flood Risk Assessment (FRA) (available at Appendix 21.4, Volume 3). These documents inform the assessment of the health effects of flooding, including the change in flood risk (including extent), the management measures that will be used and regulatory compliance.

12.10.204 The DCO Project is located in the lower reaches of the River Thames catchment within the direct catchments of several tributaries of the Thames, notably the Rivers Colne and Crane as well as a number of smaller watercourses. The Chapter 21: Water environment Local Surface Water Study Area (LSA) is predominantly a low-lying area with a large urban and suburban extent. Moving out to the north of the Chapter 21: Water environment Wider Surface Water Study Area (WSA), the wider Colne catchment extends north into the Chiltern Hills and includes several chalk streams in its headwaters, while in the south of the WSA the River Thames flows into its tidal reaches at Teddington in London.

12.10.205 There are two distinct river systems which require compensatory flood storage due to the DCO Project: the Colne Brook and the River Colne, between which the M25 acts as a rough dividing line. The loss of existing floodplain due to the DCO Project will also require the provision of compensatory flood storage areas.

12.10.206 A plausible source-pathway-receptor linkage has been established between a change in flood risk and a change in health outcomes.
1. Source: the change in land use and construction activities due to the DCO Project

2. Pathway: the change in land use and changes to the river and groundwater environment influencing the area at risk of flooding

3. Receptors: the community directly affected by flooding, including people and property.

Although a plausible source-pathway-receptor linkage has been established between flood risk and health outcomes, the conditions required for the source-pathway-receptor linkage are highly improbable due to the commitment to embedded environmental measures (described below). The potential effect is therefore considered unlikely (for instance it is plausible but not probable). The following paragraphs provide additional context and detail in support of this conclusion.

Chapter 21: Water environment concludes that, for construction activities, changes to fluvial flood risk, pluvial flood risk, groundwater flooding and sewer flooding are assessed as having a negligible magnitude of change on the basis of compliance with permitting and the incorporation of appropriate drainage strategies. The Water environment assessment concludes that flood risk effect from construction activity is not significant. Change to the risk of flooding from infrastructure such as reservoirs, canals, new raised water bodies (for example flood storage areas, surface water management) would have no effect from construction activities.

Chapter 21: Water environment concludes that, for operational activities, changes to fluvial flood risk are assessed as having a negligible magnitude of change based on the conclusions of Appendix 21.4. Changes to pluvial flood risk and changes to the risk of sewer flooding from operational activities are assessed as having a negligible magnitude of change on the basis of appropriate drainage strategies being implemented. Changes to groundwater flood risk from operational activities are assessed as having a negligible magnitude of change on the basis of appropriate design and alignment of subsurface features, and of new and updated drainage networks, avoiding changes to the groundwater regime. The Water environment assessment conclude that flood risk effect from operational activities is not significant. Change to the risk of flooding from infrastructure such as reservoirs, canals, new raised water bodies (for example flood storage areas, surface water management) would have no effect from operational activities.

These conclusions demonstrate that the risk to people and property from flooding has been considered through the preparation of a Flood Risk Assessment. It is acknowledged that however small the risk of flooding is, the residual risk can be a source of anxiety, particularly to those people who have experienced flooding of
property in the past. Embedded environmental measures include developing emergency flood warning and response procedures and flood risk plan preparation.

12.10.211 Based on the design and monitoring regimes in place, the potential effect is unlikely, so it is not a likely significant effect and therefore health effects are rated as negligible (not significant) for all phases of the DCO Project. This issue is not assessed further. A watching brief will be maintained on this issue and, if appropriate, any update will be reported in the ES.

Environment: construction effects

Introduction

12.10.212 The construction activities of the DCO Project will give rise to a range of environmental exposures that have similar spatial and temporal extents. Construction effects are considered as a single health issue due to the interrelated nature of both the exposures and of the potential physical and mental health outcomes.

12.10.213 A source-pathway-receptor linkage is proposed between construction related exposures and consequently experiencing a change in health outcomes.

1. Source: construction activities due to the DCO Project, including noise, vibration, air quality, dust, odour and lighting

2. Pathway: increased concentrations of environmental exposures transmitted through the air and across the ground

3. Receptors: residents; visitors to the area; airport passengers and visitors; Heathrow colleagues; and the construction workforce.

12.10.214 This issue informs and has been informed by Chapter 7: Air quality and odour, Chapter 15: Landscape and visual amenity and Chapter 17: Noise and vibration. Regard has also been had to the findings of Chapter 14: Land quality and Chapter 21: Water environment.

1. The air quality chapter identifies changes by area for relevant air pollutants, including nitrogen dioxide and fine particulate matter. It also includes dust and odour risk assessments

2. The noise and vibration chapter identifies noise and vibration effects by area

3. The landscape and visual amenity chapter identifies visual change by area

4. Lighting principles relevant to construction are set out in Appendix 5.2.
This section of the health chapter focuses on qualitative discussion of the health consequences of the combined construction experience for communities closest to the Airport, particularly in relation to construction related exposures and visual disturbance associated with the construction activities themselves (as opposed to the structures they create). The section of this chapter on Community cohesion: community identity considers the wider influence on how people feel about their sense of place based on the changing community context due to the new structures, new land uses and new operational Airport activities.

Project activities and temporal scope

Relevant DCO Project activities in Phase 1 relate to 2023 as the year of peak construction activity, from which short, medium and long term health effects are identified. 2023 is considered to appropriately reflect the greatest level of change in environmental conditions as well as being indicative of the largest construction related effects discussed by the air quality, noise and vibration and landscape and visual amenity aspects.

During Phases 2 and 3 there would be ongoing construction activity, which is considered as part of the medium and long term effects from the assessment year.

1. Phase 1 (c. 2022 - 2026) - Construction activities are set out in Table 6.11 of Chapter 6: DCO Project description
2. Phase 2 (c. late 2026 - 2033) - Construction activities are set out in Table 6.12 of Chapter 6: DCO Project description
3. Phase 3 (c. 2034 – 2050) - Construction activities are set out in Table 6.13 of Chapter 6: DCO Project description.

During Phase 1 the health effects prior to the 2023 assessment year (for instance 2022 to 2023) have and will continue to be considered in terms of assessment and development of environmental measures (for instance they are part of the build up to the year of peak DCO Project construction activity). Prior to the assessment year the build-up in DCO Project activities is best categorised as not significant, acknowledging that during this time health outcomes will start to be affected and by the assessment year effects will become significant for some. The influence of earlier activities on the health effects associated with the 2023 assessment year are therefore taken into account as part of the assessment.

In categorising EIA significance for health, the embedded measures set out in Section 12.5 of this chapter have been taken into account. This includes the draft CoCP with measures to reduce construction impacts on the community.
Geographic scope

12.10.220 The study area for this issue is defined by the LPAs of the London Borough of Hillingdon; Slough Borough; London Borough of Hounslow; Spelthorne Borough; and South Bucks District (being the LPAs within which construction activities will occur).

12.10.221 Effects focus around the community areas of Harmondsworth; Sipson; Harlington; Stanwell; Stanwell Moor; Colnbrook; and Poyle (being the community areas within which construction activities will occur (excluding Longford as the community would be fully relocated)).

Receptors (population scope)

12.10.222 General population receptor: The population of the study area defined in the geographic scope.

12.10.223 Vulnerable group receptor: Relevant characteristics of the study area population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. The population adjacent to the Site (site-specific effects relating to environmental change)

2. Children and young people

3. Older people (particularly frail elderly)

4. People (and their carers) with existing poor health (physical and mental health), including where this is due to disabilities

5. People who are: unemployed, on low incomes (including working part time) or have regular shift worker (more likely to spend extended periods at home)

6. People living in areas known to exhibit high deprivation or poor economic and/or health indicators.

Step 1: Describing the potential effects on health

12.10.224 Chapter 7: Air quality and odour construction related effects can be summarised as follows:

1. Construction activities give rise to emissions of dust and odour causing potential loss of amenity at residential properties, schools, medical facilities, commercial sites, businesses, work sites and haul roads. However, the good practice measures included in the draft CoCP will be used to reduce dust and
odour emissions from construction activities and control them where necessary so that effects are not significant.

2. In 2022, during the construction phase, exceedances of the limit values are predicted within the ‘Core Air Quality Objective Assessment Area’ without the DCO Project. In 2022, projected changes in pollutant concentrations due to the DCO Project are principally driven by construction traffic. The air quality assessment notes the following with regard to risk assessment of compliance with the EU Directive on ambient air quality. During construction, based on a conservative assessment, preliminary findings are that the DCO Project is High Risk when considering the construction impacts in 2022, as modelled. These findings are based on traffic flow predictions with known limitations and do not account for the Action Plan that will be described further in the ES to reduce construction traffic flows.

12.10.225 Chapter 15: Landscape and visual amenity construction related effects can be summarised as follows:

1. Construction activities associated with the DCO Project, namely the creation and use of construction working areas, demolition, movement of plant (including cranes) and vehicles, and material stockpiles, would introduce disruptive visual elements during construction

2. The DCO Project would affect landscape/townscape character due to construction activities resulting in effects ranging from Slight Adverse (not significant) to Large Adverse (significant) effects

3. The DCO Project would affect visual amenity due to construction activities resulting in effects ranging from Slight Adverse (not significant) to Large Adverse (significant) effects.

12.10.226 Chapter 17: Noise and vibration construction related effects can be summarised as follows:

1. The noise assessment distinguishes between a ‘significant adverse effect on health and quality of life’ (SHQL) and a wider ‘adverse likely significant effect’ (ALSE)

   a. During construction, possible ‘significant effects on health and quality of life’ (SHQL) day, evening and night are avoided in the communities of Harlington, Harmondsworth, Sipson, Stanwell, Stanwell Moor and Poyle through noise control measures, noise insulation and temporary rehousing

   b. During construction, wider ‘adverse likely significant effects’ (ALSE) are expected, though they would be reduced by measures set out in the draft
CoCP. Such noise levels would affect residents in Colnbrook, Poyle, Harmondsworth, Sipson and Harlington.

2. General noise controls are set out in the draft CoCP. Temporary tall noise barriers are proposed around the perimeter of construction sites close to residential areas. Site specific noise controls would be agreed with LPAs before construction is started. Noise insulation would be provided for qualifying properties close to construction activities where noise would otherwise be disruptive and temporary re-housing provided if levels were unacceptable, in line with the draft Noise Insulation Policy.

12.10.227 The health effect associated with the collective construction experience is best categorised as negative. Direct and indirect influences on health physical and mental health and wellbeing outcomes will be expected. These will predominantly relate to changes in wellbeing and the burden of disease within the population, though the potential for contributions to changes in mortality (for example due to noise and air pollutant exposure) are also noted. This includes the onset of new health conditions or health related states, changes in existing health conditions and changes to day-to-day functioning. The exposure can be characterised as moderate or high over a medium or long period. Given the urban context the population is predominantly in close proximity to the construction related sources and baseline conditions (such as ambient air quality) may already be approaching regulatory standards.

12.10.228 Many people in communities close to construction activities will be affected to varying degrees. Effects are likely in the short, medium and long term, reflecting that construction activities occur in Phases 1, 2 and 3. However, it is noted that whilst construction activities are centred around the Airport, they are also localised in discrete areas at particular times (effects at particular dwellings will therefore vary over time). At any given location where a construction activity is occurring the influence on the population can be characterised as continuous (as opposed to infrequent or rare). The construction experience’s influence on health outcomes will predominantly relate to transitory or reversible health outcomes. However, given the potential for elevated and long-term exposures there is also the potential for more permanent, progressive or irreversible effects (for example on cardiovascular disease, as set out in the discussion of scientific literature below).

Step 2: Framing judgments on significance

12.10.229 The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.
Scientific literature

12.10.230 **Air quality**: Based on the literature reviewed, the strength of evidence is strong for a direct causal relationship between air quality and health outcomes. The evidence is strongest for cardiovascular and respiratory effects, particularly in younger and older people. The evidence for important population level changes in health outcomes due to concentrations of fine particulate matter and nitrogen dioxide below UK statutory levels is more limited, but there is a general association of sufficient strength to warrant assessment and development of environmental measures to reduce emission levels to as low as reasonably practicable.

12.10.231 **Visual amenity**: There is a reasonable body of evidence indicating that both actual and perceived community quality plays an important role in physical and mental health. Broadly the literature indicates that environmental features of a neighbourhood, such as its attractiveness or levels of pollution, affect the socio-economic position of residents, which in turn affects health and health inequalities. The evidence for health effects from artificial lighting is more limited.

12.10.232 **Noise**: Based on the literature reviewed, the strength of evidence is strong for a direct causal relationship between noise disturbance and health outcomes. The evidence is strongest for annoyance, cardiovascular, learning disruption and sleep disturbance effects, particularly linked to road transport. There is little evidence for adaptation to elevated transport related noise levels.

Baseline conditions

12.10.233 **For air quality** the baseline considers: age structure, self-reported wellbeing, including anxiety, happiness and satisfaction, smoking rates and cardiovascular indicators. In addition, people with certain respiratory conditions are particularly sensitive to changes in air quality so rates for asthma and Chronic Obstructive Pulmonary Disease (COPD) (based on records for registered patients) are included as relevant baseline data. The public health indicator for air quality is also included, which measures annual mean concentration of human-made fine particulate matter (PM$_{2.5}$).

12.10.234 **For visual amenity** the baseline considers indicators relating to population sensitivity to visual influences on wellbeing such as: self-reported anxiety, happiness and the prevalence rates of depression.

12.10.235 **For noise** the baseline considers: age structure, self-reported wellbeing, including anxiety, happiness and satisfaction, deprivation, depression, cardiovascular health indicators and educational outcomes. Additional baseline indicators relevant for noise include: % of year 1 pupils achieve the expected level in the phonics screening check; the rate of complaints per year about noise; the % of the population exposed to road, rail or air transport noise of 65 dB(A) or more; and the
% of the population are exposed to road, rail or air transport noise of 55 dB(A) or more at night (8 hours is the period 2300 – 0700).

For all construction related effects, people who spend extended periods at home may experience greater risks than those who are absent during normal working hours. Indicators for this population include: % of households have no adults in employment; % of households include dependent children; and % of households include a person with a long-term health problem or disability.

The following are illustrative of health baseline indicators that may be influenced over time due to construction activities (though it is unlikely that such cross-sectional measures could apportion and attribute a particular level of change to the DCO Project):

1. London Borough of Hillingdon: The estimated prevalence of people with asthma is 4.96%; the estimated prevalence of people with COPD is 1.27%; 29% of households have no adults in employment (28% for London and 33% for England); 36% of households include dependent children (31% for London and 29% for England); 24% of households include a person with a long-term health problem or disability (22% for London and 26% for England); and the rate of complaints per year about noise is 5 per 1,000 population (15 per 1,000 population for London and 6 per 1,000 population for England)

2. Slough Borough: The estimated prevalence of people with asthma is 5.32%; the estimated prevalence of people with COPD is 1.11%; 25% of households have no adults in employment (31% for the south-east); 39% of households include dependent children (29% for the south-east); 22% of households include a person with a long-term health problem or disability (24% for the south-east); and the rate of complaints per year about noise, is 3 per 1,000 population (5 per 1,000 population for the south-east)

3. London Borough of Hounslow: The estimated prevalence of people with asthma is 4.5%; the estimated prevalence of people with COPD is 1.05%; 26% of households have no adults in employment; 35% of households include dependent children; 23% of households include a person with a long-term health problem or disability; and the rate of complaints per year about noise is 14 per 1,000 population

4. Spelthorne Borough: In North West Surrey at the CCG level the estimated prevalence of people with asthma is 4.96%; in North West Surrey at the CCG level the estimated prevalence of people with COPD is 1.36%; 29% of households have no adults in employment; 30% of households include dependent children; 23% of households include a person with a long-term health problem or disability; and the rate of complaints per year about noise is 4 per 1,000 population
5. South Bucks District: North West Surrey asthma and COPD estimated prevalence is as for Spelthorne; 30% of households have no adults in employment; 31% of households include dependent children; 22% of households include a person with a long-term health problem or disability; and the rate of complaints per year about noise, is 3 per 1,000 population.

12.10.238 The existing health status of the population likely to experience construction activities can be characterised as good-average levels of self-reported health. Current levels of deprivation for these groups is between the 4th and 6th IMD decile. Varying degrees of adaptation are expected within the population (some low others up to high). All life stages will be more likely to be influenced by the change (including as dependents). Given the extent of construction activities there may be a lack of access to locations that offer respite from construction activities. The population would therefore not have good access to alternatives of sufficient capacity at all times (a high degree of adaptive behaviour required).

**Health priorities**

12.10.239 No health priorities specific to construction activities and health have been identified.

12.10.240 More generally LPA health priorities identify that for air quality: respiratory disease is a major health issue; improving air quality is a key priority; and active measures should be used to reduce air pollution from road traffic.

12.10.241 More generally LPA health priorities identify that for visual amenity: efforts should be made to protect and enhance the environment; and achieve a high quality built environment.

12.10.242 More generally LPA health priorities identify that for noise: developers should offer appropriate mitigation from excess noise and vibration; noise from road traffic should be reduced; and development schemes should be seen as opportunities to improve people's health and wellbeing through action to address environmental issues.

**Consultation responses**

12.10.243 At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

**Standards / controls**

12.10.244 Air quality: as set out in Chapter 7: Air quality and odour, including the Air Quality (England) Regulations 2000, the Air Quality Standards Regulations 2010 and associated Air Quality Objectives (AQOs).
12.10.245 Visual amenity: as set out in Chapter 15: Landscape and visual amenity.


Policy context

12.10.247 Air quality: The national policy context is that the Government supports the DCO Project, acknowledging that whilst the DCO Project would generate air quality emissions, such emissions are capable of being mitigated so as to minimise detrimental effects on amenity. The health policy themes summarised from the main adopted and emerging planning documents of LPAs within the geographic scope are as follows: prevent new development proposals from delaying the LPAs from achieving their air quality compliance and inform developers how they need to control and manage air pollution using Site Works Management Plan and complying with requirements.

12.10.248 Visual amenity: The national policy context is that the Government supports the DCO Project, acknowledging that some changes in visual amenity would occur (including associated with artificial light). The health policy themes summarised from the main adopted and emerging planning documents of LPAs within the geographic scope are as follows: development must be appropriate to the identity and context of local buildings, townscapes, landscapes and views; should seek to protect the amenity of surrounding land and buildings, particularly residential properties; development should not give rise to unacceptable levels of light pollution; and should seek to reduce light pollution.

12.10.249 Noise: The national policy context is that the Government supports the DCO Project, without raising any concerns or requirements in relation to construction noise, other than to follow standard good practice for assessment and mitigation. The health policy within the main adopted and emerging planning documents of LPAs within the geographic scope does not specifically relate to construction noise. There is an alignment between national and local policy in not raising specific policy concerns in relation to construction noise. Such alignment supports the view that standard good practice would be sufficient to reduce any adverse health effects associated with construction noise.

Step 3: Categorising effects on human health

12.10.250 Chapter 7: Air quality and odour, Chapter 15: Landscape and visual amenity and Chapter 17: Noise and vibration identify the potential for adverse construction related effects relevant to health.
12.10.251 There is a relationship between relevant construction related environmental exposures (particularly noise and air pollutants) and health outcomes. Furthermore, there is the potential for: a substantial change from the baseline position; a small widening of inequalities; and a direct and large contribution to recognised health priorities. As the consultation for the DCO Project continues, it is expected that the experience of construction will emerge as a theme of consultation by both health stakeholders and the public. The effect aligns with published national policy expectations.

12.10.252 The effect for the general population across the study area in the short term (0-5 years) and medium term (5-10 years) from the 2023 assessment year (peak of construction activity) is considered to be moderate negative (not significant). This is the greatest health effect expected. This conclusion reflects that whilst the DCO Project’s embedded measures in the draft CoCP will reduce construction related exposures, for many the scale of change will affect wellbeing and will incrementally increase existing exposure to noise and air pollutants already elevated within the urban context. In the long term (10+ years) effects would be expected to reduce to minor negative (not significant) as the scale of construction declined, becoming negligible (not significant) once construction activities were complete.

12.10.253 The effect for the vulnerable group (a judgement of the greatest expected effect due to characteristics that increase sensitivity) ranges between negligible (not significant) and major negative (significant) depending on the timeframe and relevant vulnerable group characteristics. Exposure effects are strongly linked to proximity, with the greatest effects expected for those close to the Site boundary or construction traffic routes that (based on current modelling) would experience air quality limit value exceedances even without the DCO Project. The negative effect is driven by the sensitivity to poor air quality and sleep disturbance (from noise or lighting) of particular groups such as children, older people and those with existing poor health. Effects may be particularly influential where people spend extended periods at home, for example due to being in poor health, unemployed, retired, shift workers or providing care. For those people who already experience deprivation or social disadvantage the construction related effects may exacerbate or perpetuate such trends, for example by making neighbourhoods less desirable and outdoor spaces less conducive to social gathering and leisure.

12.10.254 In the short term (0-5 years) (from the 2022 assessment year) the greatest effect on vulnerable groups is major negative (significant). On a precautionary basis such vulnerable group effects would be expected for a large population (estimated at over 500 people). The effect is expected to range between major negative (significant) and moderate negative (not significant) depending on the severity and duration of exposures at particular dwellings. For many the measures in the draft
CoCP are likely to mean that significant effects would be avoided. The major effect is driven by the air quality findings, for PEIR, that construction traffic may contribute further to exceedances of relevant air quality limit values that would occur even without the DCO Project. The Chapter 7: Air quality and odour findings relate to exceedances of relevant air quality limit values for a small population (currently estimated at less than 100 people) in 2022 only, with negligible effects at the majority of receptors.

12.10.255 In the medium term (5-10 years), a reduction in construction activities, as well as a degree of adaptive behaviour to visual change and potentially noise effects, would be expected for most people. However, this would not necessarily alleviate all effects on health outcomes. On a precautionary basis a sustained major negative (significant) to moderate negative (not significant) effect ranking is therefore given to acknowledge the potential for a range of physiological responses to longer-term exposures, even where awareness of the exposure diminishes. The latter may remain the case for a large population (estimated at over 500 people). As with short-term effects further environmental measures are expected to reduce this effect.

12.10.256 In the long term (10+ years) construction activities would decline further and for most people effects would become negligible (not significant). A sustained moderate negative (not significant) effect may persist for a small population (currently estimated at less than 100 people) due to long-term effects of air quality and noise on health outcomes such as cardiovascular disease. The score reflects that whilst this group may experience increasing adverse health effects that may be associated in part with construction activity related exposures (and whilst the ES will consider the potential for targeted development of environmental measures); the expectation is that only a very few people would be affected in this way. Consequently, there would not be a population level effect (even at the community level) that was significant in EIA terms.

**Healthy lifestyles: construction workforce**

**Introduction**

12.10.257 The DCO Project will require a sizeable construction workforce. Some of the construction workforce will be non home based, that is they will move to the area and they will require accommodation. Communities close to the Airport may interact with the non home based construction workforce. This is likely to be positive but residents also express concerns about factors such as worker conduct when they are off-shift.

12.10.258 There is a plausible link between source-pathway-receptor that supports a change in health outcomes:
1. Source: the presence of a transient non home based construction workforce due to the DCO Project

2. Pathway: behaviour and social norms

3. Receptors: residents interacting with the construction workforce and the non home based transient construction workforce.

The potential effect is both plausible and probable and is therefore considered to be likely.

This issue informs, and has been informed by, Chapter 11: Community and Chapter 18: Socio-economics and employment. The Community and socio-economics chapters identify the change in construction employment over time, the likely distribution of the workforce accommodation and the likely demographic profile of the workforce. The Health chapter focuses on qualitative discussion of the health consequences of changes in risk taking behaviour associated with community and workforce interaction, linking with the draft CoCP.

Project activities and temporal scope

Pre-Phase 1: uncertainty around the construction workforce and where their interaction with communities will occur.

Heathrow has modelled the estimated total job years required for the DCO Project construction to be between 89,000 and 98,000 across all phases. The majority of this is anticipated to be in Phase 1: up to 13,600 job years are anticipated to be in 2023 (the peak construction year), and up to 10,100 job years required in 2025.

Phase 2 and Phase 3 will have a lower requirement for construction: up to 3,900 job years are anticipated to be required in 2027, up to 2,200 are anticipated to be in 2035 and less than 2,000 job years are expected in 2050.

The following assumptions are made at PEIR:

1. 20% of construction workforce are non home based (2,700 workers in Phase 1) – this is considered to be a conservative estimate

2. 50% of these (1,350 workers) will find accommodation through the private sector

3. Approximately one third would seek project-sponsored accommodation (including potentially residential properties acquired by Heathrow through the WPO, or via the use of established systems to use hotel availability within the current hotel capacity in the vicinity of Heathrow)

4. The remainder (c. 500) would want to bring their own caravans to the area, requiring well-managed and maintained pitches within the construction site.
The approach to managing the construction workforce is underpinned by the following objectives: reduce the number of workers on site by increasing off site manufacturing and pre-fabrication through the Logistics Hubs initiative and improving on-site execution; achieve optimum staff productivity by providing high quality, site-wide workforce facilities and services; provide a healthy and safe working environment, whilst ensuring that people can move to where they are required in the right numbers and at the right time; and avoid or mitigate potential effects on the local community.

A draft CoCP sets out the proposed measures and standards of work that will be implemented by Heathrow and its contractors throughout construction. The draft CoCP will provide mechanisms to engage with the local community and their representatives throughout construction.

The Site’s location benefits from a well-developed housing market. There are also some established systems to use room availability within the current hotel capacity in the local vicinity of Heathrow.

During construction measures will be employed to ensure the Site is kept secure, with controls on the people and materials entering and leaving the Site. The workforce will arrive at the Site either by car or on public transport, with travel by public transport being encouraged due to the Airport’s geographical location and connectivity especially with Central London:

1. With regards to public transport, it is assumed the majority of the workforce will be commuting from the east of the DCO Project and arriving at the Central Terminal Area (CTA), Hatton Cross or at Terminal 5. From these hubs a workforce shuttle bus system will transport the workforce to the Construction Support Site (CSS) ‘clusters’ in the west, east and south of the DCO Project, or to their work location direct

2. The approach to car parking for the construction workforce is to provide temporary parking facilities controlled by Heathrow. The parking facilities will be located at the CSS clusters, from where the shuttle bus system will then transport workers from the car parks to their site offices or workplaces

3. Some construction workers may walk or cycle direct to site or bus pick-up points whilst others might be dropped-off by a friend or family member and these could be provided at the parking facilities to cater for these modes of transport.

For some, effects may commence pre-Phase 1 from uncertainty around the construction workforce. Whilst these are not effects of the DCO Project commencing, these activities influence the health effects associated with Phase 1
and so are taken into account as part of that assessment and development of environmental measures.

12.10.270 During Phase 1 the health effects prior to the 2023 assessment year (for instance 2022 to 2023) have and will continue to be considered in terms of assessment and development of environmental measures (for instance the build-up in construction workers to the year of peak DCO Project construction activity). Prior to the assessment year the increase in non home based construction workers may start to affect health outcomes, but effects for that time period are considered not significant. However, the presence of those workers does contribute to the health effects associated with the 2023 assessment year and so is taken into account as part of that assessment.

12.10.271 The DCO Project activity assessment year to which the greatest potential health effects are anticipated to relate is 2023 (this is the assessment year from which significance rankings are made for short, medium and long term health effects).

12.10.272 In categorising significance for health, the embedded measures set out in Section 12.5 of this chapter have been taken into account. This includes: a Worker Code of Conduct covering behaviour, use of temporary living accommodation, car parking, use of local community facilities, anti-social behaviour and communicable diseases; dedicated areas for caravans; occupational healthcare to all construction workers; health promotion in relation to risk-taking behaviour and controlling communicable disease; the draft CoCP with measures to reduce construction impacts on the community; and a complaints procedure.

**Geographic scope**

12.10.273 The majority of workers are expected to commute daily to the DCO Project. The urban context and proximity to major transport hubs/routes will mean that the home based construction workforce will be distributed across London and the south-east. This is not expected to give rise to any noticeable effects.

12.10.274 The study area for this issue is defined by the LPAs of the London Borough of Hillingdon; Slough Borough; London Borough of Hounslow; Spelthorne Borough; and South Bucks District. These LPAs reflect that the presence of the construction workforce is expected to be most apparent close to the Airport.

12.10.275 Approximately 1,350 construction workers will be accommodated on-site or in project-sponsored accommodation in the vicinity of Heathrow. These construction workers are expected to have a more noticeable effect, and a closer relationship with, local communities than those dispersed in private accommodation.
Receptors (population scope)

12.10.276 General population receptor: The population of the study area defined in the geographic scope, particularly linked to off-site accommodation.

12.10.277 Vulnerable group receptor: Relevant characteristics of the study area population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. The population adjacent to the Site (site-specific effects relating to social, behavioural and economic change, particularly linked to on-site accommodation)
2. Children and young people (young adults and vulnerable children)
3. Women
4. Older people (particularly frail elderly and vulnerable adults)
5. People living in areas known to exhibit high deprivation or poor economic and/or health indicators
6. People who may experiencing social isolation, discrimination or social disadvantage (including relevant protected characteristics, for example where health effects may be greater due to ethnicity, noting the local baseline context of a high proportion of BAME groups).

12.10.278 Effects may also extend to owners, operators and users of community and amenity facilities, as well as to police and healthcare services who may experience changes in levels of service demand.

12.10.279 Concern about the presence of 'well-paid' construction workers as an unintegrated population with communities that are already socio-economically deprived may increase inequalities. Conversely the presence of the construction workforce could bring direct and indirect economic benefit to such socio-economically deprived communities (use of local goods and services), reducing inequalities. As the communities neighbouring the draft DCO limits will be more aware of the construction activities, it is expected that it will be these communities that will associate any community change with the construction workforce. It may also be the case that some construction workers choose to relocate for some or all of their contract to accommodation close to the Airport. The visibility of such construction workers (for example, project specific branding on clothing, equipment or vehicles), even if a small minority, may reinforce community views about the DCO Project. A greater actual, or perceived, presence of construction workers in communities close to the Airport may disproportionately affect users, or displace users, of local accommodation and leisure venues.
Within the indices of multiple deprivation, the domains of ‘crime’ and 'barriers to housing and services' deprivation are particularly relevant to communities near the Airport. High crime deprivation may also indicate greater potential for community concern about the conduct of, and potentially conflict with, the construction workforce, for example, at venues serving alcohol. These factors indicate higher levels of sensitivity.

Young adults may be at a more impressionable age for adopting risk taking behaviours, so may be more influenced by any actual or perceived rise in activities such as smoking, alcohol consumption or gambling occurring within their communities. Older people may be more sensitive to changes in community factors relating to social isolation (for example, how safe they feel on the streets).

Although the numbers of construction workers are high, approximately 90% are expected to commute to work at the Airport (for instance 80% being home based workers plus 10% (the half of the non home based workers who find accommodation through the private sector).

Step 1: Describing the potential effects on health

Whilst the presence of the construction workforce should not be a cause for concern this effect is best categorised at PEIR as negative. Physical and mental health and wellbeing outcomes could be linked to potential changes in patterns of risk-taking behaviour, anti-social behaviour and the prevalence of communicable disease.

These will predominantly relate to changes in the burden of disease and changes in wellbeing within the population. This includes the onset of new health conditions or health related states, changes in existing health conditions and changes to day-to-day functioning.

It is expected that the numbers of people affected by poor construction worker behaviour in communities hosting construction workers will be small. Effects may operate in the short to medium term. The influence on the population will likely range from infrequent to rare depending on the types of social interaction. The influence on health outcomes will likely range from transient temporary symptoms to reversible or non-progressive health outcomes.

Step 2: Framing judgments on significance

The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.
Scientific literature

12.10.287 The scientific literature indicates that there is evidence to support an association between the arrival and presence of the DCO Project’s construction workforce and health and wellbeing outcomes in the host community and amongst the construction workforce.

12.10.288 Transient construction workers tend to be stereotyped in a negative way. A recent study found that they are seen as being predominantly young males and as being associated with a high consumption of alcohol and illicit substances and as being associated with the threat of violence and of creating a demand for sex work. The same study reports that transient construction workforces on infrastructure projects are likely to be older, to be family-oriented, hardworking individuals who travel significant distances and spend a great deal of time away from home with a main aim being to send money to their families.

12.10.289 There is evidence from international studies that, migrant workforces, whether they be in-country or international, are associated with an increased incidence of sexually transmitted infections. These studies apply to predominantly low status migrant workers and do not focus upon skilled construction workers. The same studies suggest that migrant workers have higher rates of smoking, drinking alcohol and use of illicit substances than the host populations. These behaviours, characterised as risk-taking behaviours, are associated with negative physical and mental health outcomes.

12.10.290 Based on the literature reviewed, the strength of evidence is weak for a direct causal relationship between the arrival and presence of construction workers to a community (in high-income countries) and negative health outcomes. The evidence for the arrival and presence of the transient construction workforce affecting risk taking behaviour and anti-social behaviour within a community is limited, but there is a general association of sufficient strength to warrant assessment and measures on workforce conduct and health promotion.

Baseline conditions

12.10.291 The baseline considers a range of lifestyle factors relating to risk taking behaviour, which could potentially be affected by the presence of the construction workforce. These include smoking, alcohol specific conditions, violent crime and STIs.

12.10.292 The health baseline, as measured by routine LPA level indicators, may change in response to the DCO Project activities described above. The following are illustrative of health baseline indicators that may be influenced over time (though it is unlikely that such cross-sectional measures could apportion and attribute a particular level of change to the DCO Project):
1. London Borough of Hillingdon: the rate of violent crimes is 21 per 1,000 population (22 per 1,000 population for London and 20 per 1,000 population for England); and the rate of new sexually transmitted infection (STI) diagnoses amongst those aged 15 to 64 years old (excluding chlamydia in under 25 year olds) is 919 per 100,000 population (1,547 per 100,000 population for London and 794 per 100,000 population for England)

2. Slough Borough: The rate of violent crimes is 23 per 1,000 population (19 per 1,000 population for the south-east); and the rate of new STI diagnoses amongst those aged 15 to 64 years is 721 per 100,000 population (648 per 100,000 population for the south-east)

3. London Borough of Hounslow: The rate of violent crimes is 23 per 1,000 population; and the rate of new STI diagnoses amongst those aged 15 to 64 years old is 902 per 100,000 population

4. Spelthorne Borough: The rate of violent crimes is 19 per 1,000 population; and the rate of new STI diagnoses amongst those aged 15 to 64 years old is 636 per 100,000 population

5. South Bucks District: The rate of violent crimes is 11 per 1,000 population; and the rate of new STI diagnoses amongst those aged 15 to 64 years old is 534 per 100,000 population.

The current health status of the population in the study area can be characterised as good-average levels of self-reported health. Current levels of deprivation are between the 4th and 6th IMD decile. Some LSOAs in West Drayton, Pinkwell and Heston West have higher levels of deprivation. Varying degrees of adaptation are expected within the population (some low others up to high). Although a range of life stages are relevant, young people (adolescent life stage) are considered more likely than other life stages to be influenced by the presence of, or interaction with, the construction workforce.

Health priorities

LPA health priorities have been set that link with healthy lifestyles as a determinant of health. The health priority themes summarised from the LPAs within the geographic scope are: prevent harm especially from alcohol, drugs and smoking; enable people who want to quit smoking or reduce drinking; develop a cost effective prevention strategies for young people undertaking risky behaviours; improving public confidence in the ability of public services to keep areas safe and reduce crime and anti-social behaviour; reduce crime, including anti-social behaviour, and fear of crime; and improve the safety of local people.
Consultation responses

12.10.295 At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

Standards / controls


12.10.297 The Modern Slavery Act 2015 (HM Government of Great Britain & Northern Ireland, 2015) gives law enforcement the tools to fight modern slavery, ensure perpetrators can receive suitably severe punishments for these appalling crimes and enhance support and protection for victims. It requires businesses over a certain size to disclose each year what action they have taken to ensure there is no modern slavery in their business or supply chains.

Policy context

12.10.298 At a national level the Government supports the DCO Project, without raising any concerns or requirements in relation to potential construction workforce related effects on community health.

12.10.299 The health policy themes summarised from the main adopted and emerging planning documents of LPAs within the geographic scope are as follows: create and maintain a safe and secure environment for those who live, work in and visit the area; manage development related activities which have the potential to create anti-social behaviour; and provide activities that promote social cohesion.

12.10.300 As the national policy is silent on this issue, the local policy context is of particular relevance to the assessment. In general terms the local policy context identifies standard good practice construction workforce management and health promotion practices that will also protect and promote community health.

Step 3: Categorising effects on human health

12.10.301 There is evidence to establish an association between the arrival and the presence of the construction workforce and health outcomes in the host community. The change from the baseline position is expected to be slight. Whilst there may be a slight and indirect contribution to recognised health priorities, no discernible change in inequalities is expected. As the consultation for the DCO
Project continues, it is expected that workforce conduct will emerge as a theme raised by both health stakeholders and the public. The DCO Project aims to align with local policy.

12.10.302 The effect for the general population across the study area in the short term (0-5 years) from the 2023 assessment year is considered to be minor negative (not significant). This is when the greatest health effect is expected. The negative ranking reflects the potential for concern about the conduct and behaviour of the construction workers. This is based upon the ways in which construction workforces tend to be stereotyped and on community experience during the construction of Terminal 5. People who live further from the Airport are likely to encounter those members of the construction workforce who stay in rented properties, B&Bs and hotels. In the medium term (5-10 years) the effect is likely to reduce for most people to negligible (not significant), though for some ongoing concerns may sustain a minor negative (not significant) effect. In the long term (10+ years) the effect is expected to reduce to negligible (not significant).

12.10.303 The effect for the vulnerable group (a judgement of the greatest expected effect due to characteristics that increase sensitivity) ranges between negligible (not significant) and moderate negative (not significant) depending on the timeframe and relevant vulnerable group characteristics. The potential for effects is considered greater for people who live close to DCO Project sponsored accommodation for the non home based workforce. A similar trend is expected for the following population groups: young adults; vulnerable adults or children; women; frail elderly; or people experiencing high deprivation, poor health, social isolation, discrimination or social disadvantage. For those sensitive only due to living in areas known to exhibit high deprivation or poor economic and/or health indicators effects are likely to be lower.

12.10.304 In the short term (0-5 years) (from the 2023 assessment year) the greatest health effect on affected vulnerable groups is considered to be moderate negative (not significant). The effect is driven by concern about non home based construction workforce conduct for a large population (estimated at over 500 people). The effect is likely to range between minor negative (not significant) and moderate negative (not significant) depending on levels of interaction with, or awareness of, the non home based construction workforce.

12.10.305 In the medium term (5-10 years) a reducing effect would be expected for most people as good conduct is demonstrated. A sustained minor negative (not significant) to moderate negative (not significant) effect may occur in this timeframe where strong views are held, or isolated incidents occur. The latter may be the case for a medium population (estimated at 100-500 people).
In the long term (10+ years) as construction workforce requirements decline the effect is likely to further reduce to negligible (not significant) for most people. A minor negative (not significant) effect may persist where strong views are held, or isolated incidents occur. The score reflects that whilst the potential for isolated incidents exists (and whilst the ES will consider the potential for targeted development of environmental measures); the expectation is that only a very few people (if any) would be affected in this way. Consequently, there would not be a population level effect (even at the community level) that was significant in EIA terms. The effect ceases (becomes negligible (not significant)) with completion of construction.

The rankings mean that, in EIA terms, the findings are not significant. This depends upon close working between Heathrow and safeguarding partners, such as LPAs and the Metropolitan Police and others, to enable them to fulfil their statutory duties. The construction workforce will be well behaved and law-abiding. Furthermore, Heathrow will take reasonable steps to safeguard the welfare of its employees and those acting on behalf of the company and its supply chain. The occupational health service will provide health promotion advice for mental and physical health and wellbeing. Where it is appropriate Heathrow will take reasonable steps to safeguard the welfare of the general public, such as the steps described in this section.

**Healthy lifestyles: presence of pests**

The vacating, demolition and clearance of areas in connection with the construction of the DCO Project has the potential to give rise to an increase in the population of ‘pests’ and/or may also be associated with the migration of pest populations out of the construction area. Pests are a loosely defined term for insects or animals causing harm or nuisance, for example, flies or rodents.

The issue of non-native insects arriving by aircraft and acting as disease vectors is discussed in relation to communicable disease. This section is concerned with native species, where large population increases and/or migrations may arise due to construction activities associated with the DCO Project.

A plausible source-pathway-receptor linkage has been established between increases in pests and local community health outcomes:

1. Source: flies and/or rodents at infestation levels due to the DCO Project, causing annoyance or carrying pathogens
2. Pathway: migration of pests from the construction site by air (flies) or land (rodents), including disused pipe networks, to surrounding residential areas
3. Receptors: the communities neighbouring the Airport living near construction sites.
The DCO Project will be developed over landfill sites of varying waste composition, age and depth. Earthworks required will result in a substantial volume of landfill material being displaced. In order to limit transportation of waste materials off-site it is proposed that three new non-hazardous landfills will be created to dispose of waste unable to be reused or recovered within the earthworks. The new landfills will be constructed at the Northern Strip, Taxiway Island and Old Slade Lake.

Although a plausible source-pathway-receptor linkage has been established between the presence of pests and health outcomes, the conditions required for the source-pathway-receptor linkage are highly improbable due to the commitment to good construction practices. The potential effect is therefore considered unlikely (for instance it is plausible but not probable). The following paragraphs provide additional context and detail in support of this conclusion.

Part III of the Environmental Protection Act 1990 (HM Government of Great Britain & Northern Ireland, 1990) includes some insects within statutory nuisance where they are arising from a commercial premise and are considered to be prejudicial to health or a nuisance. The Prevention of Damage by Pests Act 1949 places duty on LPAs to take steps to keep areas free from rats and mice and includes provisions for them to require enforce the duties on owners and occupiers of land.

The World Health Organization published a report on the public health significance of urban pests in 2008 (World Health Organization Regional Office for Europe, 2008). Whilst the report discusses a range of potential pests, the two considered most relevant in the context of this discussion are flies and rodents. The following observations are based on WHO report findings.

Health effects associated with pests are generally associated either with disease transmission or reductions in well-being from sharing living or recreational space with infestations. The former has some well evidenced examples in the literature. The latter is less well evidenced. Flies constitute a group of nuisance species as well as being potential disease vectors due to their association with contaminated substrates. In urban areas of the northern hemisphere, most complaints about flies are due to annoyance. Flies could constitute a nuisance simply because of their sheer numbers. Rodents can be infected with a large variety of parasites and zoonotic agents, which elevates their status from mere nuisances to public health pests, especially to people whose health is already compromised. A high correlation is found between rat infestations and areas with widespread problems of litter, vandalism, dishevelled gardens, neglect and vacant buildings. Domestic mouse infestations are most likely to occur where there is poor structural maintenance and poor hygiene.
The report highlights passive control of all pests through design and construction techniques as the most sustainable approach. The consequence being that when pests lack the conditions they need to breed, such as food, drink, warmth and safe harboursages, they simply cannot survive in an area. This basic approach is valid for all pests and underpins integrated pest management.

Whilst there is potential for pest related effects on health, it is part of standard construction practice to take steps to avoid conditions that give rise to levels of pests that could pose a significant risk to population health.

The draft CoCP includes appropriate provisions in relation to pest avoidance and management. As set out in Section 12.5, the embedded measure is:

‘Preventative pest and vermin control and prompt treatment of any pest and vermin infestation, including arrangements for disposal of food waste or other attractive material. If infestation occurs, the main contractor will seek to eliminate the infestation and prevent further occurrence’.

The potential effect is unlikely, so it is not a likely significant effect and therefore health effects are rated as negligible (not significant) for all phases of the DCO Project. This issue is not assessed further. A watching brief will be maintained on this issue and, if appropriate, any update will be reported in the ES.

**Employment, training and economy: displacement of business and commercial activity**

**Introduction**

The land requirements of the DCO Project may affect the health of people who become unemployed due to the temporary or permanent displacement of business or commercial activity (including effects on dependants of those employed).

A plausible source-pathway-receptor linkage has been established between unemployment associated with commercial displacements due to the DCO Project and consequently experiencing a change in health outcomes.

1. Source: businesses relocating or closing due to the DCO Project
2. Pathway: unemployment and its link to mental health and on purchasing power for health promoting goods and services
3. Receptors: the employers/employees (including dependants of employees) or users of businesses directly affected by commercial displacements.

This issue informs, and has been informed by, Chapter 18: Socio-economics and employment. The Socio-economics and employment assessment identifies the displacement in commercial property (and expected reprovision) in terms of
quantum of displaced type of floorspace (office/industrial/hotels). The Health chapter focuses on qualitative discussion of the health consequences of displacement of commercial property (due to unemployment).

12.10.323 The DCO Project includes for some reprovided commercial and business floorspace (approximately a quarter of office floor space, half the warehousing/industrial floor space, and all of the hotel rooms) and the expectation is that a number of the businesses affected by displacements would relocate. Property Policies (incorporating compensation schemes) are also available. The intentions of the businesses directly affected by commercial property displacement are not known at this time although it is unlikely that all workers at those businesses or commercial activities not reprovided as part of the DCO Project will be made redundant.

Project activities and temporal scope

12.10.324 The activities that drive the potential effect are:

1. Pre-Phase 1 – businesses affected by commercial property displacement may begin to consider locations as part of their commercial decisions

2. Phase 1 (.c 2022 – 2026) – Site mobilisation and start of full construction works – it is expected the businesses and commercial activity will be displaced between 2022 and 2026. Chapter 6: DCO Project description (Table 6.9) summarises the displacement of existing commercial uses. Chapter 18: Socio-economics and employment (Table 18.28) sets out the extent of commercial displacements in terms of floorspace by use class.

12.10.325 For some, effects may commence pre-Phase 1 due to the commercial decisions of affected businesses. This includes the potential for uncertainty and anxiety amongst employees. Whilst these are not effects of the DCO Project commencing, these activities influence the health effects associated with Phase 1 and so are taken into account as part of that assessment and development of environmental measures.

12.10.326 The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2022 (this is the assessment year from which significance rankings are made for short, medium and long term health effects).

Geographic scope

12.10.327 Although the displacement of commercial property will occur at locations close to the Site, the effect of changes in employment is considered at the ‘core study area’ level, as set out in Chapter 18: Socio-economics and employment and Figure 18.1, Volume 2. This reflects that in most cases employees will not live in close proximity to their place of employment. Where there are reasons that people are
reliant on employment close to their homes, this is discussed in the assessment as a relevant vulnerable group characteristic.

The ‘core study area’ for this issue is defined by the LPAs of the London Borough of Hillingdon; Slough Borough; London Borough of Hounslow; Spelthorne Borough; South Bucks District; the Royal Borough of Windsor and Maidenhead; London Borough of Ealing; Runnymede Borough; and Elmbridge Borough.

**Receptors (population scope)**

General population receptor: The population of the ‘core study area’ defined in the geographic scope.

Vulnerable group receptor: Relevant characteristics of the ‘core study area’ population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. The population adjacent to the Site (those reliant on local employment of displaced businesses with effects relating to social, environmental and economic change)
2. Children and young people (particularly young adults with limited employment history (and children as dependants indirectly affected by job losses))
3. Older people (particularly those approaching retirement age (and frail elderly as dependants indirectly affected by job losses))
4. People who are: unemployed, on low incomes, have regular shift worker, have low job stability, or have few progression prospects (including those unable to work due to ill health as dependants indirectly affected by job losses)
5. People living in areas known to exhibit high deprivation or poor economic and/or health indicators
6. People who may experiencing social isolation, discrimination or social disadvantage (including relevant protected characteristics, for example where health effects may be greater due to ethnicity, noting the local baseline context of a high proportion of BAME groups)
7. People experiencing barriers in access to services, amenities and facilities.

People unable to find alternative employment will be of working age (though potentially unevenly distributed towards younger low skilled people and older people approaching retirement age).

People unable to find alternative employment may include a higher proportion of lower skilled and older people, as well as any groups who experience barriers to
seeking work further from their homes, for example, due to disability or because they are also carers. These groups may be sensitive to the changes due to the DCO Project. Similarly, people unable to find alternative employment who are already experiencing above average deprivation (which may be worsened through unemployment) may be more sensitive to experiencing a reduction in health outcomes. It is noted that unemployment is both a cause and a consequence of poor health.

For people unable to find alternative employment following job losses associated with the land requirements of the DCO Project the job loss will be a one-off event, but potentially with an ongoing effect if unemployment continued (noting that negative effects tend to increase with greater time spent unemployed). Depending on the period of unemployment and the quality of new employment, effects could be reversible once established in new employment.

For those affected by loss of existing commercial properties, the majority are expected to relocate with the businesses, however those who became unemployed and could not obtain alternative employment may experience a reduction in health outcomes.

Step 1: Describing the potential effects on health

Commercial displacements are categorised as an indirect negative on health outcomes, due to potential for unemployment. Physical and mental health and wellbeing outcomes may be affected. These will predominantly relate to changes in the burden of disease within the population. This includes the onset of new health conditions or health related states, changes in existing health conditions and changes to day-to-day functioning. Unemployment of a duration to affect health outcomes is expected for only a few working age people affected by commercial displacements. Effects are expected over the medium to long-term, reflecting that health effects are typically linked to prolonged unemployment. The influence on the population can be characterised as continuous (as opposed to infrequent or rare). The influence on health outcomes will typically be non-permanent, reversible and non-progressive health conditions, with improved health once back in employment.

Step 2: Framing judgments on significance

The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.

Scientific literature

The scientific literature indicates that there is an association between unemployment linked to displacement of business and commercial property due to
the DCO Project and health and wellbeing outcomes. Key findings are that there is a reasonable body of evidence that employment is positive for health, particularly mental health. The evidence particularly points to long-term unemployment being associated with poor health. The quality of jobs and income are important factors in determining the health benefit.

12.10.338 The type of health outcomes relating to unemployment that are identified in the scientific literature include: general health; mental health and wellbeing; and hospitalization. Negative effects relate particularly to the long-term unemployed. Effects due to commercial displacements are likely to relate to short-term changes in risk factors and quality of life associated with socio-economic and mental health challenges of temporary unemployment. Widespread onset of new clinical conditions or widespread exacerbation of existing clinical conditions are considered less likely as most people are expected to find alternative employment.

12.10.339 Based on the literature reviewed, the strength of evidence is moderate for a direct causal relationship between employment and health outcomes. The evidence is strongest for the negative effects on mental health of unemployment or low incomes. The evidence for the health benefits of employment is more limited, but there is a general association of sufficient strength to warrant assessment and measures to promote good quality stable job opportunities from the DCO Project, particularly where this can reduce inequalities.

Baseline conditions

12.10.340 The baseline relates to: the age breakdown of the population including the number of working age people; the level of educational attainment; the number of economically active and inactive adults; the number of households that have no adults in employment; 16-18 year olds not in education employment or training (NEET); deprivation relating to the education, skills and training.

12.10.341 The health baseline, as measured by routine LPA level indicators, may change in response to the DCO Project activities described above. The following are illustrative of health baseline indicators that may be influenced over time due to commercial displacements (though it is unlikely that such cross-sectional measures could apportion and attribute a particular level of change to the DCO Project).

1. London Borough of Hillingdon: 4% of economically active people are unemployed (5% for London and 4% for England)
2. Slough Borough: 5% of economically active people are unemployed (3% for the south-east and 4% for England)
3. London Borough of Hounslow: 5% of economically active people are unemployed
4. Spelthorne Borough: 3% of economically active people are unemployed
5. South Bucks District: 3% of economically active people are unemployed
6. The Royal Borough of Windsor and Maidenhead: 3% of economically active people are unemployed
7. London Borough of Ealing: 5% of economically active people are unemployed
8. Runnymede Borough: 3% of economically active people are unemployed
9. Elmbridge Borough: 3% of economically active people are unemployed.

The existing health status of the population in the ‘core study area’ can be characterised as good-average levels of self-reported health. Existing deprivation in the ‘core study area’ is between the 4th and 6th IMD decile. There are LSOAs with higher deprivation in West Drayton, Pinkwell and Heston West. A high degree of adaptive behaviour (seeking alternative jobs) is expected within those affected by job losses. All life stages are likely to be influenced by the change (including as dependants). Although the DCO Project will introduce new job opportunities, the commercial displacements may result in a loss of a particular role or skill requirement within the area. Consequently, some of the population may not have good access to alternative employment opportunities, requiring a high degree of adaptive behaviour on their part (for example retraining).

Health priorities

LPA health priorities have been set that link with unemployment as a determinant of health. The health priority themes summarised from the LPAs within the geographic scope are: facilitate and increase access to employment, apprenticeships and skills training; to promote economic growth and employment for local people; recognition that people are healthy when they have good jobs and working conditions and the local economy impacts on mental health; build business, enterprise and innovation and promote global competitiveness; and enable people of working age to participate as fully as possible in working life and economic outcomes for them and their families.

Consultation responses

At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

Standards / controls

No relevant standards have been identified.
Policy context

12.10.346 At a national level the Government supports the DCO Project, acknowledging that the preferred runway configuration will result in the displacement of a number of commercial properties.

12.10.347 The health policy themes summarised from the main adopted and emerging planning documents of LPAs within the geographic scope are as follows: ensure local people benefit from sustainable economic growth; link deprived areas with employment benefits arising from the development; and optimise the potential employment and educational benefits of Heathrow Airport for local residents.

12.10.348 There is general alignment between the national policy, to achieve a greater number of jobs through the expansion and the local policy of general support for development which increases job opportunities.

Step 3: Categorising effects on human health

12.10.349 There is evidence to establish an association (though not clear causation) between unemployment linked to commercial displacements and health outcomes. Furthermore, there is the potential for: a small change from the baseline position; a slight widening of inequalities; and an indirect slight contribution to recognised health priorities. Whist consultation continues, it is expected that commercial displacements will emerge as a minority theme of consultation, particularly in responses from the public. In policy terms the effect aligns with published national policy expectations.

12.10.350 The effect for the general population across the ‘core study area’ in the short term (0-5 years) from the 2022 assessment year is considered to be minor negative (not significant). This is when the greatest health effect is expected. This ranking reflect that most people’s employment will be unaffected (relatively few businesses being affected). Furthermore, the reprovision of many businesses and expanding local employment opportunities associated with the DCO Project will offer most affected employees continuity of employment or alternative employment opportunities. The effects of uncertainty and potential short periods of unemployment that drive the minor negative effect are expected to reduce to negligible (not significant) in the medium term (5-10 years) and the long term (10+ years).

12.10.351 Due to the nature of the displaced businesses (for example immigration, waste management, aggregates, offices and Airport hotels) there is limited potential for community users to experience negative health effects from the loss of a local service provider. The only community businesses that are affected are two public houses in Longford (the King’s Arms and the White Horse). As the Longford population will also be displaced no effect due to such commercial displacements
is likely. Commercial customers of the businesses displaced by the DCO Project are unlikely to lack alternatives in the wider London economy. Widespread economic repercussions that could affect population health are therefore unlikely.

12.10.352 The effect for the vulnerable group (a judgement of the greatest expected effect due to characteristics that increase sensitivity) ranges between negligible (not significant) and major negative (significant) depending on the timeframe and relevant vulnerable group characteristics. The assessment reflects that those working age employees (employed directly or indirectly) who are made redundant and are unable to final alternative employment will be likely to experience reduced health outcomes. Effects may extend indirectly to their dependants, including children, elderly relatives or those with special care needs. Following redundancies unemployment would reduce incomes. Long-term unemployment may have a sustained effect on health due to continuing low income and likelihood of reduced mental health. Groups particularly vulnerable to such effects include young adults with limited employment history, older adults approaching retirement age and those with low job stability or few progression prospects (including due to care commitments for dependants).

12.10.353 For the population adjacent to the Site the loss of local businesses (for example loss of hotels or offices) may result in gaps in employment prior to business re-provision. In addition to direct employees this may also affect local people who are not direct employees, including hospitality, office cleaning or other supporting roles/businesses. For those affected, such change may reduce incomes or increase job insecurity. Such effects are expected to reduce over time due to the opportunities from re-provided or alternative businesses. Groups more sensitive to these types of effect include those that have high deprivation, experience social disadvantage or have access barriers to alternative employment further afield.

12.10.354 In the short-term (0-5 years) (from the 2022 assessment year) the effect on affected vulnerable groups is expected to be moderate negative (not significant), driven by potential for unemployment for a medium population (currently estimated at 100-500 people). The effect may range between negligible (not significant) to moderate negative (not significant) depending on the extent to which continued or alternative employment (of equivalent quality) is acquired.

12.10.355 In the medium term (5-10 years) a negligible (not significant) effect would be expected for most due to re-employment. In this timeframe a sustained negative minor negative (not significant) to moderate negative (not significant) effect may occur if commercial displacements result in ongoing unemployment. The latter may be the case for a small population (currently estimated at less than 100 people).
12.10.356 In the long term (10+ years) a negligible (not significant) effect would be expected for most of those previously affected by unemployment. However, the moderate negative (not significant) effect may persist if long-term unemployment continues. The latter may be the case for a small population (estimated at less than 100 people, likely towards the lower end). The score reflects that whilst this group may experience increasing adverse health effects from persistent long-term unemployment, including effects to dependants (and whilst the ES will consider the potential for targeted development of environmental measures); the expectation is that only a very few people would be affected in this way. Consequently there would not be a population level effect (even at the community level) that was significant in EIA terms.

**Employment, training and economy: procuring goods and services and the local economy**

**Introduction**

12.10.357 The DCO Project’s local construction related procurement of goods and services (including to meet the on-site needs of the construction workforce) may affect the health of local people whose indirectly benefit through employment or expenditure in the local economy.

12.10.358 A plausible source-pathway-receptor linkage has been established between DCO Project related procurement in local communities and consequently experiencing a change in health outcomes:

1. Source: economic benefits to local businesses due to the DCO Project
2. Pathway: facilitating expansion or investment that may pass benefits to staff, including greater job security, a better work environment or improved pay
3. Receptors: employers/employees in businesses benefiting from local procurement and their families and dependants.

12.10.359 The potential effect is both plausible and probable and is therefore considered to be likely.

12.10.360 This issue informs, and has been informed by, Chapter 18: Socio-economics and employment.

12.10.361 The economics and employment chapter identifies the wider induced economic benefits expected from the DCO Project. At PEIR there is not detail on the scale of induced construction related economic benefits associated with the construction workforce.

12.10.362 The health chapter focuses on qualitative discussion of the potential health consequences of indirect economic benefits during construction.
Project activities and temporal scope

12.10.363 DCO Project activity information on this issue is still being developed so is not available to inform the assessment at PEIR. Professional judgment has been used to provide a preliminary assessment and a more detailed assessment will be included in the ES.

12.10.364 During Phase 1 the health effects prior to the 2023 assessment year (for instance 2022 to 2023) have and will continue to be considered in terms of assessment and development of environmental measures (for instance they are part of the build up to the year of peak DCO Project construction activity). Prior to the assessment year the build-up in procurement opportunities will start to affect health outcomes, but the effects are considered not significant. Where those activities do influence the health effects associated with the 2023 assessment year they are taken into account as part of that assessment.

12.10.365 The DCO Project activity assessment year to which the greatest health effects are anticipated to relate is 2023 (this is the assessment year from which significance rankings are made for short, medium and long term health effects).

Geographic scope

12.10.366 Procurement opportunities relating to the on-site construction workforce are expected to be experienced across Greater London and surrounding areas. However, the focus of the assessment is on the benefits of local procurement.

12.10.367 The study area is aligned to the ‘core study area’ identified in Chapter 18: Socio-economics and employment. Figure 18.1, Volume 2 shows the geographical extent of the core study area, which is defined by the LPAs of the London Borough of Hillingdon; Slough Borough; London Borough of Hounslow; Spelthorne Borough; South Bucks District; the Royal Borough of Windsor and Maidenhead; London Borough of Ealing; Runnymede Borough; and Elmbridge Borough. However, this demarcation should not be seen as a cut-off for benefits or opportunities.

Receptors (population scope)

12.10.368 General population receptor: The population of the ‘core study area’ defined in the geographic scope.

12.10.369 Vulnerable group receptor: Relevant characteristics of the ‘core study area’ population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:
1. Children and young people (particularly young adults with limited employment history (and children as dependants indirectly benefiting from induced economic benefits of construction))

10. Older people (particularly frail elderly as dependants indirectly benefiting from induced economic benefits of construction)

2. People who are: unemployed, on low incomes, have regular shift worker, have low job stability, or have few progression prospects (including those unable to work due to ill health as dependants indirectly benefiting from induced economic benefits of construction)

3. People living in areas known to exhibit high deprivation or poor economic and/or health indicators.

**Step 1: Describing the potential effects on health**

12.10.370 Economic opportunities for the procurement of goods and services are likely to have indirect positive influences on health outcomes. Physical and mental health and wellbeing outcomes will be affected. These will predominantly relate to changes in the burden of disease within the population. This includes the onset of new health conditions or health related states, changes in existing health conditions and changes to day-to-day functioning. The economic opportunities are likely to benefit many people to varying degrees. Effects are expected in the short to medium term, linked to the peak in construction. The influence on the population can be characterised as continuous (as opposed to infrequent or rare). The influence on health outcomes from greater economic prosperity will likely be reversible or non-progressive health outcomes.

**Step 2: Framing judgments on significance**

12.10.371 The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.

**Scientific literature**

12.10.372 The scientific literature indicates that there is an association between economic benefits of local procurement due to the DCO Project and health and wellbeing outcomes. Key findings are that there is a reasonable body of evidence that employment is beneficial for health, particularly mental health. The evidence particularly points to long-term unemployment being associated with poor health. The quality of jobs and income are important factors in determining the health benefit.

12.10.373 Key health outcomes identified in the scientific literature and associated with the local economy include general health; and mental health and wellbeing. Positive
effects relate to underlying socio-economic benefits from good quality employment.

12.10.374 Based on the literature reviewed, the strength of evidence is moderate for a direct causal relationship between employment and health outcomes. The evidence is strongest for the adverse effects on mental health of unemployment or low incomes. The evidence for the health benefits of employment is more limited, but there is a general association of sufficient strength to warrant assessment and development of environmental measures to promote good quality stable job opportunities from the DCO Project, particularly where this can reduce inequalities.

Baseline conditions

12.10.375 The baseline relates to the age breakdown of the population including the number of working age people; the level of educational attainment; the number of economically active and inactive adults; the number of households that have no adults in employment; 16-18 year olds not in education employment or training (NEET); deprivation relating to the education, skills and training.

12.10.376 The health baseline, as measured by routine LPA level indictors, may change in response to the DCO Project activities described above. The following are illustrative of health baseline indicators that may be influenced over time due to local construction procurement opportunities (though it is unlikely that such cross-sectional measures could apportion and attribute a particular level of change to the DCO Project).

1. London Borough of Hillingdon: 74% of people aged 16-64 are in employment (74% for London and 74% for England).
2. Slough Borough: 74% of people aged 16-64 are employment (78% for the south-east).
3. London Borough of Hounslow: 72% of people aged 16-64 are employment.
4. Spelthorne Borough: In the county of Surrey 80% of people aged 16-64 are in employment (data for Spelthorne, Runnymede and Elmbridge is not available).
5. South Bucks District: In the county of Buckinghamshire 82% of people aged 16-64 are employment (data for South Bucks is not available).
6. The Royal Borough of Windsor and Maidenhead: 80% of people aged 16-64 are employment.
7. London Borough of Ealing: 75% of people aged 16-64 are in employment.

12.10.377 The existing health status of the population in the affected community areas can be characterised as good-average levels of self-reported health. Existing deprivation in the communities can be characterised as average (between the 4th and 6th IMD decile, but acknowledging potential for pockets of deprivation and higher deprivation in some wider area LSOAs in West Drayton, Pinkwell and Heston West). Varying degrees of adaptation to take advantage of the opportunities are expected within the population. All life stages are likely to be influenced by the change (including as dependants).

Health priorities

12.10.378 LPA health priorities have been set that link with indirect employment as a determinant of health. The health priority themes summarised from the LPAs within the geographic scope are as follows: continue promoting the wellbeing for all residents with specific focus to improve health and improve employment; create and sustain healthy workplaces; create fair employment and good work for all.

Consultation responses

12.10.379 At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

Standards / controls

12.10.380 Not applicable for this issue.

Policy context

12.10.381 At a national level the Government supports the DCO Project acknowledging the strong economic case, including recognising the wider economic benefits to communities, though not specifically in relation to construction related procurement.

12.10.382 The health policy themes summarised from the main adopted and emerging planning documents of LPAs within the geographic scope are as follows: promote as a strong location for professional services and the knowledge economy; increase the presence of high value and knowledge based businesses; attract businesses to the Boroughs and support the retention, creation and development of local businesses; ensure local people benefit from sustainable economic growth located both within the Airport boundaries and in the surrounding areas.

12.10.383 There is alignment between the national policy and the local policy in both seeing to promote the wider economic benefits to local communities. Such alignment of
national and local policy drivers is likely to enhance beneficial effects linked to construction procurement.

**Step 3: Categorising effects on human health**

12.10.384 There is evidence to establish an association (though not clear causation) between economic benefits arising from local procurement and health outcomes. There is considered the potential for: a slight change from the baseline position; a slight narrowing of inequalities; and an indirect small contribution to recognised health priorities. Whilst technical engagement continues, it is expected that relatively few responses will relate to the health effects of local procurement. In policy terms the effect aligns with published national and local government policy expectations.

12.10.385 The effect for the general population across the core study area is expected to be negligible (negligible) in the short term (0-5 years), medium term (5-10 years) and long term (10+ years) following the 2023 assessment year (the peak of construction activities).

12.10.386 The effect for the vulnerable group (a judgement of the greatest expected effect due to characteristics that increase sensitivity) ranges between minor positive (not significant) and negligible (not significant) depending on the timeframe and relevant vulnerable group characteristics. The positive effect is closely linked to the scale of construction activities with the greatest effects expected in Phase 1, followed by a smaller effect in Phases 2 and 3 as the local construction procurement requirement declines. Groups particularly likely to benefit include: young adults with limited employment history; people who were previously unemployed, on low incomes, had low job stability, or have few progression prospects; and those experiencing high levels of deprivation. Benefits will also be expected to extend to their dependants, including children, frail elderly and those requiring care due to poor health.

12.10.387 For vulnerable groups, in the short term (0-5 years) (from the 2023 assessment year) a minor positive (not significant) effect would be expected for a large population (estimated at over 500 people).

12.10.388 In the medium term (5-10 years), the economic benefits to health from local construction related procurement would be expected to continue (including for dependants), though benefits may start to decline. Effects are likely to range between minor positive (not significant) and negligible (not significant) for a large population (estimated at over 500 people).

12.10.389 In the long-term (10+ years) a negligible (not significant) effect would be expected as the construction procurement requirements further declined and ceased with the completion of construction works.
Employment, training and economy: demand for construction workforce and employment

Introduction

The DCO Project activities, principally demolition and earthworks, construction of the North West Runway and airfield infrastructure and local roads and changes to the M25 will require a construction workforce.

A plausible source-pathway-receptor linkage has been established between DCO Project related employment and consequently experiencing a change in health outcomes:

1. Source: employment in construction due to the DCO Project
2. Pathway: improved socio-economic status and mental wellbeing
3. Receptors: the workforce directly or indirectly employed during construction (including their dependants).

The potential effect is both plausible and probable and is therefore considered to be likely.

This issue informs, and has been informed by, Chapter 18: Socio-economics and employment. The Socio-economics and employment assessment identifies the change in construction employment, including changes in employment over time. The Health chapter focuses on qualitative discussion of the health consequences of direct employment.

Project activities and temporal scope

In addition to the Construction Support Sites around the Airport, it is proposed to utilise four remote Hubs (Logistic Centres) elsewhere in the country that aim to increase off-site activities (for example prototyping, pre-assembly and consolidation) and spread the economic benefit of the DCO Project.

As part of the discussion of 'Healthy lifestyles: construction workforce', paragraphs 12.10.262 and 12.10.263 set out the expected total job years required for the DCO Project construction across each phase. Chapter 18: Socio-economics and employment (Table 18.38) sets out construction workforce job years by location of residence within and outside of the ‘core study area’ (refer to Figure 18.1, Volume 2 for geographical extent of the core study area). The demand is expected to be the following for each of the assessment years:

1. Phase 1 peak construction employment (2023): 13,600 job years supported nationally, of which 3,500 are anticipated to commute from within the Chapter 18: Socio-economics and employment core study area
2. Phase 1 (2025): 10,100 job years supported nationally, of which 2,600 are anticipated to commute from within the Chapter 18: Socio-economics and employment core study area

3. Phase 2 (2027): 3,900 job years supported nationally, of which 1,000 are anticipated to commute from within the Chapter 18: Socio-economics and employment core study area

4. Phase 3 (2035): 2,200 job years supported nationally, of which 600 are anticipated to commute from within the Chapter 18: Socio-economics and employment core study area

5. Phase 3 (2050): <2,000 job years supported nationally, of which <500 are anticipated to commute from within the Chapter 18: Socio-economics and employment core study area.

12.10.396 The construction workforce mobilisation and training stage could have some small effect prior to actual construction commencing. There may be short- to medium term effects linked to construction employment. Long-term effects are likely to be limited, but the construction workforce may benefit from a legacy of upskilling and large project experience, particularly where this relates to developing technical specialisms linked to higher and more stable earnings.

12.10.397 During Phase 1 the health effects prior to the 2023 assessment year (for instance 2022 to 2023) have and will continue to be considered in terms of assessment and development of environmental measures (for instance the build-up in construction workers to the year of peak DCO Project construction activity). Prior to the assessment year the build-up in construction job opportunities will start to affect health outcomes, but for that time period are considered not significant. However, those job opportunities do contribute to the health effects associated with the 2023 assessment year and so are taken into account as part of that assessment.

12.10.398 The DCO Project activity assessment year to which the greatest potential health effects are anticipated to relate is 2023 (this is the assessment year from which significance rankings are made for short, medium and long term health effects).

12.10.399 In categorising EIA significance for health, the embedded measures set out in Section 12.5 of this chapter have been taken into account. This includes Heathrow’s Economic Development Strategy.

**Geographic scope**

12.10.400 Employment opportunities generated by the DCO Project are expected to be experienced in regions across the UK, including across Greater London and surrounding areas. However, the focus of the health assessment is on the benefits of local employment which is represented by the ‘core study area’ as set out in
Chapter 18: Socio-economics and employment. Figure 18.1, Volume 2 shows the geographical extent of the core study area.

12.10.401 The core study area is defined by the LPAs of the London Borough of Hillingdon; London Borough of Hounslow; South Bucks District; Slough Borough; Spelthorne Borough; the Royal Borough of Windsor and Maidenhead; London Borough of Ealing; Runnymede Borough; and Elmbridge Borough.

Receptors (population scope)

12.10.402 General population receptor: The population of the core study area defined in the geographic scope and more broadly the national population of the UK.

12.10.403 Vulnerable group receptor: Relevant characteristics of the core study area population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. The population adjacent to the Site (local employment benefits)
2. Children and young people (particularly young adults with limited employment history (and children as dependants indirectly benefiting from construction jobs))
3. Older people (particularly frail elderly as dependants indirectly benefiting from construction jobs)
4. People who are: unemployed, on low incomes, have regular shift worker, have low job stability, or have few progression prospects (including those unable to work due to ill health as dependants indirectly benefiting from construction jobs)
5. People living in areas known to exhibit high deprivation or poor economic and/or health indicators.

12.10.404 Much of the construction employment opportunity may disproportionately benefit occupations associated with lower socio-economic status and follow construction industry trends in providing opportunities predominantly to young or middle-aged men. Whilst the DCO Project may perpetuate industry inequalities related to socio-economic status, age and gender, Heathrow will expect its contractors will operate appropriate equality policies. The wider employment benefits from construction employment are expected to narrow inequalities by providing greater opportunity to those with lower incomes (including benefiting dependants). The provision of training and upskilling through construction employment will also be expected to narrow inequalities relating to career ceilings and future earning capacity.
People experiencing above average deprivation may particularly benefit from construction employment opportunities, reducing deprivation through improved social mobility.

In general, the working age population in employment, particularly active (non-sedentary) roles as will often (but not always) be the case in construction, is expected to have a health status that was better than the national average. Whilst construction related employment has occupational risks, Heathrow will expect contractors to operate appropriate health and safety practices, as well as health promotion and occupational hygiene, to ensure that the construction workforce did not experience negative health outcomes due to the DCO Project.

Direct construction employment will benefit working age people. Younger and older people may benefit indirectly as dependants of those employed.

Construction workforce opportunities of the DCO Project may affect the health of people who obtain direct or indirect employment (including effects on dependants of those employed).

The construction stage will be finite, and the benefits of employment may be reversible if construction workers subsequently becoming unemployed. However, the upskilling and experience from the DCO Project is expected to reduce the potential for those employed to subsequently become unemployed for any period of time that appreciably reduced their health outcomes.

Whilst there will be a sizable construction workforce, most roles will already exist within construction related industries. However, for those living locally and searching for employment or currently in education or training, the new demand created due to the DCO Project is likely to present a positive opportunity and good practice measures are included to maximise these opportunities.

**Step 1: Describing the potential effects on health**

Construction employment is expected to have direct positive health effects, with a mix of interrelated physical and mental health and wellbeing outcomes. These will predominantly relate to changes in the burden of disease within the population. This includes the onset of new health conditions or health related states, changes in existing health conditions and changes to day-to-day functioning. Many people are expected to benefit from the employment opportunities to varying degrees. Effects will most likely be short to medium term, linked to construction phasing. The influence on the population can be characterised as continuous (as opposed to infrequent or rare). The influence on health outcomes provided through the economic, social and psychological benefits of employment will likely be reversible or non-progressive health outcomes.
**Step 2: Framing judgments on significance**

12.10.412 The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.

**Scientific literature**

12.10.413 The scientific literature indicates that there is evidence to support an association between construction employment due to the DCO Project and health and wellbeing outcomes. Key findings are that there is a reasonable body of evidence that employment is positive for health, particularly mental health. The evidence particularly points to long-term unemployment being associated with poor health. The quality of jobs and income are important factors in determining the health benefit.

12.10.414 The type of health outcomes relating to employment that are identified in the scientific literature include: general health; and mental health and wellbeing. Positive effects relate to underlying socio-economic benefits from good quality employment. The evidence particularly points to long-term unemployment being associated with poor health. The quality of jobs and income are important factors in determining the health benefit. Effects due to construction job opportunities are likely to relate to changes in risk factors and quality of life associated with socio-economic benefits of employment (for example, greater spend on health promoting goods, services and lifestyle choices – including for dependants).

12.10.415 Based on the literature reviewed, the strength of evidence is moderate for a direct causal relationship between employment and health outcomes. The evidence is strongest for the negative effects on mental health of unemployment or low incomes. The evidence for the health benefits of employment is more limited, but there is a general association of sufficient strength to warrant assessment and development of environmental measures to promote good quality stable job opportunities from the DCO Project, particularly where this can reduce inequalities.

**Baseline conditions**

12.10.416 The baseline relates to: the age breakdown of the population including the number of working age people; the level of educational attainment; the number of economically active and inactive adults; the number of households that have no adults in employment; 16-18 year olds not in education employment or training (NEET); deprivation relating to the education, skills and training.

12.10.417 The health baseline, as measured by routine LPA level indicators, may change in response to the DCO Project activities described above. The following are illustrative of health baseline indicators that may be influenced over time due to construction employment (though it is unlikely that such cross-sectional measures could apportion and attribute a particular level of change to the DCO Project):
1. London Borough of Hillingdon: 74% of people aged 16-64 are in employment (74% for London and 74% for England)

2. Slough Borough: 74% of people aged 16-64 are employment (78% for the south-east)

3. London Borough of Hounslow: 72% of people aged 16-64 are employment.

4. Spelthorne Borough: In the county of Surrey 80% of people aged 16-64 are in employment (data for Spelthorne, Runnymede and Elmbridge is not available)

5. South Bucks District: In the county of Buckinghamshire 82% of people aged 16-64 are employment (data for South Bucks is not available)

6. The Royal Borough of Windsor and Maidenhead: 80% of people aged 16-64 are employment

7. London Borough of Ealing: 75% of people aged 16-64 are in employment

8. Runnymede Borough: As for Spelthorne Borough


The existing health status of the population from which construction workers are likely to be drawn can be characterised as good-average levels of self-reported health. All life stages are likely to be influenced by the change (including as dependants).

Health priorities

LPA health priorities have been set that link with employment as a determinant of health. The health priority themes summarised from the LPAs within the geographic scope are: increase access to employment, apprenticeships and skills training; maximising family incomes; increasing the number of young people progressing to apprenticeships; create fair employment and good work for all; support into local jobs by providing access to training and employment support opportunities; developments may be expected to deliver construction training and provide local access to new training and employment opportunities.

Consultation responses

At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

Standards / controls

Not applicable for this issue.
Policy context

12.10.422 At a national level the Government supports the DCO Project acknowledging the strong economic case, particularly around employment in general, though not specifically in relation to construction related employment.

12.10.423 The health policy themes summarised from the main adopted and emerging planning documents of LPAs within the geographic scope are as follows: link deprived areas with employment benefits arising from the development of major sites; optimise the potential employment and educational benefits of Heathrow Airport for local residents; and ensure intensive employment generating uses which increase the level of in-commuting contribute toward appropriate mitigation measures.

12.10.424 There is alignment between the national policy and the local policy in both seeing to promote local employment and to mitigate any negative effects. Such alignment of national and local policy drivers is likely to enhance positive effects linked to construction employment.

12.10.425 As set out in Chapter 18: Socio-economics and employment, embedded measures relevant to the construction workforce include the submission of an Economic Development Strategy with the DCO. This will include measures to promote construction recruitment, developing skills, education and training, recruiting and developing apprentices. The evolving content of the Economic Development Strategy will inform, and be informed by, the assessment of health effects for the ES.

Step 3: Categorising effects on human health

12.10.426 There is evidence to establish an association (though not clear causation) between construction employment and health outcomes. Furthermore, there is the potential for: a small change from the baseline position; a slight narrowing of inequalities; and a direct and large contribution to recognised health priorities. Whilst consultation continues, it is expected that construction employment opportunities will emerge as a strong and consistent theme of consultation by both health stakeholders and the public. In policy terms the effect aligns with published national and local government policy expectations.

12.10.427 The effect for the general population across the core study area is minor positive (not significant) in the short term (0-5 years) and medium term (5-10 years) from the 2023 assessment year. This ranking reflects that whilst the DCO Project will support employment, the majority of roles will already exist, and the employment of most people will be unaffected. For some of those employed, the DCO Project will represent ongoing job security over a number of years. In the long term (10+ years) the benefits would be expected to decline to negligible (not significant).
12.10.428 The effect for the vulnerable group (a judgement of the greatest expected effect due to characteristics that increase sensitivity) ranges between negligible (not significant) and moderate positive (not significant) depending on the timeframe and relevant vulnerable group characteristics. For the population within the communities surrounding Heathrow a positive effect is expected to persist for the period of construction employment. This reflects the expectation that 10,900 members of the peak construction workforce (2023) are expected to be home-based workers. Those likely to experience beneficial effects when obtaining good quality construction roles include: young adults with limited employment history (establishing their career and skills); people who were previously unemployed, on low incomes, had low job stability, or have few progression prospects; and those experiencing high levels of deprivation. Benefits will also be expected to extend to their dependants, including children, frail elderly and those requiring care due to poor health.

12.10.429 In the short term (0-5 years) (from the 2023 assessment year) the health effect on affected vulnerable groups is considered to be moderate positive (not significant). The effect is driven by local construction employment opportunity for a large population (estimated at over 500 people).

12.10.430 Over the medium term (5-10 years) benefits are likely to decrease from a moderate positive (not significant) to minor positive (not significant) in line with construction workforce requirements. Effects would continue to be for a large population (estimated at over 500 people).

12.10.431 In the long term (10+ years) whilst for most effects may further decline to negligible (not significant), for many a sustained minor positive (not significant) effect would be expected from upskilling during construction. The latter may remain the case for a large population (estimated at over 500 people).

Employment, training and economy: demand for operational workforce and employment

Introduction

12.10.432 The DCO Project activities, principally those associated with operating an airport handling more flights and passengers, will require an increased operational workforce.

12.10.433 Operational workforce opportunities of the DCO Project may affect the health of people whose obtain direct or indirect employment (including effects on dependants of those employed).
A plausible source-pathway-receptor linkage has been established between Project related employment and consequently experiencing a change in health outcomes:

1. Source: operational jobs due to the DCO Project
2. Pathway: employment related determinants of health, including improved socio-economic status and mental wellbeing
3. Receptors: the workforce directly or indirectly employed during operation (including their dependants).

The potential effect is both plausible and probable and is therefore considered to be likely.

This issue informs, and has been informed by, Chapter 18: Socio-economics and employment. The socio-economics and employment assessment identifies the change in operational employment, including changes in employment over time. The Health chapter focuses on qualitative discussion of the health consequences of direct employment.

**Project activities and temporal scope**

As the numbers of flights and passengers using the Airport increase, the need for operational workers is likely to increase. Therefore, this assessment is relevant to Phases 1, 2, and 3. The operational workforce is expected to be required to increase as the Airport expands, from an estimated baseline of 72,700 direct employees. Chapter 18: Socio-economics and employment (Table 18.42) estimates that the gross number of employees directly employed on-site will increase from the future baseline: Phase 1 (2025) an additional 5,200 jobs; Phase 2 (2027) an additional 7,800 jobs; Phase 3 (2035) an additional 16,200 jobs (at PEIR forecasts are not available for 2050). Chapter 18: Socio-economics and employment (Table 18.45) goes on to consider net employment (which includes displacement and multiplier effects from induced employment). That assessment allows for a combined national employment multiplying factor of between 1.4 and 2.3, however for a conservative heath chapter assessment gross, rather than net, figures are used.

The operational workforce, mobilisation and training stage could have some small effect prior to actual operation commencing. Long-term benefits of additional good quality employment is likely to be an important benefit of the DCO Project. Long-term effects are likely for both direct employment of Heathrow colleagues at the Airport and indirect employment in air travel support and related industries.

During Phases 1, 2 and 3 the health effects prior to the 2035 assessment year (for instance 2022 to 2035) have and will continue to be considered in terms of
assessment and development of environmental measures. Prior to the assessment year the build-up in operational employment is best categorised as not significant, acknowledging that during this time health outcomes will start to be affected and by the assessment year effects will have become significant for many. The influence of earlier employment on the health effects associated with the 2035 assessment year has therefore been taken into account as part of the assessment.

12.10.440 The DCO Project activity assessment year to which the greatest potential health effects are anticipated to relate is 2035 (this is the assessment year from which significance rankings are made for short, medium and long term health effects). The reflects the Chapter 18: Socio-economics and employment assessment year of greatest operational employment, and therefore greatest potential for employment related health benefits. It also reflects that the benefits of employment tend to affect population health over time, rather than instantaneously.

12.10.441 In categorising EIA significance for health, the embedded measures set out in Section 12.5 of this chapter have been taken into account. This includes Heathrow’s Economic Development Strategy, with its skills, education and training action plan and credible plan to implement the commitment to deliver a total of 10,000 apprenticeships at the expanded Airport. The DCO Project will seek to maximise the benefits to the local residents through employment and training opportunities. The evolving content of the Economic Development Strategy will inform, and be informed by, the assessment of health effects for the ES.

Geographic scope

12.10.442 Employment opportunities generated by the DCO Project are expected to be experienced in regions across the UK, including across Greater London and surrounding areas. However, the focus of the health assessment is on the benefits of local employment which is represented by the ‘core study area’ as set out in Chapter 18: Socio-economics and employment. Figure 18.1, Volume 2 illustrates the geographical extent of the core study area.

12.10.443 The core study area is defined by the LPAs of the London Borough of Hillingdon; Slough Borough; London Borough of Hounslow; Spelthorne Borough; South Bucks District; the Royal Borough of Windsor and Maidenhead; London Borough of Ealing; Runnymede Borough; and Elmbridge Borough. However, this demarcation should not be seen as a cut-off for benefits or opportunities.

Receptors (population scope)

12.10.444 General population receptor: The population of the core study area defined in the geographic scope and more broadly the national population of the UK.
12.10.445 Vulnerable group receptor: Relevant characteristics of the core study area population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. Children and young people (particularly young adults with limited employment history (and children as dependants indirectly benefiting from operational jobs))
2. Older people (particularly frail elderly as dependants indirectly benefiting from operational jobs)
3. People who are: unemployed, on low incomes, have regular shift worker, have low job stability, or have few progression prospects (including those unable to work due to ill health as dependants indirectly benefiting from operational jobs)
4. People living in areas known to exhibit high deprivation or poor economic and/or health indicators.

12.10.446 The operational employment benefits are expected to narrow inequalities by providing greater opportunity to those who are unemployed, in insecure or poor-quality employment or with lower incomes (including benefiting dependants). The provision of training and upskilling through operational employment will also be expected to narrow inequalities relating to career ceilings and future earning capacity.

12.10.447 People experiencing above average deprivation may particularly benefit from operational employment opportunities, reducing deprivation through improved social mobility.

12.10.448 Direct operational employment will benefit working age people. Younger and older people may benefit indirectly as dependants of those employed. In general, the working age population in employment, particularly active (non-sedentary) roles, is expected to have a health status that was better than the national average. Whilst some operation related employment has occupational risks, Heathrow will expect to operate appropriate health and safety practices, as well as health promotion and occupational hygiene, to ensure that its operational workforce did not experience negative health outcomes due to their employment.

12.10.449 Operational employment is likely to have ongoing/continuous benefits, including benefits associated with upskilling. Long-term good quality operational employment is expected to have permanent benefits to health outcomes.

12.10.450 The direct on-site employment operational workforce is expected to increase by approximately 16,200 by 2035. The creation of additional job opportunities is a key local policy objective. For those living locally and searching for employment or
Currently in education or training, the new demand created due to the DCO Project is likely to present a positive opportunity.

**Step 1: Describing the potential effects on health**

Operational employment will bring direct positive health benefits across a mix of interrelated physical and mental health and wellbeing outcomes. These will predominantly relate to changes in the burden of disease within the population. This includes the onset of new health conditions or health related states, changes in existing health conditions and changes to day-to-day functioning. Many people will benefit from the operational employment opportunities. Health benefits are expected over the medium to long term, reflecting the permanent nature of employment and that the benefits arise from sustained good quality employment. The influence on the population can be characterised as continuous (as opposed to infrequent or rare). The influence on health outcomes from the economic, social and psychological benefits of employment will likely be reversible or non-progressive health outcomes.

**Step 2: Framing judgments on significance**

The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.

**Scientific literature**

The scientific literature indicates that there is evidence to support an association between operational employment due to the DCO Project and health and wellbeing outcomes. Key findings are that there is a reasonable body of evidence that employment is positive for health, particularly mental health. The evidence particularly points to long-term unemployment being associated with poor health. The quality of jobs and income are important factors in determining the health benefit.

The type of health outcomes relating to employment that are identified in the scientific literature include: general health; and mental health and wellbeing. Positive effects relate to underlying socio-economic benefits from good quality employment. Effects due to operational job opportunities are likely to relate to changes in risk factors and quality of life associated with socio-economic benefits of employment (for example, greater spend on health promoting goods, services and lifestyle choices – including for dependants). Benefits of long-term good quality employment may be protective against health conditions that are associated with poverty.

Based on the literature reviewed, the strength of evidence is moderate for a direct causal relationship between employment and health outcomes. The evidence is
strongest for the negative effects on mental health of unemployment or low incomes. The evidence for the health benefits of employment is more limited, but there is a general association of sufficient strength to warrant assessment and development of environmental measures to promote good quality stable job opportunities from the DCO Project, particularly where this can reduce inequalities.

**Baseline conditions**

12.10.456 The baseline relates to: the age breakdown of the population including the number of working age people; the level of educational attainment; the number of economically active and inactive adults; the number of households that have no adults in employment; 16-18 year olds not in education employment or training (NEET); deprivation relating to the education, skills and training. The working age population (16-64) in the core study area is approximately one million, with employment and unemployment rates that are around the regional and national averages.

12.10.457 The health baseline, as measured by routine LPA level indicators, may change in response to the DCO Project activities described above. The following are illustrative of health baseline indicators that may be influenced over time due to operational employment (though it is unlikely that such cross-sectional measures could apportion and attribute a particular level of change to the DCO Project). This indicator is particularly relevant to apprenticeships, the general employment indicator is as for construction employment:

1. London Borough of Hillingdon: 3% of 16-18 year olds are NEET (3% for London and 4% for England)
2. Slough Borough: 4% of 16-18 year olds are NEET (4% for the south-east)
3. London Borough of Hounslow: 3% of 16-18 year olds are NEET
4. Spelthorne Borough: In the county of Surrey 2% of 16-18 year olds are NEET (data for Spelthorne, Runnymede and Elmbridge is not available)
5. South Bucks District: In the county of Buckinghamshire 3% of 16-18 year olds are NEET (data for South Bucks is not available)
6. The Royal Borough of Windsor and Maidenhead: 5% of 16-18 year olds are NEET
7. London Borough of Ealing: 3% of 16-18 year olds are NEET
8. Runnymede Borough: As for Spelthorne Borough
12.10.458 The existing health status of the population in the core study area likely to take up employment opportunities can be characterised as good-average levels of self-reported health. All life stages are likely to be influenced by the employment opportunities (including as dependants).

Health priorities

12.10.459 LPA health priorities have been set that link with employment as a determinant of health. The health priority themes summarised from the LPAs within the geographic scope are: to facilitate participation in education, training and work, including people who need extra support, to support carers and to work with employers to promote the wellbeing of staff: create fair employment and good work for all.

Consultation responses

12.10.460 At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

Standards / controls

12.10.461 Not applicable for this issue.

Policy context

12.10.462 At a national level the Government supports the DCO Project acknowledging the strong economic case, particularly around operational employment, including apprenticeships.

12.10.463 The health policy themes summarised from the main adopted and emerging planning documents of LPAs within the geographic scope are as follows: to ensure local people benefit from sustainable economic growth located both within the Airport boundaries and in the surrounding areas; optimise the potential employment and educational benefits of Heathrow Airport for local residents; supporting residents into local jobs by providing access to training and employment support; supporting initiatives to improve the skills of the local workforce; and being responsive to market demands.

12.10.464 There is alignment between the national policy and the local policy in both seeing to promote local employment and economic growth. Such alignment of national and local policy drivers is likely to enhance positive effects linked to operational employment.
Step 3: Categorising effects on human health

There is evidence to establish an association (though not clear causation) between operational employment and health outcomes. Furthermore, there is the potential for: a substantial change from the baseline position; a small narrowing of inequalities; and a direct and large contribution to recognised health priorities. Whilst consultation continues, it is expected that operational employment will emerge as a strong and consistent theme of consultation by both health stakeholders and the public. In policy terms the effect aligns with published national and local government policy expectations.

The effect for the general population across the core study area is expected to be greatest in the long term (10+ years) from the 2035 assessment year when health effects are considered to be minor positive (not significant). During in the short term (0-5 years) and the medium term (5-10 years) beneficial effects are likely to range between negligible (not significant) and minor positive (not significant) depending on the change in quality and stability of operational employment, compared to existing employment. In the long term (10+ years) a persistent minor positive (not significant) effect reflects the benefits of a period of stable good quality employment.

The effect for the vulnerable group (a judgement of the greatest expected effect due to characteristics that increase sensitivity) ranges between minor positive (not significant) and major positive (significant) depending on the timeframe and relevant vulnerable group characteristics. The positive effect is expected as operational ATMs start to increase, with the effect benefiting a larger population following the opening of the North West Runway and the corresponding expansion in employment opportunities. Effects during Phases 2 and 3 are particularly likely where good quality jobs are maintained, including transitions from apprenticeships. The increasing benefit reflects the growth in operation activities (and associated jobs), as well as the benefits to physical and mental health being linked to a sustained period of improved income and job stability. Groups particularly likely to benefit include: young adults with limited employment history; people who were previously unemployed, on low incomes, had low job stability, or have few progression prospects; and those experiencing high levels of deprivation. Benefits will also be expected to extend to their dependants, including children, frail elderly and those requiring care due to poor health.

In the short term (0-5 years) (from the 2035 assessment year) the greatest short-term improvement in health outcomes for vulnerable groups would be expected for people who were previously unemployed, on low incomes or had low job stability. Effects are likely to range between minor positive (not significant) and major positive (significant) depending on the immediate change in circumstances that the employment provides. The effect is driven by local operational employment
opportunity (as well as indirect employment) for a large population (estimated at over 500 people).

12.10.469 In the medium term (5-10 years), the benefits of employment would be expected to continue (including for dependants), including more gradual improvements in health for a wider range of vulnerabilities (such as those who previously had few progression prospects or experienced high levels of deprivation). Effects are likely to range between moderate positive (not significant) and major positive (significant) for a large population (estimated at over 500 people).

12.10.470 In the long-term (10+ years) a sustained major positive (significant) effect would be expected from good quality stable operational employment and upskilling for a large population (estimated at over 500 people). This is likely to be influential for the overall health of the study area population. A further benefit ranging from moderate positive (not significant) to major positive (significant) may also be expected for dependants of those employed.

**Environment: noise**

12.10.471 The DCO Project has the potential to result in health effects from changes in aircraft noise exposure as a result of additional ATMs (and other noise and vibration sources), different operating regimes and changes to aircraft fleet mix. Noise (unwanted sound) is a pathway for health effects relating to annoyance; sleep disturbance; cardiovascular impacts and cognitive development of children.

12.10.472 Appendix 17.1 Annex E sets out the evidence for associations between environmental noise sources and health for a number of different health outcomes.

12.10.473 Noise health effects are assessed in Chapter 17: Noise and vibration to meet requirements of the ANPS.

12.10.474 Section 17.10 sets out the significant Health and Quality of Life (HQL) effects arising from the operation of the expanded Airport on health and quality of life in terms of daytime annoyance and reported sleep disturbance at night.

12.10.475 Section 17.10 also provides a comparison of the effect of aircraft noise during operation on cardiovascular impacts (Acute Myocardial Infarction (heart attack) and hypertension (stroke and vascular dementia)) with and without the DCO Project.

12.10.476 An assessment of the possible impact of noise and noise change due to the DCO Project on children’s learning is presented in Section 17.11 for the inner reporting area. Effects for the wider reporting area at will be reported in the ES.

12.10.477 Where noise effects influence health in-combination effects, these are reported at the end of Section 12.10.
Environment: air quality

Introduction

Changes in emissions from aircraft movements both on-airport and during landing and take-off, as well as from Airport support equipment, together with changes in emissions from vehicles on public highways will affect exposure to pollutants that could affect human health. The key pollutants are nitrogen dioxide (NO₂) and particulate matter (PM).

A plausible source-pathway-receptor linkage has been established:

1. Source: increased emissions from aircraft and vehicles associated with the DCO Project
2. Pathway: increased concentrations of pollutants affecting air quality
3. Receptors: members of the public exposed to the changes in air quality.

The potential effects are both plausible and probable and are therefore considered to be likely.

This issue has been informed by Chapter 7: Air quality and odour. The air quality assessment identifies the change in concentrations of relevant air pollutants (including extent) due to combined construction and operational activities. The chapter provides quantitative outputs from models to understand changes in concentrations relative to applicable standards; no health effects are reported in the Air Quality chapter, although reference is made to concentrations in relation to health-based air quality standards. The health chapter focuses on qualitative discussion of the health consequences of changes in air quality, as well as providing quantitative calculations of morbidity and mortality health outcomes.

Project activities and temporal scope

The DCO Project activities that may result in changes to air quality are: aircraft movements associated with the North West Runway and taxiways (including the landing and take-off cycle); land-based activities in support of Airport operation (including use of vehicles airside and Ground Support Equipment, rail freight etc.); and vehicular traffic associated with Heathrow colleagues, passengers and freight, (including that in car parks).

Air quality effects related to construction activities are set out in the Environment: Construction effects section of this chapter

The activities that drive the potential health effects are:

1. Phase 1: 2022 includes the start of release of additional ATMs on the existing runways (which occurs over a four year period up to 2025), together with
additional traffic due to the construction works for the DCO Project, and the removal of the Energy from Waste plant. Dispersion modelling has been carried out to predict pollutant concentrations at receptors in this year.

2. Phase 2: 2027 is the first full calendar year when the North West Runway is operational. Dispersion modelling has been carried out to predict pollutant concentrations at receptors in this year. 2030 is the ANPS test for surface access targets. Dispersion modelling has also been carried out to predict pollutant concentrations at sensitive receptors in this year.

3. Phase 3: 2035, referred to as the year of minimum ANPS capacity, when the number of ATMs at the Airport reaches a capacity of at least 740,000. This is the assessment year presented in Chapter 7: Air quality and odour. Dispersion modelling has been carried out to predict pollutant concentrations at sensitive receptors in this year.

The focus for this assessment is on health effects occurring from Phase 2 onwards. The dispersion modelling for the four assessment years, 2022, 2027, 2030 and 2035, is described in Chapter 7: Air quality and odour.

Geographic scope (study area)

The study area for this issue is shown in Figure 12.1, Volume 2. This study area is defined by all the LPAs in the Greater London area, together with the LPAs in the Fully Modelled Area (the area covered by the traffic modelling), and the Core Air Quality Objective Assessment Area (core study area for air quality assessment immediately around the Airport).

This area exceeds the study area defined in Chapter 7: Air quality and odour, by including all the London LPAs. This large area is defined to acknowledge the absence of a recognised threshold for effects of the key pollutants, thus even small changes in exposure can give rise to effects at the population level. In the absence of any published guidance on how to define a suitable study area for the calculation of health outcomes, the inclusion of the whole of the Greater London urban area is considered to be a reasonable extension of the study area based on the likely extent of change in emissions to establish the effects of the DCO Project on the surrounding area, including the neighbouring major urban area.

Receptors (population scope)

Population groups are identified in relation to both sensitivity due to proximity and sensitivity for reasons other than proximity. In both cases the populations may include: residents; owners, operators and users of community and amenity facilities (including healthcare services and schools); visitors to communities, open spaces and sports facilities around Heathrow; and road users.
12.10.489 General population receptor: The population of the study area defined in the geographic scope.

12.10.490 Vulnerable group receptor: Relevant characteristics of the study area population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. The population in proximity to locations where changes in concentrations due to the DCO Project are greatest
2. Children and young people (including pregnant women and unborn children)
3. Older people (particularly frail elderly)
4. People with existing poor health (for example respiratory or cardiovascular conditions).

Step 1: Describing the potential effects on health

12.10.491 While the benefits of future reductions in emissions from vehicles accessing the Airport and on-airport are recognised, the increase in aircraft emissions associated with the increased ATMs means that the health effects are best categorised as negative and direct. The effects are expected to predominantly relate to physical health outcomes that could change mortality rates and the burden of disease within the exposed population. This includes the onset of new health conditions or health related states, changes in existing health conditions and changes to day-to-day functioning. People in communities experiencing changes in exposure would be affected to varying degrees. Effects are expected in the medium to long term, reflecting the phased increase in ATMs. Although concentrations would vary with meteorological conditions and due to the levels and timings of source emissions, the influence on the population can be characterised as continuous (as opposed to infrequent or rare). The influence on health outcomes would likely range from permanent, progressive or irreversible changes in health conditions, health states or health events through to transient temporary symptoms.

12.10.492 The health outcomes that have been quantified for the PEIR are the changes in mortality and changes in hospital admissions. Further details of the data sources and calculations are provided in the following paragraphs.

12.10.493 Exposure-response coefficients, published by Defra, have been applied to the population (estimated in 2022, 2027, 2030 and 2035) in the study area, using the population-weighted change in concentrations across the study area to calculate the change in the health outcome.

12.10.494 The modelling of the traffic-related and on-airport and aircraft emissions of both NOx and PM is described in Chapter 7: Air quality and odour. The approach
has been to model concentrations at all AddressBase points in the ‘Core Air Quality Objective Assessment Area’ and ‘Fully Modelled Area’, and at population-weighted centroids of census data Output Areas covering the additional London LPAs. These concentrations have been determined from gridded model outputs using interpolation and nearest neighbour analyses, as appropriate. The results have been used to derive a population-weighted concentration with and without the DCO Project, and hence the change with the DCO Project (Office for National Statistics, 2018, NOMIS, 2017).

12.10.495 The risk coefficients have been taken from Defra (Ricardo Energy & Environment, 2019).

12.10.496 The coefficients are expressed as the Relative Risk per 10 µg/m³ of the pollutant (RR10) and are 1.06 for PM$_{2.5}$ attributable mortality, 1.023 for NO$_2$ attributable mortality, 1.008 for PM$_{10}$ attributable respiratory and cardiovascular hospital admissions. These are the health outcomes for which Defra (Ricardo Energy & Environment, 2019) states there is strong evidence of an association.

12.10.497 The Relative Risk (RRc) for the population weighted concentration (c) is then derived as follows: $RRc = RR10 \left( \frac{c}{10} \right)$. The Attributable Fraction (AF) of the health outcome is derived from the Relative Risk as follows: $AF = (RRc - 1)/RRc$. The Attributable Fraction is then applied to the base data.

12.10.498 In the case of mortality, the base data are the non-accidental deaths for the population over 30 years of age, derived for each LPA and for the whole study area.

12.10.499 For hospital admissions, it has not been possible to obtain data for individual LPAs, so use has been made of the rate of hospital admissions per resident of England in 2017 derived from national admissions data from the NHS (NHS Digital, 2018)$^6$.

12.10.500 The results for the DCO Project are presented Table 12.14.

$^6$ NHS hospital episode statistics applied to the population of England and then applied to the future year population estimates. This is likely to present a conservative approach, as it is known that the rate in the London area is less than the national average.
### Table 12.14: Health outcomes attributable to the DCO Project in 2022, 2027, 2030 and 2035

<table>
<thead>
<tr>
<th>Health outcome</th>
<th>Change when comparing with and without the DCO Project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in 2022 (estimated increase)</td>
</tr>
<tr>
<td>Mortality(^a) attributable to air pollution</td>
<td>0.0001%</td>
</tr>
<tr>
<td>Respiratory hospital admissions(^b) attributable to PM(_{10})</td>
<td>0.00002%</td>
</tr>
<tr>
<td>Cardiovascular hospital admissions(^b) attributable to PM(_{10})</td>
<td>0.00002%</td>
</tr>
</tbody>
</table>

\(^a\) base is non-accidental mortality for people >30yrs of age  
\(^b\) base is total hospital admissions

**12.10.501** The mortality calculations have been carried out for both 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 COMEAP advice (COMEAP, 2018). COMEAP advises that the NO\(_2\) results based on single pollutant epidemiological models, will reflect exposure to NO\(_2\) and other pollutants, including PM\(_{2.5}\). It is for this reason that the NO\(_2\) and PM\(_{2.5}\) results are not treated as additive. The results are thus presented as mortality attributable to air pollution. They should not be ascribed to NO\(_2\) alone.

**12.10.502** There are very small percentage increases in both mortality and hospital admissions attributable to increased emissions associated with the DCO Project. These are mostly related to the increase in nitrogen oxides (NOx) emissions from the aircraft and other on-airport activities and not to the changes in traffic emissions. As concentrations of NO\(_2\) and PM decrease steadily with distance from the Airport, the changes in health outcome will be proportionally smaller further from the Airport.

**Step 2: Framing judgments on significance**

**12.10.503** The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.
Scientific literature

12.10.504 The scientific literature indicates that there is sufficient strength of evidence from sufficiently high-quality studies to support an association between changes in air quality due to the DCO Project and health outcomes. The literature indicates particular sensitivities for younger and older people. There is a strong body of evidence that negative health effects are associated with exposure to PM, with no recognised threshold, below which there are no effects. There is also a growing body of evidence that exposure to NO$_2$ is associated with negative effects, again with no recognised threshold. It is though difficult to disentangle the effects of PM and NO$_2$ in epidemiological studies, and it is not appropriate to treat the effects as additive when they are based on single pollutant risk coefficients.

12.10.505 The health outcomes related to urban air pollution include: mortality, cardiovascular and respiratory hospital admissions, lung cancer, diabetes, chronic heart disease, stroke, asthma and chronic bronchitis. The certainty is not the same for each outcome, nor for the role of each pollutant, PM and NO$_2$. For the PEIR, the calculation has focussed on mortality and hospital admissions, as these are the outcomes for which Defra reports a strong association (Ricardo Energy & Environment, 2019).

12.10.506 The quantification of the effects is generally based on long-term concentrations, expressed as annual means, although in some cases the annual mean is used as a surrogate for short-term exposure (in particular for 24-hour PM$_{10}$).

12.10.507 The quantification of the effects is useful for comparing the burden on the population from various estimates of incidence of disease and other risk factors (for example obesity, smoking, etc) to inform policy interventions. For the burden of air pollution, this is the effect on mortality (in a given year) of long term exposure of the current population to current levels of air pollution.

12.10.508 In interpreting figures on ‘attributable deaths’, Public Health England (2014) advise:

‘COMEAP stressed that a calculated figure of ‘attributable deaths’ does not represent the number of individuals whose length of life has been shortened by air pollution. Long-term exposure to air pollution is understood to be a contributory factor to deaths from respiratory and, particularly, cardiovascular disease, ie unlikely to be the sole cause of deaths of individuals. This means that it is likely that air pollution contributes a small amount to the deaths of a larger number of exposed individuals rather than being solely responsible for a number of deaths equivalent to the calculated figure of ‘attributable deaths’, although the distribution of the mortality effect within the population is unknown.’
Based on the literature reviewed, the strength of evidence is strong for a direct causal relationship between air quality and health outcomes. The evidence is strongest for cardiovascular and respiratory effects.

**Baseline conditions**

The baseline relates to resident population and age structure, reported wellbeing, including anxiety, happiness and satisfaction, smoking rates and cardiovascular indicators. In addition, people with certain respiratory conditions are particularly sensitive to changes in air quality, so the under 75 mortality rate from respiratory disease and prevalence rates for asthma and Chronic Obstructive Pulmonary Disease (COPD) (based on records for registered patients) are included as relevant baseline data.

The health baseline, as measured by routine LPA level indicators, may change in response to the DCO Project activities described above. The following are illustrative of health baseline indicators for the health baseline study area (closest to the source of change) that may be influenced over time (though it is unlikely that such cross-sectional measures could apportion and attribute a particular level of change to the DCO Project):

1. London Borough of Hillingdon: The under 75 mortality rate from respiratory disease is 28 per 100,000 population (30 per 100,000 population for London and 33 per 100,000 population for England); the estimated prevalence of people with asthma is 4.96%; and the estimated prevalence of people with Chronic Obstructive Pulmonary Disease (COPD) is 1.27%

2. Slough Borough: The under 75 mortality rate from respiratory disease is 39 per 100,000 population (27 per 100,000 population for the south-east); the estimated prevalence of people with asthma is 5.32%; and the estimated prevalence of people with COPD is 1.11%

3. London Borough of Hounslow: The under 75 mortality rate from respiratory disease is 36 per 100,000 population; the estimated prevalence of people with asthma is 4.5%; and the estimated prevalence of people with COPD is 1.05%

4. Spelthorne Borough: The under 75 mortality rate from respiratory disease is 26 per 100,000 population; in North West Surrey at the CCG level the estimated prevalence of people with asthma is 4.96%; and the estimated prevalence of people with COPD is 1.36%

5. South Bucks District: The under 75 mortality rate from respiratory disease is 23 per 100,000 population; in North West Surrey at the CCG level the estimated prevalence of people with asthma is 4.96%; and the estimated prevalence of people with COPD is 1.36%
6. The Royal Borough of Windsor and Maidenhead: The under 75 mortality rate from respiratory disease is 22 per 100,000 population; in East Berkshire at the CCG level the estimated prevalence of people with asthma is 5.32%; and the estimated prevalence of people with COPD is 1.11%.

7. London Borough of Ealing: The under 75 mortality rate from respiratory disease is 31 per 100,000 population; the estimated prevalence of people with asthma is 5.07%; and the estimated prevalence of people with COPD is 0.91%.

8. Runnymede Borough: The under 75 mortality rate from respiratory disease is 26 per 100,000 population; in North West Surrey at the CCG level the estimated prevalence of people with asthma is 4.96%; and the estimated prevalence of people with COPD is 1.36%.

9. London Borough of Richmond upon Thames: The under 75 mortality rate from respiratory disease is 22 per 100,000 population; the estimated prevalence of people with asthma is 4.33%; and the estimated prevalence of people with COPD is 1.03%.

12.10.512 A low degree of adaptation will be expected across the population, as changes in ambient air quality are not easily discernible or avoidable. All life stages are likely to be influenced by the change (including as dependants).

12.10.513 The changes in air quality may affect inequalities, as more deprived areas are often located closer to pollution sources, in particular to busy roads, where changes in concentrations will be greatest. In turn deprivation can lead to greater sensitivity to exposure.

Health priorities

12.10.514 LPA health priorities have been set that link with air quality as a determinant of health. The health priority themes summarised from the LPAs within the health baseline study area are as follows: respiratory disease is a major health issue; improving air quality is a key priority; active measures such reducing air pollution from road traffic; need for measures to mitigate the impacts of national development, such as the expansion of airports.

Consultation responses

12.10.515 At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

Standards / controls

12.10.516 Relevant regulatory standards to protect human health are expressed as concentrations that should not be exceeded. The legal basis for the UK air quality
objectives and EU limit values for both NO$_2$ and PM (PM$_{2.5}$ and PM$_{10}$) is set out in Chapter 7: Air quality and odour. These standards are informed by public health priorities and set on the basis of scientific knowledge, including the World Health Organization.

In recognition of the absence of any clear threshold for the effects of exposure to PM, an exposure-reduction approach has been applied to reduce exposure of the population as a whole. The EU has set targets for the reduction in urban background concentrations of PM$_{2.5}$ over a ten-year period (2010 to 2020). The target for the UK is a 15% reduction on average. This approach is not applicable to individual developments.

Policy context

The national policy context is that the Government supports the DCO Project, acknowledging that whilst it would generate air quality emissions, such emissions are capable of being mitigated so as to comply with legal requirements, in particular the EU limit values.

At the local level LPAs have a legal duty to identify the need for air quality management areas (AQMAs), and then put in place action plans (Aps) to help achieve the health-based air quality objectives. All of the LPAs in the study area have declared AQMAs and prepared Aps, most of which have been in place for many years.

The health policy themes summarised from the main adopted and emerging planning documents of LPAs within the health baseline study area are as follows: requirements for climate change mitigation and adaptation through a low carbon emission strategy; minimise emissions of local air quality pollutants, improving air quality and climate change mitigation through low carbon strategies; the need to mitigate Heathrow’s impact on air quality in certain areas.

There is an alignment between the intentions of both national and local policy to manage air quality emissions, recognising the potential for poor health outcomes. Such alignment of national and local policy drivers is likely to reduce negative effects on health associated with poor air quality.

Step 3: Categorising effects on human health

There is sufficient strength of evidence from sufficiently high-quality studies to establish a causal relationship between exposure to air pollutants and health outcomes, such as to warrant assessment. Furthermore, there is the potential for a very small change from the baseline position and a slight widening of inequalities. Whilst consultation continues, it is expected that air quality will emerge as a strong and consistent theme of consultation by both health stakeholders and the public.
In policy terms there is alignment between the intentions of both national and local policy to manage air quality emissions.

A number of measures will be progressed as part of the DCO Project to manage emissions. These cover design measures and procedures to reduce airside emissions, such as ensuring minimum taxiing and hold times through taxiway design, the use of fixed electrical ground-power units to avoid the use of Auxiliary Power Units when on stand, and use of low-emission boiler plant; and measures to reduce road traffic emissions, such as the targets set in the SAP, namely to increase the mode share for journeys to the Airport by public transport, cycling and walking to at least 50% by 2030 and 55% by 2040, and a 25% reduction of all staff car trips by 2030 and 50% by 2040, from a 2013 base, together with a phased reduction in Heathrow colleague parking spaces.

The general population effect over the geographic scope is minor negative (not significant) in all assessment years. The likely change in the health outcomes as a result of the DCO Project is considered to be a very small increase in the relative risk of mortality and hospital admissions, based on the changes in air pollution to which the population across the study area would be exposed. There is uncertainty around the duration of the effect as assessment beyond 2035 has not been possible at this stage.

The findings of Chapter 7: Air quality and odour predicts that the overall effect of the DCO Project on NO$_2$ and PM concentrations around the expanded Airport is likely to be not significant. Exceedances of the annual mean NO$_2$ Air Quality Objective and substantial adverse impacts at a small number of receptors are predicted during the Phase 1 (2022), however impacts will be negligible at the majority of receptors and no exceedances of the of the NO$_2$ annual mean Air Quality Objective are predicted in other assessment years (2027, 2030 and 2035). No exceedances of the relevant PM Air Quality Objectives are predicted and the majority of receptors will experience negligible impacts.

The vulnerable group effect (a judgement of the greatest expected effect due to characteristics that increase sensitivity) ranges between minor negative (not significant) and major negative (significant) depending on the timeframe and relevant vulnerable group characteristics. Although the scale of change is considered small and the number of people affected may also be small, this rating represents a precautionary conclusion and additional analysis will be undertaken to inform the ES.

The health effects are driven by changes in exposure and the cumulative effects of exposure are likely to increase over time. Therefore, the health effects start at the time of exposure and continue through the short, medium and long term. For air quality, the population of the study area has already experienced some exposure
to air pollutants (associated with the Airport or other sources) and therefore it is possible that short term exposure associated with the changes from the DCO Project would be additional to existing long term exposure. Therefore, there is commonality between ratings for short, medium and long term effects, as not applying this principle could ignore the existing exposure and cumulative nature of health effects.

12.10.528 Groups representing younger age (children and pregnant women and unborn children) are particularly sensitive, particularly in locations where prolonged exposure, rather than transitory exposure, would be likely.

12.10.529 People of older age and particularly those with existing respiratory or cardiovascular conditions are particularly sensitive. This group is likely to already have been exposed to poor air quality over the long-term and could already be experiencing poor health. Therefore, the health effects on older people are likely to be consistent through the short, medium and long term. Where existing health conditions relate to existing respiratory conditions such as asthma, it is likely to be peaks in air pollution that pose the greatest risk to health.

12.10.530 As the health effects considered here are based on the change resulting from the DCO Project it is reasonable to consider those populations closest to the source of that change (Airport and surface access infrastructure) and experiencing large changes in concentrations as a population that may be more sensitive to change in the health effects.

12.10.531 The focus for managing air quality is the embedded environmental measures set out in Chapter 7: Air quality and odour, Section 7.5.

**Transport: road safety**

**Introduction**

12.10.532 The increase in ATMs and passengers is expected to result in a change in the total distance travelled by road (typically measured in ‘vehicle kilometres’, or vehicle km). Because road traffic incidents are (at least in part) a function of exposure to traffic, a change in vehicle kilometres may result in a change in the number road traffic incidents, although other factors such as vehicle speeds and changes to physical road layouts may also influence the number and severity of incidents.

12.10.533 The Department for Transport publishes statistical data about the location and severity of road traffic incidents each year. An incident rate can be calculated for an individual road or for all roads in an area by correlating vehicle kilometres data to the number of road traffic incidents resulting in deaths and serious injury to road
users, including pedestrians (referred to as Killed or Seriously Injured or KSI incidents).

12.10.534 A plausible source-pathway-receptor linkage has therefore been established between vehicle kilometres travelled and road traffic incident rates resulting in a potential for a change in health outcomes:

1. Source: the estimated change in vehicle kilometres travelled due to the DCO Project
2. Pathway: potential for change in the risk of road traffic incidents that result in serious injury or death
3. Receptors: road users including pedestrians within the study area.

12.10.535 The potential effect is both plausible and probably and is therefore considered to be likely.

12.10.536 This assessment reflects results reported in the PTIR published as part of the Airport Expansion Consultation (June 2019). The PTIR details the methodology for calculating the potential changes in the number of KSI incidents and presents forecasts of the potential number of KSI incidents in the future baseline and DCO Project scenarios in 2022 and 2035.

12.10.537 Chapter 19: Transport network users also provides details on collision clusters, defined as areas where nine or more collisions have occurred within a 30m radius (findings are reported in the chapter as significant adverse effects on accidents and safety for particular sections of road). This assessment is not directly adopted by this assessment since those accidents are included within the KSI data taken from the PTIR.

**Project activities and temporal scope**

12.10.538 The DCO Project activities that drive the potential health effects are during Phase 1 (2022) where the commencement of construction activity (including construction vehicles) and early release of ATMs will change the journeys to the Airport; and 3 (2035 – year of minimum ANPS capacity) when ATMs and passengers accessing the Airport will continue to increase, with highway modelling used to estimate the likely number of incidents resulting in death or seriously injury across the modelled road network. The nature of the health effects (death or serious injury) means that a single incident has the potential to influence health across short, medium and long term timescales (this is assumed to be the case in this assessment).

12.10.539 Generally, where new sections of motorway (including the cut and cover M25 tunnels) or roads and associated infrastructure, including roundabouts, are constructed, this will involve maintaining the existing road system until the new replacement roads are complete in order to maintain traffic connectivity. At which
point the original road or roundabout will be demolished. A key exception is Junction 14a which will be redeveloped in phases to maintain traffic flow to Terminal 5 and Sofitel.

**Geographic scope (study area)**

12.10.540 The study area for this assessment is the same as adopted by the PTIR, which includes the LPAs within 16km (10 miles) of the Airport. However, forecasts of vehicle kilometres can only be produced for LPAs that also fall within the ‘fully modelled area’ of the highway assignment model (HHASAM), which represents the area over which the DCO Project is expected to have influence on the road network. As a result, the London Borough of Wandsworth, the London Borough of Merton and the Royal Borough of Kensington & Chelsea are excluded from the analysis.

12.10.541 The LPAs within the study area have been spilt into four quadrants and are: (North east quadrant) London Borough of Hillingdon, London Borough of Ealing, London Borough of Harrow, London Borough of Brent; (South east quadrant) London Borough of Hounslow, London Borough of Richmond-upon-Thames, Royal Borough of Kingston-upon-Thames, London Borough of Hammersmith & Fulham; (South west quadrant) Surrey Heath Borough, Runnymede Borough, Spelthorne Borough, Elmbridge Borough; (North west quadrant) Bracknell Forest Borough, Slough Borough, Royal Borough of Windsor & Maidenhead, South Bucks District.

**Receptors (population scope)**

12.10.542 Population groups potentially affected (by their proximity or use of the road network) may include road users and pedestrians. Road users and pedestrians will include; residents; visitors to the area (as commuters on the road network); Airport passengers and visitors (commuting to the Airport); Heathrow colleagues (commuting to the Airport); the construction workforce (commuting to work); and road users for other reasons (including non-motorised users (NMUs), particularly as pedestrians and cyclists).

12.10.543 General population receptor: The population of the study area defined in the geographic scope.

12.10.544 Vulnerable group receptor: Relevant characteristics of the study area population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. The population adjacent to the local road network serving Heathrow (local effects relating to construction and surface access road safety)

2. Children and young people (including as passengers and NMUs)
3. Older people (particularly frail elderly including as passengers and NMUs)
4. People (and their carers) with existing poor health (physical and mental health), including where this is due to disabilities.

**Step 1: Describing the potential effects on health**

12.10.545 The potential health effect considered in this chapter relates to potential change in vehicle kilometres travelled and the statistical relationship to number of road traffic incidents resulting in serious injuries and death. The potential for mental health-related post-traumatic stress is noted but not explicitly assessed due to lack of evidence demonstrating quantifiable causal relationship.

12.10.546 The assessment is based on modelling that relies on well-established causal relationships defined through analysis of road use and road traffic incidents.

12.10.547 To assess road traffic incidents, the study area has been divided into 1km by 1km grid squares. Personal injury collision (PIC) data obtained from the DfT for a three-year period between 2015 and 2017 have been used to calculate the KSI rate for each grid square, which is expressed as the number of KSI incidents per billion vehicle kilometres.

12.10.548 The total annual vehicle kilometres travelled within each grid square has been calculated by extracting link lengths (in kilometres) and the Annual Average Daily Traffic (AADT) flows for all of the links in each grid square from the HHASAM v2.0 highway assignment model (for additional details on the HHASAM v2.0 highway assignment model refer to the PTIR).

12.10.549 The calculation can be summarised as follows: Annual vehicle kms = Link length (km) x AADT (vehicles) x 365 days.

12.10.550 These values have been summed for all links within each grid square to give an overall annual vehicle kilometre figure for that grid square.

12.10.551 The number of KSIs per billion vehicle kilometres in the baseline has then been calculated by multiplying the average number of KSIs in each grid square over a three-year period (2015-2017) by one billion and then dividing the resultant figure by the annual vehicle kilometres in that grid square: KSI rate = Average number of KSIs x 1,000,000,000 / Annual Vehicle kms.

12.10.552 In order to estimate the number of KSIs in each grid square for the future baseline and DCO Project scenarios in 2022 and 2035, the KSI rate for the 2015-2017 baseline has been applied to the forecast annual vehicle kilometres derived from the HHASAM v2.0 highway assignment model for those scenarios.
Step 2: Framing judgments on significance

The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.

Scientific literature

The scientific literature indicates that there is sufficient evidence to support an association between changes in road traffic (measured as vehicle kilometres travelled) due to the DCO Project and health and wellbeing outcomes. Key findings are that there is good evidence that changes in road traffic affects health, particularly road traffic incident related injuries. The literature indicates the importance of road travel to society, as well as the need for spatial planning to reduce actual and perceived road related hazards.

The evidence for road safety affecting mental health and wellbeing is more limited and mental health and wellbeing effects are not directly assessed in this section.

Based on the literature reviewed, the strength of evidence is strong for a direct causal relationship between road safety and health outcomes. The evidence is strongest for road accident related injury.

Baseline conditions

The baseline relates to: age structure; average distance travelled to work; and the rate of people reported killed or seriously injured (KSI) on the roads.

Baseline KSI data for the study area is summarised in Table 12.15 based on publicly available DfT road safety data for the period 2015-2017 (Department for Transport, 2018b).

Table 12.15: Baseline average annual KSIs

<table>
<thead>
<tr>
<th>Area</th>
<th>LPA</th>
<th>Baseline annual KSIs (average for 2015-2017)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North-east of the Airport</td>
<td>London Borough of Hillingdon</td>
<td>73.3</td>
</tr>
<tr>
<td></td>
<td>London Borough of Ealing</td>
<td>100.7</td>
</tr>
<tr>
<td></td>
<td>London Borough of Harrow</td>
<td>55.3</td>
</tr>
<tr>
<td></td>
<td>London Borough of Brent</td>
<td>90.0</td>
</tr>
<tr>
<td>South-east of the Airport</td>
<td>London Borough of Hounslow</td>
<td>88.3</td>
</tr>
<tr>
<td></td>
<td>London Borough of Richmond-upon-Thames</td>
<td>47.0</td>
</tr>
<tr>
<td></td>
<td>Royal Borough of Kingston-upon-Thames</td>
<td>38.3</td>
</tr>
<tr>
<td></td>
<td>London Borough of Hammersmith &amp; Fulham</td>
<td>67.7</td>
</tr>
</tbody>
</table>
The existing health status of the population in the study area can be characterised as good-average levels of self-reported health. All life stages are likely to be influenced by the change (including as dependants). Given embedded environmental measures will provide road diversions where appropriate, the population will have good access to alternatives at all times, requiring relatively little adaptive behaviour on their part.

The PTIR has quantified the number of people killed or seriously injured for the future baseline and DCO Project scenarios in 2022 and 2035.

Table 12.16: Baseline and forecast annual KSIs in 2022 for future baseline and DCO Project Scenarios
### Table 12.17: Baseline and forecast annual KSIs in 2035 for future baseline and DCO Project Scenarios

<table>
<thead>
<tr>
<th>Area</th>
<th>LPA</th>
<th>KSIs 2015-2017 baseline</th>
<th>KSIs 2035 future baseline</th>
<th>KSIs 2035 with DCO Project</th>
<th>Change in KSI (and % change)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>South-west of the Airport</strong></td>
<td>Royal Borough of Kingston-upon-Thames</td>
<td>38.3</td>
<td>40.0</td>
<td>40.0</td>
<td>0 (+0.1%)</td>
</tr>
<tr>
<td></td>
<td>London Borough of Hammersmith &amp; Fulham</td>
<td>67.7</td>
<td>67.3</td>
<td>67.5</td>
<td>+0.1 (+0.2%)</td>
</tr>
<tr>
<td></td>
<td>Surrey Heath Borough</td>
<td>35.0</td>
<td>36.5</td>
<td>36.5</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>Runnymede Borough</td>
<td>49.3</td>
<td>52.5</td>
<td>52.4</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>Spelthorne Borough</td>
<td>35.3</td>
<td>36.9</td>
<td>36.9</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>Elmbridge Borough</td>
<td>59.3</td>
<td>62.1</td>
<td>62.1</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td><strong>North-west of the Airport</strong></td>
<td>Bracknell Forest Borough</td>
<td>30.3</td>
<td>32.5</td>
<td>32.5</td>
<td>0 (-0.1%)</td>
</tr>
<tr>
<td></td>
<td>Slough Borough</td>
<td>38.0</td>
<td>40.9</td>
<td>41.0</td>
<td>+0.1 (+0.3%)</td>
</tr>
<tr>
<td></td>
<td>Royal Borough of Windsor &amp; Maidenhead</td>
<td>53.7</td>
<td>57.2</td>
<td>57.2</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>South Bucks District</td>
<td>45.0</td>
<td>47.6</td>
<td>47.7</td>
<td>0 (-0.1%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area</th>
<th>LPA</th>
<th>KSIs 2015-2017 baseline</th>
<th>KSIs 2035 future baseline</th>
<th>KSIs 2035 with DCO Project</th>
<th>Change in KSI (and % change)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>North-east of the Airport</strong></td>
<td>London Borough of Hillingdon</td>
<td>73.3</td>
<td>87.2</td>
<td>85.4</td>
<td>-1.8 (-2.0%)</td>
</tr>
<tr>
<td></td>
<td>London Borough of Ealing</td>
<td>100.7</td>
<td>115.2</td>
<td>115.8</td>
<td>+0.7 (+0.6%)</td>
</tr>
<tr>
<td></td>
<td>London Borough of Harrow</td>
<td>55.3</td>
<td>63.3</td>
<td>63.9</td>
<td>+0.5 (+0.9%)</td>
</tr>
<tr>
<td></td>
<td>London Borough of Brent</td>
<td>90.0</td>
<td>104.7</td>
<td>105.6</td>
<td>+0.9 (+0.9%)</td>
</tr>
</tbody>
</table>
The analysis indicates that there is forecast to be limited change in the number of KSIs between the future baseline and DCO Project scenarios in both 2022 and 2035, with a maximum likely increase of one KSI incident in any LPA in 2035 as a result of the DCO Project.

**Health priorities**

LPA health priorities have been set that link with road safety as a determinant of health. The health priority themes summarised from the LPAs within the geographic scope are as follows: reduce disorder on public transport; invest in transport infrastructure; encourage children and young people to walk and cycle safely and engaging with young drivers about safety; investigate patterns of...
accident occurrence in children; and ensure the plans to reduce injuries on roads are evaluated for impact; work in partnership to reduce congestion, enhance road safety and encourage more sustainable forms of travel; work with highways and other partners to examine the road safety needs and records so that actions can be taken.

Consultation responses
12.10.563 At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

Standards / controls
12.10.564 No relevant regulatory standards have been identified.

Policy context
12.10.565 The national policy context is that the Government supports the DCO Project, acknowledging that transport infrastructure changes would be required to facilitate it, and directing that road safety improvements should be included where it is proportionate to do so.

12.10.566 The health policy themes summarised from the main adopted and emerging planning documents of LPAs within the geographic scope are as follows: promote sustainable forms of transport; require development to consider road accident casualties in highway improvements; improve surface access provision to and from Heathrow in the form of public transport and cycling, and make more efficient use of the road network; promote The Safer Routes to School scheme; make provision for a network of green ways to encouraging walking and cycling; and support development proposals which maintain or enhance the efficient and safe operation of the highway network.

12.10.567 There is an alignment between the intentions of both national and local policy to improve road safety. Such alignment of national and local policy drivers is likely to enhance positive effects linked to road safety, including safe active travel.

Step 3: Categorising effects on human health
12.10.568 There is evidence to establish an association between increase in road traffic and road traffic incidents resulting in serious injury and fatalities. The modelling of road traffic incidents indicates that in both 2022 and 2035 there is likely to be a small increase in the number of KSI incidents due to the projections of traffic movements in the vicinity of the expanded Airport, with an indirect small contribution to recognised health priorities.
Whist consultation continues, it is expected that road safety will be a relatively minor theme of consultation by both health stakeholders and the public. In policy terms the mitigated effect aligns with published national and local government policy expectations.

Within the study area the sensitivity of the general population to any change is likely to be low, reflecting high level of road safety and low accident rates in the baseline. For vulnerable groups, such as older people, young people and children sensitivity is likely to be higher (either as a consequence of their likelihood to be involved in an incident within a vehicle, for example young people, or their vulnerability outside of a vehicle, for example children).

The general population effect across the study area is considered to be minor negative (not significant) in the short, medium and long term, assessed from the 2035 assessment year where the effects are greatest. Effects assessed at 2022 are rated as negligible (not significant) in the short, medium and long term.

The vulnerable group effect (a judgement of the greatest population level effect due to relevant characteristics or combinations of characteristics that increase sensitivity) for the 2035 assessment year ranges between minor negative (not significant) and moderate negative (not significant) depending on the relevant vulnerable group characteristics. For the 2022 assessment year, the range is negligible (not significant) to minor negative (not significant).

Due to the nature of the health effect, the consequences of being involved in a road traffic incident depend on the nature of the injury sustained and therefore distinguishing between short, medium and long term effects with any certainty is not possible; in addition, incidents could be fatal and serious injuries have consequences across all these timescales.

While the modelling of KSI rates does not distinguish between population types the evidence indicates that any change in KSI is likely to be proportionately more significant for the following vulnerable groups than for the general population.

Children are at risk due to their limited physical and cognitive development. Their height means it can be difficult for children to see or be seen. If they are involved in road traffic incidents, their softer heads make them more susceptible to serious head injury. Younger drivers are more prone to risk taking behaviour in their driving and therefore are a risk group (for individuals this risk would decrease over time as experience of driving increases, but for a population group it remains).

Older people may be more fragile and, if involved in an accident, the consequences could be more severe. In addition, as drivers, some of the changes that come with aging can affect driving ability, such as reaction times and clarity of
vision. Disabled people are more likely to be injured in road traffic accidents as a pedestrian than non-disabled people.

12.10.577 The new infrastructure required for the DCO Project and the concentration of traffic flows all occur immediately adjacent to the Airport boundary, mostly to the north. Changes in road layouts can lead to a lack of familiarity in the short term but this would reduce over time.

**Electromagnetic field effects**

12.10.578 The development activity undertaken as part of the DCO Project will require the siting of new, replacement or repositioned electrical infrastructure, including cables, power lines and substations. This activity has the potential to change the electrical and magnetic field (EMF) exposures to the general public, workforce and users of the Airport.

12.10.579 Expansion of the existing electrical network would be required both to meet the future electrical demand of the DCO Project and to increase the resilience of the 33kV energy distribution network. There is a predicted increase in the electrical energy demand for Heathrow from 75 Mega Volt Amps (MVA) (current estimate 2016) to approximately 142MVA by the year 2050.

12.10.580 Electrical power would be provided for the construction works by means of a dedicated supply from the existing power network with a new temporary distribution network serving the whole of the construction site. Extensive sub-metering would be installed to monitor construction electricity usage. The temporary electrical systems would be decommissioned as the construction area is cleared.

12.10.581 The diversion of the M25 would require the early diversion of the SSE overhead line equipment and substation (before grant of DCO consent) and the clearance of several facilities and infrastructure.

12.10.582 Chapter 6: DCO Project description (Table 6.6) describes the utilities works that form part of the DCO Project, including in relation to power lines.

12.10.583 A plausible source-pathway-receptor linkage has been established between changes in electrical infrastructure and consequent changes in the EMF fields, which with high and prolonged exposure could affect health outcomes:

1. Source: EMF arising from changes in electrical infrastructure due to the DCO Project, including cables, power lines and substations

2. Pathways: physiological responses to EMF and public understanding of EMF risk causing concern or uncertainty
3. Receptors: people in close proximity to the electrical infrastructure for extended periods.

12.10.584 Although a plausible source-pathway-receptor linkage has been established between the expansion of the Airport and EMF affecting health outcomes, the conditions required for the source-pathway-receptor linkage are highly improbable due to the development of the DCO Project design’s compliance with national and international guidance. The potential effect is therefore considered unlikely (for instance it is plausible but not probable) and hence there are unlikely to be significant effects on health as a result of exposure to electromagnetic fields in any DCO Project phase.

12.10.585 The scientific literature on EMF indicates that the potential for likely significant health effects is restricted to conditions of high and prolonged exposure to EMF. The literature also indicates that field strengths decrease rapidly with distance from the infrastructure, meaning that only relatively small separation distances (often a matter of meters) are required to achieve background EMF levels.

12.10.586 There are two considerations to be made when assessing EMF, the electrical element and the magnetic element, both of which form fields with different characteristics. Typically, these fields are discussed collectively as EMF.

12.10.587 EMF occur naturally within our bodies and in the surrounding environment. The earth generates its own magnetic fields and the atmosphere contains natural electrical fields. Within our homes, all mains appliances produce EMFs. The strength of a magnetic field decreases dramatically with increasing distance from the source. For example, a TV or microwave may produce a magnetic field of 50 µT close to the appliance, which drops to around 0.2 µT when one metre away.

12.10.588 In most cases modern electrical infrastructure in the UK uses alternating current (AC). Within the UK, the frequency of mains electricity is 50 hertz (Hz). AC fields are described as Extremely Low Frequency (ELF). There is weak evidence that ELF may be associated with increased susceptibility to cancer. The results relate to North American studies of residential populations, with contradictory results from European studies (Zhang et al., 2016). For this reason, PHE adopts a precautionary approach, requesting appropriate consideration of potential EMF exposures. Within the UK, the Government has set guidelines (Department of Energy and Climate Change, 2012) for exposure to EMF based on advice from PHE. These guidelines include permitted levels of exposure, as well as reference levels for exposure where reference levels of EMF are exceeded. Typically, potential EMF concerns relate to long-term exposures, for example, living close to electrical infrastructure.

12.10.589 In relation to short-term EMF exposures, such as walking past a transformer or telecommunications mast, the literature indicates there is no causal relationship
between short-term exposure to EMF and subjective well-being in members of the public whether or not they report perceived sensitivity to EMF (Eltiti et al., 2015).

12.10.590 In an appendix to the Scoping Opinion provided by PINS, the PHE response provides a standard information resource to support planning proposals involving electrical installations such as substations and connecting underground cables or overhead lines. Heathrow has taken this information into consideration. For example, in relation to substations, the precautionary findings of the UK Stakeholder Advisory Group on Extremely Low Frequency Electric and Magnetic Fields (SAGE) are noted (Stakeholder Advisory Group on ELF EMFs, 2010). SAGE was initiated by National Grid and was adopted by the Department of Health in order to provide advice to the Government. SAGE notes that for ground-mounted final distribution substations, background electromagnetic field levels are achieved within two to five meters.

12.10.591 Heathrow confirms that proposed new electrical infrastructure for the DCO Project will comply with Government policy and with UK exposure guidelines. The resultant electric and magnetic fields generated will be within the accepted UK guidelines on exposure levels. This will include having due regard to the placement of electrical infrastructure in relation to community, Airport and occupational settings, for example, the proximity between sub-stations and dwellings, offices or waiting areas; or changes in field strength where buried powerlines intersect one another.

12.10.592 The DCO Project’s final design for all major electrical infrastructure (including new, replacement or repositioned infrastructure) will, in order to appropriately limit exposure to the general public, have regard to the EMF exposure guidelines published by the International Commission on Non-ionizing Radiation Protection (2013). To this end, Heathrow will have regard to the UK Government’s voluntary code of practice (Department of Energy and Climate Change, 2012) for complying with the International Commission on Non-ionizing Radiation Protection guidelines.

12.10.593 Where the relocation of electrical infrastructure (for example, power lines) will occur outside of the DCO, as part of works by National Grid, it will be the responsibility of National Grid to ensure that appropriate embedded control measures and compliance with recommended exposure limits.

12.10.594 As the potential effect is unlikely, it is not capable of being a likely significant effect and therefore health effects are rated as negligible (not significant) for all phases of the DCO Project. This issue is not assessed further. A watching brief will be maintained on this issue and, if appropriate, any update will be reported in the ES.
Access to services and healthcare: change in demand for local healthcare

Introduction

12.10.595 To continue to meet the health needs of residents, Heathrow colleagues and Airport passengers, healthcare services need to be proportionate to the demand. As a result of Airport expansion, the expectation is that the majority of increases in demand will be for unscheduled healthcare appointments.

12.10.596 A plausible source-pathway-receptor linkage has been established between capacity of public health services due to the DCO Project and a change in health outcomes:

1. Source: increased demand on local public health services and social care services due to the DCO Project
2. Pathway: unplanned use of primary and secondary care, ambulance services affects and social care
3. Receptors: residents; passengers; visitors to the Airport; construction workers; Heathrow colleagues; and patients and clients, and the staff, of healthcare and social services.

12.10.597 The potential effect is both plausible and probable and is therefore considered to be likely.

12.10.598 This issue informs and has been informed by Chapter 18: Socio-economics and employment. The socio-economics and employment assessment identifies the expected change in numbers of passengers, construction workers and Heathrow colleagues. The Health chapter focuses on qualitative discussion of the health consequences of additional demand for NHS services.

Project activities and temporal scope

12.10.599 Issues relating to public health service viability associated with residential relocations and changes in access are discussed in the section of this chapter on Access to services and healthcare: change in access to public services.

12.10.600 The activities that drive the potential effect on demand for local healthcare from increased passengers, construction workers and Heathrow colleagues are:

1. Pre-Phase 1: the DCO, and its determination, will affect planning decisions around demand, capacity and resourcing of estates, services, staff and training. This includes planning to accommodate the healthcare needs of the construction workforce, with may include interfaces with private occupational and healthcare provision provided by Heathrow

2. During Phase 1 (c. 2022 - 2026)
a. The construction workforce will peak during this phase. The assumed number of non-home based workers is 2,700. There will be a comprehensive occupational health service provided on site. Some construction workers are likely to use NHS primary and secondary care services.

b. The growth in passenger numbers (an additional 25,000 ATMs in Phase 1 increasing Heathrow’s capacity from 78 MPPA to 95 MPPA) will increase the demand for unscheduled NHS usage by passengers.

c. The growth in the number of Heathrow colleagues (5,200 gross direct job increase by 2025) may contribute to an increase in demand for existing services if Heathrow colleagues are taken ill whilst at work and require care.

3. Phase 2 (c. late 2026 – 2033) and Phase 3 (c. 2034 - 2050): the further increase up to a capacity of at least 740,000 ATMs and 130 MPPA in 2035 (and 756,000 ATMs and 142 MPPA in 2050) in response to the North West Runway opening will continue to incrementally affect NHS demand by passengers and Heathrow colleagues (16,200 gross direct job increase by 2035). Non home based members of the construction workforce will be present during these phases, though at lower numbers (400 in 2035 and <400 by 2050).

12.10.601 The advance notice of potential increased demand will enable service planning to be proactive. Health effects will be expected from Phase 1, with the overlap of construction and operational influences. Construction workforce demand will be mitigated (embedded mitigation summarised in paragraphs 12.10.603 to 12.10.605). The greatest effects would be expected during Phase 2 and Phase 3.

12.10.602 Healthcare service planning pre-Phase 1, whilst not an effect of the DCO Project commencing, may influence the health effects associated with subsequent Phases and so is taken into account as part of that assessment and development of environmental measures.

12.10.603 During Phases 1, 2 and 3 the health effects prior to the 2035 assessment year (for instance 2022 to 2035) have been, and will continue to be, considered in terms of the assessment and the development of environmental measures. Prior to the assessment year healthcare service changes will start to affect health outcomes. This refers to the build-up and then decline in the number of non home based construction workers and the build-up Airport passengers, visitors to the Airport and Heathrow colleagues. For that time period the effects are considered not significant. They do influence the health effects associated with the 2035 assessment year and so are taken into account as part of that assessment (including service planning leading up to that point).
12.10.604 The DCO Project activity assessment year to which the greatest potential health effects are anticipated to relate is 2035. This is the assessment year from which significance rankings are made for short, medium and long term health effects. This reflects the fact that appropriate occupational health services will be available for the construction workforce and Heathrow colleagues so changes in demand for local healthcare would mostly be driven by the increase in Airport passengers and visitors. 2035 is considered an appropriate assessment point as it represents the year in which there is the greatest potential for additional demand on local healthcare services.

12.10.605 In categorising EIA significance for health, the embedded measures set out in Section 12.5 of this chapter have been taken into account. This includes the provision of occupational health services associated within the construction site and review of any residual health care requirements from non home based workers.

Geographic scope

12.10.606 Effects focus around the closest healthcare facilities to the Airport, reflecting the expected extent of influence on services such as Accident and Emergency, GP surgeries, pharmacies and dentists.

12.10.607 The study area for this issue is defined by the LPA of the London Borough of Hillingdon.

Receptors (population scope)

12.10.608 General population receptor: The population of the study area defined in the geographic scope.

12.10.609 Vulnerable group receptor: Relevant characteristics of the study area population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. Children and young people (including pregnant women and unborn children)
2. Older people (particularly frail elderly)
3. People (and their carers) with existing poor health (physical and mental health), including where this is due to disabilities
4. People living in areas known to exhibit high deprivation or poor economic and/or health indicators
5. People who may experiencing social isolation, discrimination or social disadvantage (including relevant protected characteristics, for example where
health effects may be greater due to ethnicity, noting the local baseline context of a high proportion of BAME groups)

6. People experiencing barriers in access to services, amenities and facilities (including barriers experienced by service providers).

Step 1: Describing the potential effects on health

12.10.610 The growth in passenger numbers will increase unscheduled NHS attendance and demands on social care. The growth will be stepped, in line with the increases in the ATMs, and it will be within the scope of normal service planning. However, the effect is best categorised as direct and negative given the potential for increasing the demand on services.

12.10.611 Physical and mental health and wellbeing outcomes may be affected.

12.10.612 The majority of the demand for public health care will be emergency, for instance demand for emergency vehicles, attendance at the Urgent Care Centre, at A&E or admission to a psychiatric ward. UASCs will require medical screening. The demand for social services will be in the short-term when people present to the London Borough of Hillingdon and over the longer-term as their care is arranged.

12.10.613 This will place additional demand on local services and will have a continuous effect on the local population. NHS budgets are set using allocation formulae that may not capture the increased demand due to the DCO Project within routine service planning. For example, in primary care the formula accounts for resident patients but does not take into account people who are not registered with the GP practice (NHS England, 2016). Costs for Airport passengers (or construction workers/Heathrow colleagues) from overseas are not recoverable when treatment, in A&E or primary care, is immediately necessary or urgent (NHS Improvement and NHS England, 2018). The influence on health outcomes is harder to specify but will likely include those that are permanent, progressive or irreversible, as well as those that are non-permanent, reversible, non-progressive.

Step 2: Framing judgments on significance

12.10.614 The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.

Scientific literature

12.10.615 The scientific literature indicates an association between changes in health and wellbeing outcomes and the changes in demand for healthcare that will arise due to the DCO Project. Some population groups, such as unaccompanied asylum seeking children, will have complex needs.
12.10.616 Service planning to ensure a sufficient supply of appropriately trained staff is an important factor.

12.10.617 The type of outcomes include mental health and wellbeing for service users and staff; ambulance response times; hospitalization rates; medication adherence; and treatment outcomes (including due to changes in waiting times).

12.10.618 Based on the literature reviewed, the strength of evidence is weak for a direct causal relationship between local healthcare service demand and increased Airport capacity. However, independently there is moderate strength evidence for travel related illness, occupational risk factors in the aviation industry and for healthcare capacity challenges. Together these provide a general association of sufficient strength to warrant assessment and embedded measures to ensure appropriate provision for the healthcare needs of passengers and Heathrow colleagues whilst at the Airport.

Baseline conditions

12.10.619 The baseline relates to the availability of health and social care professionals and quality indicators of NHS services such as how easy it is to make a GP appointment. In the London Borough of Hillingdon 68% of the population report having a good experience when making a GP appointment (73% for England); and 95% successfully obtained an NHS dental appointment (95% for England).

12.10.620 Approximately 50% of the 6,500 colleagues employed by Heathrow Airport Limited live in the boroughs of Hillingdon, Ealing, Hounslow, Slough and Spelthorne. There is currently no available data on the proportion of all Heathrow colleagues (72,700) that live in these boroughs. The facilities and services on-Airport are summarised within this section.

12.10.621 Heathrow Airport has a partnership agreement with London Ambulance Service (LAS) to ensure that any person that needs medical support at the Airport receives appropriate emergency care. The service includes four Heathrow Cycle Response Unit (CRU); one Fast Response Unit; and one ambulance for treating and conveying patients to the NHS. The majority of patients that are conveyed are taken to the Hillingdon Hospital.

12.10.622 Primary care: access to an NHS GP service is not available within the Airport. Heathrow colleagues can enrol in an online GP service via their mobile phones; this is linked to their current GP service and provides advice and prescription services. This process is intended to reduce pressure on NHS GPs and to ensure that Heathrow colleagues can get timely access to advice. There is no NHS GP service located at the Airport.

12.10.623 Pharmacy: advice and prescription services are available at Boots, Terminal 5 and Terminal 3.
Dentistry: service not available.

Social care: Heathrow Travel Care is the Airport crisis social work team providing services to Heathrow colleagues and passengers. This includes emergency response; social work advice to the Foreign and Commonwealth Office (FCO); help for rough sleepers; and, where unaccompanied children are involved, fulfilling the role of responsible adult. The Heathrow chaplaincy also provides support to Heathrow colleagues and passengers. These include faith-specific activities; assistance to staff, to passengers and other Airport visitors; and emergency response training. The Heathrow chaplaincy plays a role in suicide prevention and in assisting people involved in human trafficking. The chaplaincy works closely with Travelcare. The Heathrow Police assist homeless people who arrive at the Airport and also liaise with Travelcare.

Occupational health: All employers at the Airport are required to provide services to their employees. Heathrow provides an occupational health programme including on-site physiotherapists, a physiologist to promote healthy lifestyle choices, an Employee Assistance Programme that offers counselling, legal and financial support and trauma incident management that is available to all colleagues following exposure to a trauma at work.

Port Health: this is addressed in the Access to services and healthcare: Communicable diseases section of this chapter.

The facilities and services off Airport for people working at the Airport, for passengers and for visitors to the Airport are summarised below.

Primary care facilities: NHS GP facilities close to, or in, the Heathrow Villages ward:

1. Glendale Medical Centre, Harlington
2. Heathrow Medical Centre, Harlington
3. Shakespeare Health Centre, Hayes

The closest NHS A&E department (with 24hr A&E and maternity services) is Hillingdon Hospital, Uxbridge. Other A&E departments are: Wrexham Park Hospital, Slough; West Middlesex University Hospital, Isleworth; St Peter’s Hospital, Chertsey; and Kingston Hospital, Kingston Upon Thames. Hillingdon Hospital received a Care Quality Commission (CQC) rating of ‘inadequate’ in July

\[ \text{\footnotesize \textsuperscript{7} A planning application has been submitted for new premises at 401 Uxbridge Road, Hayes.} \]
An Urgent Care Centre is located at Hillingdon Hospital. Other services are at: Ashford Hospital, Ashford (a nurse-led walk-in centre); Ealing Urgent Care Centre at Ealing Hospital, Southall; West Middlesex University Hospital, Isleworth; and Chapel Medical Centre at Upton Hospital, Slough.

Dental provision: The closest NHS dentists are: the Village Dental Practice, Hayes; and Claradent Dental Care, Cranford.

Pharmacies: The London Borough of Hillingdon states that, across the borough, access to pharmacy services is ‘very good’ with 99.7% of households in Hillingdon being within a five-minute drive of a pharmacy (London Borough of Hillingdon, 2018). The pharmacies closest to the Heathrow Villages are: The Village Pharmacy, Harlington; and Orchards Pharmacy, West Drayton.

London Borough of Hillingdon states that pharmacies are evenly geographically distributed across Hillingdon. There are at least 21 per locality and the number of pharmacies per 100,000 of the population in Hillingdon is similar to that of England and London (London Borough of Hillingdon, 2018). The distance between pharmacies in Heathrow Villages ward is greater than in other wards. The pharmacies that are in the terminals at the Airport are before and after security but are not considered accessible for residents of Heathrow Villages.

Social care: Social services at London Borough of Hillingdon deal with people from the Airport in mental health crisis; with adult asylum seekers and with family reunification. Liaison with, and the transfer of people to, different boroughs has time and resource implications for London Borough of Hillingdon.

Unaccompanied children are the statutory responsibility of the LPA at which they first present on entry to the UK. An unaccompanied child is entitled to the same LPA support as any other looked after child (Department for Education and Home Office, 2017). When unaccompanied children arrive on inbound flights London Borough of Hillingdon has a duty to assess such children and to make them looked after (London Borough of Hillingdon, 2019). In London Borough of Hillingdon, 70 children were looked after who were unaccompanied asylum-seeking children (UASC) in 2018. This represents about 24% of the children in care in London Borough of Hillingdon (15% for London as a whole and 8.5% for the south-east as a whole).

Health priorities

LPA and CCG health priorities cover access to public services as a determinant of health. The health priority themes summarised from the LPAs within the geographic scope are as follows: a focus on preventative services; providing
community services; improved integration of services across health and social care; addressing the effects of high population turnover; improving access to education, jobs, leisure, health, and housing; and addressing the needs of vulnerable groups including disabled children, people with long term conditions, older people and carers.


12.10.639 NHS Hillingdon CCG (2017) seeks to develop primary care hubs across the borough with one hub being located in Hayes and Harlington. The strategic intention is to use existing estate and to target new investment to meet the predicted demand for Out of Hours services and to improve access to high quality care in high quality facilities. NHS Hillingdon CCG states that the population of Harlington is expected to increase over the next 10 years. Capacity in Harlington for primary care, for access to primary care and for reduced health inequalities, is a local focus (NHS Hillingdon CCG, 2017).

12.10.640 NHS Hillingdon CCG and the London Borough of Hillingdon (2018) note the need to improve access to healthcare for people living in Heathrow Villages and to secure long-term premises for the Shakespeare Medical Centre. NHS Hillingdon CCG also noted the service demands required to meet the needs of unaccompanied asylum seeking children.

Consultation responses

12.10.641 At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

Standards / controls

12.10.642 As per the Health and Social Care Act 2012 (HM Government of Great Britain & Northern Ireland, 2012a) and the National Health Service Act 2006 (HM Government of Great Britain, 2006) the Clinical Commissioning Groups have the function of arranging for the provision of services for the purposes of the health service.

12.10.643 Under the Health and Safety at Work Act 1974 (HM Government of Great Britain, 1974) employers have a general duty of care to protect (so far as is reasonably practicable) the health, safety and welfare of all employees.

8 A planning application has been submitted for new premises at 401 Uxbridge Road, Hayes.
The Health and Safety (First-Aid) Regulations 1981 (HM Government of Great Britain, 1981) require employers to provide adequate and appropriate equipment, facilities and personnel to ensure their employees receive immediate attention if they are injured or taken ill at work.

Policy context

At a national level the Government supports the DCO Project, acknowledging the expansion may increase demand on health services, requiring appropriate mitigation.

Health and social care organisations are required to work together as a system to take joint responsibility for local populations within a geographic area (NHS England, 2014). The policy context requires organisations to recognise their strategic role as central hubs in place-based systems of care (NHS Hillingdon CCG, 2018).

The health policy themes summarised: ensuring that community and social infrastructure is provided to cater for the needs of the existing community and future populations; responding to a need for a significant increase in the number of GPs and for better access to primary healthcare; responding to a potential reduction in accident and emergency services at Ealing; addressing the London Ambulance Service estate being reported as not fit for purpose.

Step 3: Categorising effects on human health

There is a causal relationship between health and social care services and health outcomes. There is potential for a small change from the baseline position; a slight widening of inequalities; and a direct and large contribution to recognised health priorities. Local healthcare demand has been noted by local stakeholders. In policy terms the mitigated effect aligns with published national and local government policy expectations.

The general population effect across the study area in the short term (0-5 years) from the 2035 assessment year is minor negative (not significant). This is when the greatest health effect is expected in terms of non-resident passengers, Airport visitors, Heathrow colleagues and to a lesser extent remaining construction workers making unscheduled use of NHS services. A similar trend of negligible (not significant) and minor negative (not significant) effects would be expected in the medium term (5-10 years). This finding is influenced by the additional demand placed on services. The effect on local residents and on staff is discussed further below. The negative ranking reflects the increased pressure on services (Hillingdon Hospitals NHS Foundation Trust, 2017) and the stated need to improve access to healthcare for people living in the Heathrow Villages (NHS Hillingdon CCG and London Borough of Hillingdon, 2018). The effect is expected to reduce
over time, becoming negligible (not significant) in the long term (10+ years). The reduction reflects expected adaptations through routine service planning, Heathrow’s provision of services to its colleagues and reducing construction workforce numbers.

12.10.650 The effect for the vulnerable groups (a judgement of the greatest expected effect due to characteristics that increase sensitivity) ranges between negligible (not significant) and moderate negative (not significant) depending on the timeframe and relevant vulnerable group characteristics. Groups within the resident population who may be particularly vulnerable to any reduction in the quality of local NHS services include: children and young people (including pre-natal and post-natal care); older people (particularly frail elderly); those with existing poor health (including complex or long-term conditions that require regular NHS contacts); and those experiencing high levels of deprivation, social isolation, discrimination, social disadvantage or barriers in accessing NHS services.

12.10.651 In terms of vulnerability amongst service providers, as well as GP and hospital services, effects may also be experienced by ambulance and social care services close to the Airport. Effects relate to both the experience of service users (for example waiting times affecting care outcomes) and service providers (for example staff workloads affecting mental wellbeing). For social care this acknowledges that current usage includes on occasion support to unaccompanied minors. For ambulance services this acknowledges that current services procured by Heathrow are likely to increase.

12.10.652 In all cases the change in demand for local public health services due to Airport expansion is expected to be relatively small, but that given lack of local capacity, the changes have the potential to negatively affect health outcomes. The ongoing technical engagement with local health stakeholders and ongoing assessment of the need for appropriate mitigation (including through supporting service planning and providing high quality occupational care to the construction workforce) is expected to reduce the potential for negative health effects.

12.10.653 In the short term (0-5 years) (from the 2035 assessment year) the greatest health effects are considered to be moderate negative (not significant). The effect is expected to range between minor negative (not significant) and moderate negative (not significant) for a large population (estimated at over 500 people) depending on the level of NHS service reliance and the degree to which capacity is affected at the time of service use. The effect is driven to some extent by demands from the construction workforce, but mainly by operational passenger number increases on overstretched local services. Whilst both construction and operational demands are expected to be relatively small, the adverse effect reflects local services lack capacity.
In the medium term (5-10 years) there would be a reduced contribution to the negative effect from construction workforce healthcare demand, but a greater contribution from operational Airport related healthcare demand (with increasing ATMs). Effects may reduce as service planning accounts for demand. A range between minor negative (not significant) and moderate negative (not significant) for a large population (estimated at over 500 people) is likely to remain representative of service user and service provider experiences.

In the long term (10+ years) for many people a negligible (not significant) effect would be expected where capacity issues are able to be addressed though routine service planning. During this time the construction related contribution continues to reduce. However, a sustained moderate negative (not significant) effect may be expected where the operational expanded Airport demands on services continue not to be addressed by service planning (noting that the demand due to the DCO Project is from a population not within the usual catchment of these services (for instance not local residents). The effect is likely to remain relevant for a large population (estimated at over 500 people).

**Access to services and healthcare: communicable diseases**

Although outbreaks of communicable diseases are rare, they do occasionally occur. The Scoping Opinion from PINS requested an explanation of the controls, procedures and requirements that are currently in place to address communicable diseases.

A plausible source-pathway-receptor linkage has been established between expanded Airport activity and communicable disease incidence:

1. **Source:** communicable diseases epidemics
2. **Pathway:** transmission of infected people (or vectors) aboard aircraft, with increased aircraft movements increasing risk of transmission
3. **Receptors:** Airport users, communities neighbouring the Airport and the wider UK population.

Although a plausible source-pathway-receptor linkage has been established between the expansion of the Airport and communicable diseases affecting health outcomes, the conditions required for the source-pathway-receptor linkage are highly improbable due to the continuation of existing practices undertaken by Heathrow to support the responsibilities and operations of the Port Health Authority. The potential effect is therefore considered unlikely (for instance it is plausible but not probable). The issue of communicable disease is therefore only discussed further in relation to the construction workforce, see Healthy lifestyles: construction workforce within this Section 12.10.
The International Health Regulations (World Health Organization, 2005) are a legal instrument that supports the international community in preventing and responding to acute public health risks that have the potential to cross borders and threaten people worldwide. The International Health Regulations set out procedures and reporting requirements for WHO member states. The International Health Regulations are transposed into English law by the Public Health (Aircraft) Regulations 1979 as amended by the Public Health (Aircraft) (Amendment) (England) Regulations 2007 (HM Government of Great Britain & Northern Ireland, 2007a). These statutory duties are not affected by the DCO Project and will continue to apply to the expanded Airport.

More generally, there are also statutory duties in relation to notifiable communicable diseases (those with a high public health risk as determined by PHE). The prime purpose of the notifications system is timely response to cases, clusters and epidemics of infectious diseases (and incidents on non-infectious health hazard), in order to prevent further transmission or spread of disease.

PHE aims to detect possible outbreaks of disease and epidemics as rapidly as possible. Accuracy of diagnosis is secondary, with clinical suspicion of a notifiable infection being all that is required. ‘Notification of infectious diseases’ is the term used to refer to the statutory duties for reporting notifiable diseases in the Public Health (Control of Disease) Act 1984 (HM Government of Great Britain & Northern Ireland, 1984) and the Health Protection (Notification) Regulations 2010 (HM Government of Great Britain & Northern Ireland, 2010b).

Registered medical practitioners (including those based at or near the Airport) have a statutory duty to notify the ‘proper officer’ at their local council or local health protection team of suspected cases of certain infectious diseases (Public Health England, 2010).

In the context of Heathrow, statutory requirements in relation to communicable disease centre around the Port Health Authority. Port health covers a range of health matters at an Airport, including:

1. Control of infectious disease (prevent entry and control at port) including human as well as animal disease and control of all disease vectors (including monitoring in and around the Airport of vectors (for example insects) that may have arrived in aircraft)

2. Inspection of aircraft and vessels

3. Control and inspection of food premises and safe water supplies

4. Other Environmental Health matters including health and safety.
The London Borough of Hillingdon is the Port Health Authority for Heathrow and carries out enforcement and control of matters under the International Health Regulations as well as EU directives on a range of health matters.

In fulfilling the statutory requirements in relation to communicable disease, the London Borough of Hillingdon is supported by Heathrow and PHE. The local health protection team for Heathrow and the surrounding area is the PHE North West London Health Protection Team. Heathrow provides logistical support, including space for port authority staff and their equipment. Heathrow also operates port health incidence procedures, which are reviewed annually.

The work between Heathrow, the Port Health Authority (London Borough of Hillingdon), PHE and the WHO will continue under the DCO Project, with no new or different likely significant effects expected. Resources and procedure will be scaled to continue to meet the statutory requirements. From a project point of view such resource and procedural scaling involves logistical support and procedural review as discussed above. Such activities are inherent to the operation of the Airport and, whilst supported by Heathrow, predominantly relate to the statutory duties of London Borough of Hillingdon and PHE.

The role of London Borough of Hillingdon with regards to communicable disease and port health was discussed with the Director of Public Health at the London Borough of Hillingdon in January 2019. The feedback from this discussion concluded that while large changes are not expected as a result of the Airport expansion, dialogue will continue to confirm Port Health Authority activities are not interrupted during construction and are appropriately scaled during operation.

Heathrow will continue to have port health incidence procedures in place, including appropriate updates to reflect the changes in infrastructure and passenger numbers (as agreed with the London Borough of Hillingdon as Port Health Authority).

The potential effect is not likely so, by definition, no significant effects are anticipated; health effects are rated as negligible (not significant) for all DCO Project phases. A watching brief will be maintained on this issue and, if appropriate, any update will be reported in the ES.

**Transport: leisure travel opportunities**

**Introduction**

The expanded Airport may affect people’s health through increasing the opportunity to access leisure travel. People’s health may be affected by a change in the opportunity to access holidays / vacations, which includes determinants of health such as: international ties; cultural tolerance; active lifestyle (for example,
winter season physical activity); rest and recuperation; carer respite and direct and indirect economic activity.

12.10.671 A source-pathway-receptor linkage has been proposed between greater opportunities to access destinations that support rest and recuperation from the normal stresses and strains of life and consequently experiencing a change in health outcomes.

1. Source: increased airport capacity facilitating greater access to holiday destinations due to the DCO Project

2. Pathway: transport related determinants of health, including access to opportunities for rest, connecting with friends and family, furthering cultural understanding and leisure related physical activity

3. Receptors: airline passengers from the regional population of Greater London and the south-east of England and, as a hub Airport, the national population of the UK.

12.10.672 Based on the literature reviewed, the strength of evidence is weak for a direct causal relationship between leisure travel and health outcomes. In part this reflects relatively few studies on this issue. However, given suggestive findings from the available literature (and noting that an absence of evidence is not evidence of absence (Altman and Bland, 1995)) there is considered a more general association that warrants assessment. On this basis the potential effect is both plausible and probable and is therefore considered to be likely.

12.10.673 This issue informs, and has been informed by, Chapter 18: Socio-economics and employment. The Socio-economics and employment assessment identifies the change in aviation flight capacity and expected passenger numbers. The Health chapter focuses on qualitative discussion of the health consequences of leisure travel.

**Project activities and temporal scope**

12.10.674 The Airport currently operates at around 98% of its capacity of 480,000 ATMs per year (78 MPPA). In 2018, Heathrow Airport handled 78 million passengers with 67% of these being leisure travellers (Heathrow, 2019). At the point the North West Runway opens, the Airport is expected to handle 505,000 ATMs (95 MPPA). By 2050 this would increase to 756,000 ATMs per year (142 MPPA).

12.10.675 Effects are expected to start during Phase 1 as the initial increase of 25,000 additional ATMs over four years forms part of the new Airport operating regime. Effects are likely to continue to accrue as ATMs increase through Phases 2 and 3. Effects are likely to relate to the long-term influence on leisure travel from
increased Airport capacity. Long-term benefits may be influenced by new norms for travel and the costs of travel.

12.10.676 During Phases 1, 2 and 3 the health effects prior to the 2050 assessment year (for instance 2022 to 2050) have and will continue to be considered in terms of assessment and development of environmental measures. Prior to the assessment year the build-up in ATMs will affect health outcomes through increasing leisure travel opportunities. Whilst those effects are considered not significant in EIA terms, those ATM increases do contribute to the health effects associated with the 2050 assessment year and so are taken into account as part of that assessment.

12.10.677 The DCO Project activity assessment year to which the greatest potential health effects are anticipated to relate is 2050 (this is the assessment year from which significance rankings are made for short, medium and long term health effects). The reflects the assessment year of greatest ATMs, and therefore greatest potential for leisure travel related health benefits.

12.10.678 In categorising EIA significance for health the embedded measures set out in Section 12.5 of this chapter have been taken into account.

Geographic scope

12.10.679 Benefits are expected to be national taking account of connecting flights from other UK terminals. The study area for this issue is therefore defined as the UK.

Receptors (population scope)

12.10.680 General population receptor: The population of the study area defined in the geographic scope.

12.10.681 Vulnerable group receptor: Relevant characteristics of the study area population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. People (and their carers) with existing poor health (physical and mental health), including where this is due to disabilities
2. People who are: unemployed, on low incomes, have regular shift worker, have low job stability, or have few progression prospects
3. People living in areas known to exhibit high deprivation or poor economic and/or health indicators
4. People who may experiencing social isolation, discrimination or social disadvantage (including relevant protected characteristics, for example where
health effects may be greater due to ethnicity, noting the local baseline context of a high proportion of BAME groups).

12.10.682 People who are more socio-economically deprived are expected to, in general, less regularly afford air travel leisure than people who are less socio-economically deprived. The Airport expansion may perpetuate such inequalities, increasing opportunities for the more wealthy to travel, while increasing Airport related emissions, disturbance and disruption for those who do not share in the benefits to the same degree.

12.10.683 Alternatively the Airport expansion may act to reduce inequalities by increasing the accessibility and affordability of travel, or at least preventing a bottleneck in regional aviation capacity that will otherwise have widened inequalities if future air leisure travel became more expensive and exclusive (for example, if capacity was displaced to other major Airport hubs in Europe).

12.10.684 Generally, people experiencing higher levels of deprivation are expected to make less regular use of air leisure travel. Leisure travel itself will be unlikely to affect the deprivation of those travelling, however through tourism related activities travel to national and international destinations may reduce deprivation in those communities hosting holiday makers.

12.10.685 People with serious health condition are expected to make less use of air leisure travel (and may be at increased risk of poor health outcomes if they did so). For less serious conditions, and the general healthy population, good quality leisure travel offering respite and rest (including for carers) is expected to improve health outcomes. Leisure travel is available to all ages.

Step 1: Describing the potential effects on health

12.10.686 The DCO Project effect will be a potentially ongoing/continuous influence throughout operation, which may vary in line with the Airport’s increased use of available capacity (seasonally) and as a long-term trend.

12.10.687 The expansion of Heathrow and associated increase in number of available leisure flights and destinations could be accessed by millions of people, providing temporary health benefits.

12.10.688 Improved opportunities for leisure travel are characterised as an indirect positive influence on health outcomes, particularly those relating to mental health and wellbeing. Benefits are most likely in terms of changes to day-to-day functioning rather than reducing levels of illness. The number of people experiencing these benefits is likely to relatively low in national population terms, reflecting that flights via Heathrow are only one of many options for leisure travel. Individual benefits to health outcomes will generally be temporary and be associated with travel events
that occurred at most a few times a year. The influence on population health will likely be as a small and long-term trend.

**Step 2: Framing judgments on significance**

12.10.689 The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.

**Scientific literature**

12.10.690 The scientific literature provides some evidence to support an association between greater leisure travel opportunities and health and wellbeing outcomes. Key findings are that there is some evidence that taking a vacation/holiday tends to be associated with modest short-term mental health benefits. The evidence indicates benefits from the anticipation of a break and on return to work.

12.10.691 The type of health outcomes relating to leisure travel that are identified in the scientific literature include: mental health and wellbeing. Regular leisure travel may have a lasting benefit if the experience consistently restores or improves physical and/or mental health. However, the health effects of individual leisure trips will generally be temporary in nature.

**Baseline conditions**

12.10.692 The baseline considers reported wellbeing and long-term health problems or disability.

12.10.693 The following are illustrative of health baseline indicators that may be influenced over time due to changes in leisure travel (though it is unlikely that such cross-sectional measures could apportion and attribute a particular level of change to the DCO Project): In England: 81% of the population report their general state of health as good or very good; 8% of the population report their day-to-day activities as limited a lot; 19% report high anxiety; and 9% report a low happiness score.

12.10.694 The existing health status of the population likely to engage in leisure travel can be characterised as good-average levels of self-reported health. Existing deprivation for this groups can be characterised as average. This acknowledges that whilst less deprived populations may be more frequent fliers, aviation leisure travel is widely accessible. Furthermore, travel cost, distance travelled, or frequency of travel do not necessarily predict health benefit. Adults are most likely to benefit from leisure travel (the benefits being predominantly from reducing work related stress). In the absence of the DCO Project there will not necessarily be access to alternative aviation capacity, requiring some degree of adaptive behaviour by leisure travellers (for example adopting alternative destinations, travel times or modes of travel).
Health priorities

12.10.695 No LPA health priorities have been identified for leisure travel.

Consultation responses

12.10.696 At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

Standards / controls

12.10.697 Not applicable for this issue.

Policy context

12.10.698 At a national level the Government supports the DCO Project, acknowledging the benefits to leisure (as well as other forms of) travel. The national policy identifies leisure travel as a positive effect of the DCO Project, with domestic and international travel promoting tourism, connects to family and friends and increasing the inclusivity and accessibility of leisure opportunities. Such policy support is likely to be associated with positive health effects, particularly where it encourages new routes (connecting more people and destinations) and reduces barriers to travel.

12.10.699 No health policies were identified that link with leisure travel from the main adopted and emerging planning documents of LPAs within the geographic scope.

Step 3: Categorising effects on human health

12.10.700 There is some (though limited) evidence on which to establish an association between leisure air travel and health outcomes. Whilst there is a substantial change from the baseline ATM position, there is not expected to be a discernible effect on inequalities and the issue does not relate to recognised health priorities. As the consultation for the DCO Project continues, it is expected that few responses are expected on the health benefits of leisure travel. In policy terms the effect aligns with published national government policy expectations.

12.10.701 The effect for the general population across the study area is considered to be minor positive (not significant) in the short term (0-5 years), medium term (5-10 years) and long term (10+ years) following the 2050 assessment year. Acknowledging that health effects would occur from the increase in ATMs in Phase 1, the greatest health effect is expected in the long term (10+ years) from the 2050 assessment year (once maximum ATM capacity has been reached). This conclusion reflects the potential for a small but persistent beneficial effect across a very large population.
The effect for the vulnerable groups (a judgement of the greatest expected effect due to characteristics that increase sensitivity) ranges between negligible (not significant) and minor positive (not significant) depending on the timeframe and relevant vulnerable group characteristics. The effects relate to passengers, particularly for whom good quality leisure travel offering respite and rest, including people with less serious health conditions. Leisure travel may also support increased access to opportunities for connecting with friends and family, particularly for those people who may experiencing social isolation, discrimination or social disadvantage.

In the short term (0-5 years), medium term (5-10 years) and long term (10+ years) following the 2050 assessment year effects are considered to range from negligible (not significant) to minor positive (not significant). The greatest health effect is also expected in the long term (10+ years) following the 2050 assessment year. The effect is driven by the expectation that best industry performance in the design, facilities and treatment of passengers with disabilities or mobility constraints using the Airport would not only avoid, but actively reduce, barriers to good quality leisure travel offering respite and rest (including for carers). Similarly, the additional ATM capacity and potential for new routes is expected to at least maintain, if not improve, equality of access to leisure travel for those with fewer financial means or for people who may experiencing social isolation, discrimination or social disadvantage. The vulnerable group effect would therefore have parity with that of the general population.

Aviation fuel storage emergency: potential for harm from aviation fuel spill, fire or explosion

As the numbers of aircraft using the Airport grows, the need for aviation fuel increases. The current fuel storage facilities are located on the central apron and adjacent to the cargo area. New storage facilities will increase Heathrow’s existing fuel network supply capacity.

New infrastructure would include new storage tanks in the form of a new fuel farm ‘Northern Apron Tank Farm’ to be built to the south of the North West Runway and additional Airport Transfer Pipelines (ATPs) to connect existing assets to the new receipt facility in the north: the Northern Fuel Receipt Facility (NFRF). The new NFRF is anticipated to be on the airside / landside boundary south of the North West Runway and, would have a footprint approximately twice the size of the original.

Fuel supply to the Heathrow will continue to be provided through northern and southern Fuel Receipt Facilities located on the airside / landside boundary (albeit with the northern facility in a new location). The Fuel Receipt Facilities accept pipelines from refineries and from a nearby rail deport and are linked to the
storage facilities by a system of Airport Transfer Pipelines (ATPs). The storage facilities are used for final preparation and storage of the fuel before it is classed as ‘hydrant ready’ and transferred through pipe circuits to the stands. Each storage facility serves a particular area of the Airport. There is likely to be facility to use the ATPs to transfer fuel between the storage facilities, but this is not anticipated for day-to-day operation.

12.10.707 Supply routes to Heathrow would continue to be by pipelines from Buncefield, the Total fuel depot (rail), the Esso facility to the south of Heathrow and the London Airport Pipeline from Walton.

12.10.708 A plausible source-pathway-receptor linkage has been established between aviation fuel storage and the potential for accidental releases, which could pose a risk to population health.

1. Source: an increase in the quantity of aviation fuel which is stored on-site due to the DCO Project

2. Pathway: release and subsequent exposure via ground, water or atmosphere media, including fire, exposure or fumes

3. Receptors: Airport users and communities neighbouring the Airport.

12.10.709 Although a plausible source-pathway-receptor linkage has been established between the expansion of the Airport and risks associated with aviation fuel facilities affecting health outcomes, the conditions required for the source-pathway-receptor linkage are highly improbable due to the continuation of existing practices to manage risk undertaken by Heathrow. The potential effect is therefore considered unlikely (for instance it is plausible but not probable).

12.10.710 Due to the properties of fuel and the serious nature of the consequences of an accident involving the fuel storage system (for Heathrow colleagues, communities and the emergency services), the management of the fuel facilities are a health and safety issue. Therefore, measures to manage the risks of planned activities and accidents / disasters are already in place to cover the existing fuel storage facilities and will be replicated for the DCO Project.

12.10.711 The existing and new fuel storage facilities would continue to be regulated, including under Control of Major Accident Hazards regulations (2015) (which specifically includes jet fuel), the Petroleum (Consolidation) Regulations (HM Government of Great Britain, 2014b), the Control of Substances Hazardous to Health Regulations (HM Government of Great Britain & Northern Ireland, 2002a), the Management of Health and Safety at Work Regulations (HM Government of Great Britain, 1999) and the Dangerous Substances and Explosive Atmospheres Regulations (HM Government of Great Britain & Northern Ireland, 2002b).
Heathrow also follows guidance by the Civil Aviation Authority (2004) and the Joint Inspection Group (2019) in relation to safe storage, management, handling and distribution of aviation fuel. Any discharges or releases affecting the environment are also subject to the provisions of the Environmental Permitting Regulations (HM Government of Great Britain, 2016).

Compliance with these statutory, regulatory and industry requirements and guidelines will continue for the expanded Airport.

The risks of injury associated with major accident scenarios, including those potentially involving aviation fuel storage, are considered in Chapter 16: Major accidents and disasters. This assessment concludes there will be sufficient environmental measures in place to ensure that there will be no significant effects of major accidents and disasters associated with the fuel facilities and sets out the emergency response procedures that will continue to be in place.

Therefore, there is not likely to be any discernible change for any DCO Project phases. The potential effect is not likely so, by definition, it is not a likely significant effect of the DCO Project. The health effects as a result of aviation fuel storage are therefore rated as negligible (not significant). This issue is not assessed further. A watching brief will be maintained on this issue and, if appropriate, an update will be reported in the ES.

**Community cohesion: community identity**

*Introduction*

Bringing the Airport boundary closer to remaining communities and increases in Airport related activities (including ATMs, operational lighting and the construction of new structures) may affect the health of residents in neighbouring communities through changes to how people feel about their community and sense of place.

A plausible source-pathway-receptor linkage has been established between land requirements of the DCO Project affecting how people feel about their community and consequently experiencing a change in health outcomes:

1. **Source**: changes in land use and landscape due to the DCO Project, including changes in visual amenity and light pollution
2. **Pathway**: change in sense of place and wellbeing
3. **Receptors**: residents neighbouring the Airport and its development boundaries.

The potential effect is both plausible and probable and is therefore considered to be likely.
12.10.719 This issue informs, and has been informed by, Chapter 11: Community, Chapter 15: Landscape and visual amenity, Chapter 17: Noise and vibration, Chapter 18: Socio-economics and employment and Chapter 19: Transport network users in relation to social, economic and environmental change due to the DCO Project that may affect community identity.

12.10.720 This section of the health chapter focuses on qualitative discussion of the health consequences of the wider influence on how people feel about their sense of place based on the changing community context due to the new structures, new land uses and new operational Airport activities. The section of this chapter on Environment: Construction effects considers the combined construction experience for communities closest to the Airport, particularly in relation to construction related exposures and visual disturbance associated with the construction activities themselves (as opposed to the structures they create).

**Project activities and temporal scope**

12.10.721 Changes in community identity associated with residential relocations are discussed in the section of this chapter on Community cohesion: relocation affecting the remaining communities.

12.10.722 Whilst lighting principles have been established, at PEIR there is not a completed lighting assessment and assessment of visual amenity and tranquillity are included in Chapter 15: Landscape and visual amenity.

12.10.723 The activities that drive the potential changes in sense of place are:

1. Pre-Phase 1: The application for development consent and its determination of will start to affect the identity of communities that are strongly associated with the DCO Project due to proximity to the DCO Project’s boundary or being the subject of environmental measures

2. Phase 1 (c. 2022 - 2026): DCO Project activities may negatively influence sense of place. For example:
   
   a. Site establishment works, including new construction area perimeter fencing, bunding or hoarding with associated security and temporary service roads
   
   b. Loss of familiar landmarks, such as demolition of existing roads, homes, community assets or other structures
   
   c. Large visual changes such as soil stripping and earth works affecting community setting
   
   d. Cranes and other tall structures (for example for lighting) as dominant features in the skyline
   
   e. Environmental quality, including construction noise affecting outdoor amenity
f. New buildings on previously open areas, including displaced businesses and new Airport infrastructure

g. Shifts in the community demographics and property values related to the desirability of the area

h. The release of 25,000 additional ATMs over four years (2022-2025).

3. Activities during this phase may also have positive influences. For example: through the quality and quantity of reprovided community sports facilities and open spaces, including the Green Link; communities are likely to prosper from the local construction and operational employment and investment opportunities; and community projects will be supported by Heathrow, including those to maintain and enhance community identity

4. Phase 2 (c. late 2026 - 2033): Construction activities will continue with similar influences to those in Phase 1 but to a lesser degree as the intensity of construction activity will be reduced. Once operational the majority of the new boundary between landside and airside areas will be demarked with security fencing, in the form of weld-mesh fencing panels similar to the existing boundary fence. To help prevent any unauthorised access to the airfield, the fence will be located within a sterile zone and will be locally lit to enable continuous perimeter monitoring by police and security teams. As at present, all ‘tall’ structures (for instance high-mast lighting columns) or those sited within the runway strip zones will be fitted with red obstacle identification lighting

5. Phase 3 (c. 2034 – 2050): Construction activities will continue, though by this stage the potential for further changes to community identity will be reduced by the established proximity of the expanded Airport boundary and its activities. Following the opening of the North West Runway in late 2026, there will then be major growth in the number of ATMs and passengers to 2035. Heathrow will continue to support community projects during this phase. During this phase community identity will likely benefit from the additional respite flexibility offered by the North West Runway when the Airport is operating at its new peak capacity. The North West Runway will facilitate options to provide increased respite to local communities through mode alternation. Table 6.16 in Chapter 6: DCO Project description shows the runway operating patterns to achieve the benefits of alternation for all affected communities.

For some, effects may commence pre-Phase 1 as the identity of communities that are strongly associated with the DCO Project may start to be affected. This may particularly be the case for the population adjacent to the Site boundary. Whilst these are not effects of the DCO Project commencing, these activities influence the health effects associated with subsequent Phases and so are taken into account as part of that assessment and development of environmental measures.
During Phases 1 and 2 the health effects prior to the 2027 assessment year (for instance 2022 to 2027) have and will continue to be considered in terms of assessment and development of environmental measures. Prior to the assessment year the DCO Projects activities, land use changes and structures may start to affect health outcomes, but for that time period are considered not significant. However, those activities do influence the health effects associated with the 2027 assessment year and so are taken into account as part of that assessment.

The DCO Project activity assessment year to which the greatest potential health effects are anticipated to relate is 2027 (this is the assessment year from which significance rankings are made for short, medium and long term health effects). This reflects a point at which the level of change for community identity is likely to be greatest due to both construction related activities and operational ATM increases.

In categorising EIA significance for health the embedded measures set out in Section 12.5 of this chapter have been taken into account. This includes: measures in the draft CoCP to reduce construction impacts on the community and environment; commitment to good design; protecting existing retained elements of the landscape; and community projects. It also includes consideration of the following environmental lighting principles:

1. Heathrow will ensure that suitable colour temperatures are selected for light sources where required to mitigate impacts on wildlife, reduce sky glow and minimise risk of human response to lighting where legally compliant, practicable and safe to do so.

2. Heathrow will consider applicable lighting standards and levels to reduce risk of over-lighting and reduce wasted energy.

3. Heathrow will take measures to reduce obtrusive light, taking into account the safety requirements of the airfield.

4. Heathrow will monitor the effectiveness of lighting mitigation measures for the DCO Project and carry out improvements where necessary and practicable to do so, and carry out periodic maintenance and inspections.

**Geographic scope**

The study area for this issue is defined by the LPAs of the London Borough of Hillingdon; Slough Borough; London Borough of Hounslow; Spelthorne Borough; and South Bucks District (being the LPAs in which DCO Project works will be undertaken).
Effects focus around the community areas of Harmondsworth; Sipson; Hayes; Harlington; Bedfont; Stanwell; Colnbrook; Poyle; Brands Hill; and Iver and Richings Park (being the community areas previously not near the Airport boundary that will be following the expansion).

**Receptors (population scope)**

**12.10.730** General population receptor: The population of the study area defined in the geographic scope.

**12.10.731** Vulnerable group receptor: Relevant characteristics of the study area population that may increase sensitivity for a variety of reasons collectively define the vulnerable group receptor population (vulnerable for a range of reasons, or combinations of reasons). The relevant characteristics are:

1. The population adjacent to the Site (site-specific effects relating to social, environmental and economic change)
2. Children and young people
3. Older people (particularly frail elderly)
4. People (and their carers) with existing poor health (physical and mental health), including where this is due to disabilities
5. People who are: unemployed, on low incomes, have regular shift worker, have low job stability, or have few progression prospects (including those unable to work due to ill health)
6. People living in areas known to exhibit high deprivation or poor economic and/or health indicators
7. People who may experiencing social isolation, discrimination or social disadvantage (including relevant protected characteristics, for example where health effects may be greater due to ethnicity, noting the local baseline context of a high proportion of BAME groups)
8. People experiencing barriers in access to services, amenities and facilities (including barriers experienced by service providers).

Although the aircraft are likely to be visible from a large distance, significant negative effects associated with visual amenity are only likely to be experienced by those communities close to the Airport (near views of operational activity, aircraft, buildings/structures and lighting). The population within wider communities surrounding Heathrow are likely to experience effects relating to distant views of operational activity, aircraft, buildings/structures and lighting. Vulnerable groups that may be particularly affected by changes in visual amenity are those who could
be negatively affected by significant night-time obtrusive light, for example, shift workers.

12.10.733 The DCO Project's influence on the character of the surrounding area will include a wider range of communities, including those affected by relocations. Changes in the affected communities due to voluntary relocations is likely to result in the remaining population being those who wish to live in the area. Such a population may potentially show stronger social cohesion than the pre-relocations population, being comprised of people who feel a high degree of attachment to their community. This does not mean that that population will necessarily view the DCO Project changes (construction and operation) as positive, but it will suggest that on balance they accept the change and are content with their sense of place. Such a viewpoint will be consistent with increased, but not necessarily a high degree of sensitivity. Similarly, people subsequently moving to the remaining communities near the expanded Airport boundary (for example taking up housing opportunities in properties voluntarily vacated in the remaining communities) will do so with an awareness of the changed community context. Again, these new residents may not consider the DCO Project changes positive, but if they are moving into the communities it will be reasonable to assume that they are satisfied that the benefits (for example of affordable housing) to outweigh any concerns (for example Airport related disturbance). Sensitivity will be highest for those who no longer wished to remain in the communities near the Airport and feel unable to relocate.

12.10.734 In neighbouring communities there will be an experience of construction works followed by a continuous experience of greater proximity to, or activity at, the expanded Airport. These effects could individually and collectively affect how people feel about their community, sense of place and wellbeing. There will likely be a permanent social and environmental change with potential for intergenerational effects.

**Step 1: Describing the potential effects on health**

12.10.735 Whilst a range of views are expected from residents near the Airport (including those supporting the DCO Project), the influence on health outcomes related to changes in the context of the places in which people make their homes, socialise as a community and pursue their leisure interests is best categorised as negative. Such health effects will be indirect and relate to a mix of interrelated physical and mental health and wellbeing outcomes. For many people within these communities the change may impact to varying degrees upon existing health conditions, as well as day-to-day functioning unrelated to illness. Effects will likely be greatest in the short to medium term, corresponding with clearances and establishment of the new Airport boundary as a dominant community influence. The effect on communities of such permanent context change is characterised as continuous,
with the change likely liked to non-permanent, reversible and non-progressive health conditions.

**Step 2: Framing judgments on significance**

12.10.736 The following discussion frames the judgement on significance, informed by the ‘guide questions on significance’ set out in Table 12.12.

**Scientific literature**

12.10.737 The scientific literature indicates that there is evidence to support an association between change in community identity due to the DCO Project and health and wellbeing outcomes. Key findings are that there is a reasonable body of evidence indicating that both actual and perceived community quality plays an important role in physical and mental health. Broadly the literature indicates that environmental features of a neighbourhood, such as its attractiveness or levels of pollution, affect the socio-economic position of residents, which in turn affects health and health inequalities. Whilst a pleasant view (urban or rural) can benefit wellbeing, light pollution, defined as obtrusive light, can detract from wellbeing. This occurs where unwanted light can be a source of nuisance, usually occurring at night time. Therefore, more severe health effects are likely to occur at residential properties subject to obtrusive light.

12.10.738 The type of health outcomes relating to community identity that are identified in the scientific literature include: general health; mental health and wellbeing; and health inequalities (particularly for those on low incomes). Effects due to community context are likely to relate to changes in quality of life (for example due to perceived social status of an area) and inequalities.

12.10.739 Based on the literature reviewed, the strength of evidence is moderate for a direct causal relationship between social and environmental neighbourhood conditions and health outcomes. The evidence is strongest where concentrations of poverty within poor quality neighbourhoods result in health inequalities. The evidence for a change in how local people feel about their community, sense of place and wellbeing following a large infrastructure development is more limited. However, there is a general association of sufficient strength to warrant the assessment and mitigation of how the DCO Project may affect neighbouring communities.

**Baseline conditions**

12.10.740 The baseline considers reported anxiety and happiness, deprivation and housing.

12.10.741 The health baseline, as measured by routine LPA level indicators, may change in response to the DCO Project activities described above. The following are illustrative of health baseline indicators that may be influenced over time due to
changes in community identity (though it is unlikely that such cross-sectional measures could apportion and attribute a particular level of change to the DCO Project):

1. London Borough of Hillingdon: 84% of the population report their general state of health as good or very good (84% for London and 81% for England); 21% report high anxiety (20% for London and 19% for England); and 10% report a low happiness score (8% for London and 9% for England)

2. Slough Borough: 84% of the population report their general state of health as good or very good (84% for the south-east); 23% report high anxiety (19% for the south-east); and 10% report a low happiness score (8% for the south-east)

3. London Borough of Hounslow: 84% of the population report their general state of health as good or very good; 23% report high anxiety; and 10% report a low happiness score

4. Spelthorne Borough: 84% of the population report their general state of health as good or very good; 18% report high anxiety; and 7% report a low happiness score

5. South Bucks District: 85% of the population report their general state of health as good or very good; 16% report high anxiety; and 6% report a low happiness score.

12.10.742 The existing health status of the population in the study area can be characterised as good-average levels of self-reported health. Existing can be characterised as average (between the 4th and 6th IMD decile, but acknowledging potential for pockets of deprivation and higher deprivation in some wider area LSOAs in West Drayton, Pinkwell and Heston West). Varying degrees of adaptation are expected within the population (some low others up to high). People in the life stages of adulthood and older age are more likely to be influenced by the change, typically having stronger feelings about their communities identify and sense of place as a whole. Younger people are expected to show greater adaptation to change, typically with a sense of community more narrowly defined in terms of social networks rather than the wider social and environmental context.

12.10.743 Based on indicative designs, the findings from Chapter 15: Landscape and visual amenity reports that there is expected to be a major change from the baseline for residential properties in the following areas:

1. Harmondsworth: views of the Airport perimeter, noise barrier (5m high), A4 highway proposals and aircraft using the North West Runway

2. Sipson and Hayes: views of new highways and aircraft using the North West Runway
3. Harlington: views of large-scale built development in the background and aircraft using the North West Runway

4. Bedfont: views beyond the foreground to fields would be replaced by large-scale built development and views of aircraft using the Airport

5. Stanwell: views beyond the foreground of green space would be replaced by large-scale built development and views of aircraft using the Airport

6. Colnbrook and Poyle: views of highways and built development with some landscaping alongside highways, with views of aircraft using the North West Runway

7. Brands Hill and Iver and Richings Park: views of large-scale Airport supporting infrastructure and buildings at the railhead and more aircraft using the North West Runway.

12.10.744 Changes in lighting levels required for the DCO Project have not been assessed by Chapter 15: Landscape and visual amenity at PEIR although the assessment of visual amenity does include likely effects from lighting. Based on the findings of the landscape and visual amenity assessments, it is not considered that any changes in tranquillity will result in additional health effects.

Health priorities

12.10.745 LPA health priorities have been set that link with community cohesion as a determinant of health. The health priority themes summarised from the LPAs within the geographic scope are as follows: develop active citizenship; ensure a thriving local voluntary and community sector, improve aspiration through access to learning and positive activities; reduce social isolation; and encouraging community participation and volunteering. Health priority themes also note that: development must be appropriate to the identity and context of local buildings, townscapes, landscapes and views; should seek to protect the amenity of surrounding land and buildings, particularly residential properties; and development should not give rise to unacceptable levels of light pollution.

Consultation responses

12.10.746 At the PEIR stage health-issue-specific consultation themes have yet to emerge. At this stage the broader themes that have emerged from the engagement to date (discussed in Section 12.3 of this chapter) have been taken into account.

Standards / controls

12.10.747 Not applicable for this issue.
Policy context

12.10.748 At a national level the Government supports the DCO Project, acknowledging that whilst, visual change is inherent to the scheme, the quality of the local landscape and townscape experienced by residents and visitors (particularly where it forms part of local planning policy) should be taken into account.

12.10.749 The health policy themes summarised from the main adopted and emerging planning documents of LPAs within the geographic scope are as follows: development of well-designed, attractive and well-managed environments that contribute to reducing crime and anti-social activities; maintain separation through the role of open land around Heathrow; create and enhance multifunctional open space that is accessible and multifunctional; and protecting areas of Outstanding Natural Beauty and Special Areas of Conservation.

Step 3: Categorising effects on human health

12.10.750 There is an association between environmental change, community identity and health outcomes. Furthermore, there is the potential for a substantial change from the baseline position; a small widening of inequalities; and an indirect small contribution to recognised health priorities. Whilst consultation continues, it is expected that community identity will emerge as a theme of consultation, particularly by the public. In policy terms the effect aligns with published national government policy expectations.

12.10.751 The effect for the general population across the study area is expected to be greatest in the short term (0-5 years) from the 2027 assessment year when the effect is considered to be minor negative (not significant). Such an effect encompasses the periods of greatest change, the opening of the North West Runway in Phase 2. This ranking is reflective of the population beyond the visible changes within the draft DCO limits (for instance the change typically due to the increase in ATMs, their scheduling and their flightpaths). It is acknowledged that changes to ATMs will be a permanent change for community identity. The assessment focuses on effects due to increases in ATMs (but notes that flight path changes will also reduce existing adverse effects in some areas). For the general population it is expected that over time new community identity norms will be established. In the medium term (5-10 years) changing norms may be associated with a range of negligible (not significant) to minor negative (not significant) effects depending on the prominence of Airport and aircraft related changes (noise and visual) within the local environment. In the long term (10+ years) the establishment of community identity norms would be expected to reduce health effects associated with how people feel about their community and sense of place to negligible (not significant).
The effect for the vulnerable groups (a judgement of the greatest expected effect due to characteristics that increase sensitivity) ranges between negligible (not significant) and moderate negative (not significant) depending on the timeframe and relevant vulnerable group characteristics. The largest changes are expected to be experienced by those living close to the Airport during the time between the completion of construction works and the maturing of landscaping features. People less able to voluntarily relocate in response to concerns about the changing identity of their communities may be particularly vulnerable. This includes people: with existing poor health; on low incomes; experiencing high levels of deprivation; or experiencing access barriers. For some the effect may persist where the change represents a permanent loss of a sense of place important to personal identity or wellbeing.

In the short term (0-5 years) (from the 2027 assessment year) the greatest health effect on affected vulnerable groups is considered to be moderate negative (not significant). The effect is driven by the change in context inherent to expansion, including perimeter fences, loss of landmarks, new roads and ATMs for a large population (estimated at over 500 people). Whilst this ranking is likely to represent the experience for most vulnerable group characteristics, for children and young people the effect may range from minor negative (not significant) to moderate negative (not significant), due to greater potential for adaptability to such changes.

In the medium term (5-10 years) the effect would be expected to reduce to minor negative (not significant) for many people as construction activities decline and the rate and scale of change reduces. However, a sustained moderate negative (not significant) effect may occur during this timeframe where change continues to be influential for community context, such as ATM increases or large new structures. The latter may still be the case for a large population (estimated at over 500 people).

In the long term (10+ years) a negligible (not significant) effect would be expected for most as new norms are established. There may however be a sustained minor negative to moderate negative (both not significant) effect for some people in the closest communities due to the permanent prominence of the expanded Airport boundary and activities. This may particularly be the case for older people who are long-term residents, as well as those who have contributed to a distinct local identity that protects against risks of social isolation, discrimination or social disadvantage. Such an effect may be the case for a small population (currently estimated at less than 100 people). The rating reflects that whilst this group may experience increasing adverse health effects due to reduced mental wellbeing and reduced protective benefits of community cohesion (and whilst the ES will consider the potential for targeted development of environmental measures); the
expectation is that only a very few people would be affected in this way. Consequently there would not be a population level effect (even at the community level) that was significant in EIA terms.

**In-combination health effects**

12.10.756 In-combination health effects occur through two principle means: multiple health effects occurring in the same location and multiple health effects affecting the same population group. There is also a temporal dimension, whereby the intensity of effects can be amplified if they combine at the same time or if effects occur in series and therefore over long timescales.

12.10.757 At the PEIR stage it has not been possible to complete a full in-combination health assessment, however, a number of preliminary themes are highlighted for further analysis:

1. **Multiple effects on Harmondsworth:** Residents that remain in Harmondsworth could potentially experience multiple health effects due to the combination of the loss of social networks and community cohesion associated with the residential properties that have been relocated, the displacement of community resources and disruption to accessing some services and open space, changes in local surface access and combined effects from construction activity nearby.

2. **People who maybe older and have lived in the Heathrow villages (Harmondsworth, Sipson and Harlington)** for a long time may find the combination of loss of neighbours and social networks, disruption in access to services and recreation and the presence of a construction workforce to have a cumulative effect on their wellbeing. In addition, changes to local air quality also influence the health of this population group.

3. **Children who live in the Heathrow villages** may experience a combination of health effects. For example, those attending Harmondsworth Primary School would experience a change on a daily basis, added to the residential relocation potentially affecting their school friends and the displacement of some local community facilities. There are some areas where local air quality is already in exceedance of relevant limits. Although noise insulation and night flight restrictions will reduce effects, there may be cases where noise is noticeable. There may be some schools where there is a change in the noise environment.

4. **Working age people have the opportunity to benefit from employment opportunities in the short and long term through the combination of construction and operational job opportunities**
5. People with existing poor health status, particularly those with cardiovascular conditions, could experience combined health effects from changes to both air quality and noise (within the area covered by the noise assessment).

12.10.758 The results of further analysis will be reported in the ES.

12.11 Preliminary assessment of significance

12.11.1 The significance of effects remaining once all embedded environmental measures have been taken into consideration is summarised in Table 12.18

Table 12.18: Summary of significance of positive and negative effects

<table>
<thead>
<tr>
<th>Receptor and effect</th>
<th>Short term effects from assessment year</th>
<th>Medium term effects from assessment year</th>
<th>Long term effects from assessment year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential relocation: population required to relocate (assessment year 2022)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General population.</td>
<td>Major negative (significant)</td>
<td>Moderate negative (not significant)</td>
<td>Negligible (not significant)</td>
</tr>
<tr>
<td>Vulnerable groups. Range of effects across the vulnerable groups</td>
<td>Range: Major negative (significant) to Moderate negative (not significant)</td>
<td>Range: Moderate negative (not significant) to Minor negative (not significant)</td>
<td>Range: Moderate negative (not significant) to Negligible (not significant)</td>
</tr>
<tr>
<td>Community cohesion: relocation affecting the remaining communities (assessment year 2022)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General population</td>
<td>Minor negative (not significant)</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
</tr>
<tr>
<td>Vulnerable groups. Range of effects across the vulnerable groups</td>
<td>Range: Moderate negative (not significant) to Minor negative (not significant)</td>
<td>Range: Moderate negative (not significant) to Negligible (not significant)</td>
<td>Range: Moderate negative (not significant) to Negligible (not significant)</td>
</tr>
<tr>
<td>Access to services and healthcare: change in access to public services (assessment year 2025)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General population</td>
<td>Moderate negative (not significant)</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
</tr>
<tr>
<td>Vulnerable groups. Range of effects across the vulnerable groups</td>
<td>Range: Major negative (significant) to Moderate negative (not significant)</td>
<td>Range: Moderate negative (not significant) to Minor negative (not significant)</td>
<td>Range: Moderate negative (not significant) to Negligible (not significant)</td>
</tr>
<tr>
<td>Healthy lifestyles: open spaces and active lifestyles (assessment year 2022)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General population</td>
<td>Moderate negative (not significant)</td>
<td>Minor positive (not significant)</td>
<td>Minor positive (not significant)</td>
</tr>
</tbody>
</table>

9 Where the assessment year is later than 2022 earlier activities that influence the health effects associated with the assessment year are taken into account as part of the assessment. No significant effects are predicted in earlier years.
<table>
<thead>
<tr>
<th>Receptor and effect</th>
<th>Short term effects from assessment year</th>
<th>Medium term effects from assessment year</th>
<th>Long term effects from assessment year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vulnerable groups. Range of effects across the vulnerable groups.</td>
<td>Range: Major negative (significant) to Moderate negative (not significant)</td>
<td>Range: Negligible (not significant) to Minor positive and negative (not significant)</td>
<td>Range: Negligible (not significant) to Moderate positive and negative (not significant)</td>
</tr>
</tbody>
</table>

**Healthy lifestyles: active travel (assessment year 2022)**

<table>
<thead>
<tr>
<th>General population</th>
<th>Minor negative (not significant)</th>
<th>Range: Minor positive and negative (not significant)</th>
<th>Range: Minor positive and negative (not significant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vulnerable groups. Range of effects across the vulnerable groups</td>
<td>Range: Moderate negative (not significant) to Minor negative (not significant)</td>
<td>Range: Moderate negative (not significant) to Negligible (not significant) to Minor positive (not significant)</td>
<td>Range Negligible (not significant) to Minor positive (not significant) and Minor negative (not significant)</td>
</tr>
</tbody>
</table>

**Flood risk: flood risk management (assessment year not applicable)**

<table>
<thead>
<tr>
<th>General population</th>
<th>Negligible (not significant)</th>
<th>Negligible (not significant)</th>
<th>Negligible (not significant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vulnerable groups.</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
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</tbody>
</table>

**Environment: construction effects (assessment year 2023)**

<table>
<thead>
<tr>
<th>General population</th>
<th>Moderate negative (not significant)</th>
<th>Moderate negative (not significant)</th>
<th>Minor negative (not significant)</th>
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</thead>
<tbody>
<tr>
<td>Vulnerable groups. Range of effects across the vulnerable groups</td>
<td>Range: Major negative (significant) to moderate negative (not significant)</td>
<td>Range: Major negative (significant) to moderate negative (not significant)</td>
<td>Range: Moderate negative (not significant) to Negligible (not significant)</td>
</tr>
</tbody>
</table>

**Healthy lifestyles: construction workforce (assessment year 2023)**

<table>
<thead>
<tr>
<th>General population</th>
<th>Minor negative (not significant)</th>
<th>Minor negative (not significant)</th>
<th>Negligible (not significant)</th>
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</thead>
<tbody>
<tr>
<td>Vulnerable groups. Range of effects across the vulnerable groups</td>
<td>Range: Moderate negative (not significant) to Minor negative (not significant)</td>
<td>Range: Moderate negative (not significant) to Minor negative (not significant)</td>
<td>Range: Minor negative (not significant) to Negligible (not significant)</td>
</tr>
</tbody>
</table>

**Healthy lifestyles: presence of pests (assessment year not applicable)**

<table>
<thead>
<tr>
<th>General population</th>
<th>Negligible (not significant)</th>
<th>Negligible (not significant)</th>
<th>Negligible (not significant)</th>
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</thead>
<tbody>
<tr>
<td>Vulnerable groups.</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
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</tbody>
</table>

**Employment, training and economy: displacement of business and commercial activity (assessment year 2022)**

<table>
<thead>
<tr>
<th>General population</th>
<th>Minor negative (not significant)</th>
<th>Negligible (not significant)</th>
<th>Negligible (not significant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vulnerable groups. Range of effects across</td>
<td>Range: Moderate negative (not significant)</td>
<td>Range: Moderate negative (not significant)</td>
<td>Range: Moderate negative (not significant)</td>
</tr>
<tr>
<td>Receptor and effect</td>
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</tr>
<tr>
<td>the vulnerable groups</td>
<td>to Negligible (not significant)</td>
<td>to Negligible (not significant)</td>
<td>to Negligible (not significant)</td>
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</tbody>
</table>

Employment, training and economy: procuring goods and services and the local economy (assessment year 2023)

<table>
<thead>
<tr>
<th>General population.</th>
<th>Negligible (not significant)</th>
<th>Negligible (not significant)</th>
<th>Negligible (not significant)</th>
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</thead>
<tbody>
<tr>
<td>Vulnerable groups. Range of effects across the vulnerable groups</td>
<td>Minor positive (not significant)</td>
<td>Range: Negligible (not significant) to Minor positive (not significant)</td>
<td>Negligible (not significant)</td>
</tr>
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</table>

Employment, training and economy: demand for construction workforce and employment (assessment year 2023)

<table>
<thead>
<tr>
<th>General population.</th>
<th>Minor positive (not significant)</th>
<th>Minor positive (not significant)</th>
<th>Negligible (not significant)</th>
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</thead>
<tbody>
<tr>
<td>Vulnerable groups. Range of effects across the vulnerable groups</td>
<td>Moderate positive (not significant)</td>
<td>Range: Moderate positive (not significant) to Minor positive (not significant)</td>
<td>Range: Moderate positive (not significant) to Negligible (not significant)</td>
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</table>

Employment, training and economy: demand for operational workforce and employment (assessment year 2035)

<table>
<thead>
<tr>
<th>General population.</th>
<th>Range: Minor positive (not significant) to Negligible (not significant)</th>
<th>Range: Minor positive (not significant) to Negligible (not significant)</th>
<th>Minor positive (not significant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vulnerable groups. Range of effects across the vulnerable groups</td>
<td>Range: Major positive (significant) to Minor negative (not significant)</td>
<td>Range: Major positive (significant) to Minor negative (not significant)</td>
<td>Range: Major positive (significant) to Minor negative (not significant)</td>
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</tbody>
</table>

Environment: air quality (assessment years 2022, 2027, 2030, 2035)

<table>
<thead>
<tr>
<th>General population.</th>
<th>Minor negative (not significant)</th>
<th>Minor negative (not significant)</th>
<th>Minor negative (not significant)</th>
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</thead>
<tbody>
<tr>
<td>Vulnerable groups. Range of effects across the vulnerable groups</td>
<td>Range: Major negative (significant) to Minor negative (not significant)</td>
<td>Range: Major negative (significant) to Minor negative (not significant)</td>
<td>Range: Major negative (significant) to Minor negative (not significant)</td>
</tr>
</tbody>
</table>

Transport: road safety (assessment years 2022 and 2035)

<table>
<thead>
<tr>
<th>General population.</th>
<th>Range: Minor negative (not significant) to Negligible (not significant)</th>
<th>Range: Minor negative (not significant) to Negligible (not significant)</th>
<th>Range: Minor negative (not significant) to Negligible (not significant)</th>
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<tbody>
<tr>
<td>Vulnerable groups.</td>
<td>Range: Moderate negative (not significant) to Negligible (not significant)</td>
<td>Range: Moderate negative (not significant) to Negligible (not significant)</td>
<td>Range: Moderate negative (not significant) to Negligible (not significant)</td>
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Electromagnetic field effects (assessment year not applicable)

| General population. | Negligible (not significant) | Negligible (not significant) | Negligible (not significant) |
### Receptor and effect

<table>
<thead>
<tr>
<th>Receptor and effect</th>
<th>Short term effects from assessment year</th>
<th>Medium term effects from assessment year</th>
<th>Long term effects from assessment year</th>
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<tbody>
<tr>
<td>Vulnerable groups.</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
</tr>
<tr>
<td><strong>Access to services and healthcare: change in demand for local healthcare (assessment year 2035)</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>General population.</td>
<td>Minor negative (not significant)</td>
<td>Range: Minor negative (not significant) to Negligible (not significant)</td>
<td>Negligible (not significant)</td>
</tr>
<tr>
<td>Vulnerable groups. Range of effects across the vulnerable groups</td>
<td>Range: Moderate negative (not significant) to Minor negative (not significant)</td>
<td>Range: Moderate negative (not significant) to Minor negative (not significant)</td>
<td>Range: Moderate negative (not significant) to Negligible (not significant)</td>
</tr>
<tr>
<td><strong>Access to services and healthcare: communicable diseases (assessment year not applicable)</strong></td>
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<td></td>
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</tr>
<tr>
<td>General population.</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
</tr>
<tr>
<td>Vulnerable groups.</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
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<tr>
<td><strong>Transport: leisure travel opportunities (assessment year 2050)</strong></td>
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<tr>
<td>General population.</td>
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<td>Minor positive (not significant)</td>
<td>Minor positive (not significant)</td>
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<tr>
<td>Vulnerable groups. Range of effects across the vulnerable groups</td>
<td>Range: Minor positive (not significant) to Negligible (not significant)</td>
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<td>Range: Minor positive (not significant) to Negligible (not significant)</td>
</tr>
<tr>
<td><strong>Aviation fuel storage emergency: potential for harm from aviation fuel spill, fire or explosion (assessment year not applicable)</strong></td>
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</tr>
<tr>
<td>General population.</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
</tr>
<tr>
<td>Vulnerable groups.</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
<td>Negligible (not significant)</td>
</tr>
<tr>
<td><strong>Community cohesion: community identity (assessment year 2027)</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>General population.</td>
<td>Minor negative (not significant)</td>
<td>Range: Minor negative (not significant) to Negligible (not significant)</td>
<td>Negligible (not significant)</td>
</tr>
<tr>
<td>Vulnerable groups. Range of effects across the vulnerable groups</td>
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<td>Range: Moderate negative (not significant) to Minor negative (not significant)</td>
<td>Range: Moderate negative (not significant) to Negligible (not significant)</td>
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12.12 Assessment of cumulative effects

Introduction

12.12.1 The cumulative effects assessment (CEA) presented in this section reflects Stage 3 in the CEA process set out in Section 5.8 of Chapter 5: Approach to the EIA.

12.12.2 The assessment of cumulative health effects is based on professional judgement, taking into account the levels of significance identified in the primary or ‘stand-alone’ assessment, and identifying whether effects could be different when ‘other developments’ are considered.

12.12.3 A CEA is only to be undertaken for those receptors that are likely to experience effects greater than minor in the primary assessment. This is because effects below this are unlikely to result in any discernible positive or negative effects on a receptor. It is considered that they are extremely unlikely to result in a significant cumulative effect, even if multiple effects of a similar significance are considered.

12.12.4 This section considers the cumulative effects of the DCO Project and ‘other developments’ relating to health. The ‘other developments’ considered in the CEA for the PEIR are those on the ‘assessment list’ provided in Section 5.8 of Chapter 5: Approach to the EIA.

12.12.5 There is no overarching or standalone CEA Zone of Influence (ZOI) for health. The ZOI is comprised of the following aspect ZOIs which are relevant to the health assessment: Noise ZOI, Air Quality and Odour ZOI, Air Quality Major Emitters ZOI, Dust ZOI, Landscape and Visual Amenity ZOI, Community Inner Study Area ZOI and Recreation and Amenity ZOI.

12.12.6 Only those developments in the assessment list that fall within the above ZOIs have the potential to result in cumulative health effects with the DCO Project. The ZOIs are shown in Figure 5.1, Volume 2 and Figure 5.2, Volume 2 of Chapter 5: Approach to the EIA. All developments on the assessment list falling outside the ZOIs are excluded from this assessment. The developments falling outside the ZOIs are described in Section 11 of Chapter 7: Air Quality, Chapter 11: Community, Chapter 15: Landscape and Visual Amenity and Chapter 17: Noise and Vibration. There are no developments that fall outside all seven ZOIs.

12.12.7 Employment and housing projections, future infrastructure projects and developments in both Development Plans and in the planning process inform the socio-economics assessment, the community assessment (in the wider community study area), the transport assessment and the noise and air quality assessments (for traffic-related effects only). Therefore, where these assessments inform the health aspect, for example in considering road safety, air quality and employment, no additional cumulative assessment is required.
Nonetheless, it should be noted that the modelled traffic data has not been adjusted to account for changes that may occur as a result of the O812 Western Rail Link to Heathrow (WRLtH) project. As such, potential cumulative effects associated with road traffic changes as a result of this development are not inherently included in the assessment in Section 12.10. As set out in Section 7.11 in Chapter 7: Air Quality and Odour, Section 17.11 in Chapter 17: Noise, and Section 19.11 of Chapter 19: Transport Network Users, major infrastructure schemes not currently included for in the traffic model, such as the WRLtH project, would reduce the use of and improve the operation of the strategic road network around Heathrow. It is therefore considered that long-term adverse cumulative effects are unlikely. In turn, long-term adverse cumulative effects in relation to health, are also unlikely. Cumulative effects as a result of construction activities will be considered in the assessment carried out for the ES.

It is assumed that legislative controls and industry good practice to manage risks that influence health, some of which are set out in relevant parts of Section 12.10, for example in relation to the management of fuel and pests, are applied to other developments to the satisfaction of the LPA in order for them to have received development consent.

**Screening criteria**

Additional criteria specific to health have been employed to further screen developments in the CEA assessment list. This ensures that only developments of a scale and nature that could result in likely significant cumulative effects related to health are included in the assessment. The health screening criteria are set out in Table 12.19.

<table>
<thead>
<tr>
<th>CEA Zone of Influence (ZOI)</th>
<th>Screening criteria</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Inner Study Area ZOI</td>
<td>Include: 1. Residential developments where there is a change (increase or decrease) in the number of homes and therefore population 2. Developments where there is a change (increase or decrease) in the number of community facilities, including healthcare, education and recreational facilities</td>
<td>1. Changes in residential property within this area may influence the health effects relating to residential relocation (those needing to be relocated or effects on those remaining in neighbouring communities). 2. A change in community facilities could affect access for people already experiencing effects from the DCO Project. 3. The main determinants of health have</td>
</tr>
</tbody>
</table>
### CEA Zone of Influence (ZOI)

<table>
<thead>
<tr>
<th>Screening criteria</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. On-airport developments that occur within the existing Airport boundary, where the development would result in the existing ATM cap (480,000) being exceeded, or where physical works would be noticeable to neighbouring communities.</td>
<td>already been considered in setting the existing ATM cap and therefore are not additional to the DCO Project. However, any development resulting in ATMs exceeding the cap would require assessment. Where works within the existing Airport boundary are adjacent to existing residential areas, there is the potential for cumulative effects from construction activity and community cohesion (expanding the duration of effects or exposing communities not negatively affected by the DCO Project).</td>
</tr>
<tr>
<td>Exclude:</td>
<td></td>
</tr>
<tr>
<td>4. All other types of development not meeting the inclusion criteria above.</td>
<td></td>
</tr>
</tbody>
</table>

### Outside the Community Inner Study Area ZOI, but inside the Noise ZOI, Air Quality and Odour ZOI, Air Quality Major Emitters ZOI, Dust ZOI, Landscape and Visual Amenity ZOI and Recreation and Amenity ZOI

| Include: | 1. Should new strategic infrastructure be provided, this may affect the access to services for those affected by the DCO Project |
| Exclude: | |
| 2. All other types of development not meeting the inclusion criteria above. | 2. Outside the Community Inner Study Area ZOI, all other types of developments are not considered to be affected by health effects relating to community cohesion (for example community identity) that are affected by the DCO Project. They are also unlikely to experience health effects associated with the DCO Project to such an extent that changes would result in a likely significant effect. The general effects of any ‘other development’, such as large housing developments which will increase demand for health infrastructure, has been considered through growth forecasts inherent in the information on which the health assessment presented in |
### CEA Zone of Influence (ZOI)

<table>
<thead>
<tr>
<th>CEA Zone of Influence (ZOI)</th>
<th>Screening criteria</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>All ZOIs (Community Inner Study Area ZOI, Noise ZOI, Air Quality and Odour ZOI, Air Quality Major Emitters ZOI, Dust ZOI, Landscape and Visual Amenity ZOI and Recreation and Amenity ZOI)</td>
<td>Include: 1. Any developments assessed in the CEAs in Chapter 7: Air Quality, Chapter 11: Community, Chapter 15: Landscape and Visual Amenity and Chapter 17: Noise and Vibration, where relevant to the health effects being assessed, and where the CEA has determined that the development could change the conclusions of the aspect primary assessment.</td>
<td>Section 12.10 has been based. Where primary health effects incorporate modelling outputs, these are also informed by growth forecasts incorporating planned development.</td>
</tr>
</tbody>
</table>

12.12.11 This screening stage will also be applied to the ES CEA, in order to screen the shortlist of developments and identify those that have the potential to result in likely significant cumulative effects and therefore require assessment in the Health chapter.

12.12.12 Following application of the health CEA screening criteria, the following developments on the assessment list in Section 5.8 of Chapter 5: Approach to the EIA have been screened out of the CEA for health:

1. O109 Land at Harmondsworth, Holloway Close
2. O591 Rectory Lane, Cranford Lane
3. O595 Stanwell Recycling, Stanwell Quarry
4. O596 Stanwell Recycling, Stanwell Quarry
5. O601 Queen Mary Reservoir and Land West of Queen Mary Reservoir
6. O608 Cemex Datchet Quarry, Land At Riding Court Farm
7. O609 Land East of Horton Road
8. O615 Southall Gas Works
9. O732 Queen Mary Reservoir and Land West of Queen Mary Reservoir
10. O745 Land at Milton Park Farm
11. O750 Land at Watersplash Farm
12. O751 Slough Heat & Power Station
13. O810 M4 Junctions 3 to 12 Smart Motorway
14. O811 High Speed 2 (London - West Midlands)
15. O812 Western Rail Link to Heathrow
16. O813 Southampton to London Pipeline Project.
17. A2 T5+ (T5A)
18. A3 T5+ (T5B)
19. A4 T5+ (T5C)
20. A5 Perry Oaks Fuel Farm

**Summary**

12.12.13 As application of the health CEA screening criteria means that all developments on the CEA ‘assessment list’ are screened out, no developments are considered to result in a likely significant cumulative effect for health.

**12.13 Consideration of additional environmental measures or compensation**

**Overview**

12.13.1 The assessment set out above has concluded that it will be necessary to implement some further additional environmental measures. These are being identified through the iterative process of design and would be in addition to those outlined and assessed in Section 12.5 and Section 12.10. This section identifies some potential examples of these additional measures, consistent with measures identified in Chapter 11: Community.

12.13.2 Assessment of effects on communities is inherently uncertain, and therefore a ‘plan-monitor-manage’ approach is often preferred, where implementation strategies are flexible and responsive to the scale of effects as they arise.

**Residential relocation**

12.13.3 Heathrow proposes to establish a Home Relocation Support Service providing a variety of support services to guide and help owners and residents in the Compulsory Purchase Zone throughout stages of the DCO application and the home relocation process, this may include:
1. Helping residents to understand how Heathrow’s Property Policies and eligibility for compensation offers
2. Helping residents through the bond scheme process
3. Guiding residents, if requested, on completion of paperwork and also signposting how to seek independent advice
4. Connecting residents with approved providers of surveyor services, legal advice, and potentially removals assistance.

12.13.4 Further details about the Home Relocation Support Service will be provided as part of the launch of the Home Purchase Bond.

12.13.5 An Independent Advisor has been appointed to work with the Heathrow Community Engagement Board, to engage local residents and support their understanding and decision making on relocation.

**Remaining communities**

12.13.6 As more information is available and an assessment of the potential significance related to effects on population and housing change as a result of the WPO are developed, appropriate additional environmental measures and mitigation may be developed in order to reduce the potential for negative effects.

12.13.7 Heathrow is also developing detailed plans for managing temporary relocation of people affected by construction effects, or as a result of compulsory insulation works for some homes newly affected by aircraft noise.

12.13.8 Environmental measures and mitigation may be required in addition to (and developed in recognition of) the compensation policies that Heathrow has regarding property and noise, and so strategies will be developed to deliver holistic mitigation measures across communities, drawing on multiple environmental aspects, embedded and additional measures to reduce perceived significant effects on ‘community life’ in these communities. A suite of physical and non-physical mitigation and environmental measures will be developed for each potentially affected community to mitigate effects on community sustainability, viability, integration and cohesion.

**Community facilities**

12.13.9 Between the PEIR and ES, Heathrow will undertake further technical work and engagement to ascertain whether a significant adverse effect due to environmental change would occur at each receptor. Heathrow will engage with the owners and users of these receptors to identify what further control measures are sustainable to avoid or reduce the significant adverse effect.
Heathrow aims to continue to engage with the community facilities that may be significantly affected by any environmental effect in order to:

1. Understand existing physical elements (for example insulation, ventilation) already in place at these facilities to reduce effects related to the existing environment

2. Develop a position with regard to options to avoid or reduce the effect, which may include changes to the building fabric or relocation, through engagement with the facility and further technical assessment. This will be determined through engagement with these schools and their LPAs where possible.

Community Safety Management Plan

A Community Safety Management Plan will be developed to community safety in the area during construction and operation, likely to include:

1. A precautionary approach to manage impacts on community safety, cohesion and public services, with a focus on prevention where at all practicable

2. An information pack for accommodation providers in the private rented sector and tourism sector, setting out details of the workforce profile and the Code of Conduct

3. A process and resources for the local community to register public concerns, through (for example), a hotline and awareness campaigns.

A community compensation fund

The main objective of a community compensation fund will be to mitigate residual environmental and social effects that result from the DCO Project. Residual effects are those that will not have otherwise been mitigated (or not completely mitigated) through the securing of measures in conditions/S106.

A community compensation fund will provide mitigation funds proportionate and relevant to environmental impacts. Qualifying effects could include:

1. Residual harm as identified in the ES

2. Effects that are not identifiable and/or quantifiable at the time of undertaking the EIA, and in-combination effects

3. Issues identified as risks rather than likely impacts

4. Perceived effects on quality of life.
Accessibility

12.13.14 As the design and assessment of the DCO Project continues, Heathrow will target best industry performance in the design and operation of airport infrastructure and surface access infrastructure to improve accessibility for users with physical, sensory and cognitive impairments, older people, and families with young children.

12.13.15 Building on the SAP document, a Surface Access Strategy (SAS) will be submitted as part of the DCO. The SAS will set out measures to manage surface access to ensure it is high quality, efficient and reliable and does not give rise to unacceptable congestion or environmental impacts.

12.13.16 A key part of the development of the SAP has been the identification and refinement of initiatives that we could put forward to change how people and goods travel to and from Heathrow. Proposed initiatives (see Graphic 12.3) will form the ‘toolbox’ of measures, which will be refined further following the Airport Expansion Consultation (June 2019). A number of these initiatives can be scaled up or down as needed, such as setting the level of access charge, in response to changing circumstances and ongoing monitoring.

12.13.17 A number of the initiatives will contribute to managing health effects, either directly, for example developing an active travel network, or indirectly, for example Heathrow Ultra Low Emissions Zone. Following technical engagement, the initiatives that inform the SAS that are relevant to the health assessment will inform the assessment of effects in the ES.
12.14 Next steps

Introduction

12.14.1 This section sets out the next steps, up to submission of an ES as part of the application for development consent, with regard to assessing likely significant effects and proposing mitigation or environmental measures for health.
Reviewing the baseline

12.14.2 The demographic baseline is dynamic and is subject to continual change as a result of factors such as the economy, housing market, political climate and local factors.

12.14.3 Following the publication of this PEIR, Heathrow will continue to review all available public data relevant to the current and future baseline and it will update and refine assumptions where required. For example, annual data that is released by the Office of National Statistics will form part of the ES baseline. A thorough review of all information will be undertaken and any changes from PEIR will be presented and explained in the ES. Regard will also be taken of any secondary material published by LPAs and other relevant bodies at a local, regional and national level.

12.14.4 It is expected that new Public Health England health profiles will be available to inform the ES.

12.14.5 There may be changes in the availability of health services, planned future health infrastructure, or updates to health priorities. This will be reviewed and updated information incorporated in the ES.

Consultation and engagement

12.14.6 The views of stakeholders are an important input to the health assessment process.

12.14.7 Following the publication of this PEIR, Heathrow will build on technical engagement as set out in Section 12.3 of this chapter in order to further understand the potential for effects and work with relevant groups, organisations and public bodies to develop effective mitigation.

12.14.8 This will include, but is not limited to:

1. Further engagement with LPAs and the Heathrow Strategic Planning Group in order to develop the assessment and strategies for mitigation.

2. Further engagement with relevant technical health stakeholders to confirm baseline information, health priorities and priorities for mitigation.

3. A continued programme of engagement with members of the public and local representative organisations (including work with vulnerable groups) in order to refine the Masterplan and develop mitigation strategies for communities adjacent to the expanded Airport.

4. Regular engagement with the Heathrow Community Engagement Board to ensure that the issues of most concern to communities are considered in the assessment process.
12.14.9 In addition, Heathrow will have regard to feedback from the Airport Expansion Consultation (June 2019) from communities and statutory consultees where there is potential to develop the assessment. Heathrow intends to use feedback from engagement and consultation in order to further develop important elements of mitigation and compensation.

**Developing the assessment and environmental measures**

12.14.10 There are a number of areas to prioritise further work to inform the assessment and develop effective environmental measures to avoid negative health effects and maximise health benefits.

12.14.11 Heathrow will continue to work with residents in the CPZ, landlords and their tenants (including private landlords and registered housing providers) to refine the approach taken to acquisition and the management of the process. This includes additional data gathering amongst residents within the CPZ (owner occupiers and tenants) in order to understand the circumstances for each household. Issues relevant to health include: whether assistance is required to help source ‘local’ dwellings for residents, contingent on particular circumstances, for example children attending local schools, design interventions for homes (such as wheelchair accessibility), or those wanting to re-locate close to neighbours; if there are any vulnerable residents that mean the Compulsory Acquisition process may differentially or disproportionately affect them; and the order and prioritisation of relocating residents through the Home Relocation Support Service.

12.14.12 Additional information on the users of community facilities and local public services and the routes they take to access them will supplement existing health analysis.

12.14.13 Additional information on existing active travel routes and how these could be improved through the refinement and implementation of the SAP will inform the opportunities for maximising health benefits.

12.14.14 Where additional assessment years are considered in the ES for other relevant assessments, information relevant to the health assessment will supplement the existing health analysis.

12.14.15 The Economic Development Strategy will set out interventions to deliver apprenticeships, employ local people and provide opportunities for the unemployed. These measures will help to maximise health benefits.

12.14.16 A community compensation fund could provide a vehicle to help those most affected by the DCO Project to access some benefits of the development. It will be explored how health objectives can be considered and delivered through a community compensation fund.

12.14.17 Further consideration of in-combination health effects will be presented in the ES.
References
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