



YOUR LONDON AIRPORT
Gatwick

*Our northern runway:
making best use of Gatwick*

Environmental Impact Assessment Scoping Report Volume 1: Main Text

September 2019

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1 Introduction

1.1 Background

- 1.1.1 This Scoping Report has been prepared on behalf of Gatwick Airport Limited (GAL). It proposes the scope of environmental assessment for the proposal to make best use of Gatwick Airport's existing runways (referred to within this report as 'the Project'). The Project proposes alterations to the existing northern runway which, along with the lifting of the current restrictions on its use, would enable dual runway operations. The Project includes the development of a range of infrastructure and facilities which, together with the alterations to the northern runway would allow airport passenger and aircraft operations to increase. A summary of the key components of the Project is provided in Section 1.3 below, with further details set out in Chapter 5.
- 1.1.2 GAL intends to submit an application for development consent to the Planning Inspectorate. The application will be accompanied by an Environmental Statement (ES) prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, as amended.
- 1.1.3 This Scoping Report sets out the proposed approach and key issues to be included within the Environmental Impact Assessment (EIA) process. The purpose of this document is to obtain a Scoping Opinion from the Planning Inspectorate (on behalf of the Secretary of State). It is also intended that this report will support future consultation by GAL with statutory and non-statutory consultees and stakeholders, building on consultation undertaken to date.

1.2 Site Location

- 1.2.1 Gatwick Airport is located in the county of West Sussex between the towns of Crawley and Horley. The airport's two passenger terminals (North Terminal and South Terminal) are directly served by the M23 motorway spur off the M23, which runs approximately 1.7 km to the east of the airport. The A23 (London Road) also serves the airport, running in a north-south direction through the airport. The airport sits on the London to Brighton mainline railway. Gatwick Airport's railway station is located at South Terminal, and there is a direct transit link to North Terminal.
- 1.2.2 Gatwick Airport lies within the administrative area of Crawley Borough Council and immediately adjacent to the boundaries of Mole Valley District Council to the north west, Reigate and Banstead Borough Council to the north east and Horsham District Council to the south west. Other neighbouring administrative areas include Tandridge District Council (located approximately 1.9 km to the east of Gatwick Airport) and Mid Sussex District Council (approximately 2 km to the south east).
- 1.2.3 The site location is shown on Figure 1.2.1, with administrative boundaries illustrated on Figure 1.2.2.

1.3 Overview of the Project

- 1.3.1 Gatwick Airport is served by a single main runway. The airport also has a further runway, which is located north of the main runway and is only available for use when the main runway is closed. This runway is known as the 'northern runway' or the 'standby runway'. A planning restriction

with a planning agreement has historically prevented this runway from being used at the same time as the main runway. This agreement expired in August 2019.

- 1.3.2 The Project proposes to make alterations to the northern runway, including repositioning its centreline to the north by 12 metres which, along with the lifting of the current restrictions on its use, would enable dual runway operations in accordance with international standards. The resulting operation would result in:
- All arrivals using the existing main runway;
 - Shared departures between the existing main runway and the northern runway; and
 - Controlled dependency between the two runways to enable safe crossing of the northern runway by arrivals.
- 1.3.3 It is anticipated that by 2038 these improvements could increase airport capacity up to approximately 74 million passengers per annum (mppa), compared to a maximum potential capacity based on existing facilities of 61 mppa within the same timescale. This represents an increase of approximately 13 mppa.
- 1.3.4 The Project includes the following key components:
- Alterations to the existing northern runway, including repositioning its centreline 12 metres further north to enable dual runway operations;
 - Reconfiguration of taxiways;
 - Pier and stand amendments (including a proposed new pier);
 - Reconfiguration of other airfield facilities;
 - Extensions to the North and South Terminals;
 - Provision of additional hotel and office space;
 - Provision of reconfigured car parking, including new surface and multi-storey car parks;
 - Surface access (road and potential rail) improvements;
 - Reconfiguration of existing utilities, including surface water, foul drainage and power; and
 - Landscape/ecological planting and environmental mitigation.
- 1.3.5 The land subject to the application for development consent extends to approximately 838 hectares, of which approximately 760 hectares lies within the ownership of GAL. The Project site boundary is shown on Figure 1.3.1. Further details of the key components of the Project are provided in Chapter 5 of this Scoping Report.

1.4 The Applicant

- 1.4.1 GAL is the company licensed to operate Gatwick Airport by the Civil Aviation Authority (CAA). Gatwick Airport is majority owned by VINCI Airports, with the remainder owned by a consortium of investors managed by Global Infrastructure Partners (GIP).

1.5 Consenting Regime

- 1.5.1 The Planning Act 2008, as amended, sets out definitions for Nationally Significant Infrastructure Projects (NSIPs). Alterations to existing airports in England fall under the Planning Act 2008, as amended, where the alteration would:

- Increase by at least 10 million per year the number of passengers for whom the airport is capable of providing air passenger transport services; or
- Increase by at least 10,000 per year the number of air transport movements of cargo aircraft for which the airport is capable of providing air cargo transport services.

1.5.2 'Alteration' in relation to airports for the purposes of the Planning Act includes construction, extension or alteration of a runway, buildings, radar/radio mast/antenna or other apparatus at the airport.

1.5.3 The Project would fall within the definition of an alteration to Gatwick Airport and would meet the threshold for change in the number of passengers. It therefore constitutes an airport NSIP under the Planning Act 2008, as amended. In addition, it is noted that the Project may include works that constitute a highways NSIP in their own right. Applications for development consent for NSIPs are examined by the Planning Inspectorate and determined by the Secretary of State.

1.6 Environmental Impact Assessment

1.6.1 EIA is the process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions.

1.6.2 The legislative framework for EIA is set by European Directive 2011/92/EU and amended by Directive 2014/52/EU (collectively referred to as the EIA Directive). The EIA Directive requires EIA to be completed in support of an application for development consent for certain types of project. For projects of this type in England, the European legislative requirements are transposed into UK law by The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, as amended.

1.6.3 EIA is not required for all developments of this type. The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, as amended (referred to in this report as the EIA Regulations), set out the requirements for EIA for NSIPs. The Project would fall under Schedule 2, Part 13 (1) relating to changes or extensions to existing developments listed in Schedule 1 (Gatwick Airport would fall under Part 7 (1) of Schedule 1). Such developments comprise Schedule 2 development where the change or extension may have significant adverse effects on the environment.

1.6.4 Schedule 2 development requires EIA to be undertaken where a project is likely to have significant effects on the environment by virtue of factors such as its nature, size or location. Taking into account the nature and scale of the development proposed, EIA is proposed to be undertaken for the Project.

1.7 Scoping

1.7.1 The process of identifying the issues to consider within the EIA process (establishing the scope of the assessment) is known as scoping. Scoping is not a mandatory requirement. However, it is recognised as a useful part of the assessment process which helps to identify the main effects that a project is likely to have on the environment.

- 1.7.2 Scoping is an important preliminary procedure, which sets the context for the EIA process. Through the scoping exercise, the key environmental issues are identified at an early stage, which permits subsequent work to concentrate on those environmental topics for which significant effects may arise.

1.8 Purpose of this Scoping Report

- 1.8.1 This Scoping Report describes the scope and methodology of the technical studies being undertaken to provide an assessment of any likely significant effects and, where necessary, to determine suitable mitigation measures for the construction and operational phases of the Project. It also describes those topics or sub-topics which are proposed to be scoped out of the EIA process and provides justification as to why the Project would not have the potential to give rise to significant environmental effects in these areas.

- 1.8.2 This Scoping Report has been prepared with reference to the Planning Inspectorate's Advice Note Seven (Planning Inspectorate, 2017a) and accompanies a request for a Scoping Opinion.

1.9 Structure of this Report

- 1.9.1 This Scoping Report is structured as follows:

- Chapter 1: Introduction;
- Chapter 2: Consenting Process;
- Chapter 3: Alternatives Considered
- Chapter 4: Existing Site and Operation;
- Chapter 5: Project Description;
- Chapter 6: Approach to EIA;
- Chapter 7: Proposed Scope of Assessment;
- Chapter 8: Topics Proposed to be Scoped Out of the EIA Process;
- Chapter 9: Summary of Matters to be Scoped In/Out;
- Chapter 10: Structure of the ES; and
- Chapter 11: References.

- 1.9.2 Table 1.9.1 sets out the requirements of Advice Note Seven, together with details of where this information can be found within this Scoping Report.

Table 1.9.1: Requirements of Advice Note Seven

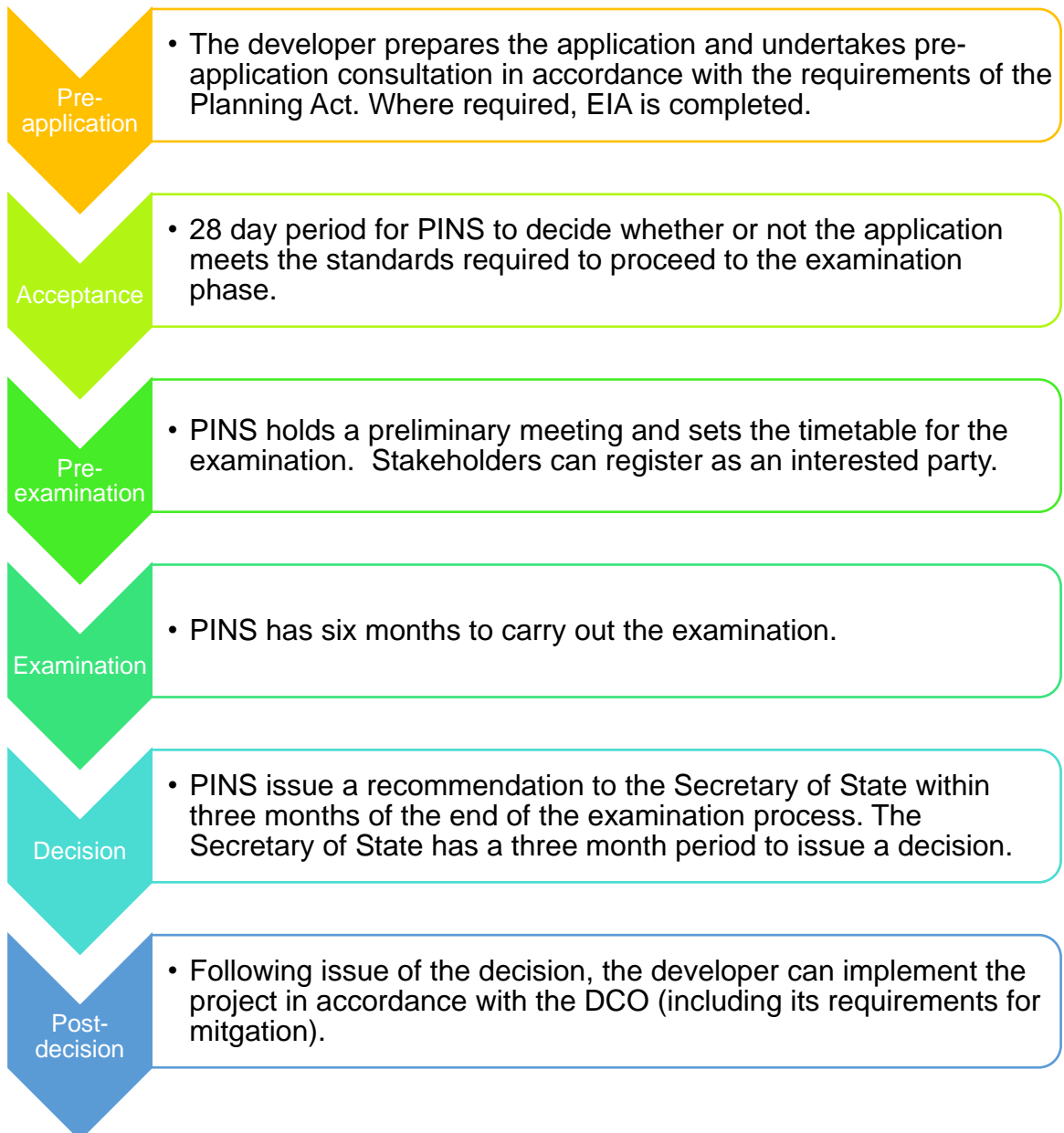
Advice Note Requirement	Location within Scoping Report
The Proposed Development	
An explanation of the approach to addressing uncertainty where it remains in relation to elements of the Proposed Development eg design parameters	Uncertainty is addressed within the methodology section of this report at Chapter 6.
Referenced plans presented at an appropriate scale to convey clearly the information and all known features associated with the Proposed Development	Chapter 5 includes numbered plans (referenced within the text) that illustrate key features of the Project.
EIA Approach and Topic Areas	
An outline of the reasonable alternatives considered and the reasons for selecting the preferred option	Chapter 3 provides an overview of alternatives considered to date and the reasons for selecting the Project.
A summary table depicting each of the aspects and matters that are requested to be scoped out allowing for quick identification of issues	A summary table is provided in Chapter 9.
A detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided	Chapter 7 sets out the proposed scope of the EIA process and details of the elements of topic-specific assessments that are proposed to be scoped out. Chapter 8 sets out details of topics proposed to be scoped out of the EIA process. Appendix 9.1.1 provides further detail regarding the scoping out of matters.
Results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters	Chapter 7 provides an overview of the desktop data and studies undertaken to date.
Aspects and matters to be scoped in, the report should include details of the methods to be used to assess impacts and to determine significance of effect eg criteria for determining sensitivity and magnitude	The overarching approach to evaluating the sensitivity of receptors, magnitude of impact and significance of effects is provided in Chapter 6.
Any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects	Chapter 7 provides an overview of the mitigation proposed, as far as this is known at this stage. The EIA process will lead to the refinement of mitigation measures needed.
Information Sources	
References to any guidance and best practice to be relied upon	Chapters 6 and 7 provides details of good practice guidance. Full references are provided in Chapter 11.
Evidence of agreements reached with consultation bodies (for example the statutory nature conservation bodies or local authorities)	Chapter 7 provides an overview of the consultation undertaken to date for each topic.
An outline of the structure of the proposed ES.	The proposed ES structure is set out in Chapter 10.

2 Consenting Process

2.1 Overview of Consenting Process

2.1.1 As set out in Chapter 1, NSIPs are defined through the Planning Act 2008, as amended. The key stages in the application process are set out in Diagram 2.1.1.

Diagram 2.1.1: Overview of Application Process



2.1.2 EIA is undertaken during the pre-application stage, with the ES submitted as part of the application for development consent.

2.2 Planning Policy

- 2.2.1 This section summarises the key planning policy documents that will inform the EIA process. Further detail on the topic-specific policies within these documents is presented in Appendix 2.2.1.

National Policy

Airports National Policy Statement

- 2.2.2 The Airports National Policy Statement (NPS) (Department for Transport, 2018a) was designated on 26th June 2018 and sets out the primary policy for decision-making in relation to the proposed new runway at Heathrow Airport. The NPS also states that it *'will be an important and relevant consideration in respect of applications for new runway capacity and other airport infrastructure in London and the South east of England.'*
- 2.2.3 Therefore, although it will not form the basis for determination for this Project, the Airports NPS is a relevant consideration for other applications for airports infrastructure in London and the south east of England.

National Policy Statement for National Networks

- 2.2.4 The NPS for National Networks (Department for Transport, 2014) sets out the need for development of road, rail and strategic rail freight interchange projects on the national networks and the policy against which decisions on major road and rail projects will be made.
- 2.2.5 Where relevant, this NPS will be taken into consideration within the EIA process.

National Planning Policy Framework

- 2.2.6 The National Planning Policy Framework (NPPF) was published in 2012 and updated in 2018 and 2019 (Ministry of Housing, Communities and Local Government, 2019a). The NPPF sets out the Government's planning policies for England and how these are to be applied. It states that planning law requires applications to be determined in accordance with the Development Plan for the relevant area unless material considerations indicate otherwise. Paragraph 2 states the NPPF *'... is a material consideration in planning decisions'*.
- 2.2.7 Paragraph 5 states that the NPPF does not contain specific policies for NSIPs. These are to be determined in accordance with the decision-making framework set out in the Planning Act and relevant national policy statements for nationally significant infrastructure, as well as any other matters that are considered both important and relevant (which may include the NPPF). It also states that NPSs form part of the overall framework of national planning policy and may be a material consideration in decisions on planning applications.

National Planning Practice Guidance

- 2.2.8 On 6th March 2014, the then Department for Communities and Local Government (DCLG) (now Ministry of Housing, Communities and Local Government, MHCLG) launched the planning

practice guidance web-based resource. The NPPG provides guidance across a range of topic areas, including in relation to environmental topic areas relevant to the EIA process.

2.2.9 In addition to the above, the following documents provide policy relevant to the Project and will be considered, where appropriate, within the EIA process:

- Aviation Policy Framework (Department for Transport, 2013);
- Beyond the Horizon: The Future of UK Aviation – Making Best Use of Existing Runways (HM Government, 2018b);
- Aviation 2050 – The Future of UK Aviation (HM Government, 2018c); and
- The National Infrastructure Delivery Plan: 2016-2021 (Infrastructure and Projects Authority, 2016).

Local Policy

2.2.10 Table 2.2.1 outlines the key local planning policies which will be considered during the EIA process, where relevant to each environmental topic.

Table 2.2.1: Key Local Planning Policy

Body	Adopted Policy	Emerging Policy
West Sussex County Council	West Sussex Local Transport Plan 2011-2026	Crawley 2035 (Draft Crawley Borough Local Plan 2020-2035)
Surrey County Council	Surrey Local Transport Plan 2011-2026	
Crawley Borough Council	Crawley 2030: Crawley Borough Local Plan 2015-2030	
Reigate and Banstead Borough Council	Reigate and Banstead Borough Local Plan 2005 (saved policies). Reigate and Banstead Local Plan: Core Strategy 2014.	Reigate and Banstead Borough Development Management Plan 2018-2027
Tandridge District Council	Tandridge District Core Strategy 2008. Tandridge Local Plan. Part 2: Detailed Policies 2014-2029	Our Local Plan 2033 (Regulation 22 Submission) 2019
Mid Sussex District Council	Mid Sussex District Plan 2014-2031. Saved Policies from the Mid Sussex Local Plan 2004	
Horsham District Council	Horsham District Planning Framework (excluding South Downs National Park) 2015 Site Specific Allocations of Land	Horsham District Council are updating the Local Plan with a series of consultation events to inform the update.
Mole Valley District Council	Mole Valley Core Strategy 2009 Mole Valley Local Plan 2000	Future Mole Valley 2018-2033

2.2.11 In addition, relevant supplementary planning documents (SPDs) will be considered.

2.3 Consultation Process

2.3.1 Pre-application consultation is an important requirement for development consent applications. It provides an opportunity for interested parties to comment on a project while at a formative stage

and for potential issues to be taken into account and, where necessary, addressed before the application is submitted for examination.

2.3.2 The Planning Act 2008 and the EIA Regulations set out the following requirements for pre-application consultation:

- Notify the Planning Inspectorate of the proposed application;
- Produce a Statement of Community Consultation (SoCC) in consultation with the relevant local authorities, setting out how the applicant proposes to consult the local community about the Project to meet the requirements of Section 47 of the Planning Act 2008;
- Publish the SoCC and undertake community consultation in accordance with the SoCC;
- Identify and consult statutory consultation bodies in accordance with Section 42 of the Planning Act 2008;
- Provide preliminary environmental information in accordance with Regulation 12 of the EIA Regulations to the statutory consultation bodies;
- Ensure sufficient time for consultation with the community and with statutory consultation bodies and have regard to relevant responses to publicity and consultation; and
- Prepare a Consultation Report to accompany the application for development consent, setting out details of the above.

Proposed Approach to Consultation

Gatwick Master Plan

2.3.3 As part of the airport planning process, GAL regularly updates its airport master plan. A draft of the latest master plan was published for consultation in October 2018 (GAL, 2018) and set out the proposals for the airport's ongoing development and sustainable growth. The 12-week public consultation on the master plan ended in January 2019. During the consultation period, GAL held several public exhibitions around the region. Following review of the consultation responses, the Gatwick Airport Master Plan and an associated Consultation Report were published in July 2019 (GAL, 2019a, 2019b).

2.3.4 The 2019 master plan sets out different scenarios as a direct response to the Government's proposal for UK airports to make the best use of their existing runways. The master plan proposes three scenarios: The first continues with the use of a single runway using technology to increase capacity; the second proposes routine use of the existing northern runway alongside the main runway; and the final scenario continues to safeguard land for an additional runway to the south.

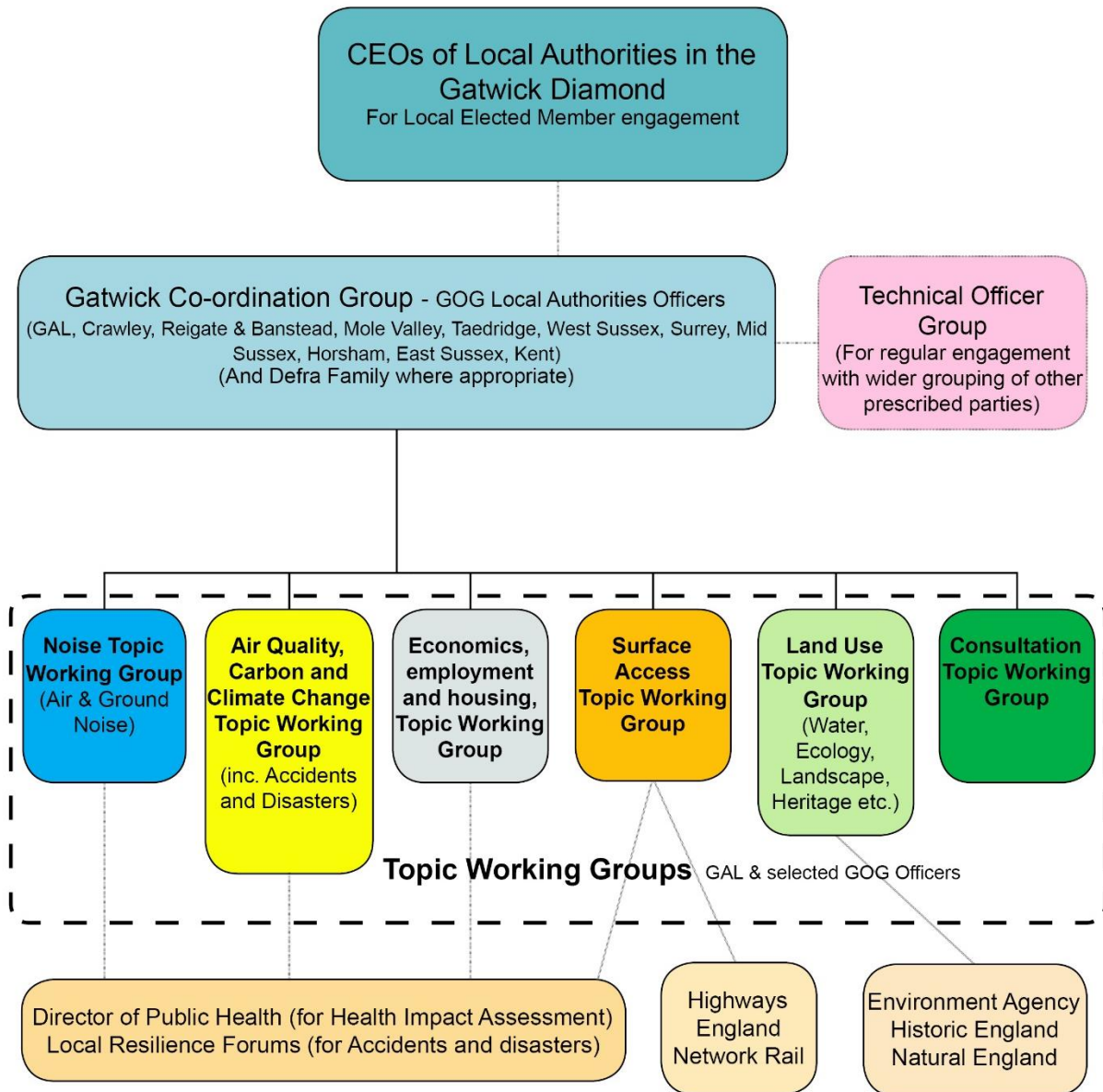
Community Consultation

2.3.5 In accordance with Section 47 of the Planning Act 2008, as amended, GAL will develop a SoCC in consultation with Crawley Borough Council and neighbouring authorities. The SoCC will set out the proposed approach to community consultation during preparation of the application for development consent.

Consultation with Statutory Consultation Bodies

- 2.3.6 This Scoping Report will form the basis of consultation with statutory bodies regarding the proposed scope of the EIA process.
- 2.3.7 GAL already benefits from a number of existing established forums which provide a helpful basis for establishing consultation arrangements with local stakeholders. These forums include a Gatwick Officers Group (GOG) and the Chief Executive Officers of local planning authorities within the Gatwick Diamond area, which comprise officer and member representatives from the following ten County and Borough/District Councils:
- West Sussex;
 - Surrey;
 - East Sussex;
 - Kent;
 - Crawley;
 - Reigate and Banstead;
 - Mole Valley;
 - Tandridge;
 - Horsham; and
 - Mid Sussex.
- 2.3.8 A number of joint meetings have already been held with officer and member representatives from these authorities at which GAL has provided both initial and more detailed briefings on the Project, as well as on the DCO process generally. These meetings have also led into discussions to agree effective and appropriate working arrangements, structures and support for ongoing engagement for the duration of the DCO process.
- 2.3.9 A series of joint Topic Working Groups has been established for detailed engagement with local planning authorities on the Project. Each Topic Working Group comprises representatives from GAL and its consultant team and nominated officers from the above County and Borough/District Councils.
- 2.3.10 Representatives from Government agencies, including the Environment Agency, Historic England, Natural England, Highways England and Network Rail, have also been invited to participate in the relevant topic working groups where appropriate. Local planning authorities are also closely involved in and are taking the lead on some matters related to health, emergency planning and local resilience. This engagement structure facilitates the involvement of Directors of Public Health and Local Resilience Forums.
- 2.3.11 The organisation structure for this engagement is shown schematically in Diagram 2.3.1.
- 2.3.12 The Topic Working Groups will report up to a Co-ordination/Steering Group comprising lead officers from local planning authority management teams and senior representatives from GAL.

Diagram 2.3.1: Proposed Engagement Structure



2.3.13 Alongside the close liaison that is planned with these host and neighbouring authorities, GAL is also in the process of establishing a Technical Officer Group. The purpose of this group is to facilitate engagement and consultation with the wider grouping of prescribed stakeholders required as part of DCO process. This will include engagement with a range of other bodies and parties.

2.3.14 In addition to the meetings held with local authorities, initial consultation has also been undertaken with a number of statutory consultees, including:

- Highways England;
- Environment Agency;
- Natural England;
- Historic England;
- Department for Transport;

- Network Rail; and
- Transport for London.

Table 2.3.1: Summary of Consultation Undertaken to Date

Consultee	Date	Details
Historic England	14 June 2019	Presentation regarding the scope of the heritage assessment that would be undertaken in the event of GAL preparing a DCO for a proposal to make better use of the existing northern runway.
Natural England meeting via Discretionary Advice Service	15 April 2019	Proposed survey methodology with respect to protected species with particular focus on bats discussed.
		Potential scope of Habitats Regulations Assessment, including with respect to effects of changes to air quality on sites in surrounding landscape and effects on Special Areas of Conservation designated for bat interest.
Department for Transport	23 April 2019	Meeting held to discuss master plan scenarios and modelling approach to assess the potential effects on the transport network.
Highways England	Various, early 2019	Various meetings held in early 2019 to discuss master plan scenarios and Highways England expectations around both modelling and testing of effects and potential mitigation on the highway network.
West Sussex County Council	15 April 2019	Meeting held with West Sussex surface access and modelling leads on to discuss master plan scenarios, West Sussex's expectations, a potential modelling approach and study area, including access to the Crawley model network.
Network Rail	13 February 2019	Meeting held with Network Rail on to discuss master plan scenarios and potential impacts on the station, South Terminal and inter-terminal shuttle. Network Rail agreed to release the Legion model used for business case modelling of the station project for use by Gatwick in relation to the DCO.
Transport for London	16 April 2019	Meeting held with Transport for London to discuss master plan scenarios and the approach to modelling and testing effects, including access to the SoLHAM model network.

2.3.15 This consultation will continue throughout the pre-application process and will inform the development of the Project design and the approach to EIA.

Preliminary Environmental Information

2.3.16 Following consultation on this Scoping Report and taking into account the Scoping Opinion provided by the Planning Inspectorate, a Preliminary Environmental Information Report (PEIR) will be prepared to meet the requirements of the EIA Regulations. In addition to the consultation meetings undertaken to date (which will continue through the pre-application phase), the PEIR will form the basis of formal consultation with the statutory consultation bodies. As far as possible, it is proposed that the PEIR will take the form of a draft ES, setting out the findings of surveys and assessments available at the time of publication.

Environmental Statement

- 2.3.17 The ES accompanying the application for development consent will take into consideration, where relevant and practicable, the comments received during consultation with the community, statutory bodies and stakeholders.

2.4 Next Steps

- 2.4.1 Following consultation with local planning authorities, a SoCC will be published, setting out the proposed approach to consultation. Alongside this process, the EIA process will continue, taking into account the responses to this Scoping Report. The preliminary findings of the EIA process will be set out within the PEIR.
- 2.4.2 The details of the Project will be further refined based on the responses to consultation with the community, statutory consultation bodies and stakeholders. The consultation responses will be used to inform the final application for development consent and the ES.
- 2.4.3 The application will be accompanied by a Consultation Report, which will set out details of the consultation undertaken, the responses to consultation and how this has informed the application.

3 Need and Alternatives Considered

3.1 Need for the Project

3.1.1 London is the biggest aviation market in the world in terms of passenger numbers. In 2017/18 the five main London airports handled 171 million passengers (GAL, 2018). This is more than New York, Tokyo or Shanghai, the next three largest markets.

3.1.2 It is recognised that airports in London and the South East of England are increasingly facing longer term capacity issues and, even with a third runway at Heathrow, it is forecast that the London airports system is due to reach maximum capacity by the mid-2030s.

The Aviation Policy Framework

3.1.3 In July 2012, the Government consulted on its future aviation strategy, publishing a draft Aviation Policy Framework document (Department for Transport, 2012). The aim of the framework document was to provide future policy on aviation, alongside any decisions made by the Government in response to the recommendations of the newly formed independent Airports Commission.

3.1.4 Following responses to the draft framework, the Government published the adopted aviation policy framework in July 2013 (Department for Transport, 2013). The framework recognised that the aviation sector contributes significantly to the UK economy. However, it also noted that airports in the south east of England (including Heathrow and Gatwick) face capacity challenges.

3.1.5 The framework identified a number of challenges in the aviation sector, noting that aviation needed to grow, delivering the benefits essential to economic wellbeing, while respecting the environment and protecting quality of life. The framework set out the Government's four main objectives:

- To ensure that the UK's air links continue to make it one of the best connected countries in the world. This includes increasing our links to emerging markets so that that the UK can compete successfully for economic growth opportunities.
- To ensure that the aviation sector makes a significant and cost-effective contribution towards reducing global emissions.
- To limit and where possible reduce the number of people in the UK significantly affected by aircraft noise.
- To encourage the aviation industry and local stakeholders to strengthen and streamline the way in which they work together.

3.1.6 Within these objectives, the framework sets out that a key priority in the short term is to make the best use of existing capacity of UK airports.

3.1.7 The framework will be replaced by the Aviation Strategy, once finalised (see below).

Airports Commission

3.1.8 The independent Airports Commission was set up in 2012 with a brief to find an effective and deliverable solution to London airport capacity problems. A process of evidence gathering was

undertaken, considering airport expansion options, alongside potential economic and environmental implications.

- 3.1.9 The Airports Commission published its final report in July 2015 (Airports Commission, 2015). This report stated that:

'Good aviation connectivity is vital for the UK economy. It promotes trade and inward investment, and is especially crucial for a global city like London. The service sector, whether the City, the media industry or universities, depends heavily on prompt face-to-face contact. There is strong evidence that good transport links, and especially aviation connectivity, make an important contribution to enhancing productivity, which is an important national challenge.'

- 3.1.10 In response, the report recommended:

- The delivery of new capacity through constructing and opening a new runway at Heathrow Airport; and
- Making best use of existing infrastructure at other airports.

National Infrastructure Delivery Plan

- 3.1.11 The first National Infrastructure Plan was published in October 2010 and sought to provide Government's integrated strategy for planning, prioritising, financing and delivering critical infrastructure projects.

- 3.1.12 The National Infrastructure Plan has now been replaced by the National Infrastructure Delivery Plan (Infrastructure and Projects Authority, 2016). This plan set out the following pipeline of airport capacity by 2021-2022:

- A decision on a preferred new runway in the South East and preparation of a new Airports National Policy Statement; and
- New airport infrastructure at Manchester, Luton, Heathrow and Gatwick.

The UK Aviation Strategy

Call for Evidence

- 3.1.13 A first phase of consultation on the emerging aviation strategy commenced in July 2017 with a call for evidence (HM Government, 2017a). The report recognised that aviation is an important part of the Government's future plans and is vital in terms of the perception of the UK across the rest of the world. The report noted that the demand for flights is increasing, with leisure tourism forming a very important part of the aviation market.

Beyond the Horizon, The Future of UK Aviation – Making Best Use of Existing Runways

- 3.1.14 Following the aviation strategy call for evidence in 2017 and further analysis, the Government set out its policy support for airports, beyond Heathrow, to make best use of their existing runways in June 2018 (HM Government, 2018b). This is on the basis that *'updated forecasts [by Department for Transport in 2017] reflect the accelerated growth experienced in recent years and that demand was 9% higher in London in 2016 than the Airports Commission forecast'* (paragraph 1.4).

- 3.1.15 Paragraph 1.5 states that *'The Aviation Strategy call for evidence set out that Government agrees with the Airports Commission's recommendation and was minded to be supportive of all airports who wish to make best use of their existing runways, including those in the South East, subject to environmental issues being addressed...'*
- 3.1.16 Paragraph 1.29 concludes that the government is supportive of airports beyond Heathrow making best use of their existing runways. However, it recognises that the development of airports can have negative as well as positive local impacts, including on noise levels. It therefore suggests that any proposals should be judged by the relevant planning authority, taking careful account of all relevant considerations, particularly economic and environmental impacts and proposed mitigations. The policy statement does not prejudge the decision of those authorities who will be required to give proper consideration to such applications. It instead leaves it up to local, rather than national government, to consider each case on its merits.

Aviation 2050 – The Future of UK Aviation

- 3.1.17 The Government published its consultation paper 'Aviation 2050' in December 2018 (HM Government, 2018c), consultation on which closed on 20 June 2019.
- 3.1.18 The Government has confirmed that its aim is to achieve a *'safe, secure and sustainable aviation sector that meets the needs of consumers and of a global, outwardlooking Britain'*. The strategy is expected to be based around six core objectives which are to:
- Help the aviation industry work for its customers;
 - Ensure a safe and secure way to travel;
 - Build a global and connected Britain;
 - Encourage competitive markets;
 - Support growth while tackling environmental impacts; and
 - Develop innovation, technology and skills.
- 3.1.19 In paragraph 1.3 of Aviation 2050, the Government confirms that *'it supports airports throughout the UK making best use of their existing runways, subject to environmental issues being addressed'*.
- 3.1.20 In relation to need, paragraph 1.20 states that: *'This highlights the need for further capacity - delivered sustainably and in a way that benefits the whole country. The London airport system will be almost entirely full by 2030 without expansion. The Airports Commission estimated that failing to address the need for extra airport capacity could cost passengers £21-23 billion in the form of fare increases and delays, and potentially £30-45 billion to the wider economy.'*
- 3.1.21 Paragraph 1.21 further states that: *'This is why the government is supportive of the development of a third runway at Heathrow Airport, which could deliver up to £74 billion worth of benefits to passengers and the wider economy. It is also supportive of airports throughout the UK making best use of their existing runways, subject to environmental issues being addressed. However, there is a need for clarity on what the future framework will be for providing additional capacity to meet demand, while managing environmental and community impacts.'*
- 3.1.22 The document also concludes at paragraph 3.11 that: *'The government believes that forecasted aviation demand up to 2030 can be met through a Northwest runway at Heathrow and by airports beyond Heathrow making best use of their existing runways subject to environmental issues'*

being addressed. To ensure that this additional capacity delivers the full benefits for the consumer and industry while minimising the negative impacts on local communities, the government proposes to work in partnership with the industry to deliver on a number of policy areas, as set out in this chapter.'

Airports National Policy Statement

- 3.1.23 The Airports NPS confirms Government support for airports beyond Heathrow making best use of existing runways. Section 2 of the NPS sets out the need for additional aviation capacity in the UK, noting that Heathrow Airport is currently the busiest two-runway airport in the world, while Gatwick Airport is the busiest single runway airport. Aviation demand is forecast to increase significantly in the period to 2050 – with demand across airports in the South East of England due to outstrip capacity by at least 34%. This would lead to detrimental effects on the UK economy.
- 3.1.24 The NPS states at paragraph 1.42 that: *'As indicated in paragraph 1.39 above, airports wishing to make more intensive use of existing runways will still need to submit an application for planning permission or development consent to the relevant authority, which should be judged on the application's individual merits. However, in light of the findings of the Airports Commission on the need for more intensive use of existing infrastructure as described at paragraph 1.6 above, the Government accepts that it may well be possible for existing airports to demonstrate sufficient need for their proposals, additional to (or different from) the need which is met by the provision of a Northwest Runway at Heathrow. As indicated in paragraph 1.39 above, the Government's policy on this issue will continue to be considered in the context of developing a new Aviation Strategy.'*
- 3.1.25 Paragraph 2.12 summarises the demand case as follows: *'Aviation demand is likely to increase significantly between now and 2050. All major airports in the South East of England are expected to be full by the mid-2030s, with four out of five full by the mid-2020s. By 2050 demand at these airports is expected to outstrip capacity by at least 34%, even on the department's low demand forecast. There is relatively little scope to redistribute demand away from the region to less heavily utilised capacity elsewhere in the country.'*
- 3.1.26 The NPS concludes at paragraph 2.14 that:
'The consequences of not increasing airport capacity in the South East of England –the 'do nothing' or 'do minimum scenarios' – are detrimental to the UK economy and the UK's hub status. International connectivity will be restricted as capacity restrictions mean airlines prioritise their routes, seeking to maximise their profits. Capacity constraints therefore lead to trade-offs in destinations, and while there is scope to respond to changing demand patterns, this necessarily comes at the expense of other connections. Domestic connectivity into the largest London airports will also decline as competition for slots encourages airlines to prioritise more profitable routes.'

3.2 Alternatives Considered

- 3.2.1 This section provides an overview of the alternatives considered to date. Further details of the options considered and the reasons for the option selected, taking into account environmental effects, will be provided within the PEIR and ES.

Gatwick Airport Master Plan Options

- 3.2.2 As part of the airport planning process, GAL regularly publishes a master plan, setting out long term plans for airport growth and development.
- 3.2.3 As a result of increasing demand, the 2019 master plan (GAL, 2019a) considers the following scenarios:
- Scenario 1: where Gatwick remains a single-runway operation using the existing main runway. This scenario would use technology to increase the capacity of the main runway, leading to incremental growth through more efficient operations;
 - Scenario 2: where the existing northern runway is routinely used together with the main runway; and
 - Scenario 3: where GAL continues to safeguard for an additional runway to the south.

Scenario 1

- 3.2.4 Scenario 1 looks at options to make best use of the existing main runway. This scenario would see passenger throughput increase to approximately 57 to 61 mppa in 2032 through investments in terminal facilities, operational efficiency and resilience, improvements to surface access and car parking and provision of additional commercial facilities.
- 3.2.5 Within this scenario, year on year growth rates would decline as the runway constraints become increasingly binding. Most of the growth would be outside the current peak times and therefore the requirement for additional infrastructure would be relatively modest. With the introduction of quieter aircraft, Gatwick's noise footprint could reduce despite the increase in aircraft movements.
- 3.2.6 Although the airport could grow to provide for up to approximately 61 mppa with the existing single-runway operation, this growth would be constrained at that level by the limits on available runway capacity. The master plan states that:

'Even with a third runway at Heathrow, the DfT [Department for Transport] is forecasting a shortfall in UK airport capacity in 2030 and this shortfall is predicted to increase over the following 20 years. Therefore it is highly likely that by 2032, capacity constraints across the London airport system will mean that some travel demand is unmet, and as a result the UK will lose valuable connectivity to international destinations and markets.'

Scenario 2

- 3.2.7 The existing northern runway at Gatwick was consented in 1979 and is located 198 metres to the north of the main runway. Its use has historically been constrained by a planning condition and an agreement with West Sussex County Council that prevents its use simultaneously with the main runway. The agreement expired in August 2019.
- 3.2.8 Scenario 2 proposes that a strip of additional pavement is laid to the northern edge of the existing northern runway, so as to allow the corresponding adjustment of its centreline north of its current position. This would allow the dual operation of the main runway and northern runway together to achieve higher throughput overall. This is in accordance with Government policy of making best use of existing runways.

- 3.2.9 This option would allow passenger throughput to increase to approximately 68 to 70 mppa by 2032.
- 3.2.10 Within this scenario the airport would remain a two terminal operation (with some requirement for reconfiguration and for new supporting facilities) and would not require changes to flight paths from the current arrangements.

Scenario 3

- 3.2.11 Scenario 3 would continue to safeguard land for an additional runway, to the south of the existing main runway. Department for Transport forecasts show that by 2025, the main London airports, with the exception of Stansted, are expected to reach capacity and that, even with a third runway at Heathrow, UK airport capacity constraints would be apparent by 2030 and beyond. This scenario would accommodate a throughput of approximately 95 mppa and would require more significant changes to the airport and surrounding roads.

Conclusion

- 3.2.12 Gatwick Airport currently contributes £5.3 billion to the UK economy and supports over 85,000 jobs (GAL, 2019a). At peak times, it is the busiest single-runway airport in the world.
- 3.2.13 Since publication of the previous master plan in 2012, Gatwick increased throughput by almost 12 million passengers, a greater increase across the six-year period than any other UK airport. Previous Department for Transport forecasts have underestimated Gatwick's growth, forecasting 34 million passengers for 2017, over 10 million less than were actually handled that year.
- 3.2.14 The growth at Gatwick has been as a result of:
- Increases in the number of passengers per flight (driven by a higher percentage of seats filled and an increase in average aircraft size);
 - Peak spreading – with a higher level of growth in traditionally quieter periods of the year; and
 - Growth in peak runway capacity (number of aircraft movements per hour).
- 3.2.15 A do minimum option (Scenario 1) would restrict future growth and Gatwick's ability to contribute to meeting future demand for increased aviation capacity. This option would not allow Gatwick to maintain best use of its existing runways as only one runway would be operational at any time.
- 3.2.16 GAL is not actively pursuing Scenario 3 in light of the Government's support for the third runway at Heathrow, but considers it to be in the national interest for land to continue to be safeguarded to allow for a new runway to be constructed to the south of the airport, if required in the future.
- 3.2.17 GAL is pursuing Scenario 2 and, therefore, this Scoping Report relates to Scenario 2, given that it results in the following benefits.
- Aligns with Government policy of making best use of existing runways at all UK airports.
 - In comparison to the existing situation and Scenario 1, provides greater UK point-to-point airport capacity to assist in delivering unmet Department for Transport-forecasted aviation demand to 2050, whilst complementing the UK hub capacity provided by the expansion of Heathrow with a third runway.

- An increase in flights, improved connectivity, increased employment and economic benefits to the local area with a much reduced scale of environmental impact compared to that arising from an additional new runway (Scenario 3).
- Creates economic benefits to the national, regional, and London economies, including through supporting inward investment for business travellers, and tourism.
- Provides additional operational resilience for the airport with the flexibility to routinely use two runways whilst minimising growth outside of the airport boundary.
- Does not prejudice the long-term safeguarding, in accordance with national policy, of the land to the south of the airport for a future additional runway.
- Delivers significant local economic benefits, including further employment and training opportunities for local people, supply chain opportunities for local businesses, increased local retail and leisure expenditure, and other economic stimuli to the local area.

3.2.18 Overall, it is considered that Scenario 2 offers a sustainable approach to providing greater operational resilience both at Gatwick Airport and improved UK airport capacity.

Alternative Design and Technology Options

3.2.19 Making best use of the two existing runways at Gatwick Airport requires alterations to the northern runway to provide an appropriate separation distance of 210 metres from the main runway. In turn, this requires relocation of a number of other airfield facilities. In addition, the Project would require amendments to be made to both airside and landside elements of Gatwick Airport, in order to accommodate the increase in aircraft and passenger throughput.

3.2.20 The development of the design for the Project is iterative and will continue to form a key part of the EIA process. To date, the design has been informed by a number of existing constraints, including:

- The location and layout of existing airport facilities;
- Operational airport constraints, such as height restrictions for buildings on or close to flightpaths;
- The availability of land within the existing airport and the desire to minimise land take outside the existing airport boundary, as far as practicable;
- The location of existing infrastructure, including the highway network and junctions; and
- The location of existing environmental receptors, including watercourses.

3.2.21 In order to secure aerodrome license and certification, airports need to demonstrate they comply with CAA and European Aviation Safety Agency regulations and specifications as well as International Civil Aviation Organization (ICAO) design recommendations or seek exceptions in the form of deviations from the standard. Below are the main documents that influence design through physical/technical requirements or recommendations for design of aerodromes, runways, taxiways, aprons, aeronautical equipment and other airfield infrastructure:

- Aerodrome Design Manual - Document 9157 (ICAO, 2006);
- Annex 14 to the Convention on International Civil Aviation: Aerodromes (ICAO, 2018);
- Commission Regulation (EU) 139/2014; and
- CAP 168: Licensing of Aerodromes (CAA, 2019b).

3.2.22 The design process remains ongoing and future design or technology options for elements of the

Project will be evaluated taking into account environmental, planning, cost, engineering and safety considerations. Where options have been considered, the alternatives chapter of the PEIR/ES will clearly set out the reasons for the selection of the preferred option, taking into account environmental effects.

4 Existing Site and Operation

4.1 Introduction

4.1.1 This chapter provides an overview of the existing airport, including its operations, and the key changes that are currently proposed in the absence of the Project (in the do minimum scenario).

4.2 Gatwick Airport

4.2.1 London Gatwick became an aerodrome in the 1930s and was formally opened as a passenger airport in 1958. Since this time, passenger numbers have grown to over 46 mppa. During 2018, Gatwick served more destinations than any other UK airport and accommodated the following:

- Total passengers: Approximately 46 million;
- Aircraft movements: 284,000; and
- Total cargo: 157,000 tonnes.

4.2.2 The operation at Gatwick Airport is served by a single main runway and two terminals: North Terminal and South Terminal. When the main runway is unavailable, the existing northern runway is used. The northern runway was used for 3,543 air transport movements in 2018.

4.2.3 The extent of the Gatwick Airport boundary is presented in Figure 4.2.1.

Existing Runway Provision

4.2.4 Gatwick's main runway is designated 08R/26L such that when the wind is from the east, aircraft using the runway operate on a heading of 80°, while when the wind is from the west, aircraft operate on a heading of 260°. The 'L' and 'R' annotation is to be read as 'Left' or 'Right', as when pilots approach the active runway, it will appear in their field of view as the left or right of a marked pair of runways. Due to the prevailing wind conditions, the runway is used in the westerly (260°) direction for approximately 75% of the time in a typical year (although this varies year on year). The runway is an instrument runway, measuring approximately 3.3 km in length and a minimum of 45 metres in width, plus runway shoulders.

4.2.5 The existing northern runway is designated 08L/26R. As with the main runway, aircraft operate on a heading of 80° when the wind is from the east, and on a heading of 260° when the wind is from the west. The runway is currently a non-instrument runway, measuring approximately 2.6 km in length and a minimum of 45 metres in width, plus runway shoulders. When not in use as a runway, the existing northern runway is used as a parallel taxiway for the main runway.

Taxiways

4.2.6 The existing Taxiway Juliet provides a northern parallel taxiway to the north of the northern runway. In addition, the airfield includes:

- A network of taxiways to the north of Taxiway Juliet, providing the ability for aircraft to move around the airfield and access the existing piers, stands, Taxiway Juliet and the runways;
- Exit taxiways between the main runway and the existing northern runway; and
- Taxiways between Taxiway Juliet and the existing northern runway.

Terminals, Piers and Stands

- 4.2.7 Gatwick Airport has two passenger terminals; North Terminal, which opened in 1988, and South Terminal, which opened in 1958. The existing terminals have gross floor areas of approximately 98,100 m² and 119,300 m² respectively. This includes facilities such as:
- Check-in desks;
 - Security;
 - Departure lounge;
 - Outbound baggage;
 - Gates;
 - Air bridges;
 - Immigration; and
 - Arrival baggage.
- 4.2.8 The two terminals are linked by an automatic tracked transit system with journey times between the two of approximately two minutes.
- 4.2.9 In addition, the terminals include offices, shops, restaurants, welfare facilities, baggage handling facilities, boilers and chillers.
- 4.2.10 Gatwick Airport currently supports six piers from which passengers embark and disembark aircraft (Piers 1, 2 and 3 at South Terminal and Piers 4, 5 and 6 at North Terminal). The number of aircraft stands serviced by each pier is dependent on the type and size of aircraft.

Existing Airfield and Supporting Facilities

- 4.2.11 The existing airport includes a number of facilities required to support operation of the airfield, including:
- Central Area Recycling Enclosure (CARE);
 - Motor Transport, Surface Transport and ground maintenance facilities;
 - Cargo facilities;
 - Instrument Landing System (ILS) localisers;
 - Airport fire station;
 - Fire training ground;
 - Aircraft hangars;
 - Air traffic control tower;
 - Noise mitigation, including the existing bund and noise wall;
 - Internal access routes; and
 - A fuel storage area (known as the fuel farm).
- 4.2.12 The existing cargo facility occupies an area of approximately 10 hectares, including 23,000 m² of cargo sheds, with office accommodation and areas for heavy goods vehicle (HGV) loading, unloading and parking.
- 4.2.13 British Airways operates one hangar south of the main runway. In addition, there are currently two hangars to the north of the runway (operated by Virgin Atlantic and easyJet). An additional two-bay hangar is currently under construction by Boeing.

Hotels, Commercial Facilities and Car Parking

- 4.2.14 Existing hotels at Gatwick Airport provide approximately 3,000 rooms (combined). The hotels include:
- BLOC – South Terminal;
 - Hampton by Hilton – North Terminal;
 - Hilton London Gatwick – South Terminal;
 - Premier Inn – North Terminal;
 - Sofitel London Gatwick – North Terminal;
 - Courtyard Marriott – South Terminal; and
 - YOTELAIR – South Terminal.
- 4.2.15 Existing main office facilities within the airport provide approximately 31,770 m² of floorspace.
- 4.2.16 A range of on airport car parking is currently provided, including short stay, long stay and staff parking. Approximately 46,700 parking spaces were available in summer 2018 within the airport boundary.

Surface Access

Highways Connections

- 4.2.17 Gatwick Airport is directly connected to the M23 via the M23 spur road, approximately 25 miles south of central London.
- 4.2.18 The South Terminal junction (M23 Junction 9A) currently consists of a three-arm at grade roundabout, with the M23 spur approaching from the east and Airport Way from the west. The southern arm of the roundabout provides access to the South Terminal, car parking and hotels and offices.
- 4.2.19 The North Terminal roundabout is the entry point to the North Terminal and local access roads, including the north and east perimeter roads. The existing layout consists of a circular five-arm at grade roundabout to the north east of the North Terminal, to the south west of the A23.

Gatwick Station

- 4.2.20 Gatwick's railway station is located at the South Terminal. There is a direct transit link from the railway station to the North Terminal. The station provides over 120 direct rail connections, including direct trains to central London. These include the Gatwick Express service to London Victoria as well as the Southern and Thameslink networks. The station serves over 20 million journeys per year.

Shuttle Service

- 4.2.21 The two terminals are connected by an Inter-Terminal Transit System (ITTS), an automated people mover (monorail shuttle service). This currently operates two three-car trains every few minutes between the terminals.

Bus Services

4.2.22 Both terminals provide access to local and regional bus and coach services.

Surface and Foul Water Drainage

4.2.23 Within the airport, surface water is managed through existing Ponds A to G and Dog Kennel Pond. Rainfall runoff from the airport generally drains via attenuation ponds and pollution control structures to one of three watercourses: Crawler's Brook, Gatwick Stream and the River Mole, in accordance with existing discharge consents.

4.2.24 Foul water currently passes to the Crawley Sewage Treatment Works to the south east of the airport or Horley Sewage Treatment Works to the north east of the airport.

Existing Operation and Maintenance

4.2.25 Approximately 24,000 staff work at the airport, of which approximately 3,000 are employed directly by GAL.

4.3 Proposed/Consented Projects

4.3.1 The following projects are proposed or have already been consented and would proceed in the short term, in the absence of the Project.

Airfield Facilities

4.3.2 As part of already committed airport improvements, a western extension to Pier 6 is expected to commence towards the end of 2019. The Pier 6 extension will increase the number of pier-served stands.

4.3.3 A number of existing remote stands would be temporarily converted to 'push and hold' stands. This would allow departing aircraft to push back on schedule and taxi to the new stands as an intermediate holding point, close to the runway, freeing up the pier-served stands for other flights.

4.3.4 In addition to the above, normal operation and maintenance of the main runway would require the following:

- Resurfacing of the main runway in accordance with the usual maintenance schedule; and
- Replacement of the ILS localisers.

4.3.5 As set out above, a new hangar currently is currently being constructed by Boeing in the north west part of the airport and is expected to be completed later in 2019.

Car Parking

4.3.6 A number of new car parks are proposed for implementation in the absence of the Project. These include the following:

- New multi-storey car parking capacity: 4,250 spaces; and
- Use of robotics technology within existing long stay parking areas, resulting in an additional 2,500 spaces.

Highways

- 4.3.7 Proposed highway improvements include local widening on the junction entry/exit lanes for both the North Terminal and South Terminal roundabouts, together with signalisation of the roundabouts and provision of enhanced signage.

Hotel and Commercial Facilities

- 4.3.8 A number of facilities are planned for implementation in the absence of the Project, including:
- Extension to the existing BLOC hotel (approximately 200 additional bedrooms); and
 - Reconfiguration of the existing Hilton hotel to provide 50 additional bedrooms.

4.4 Projects Undertaken by Others

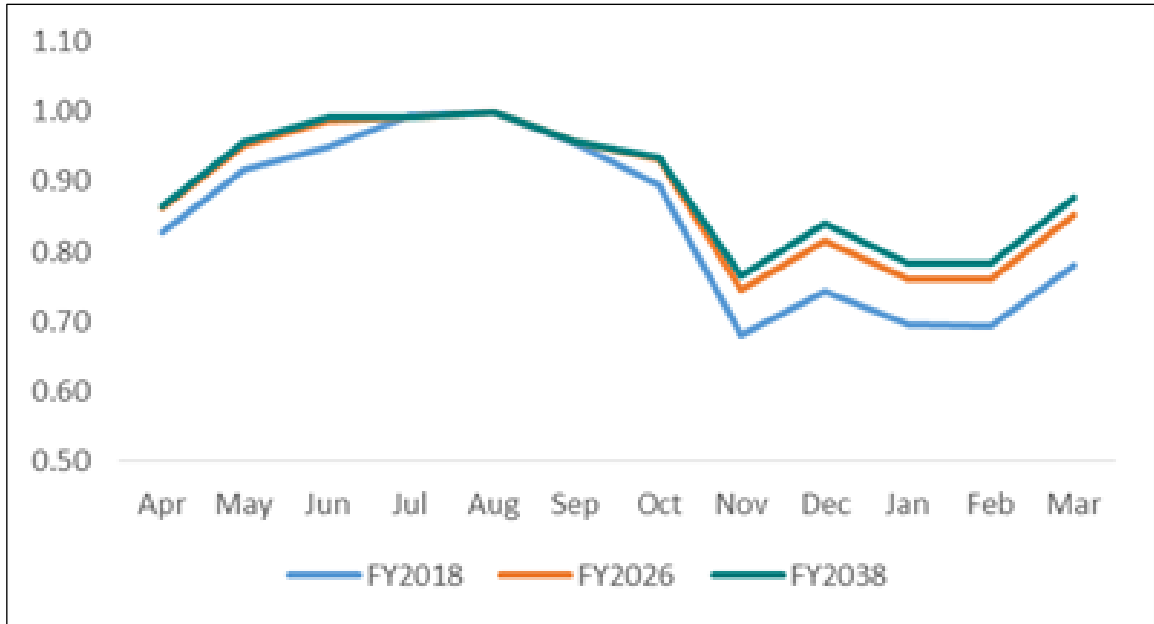
- 4.4.1 Highways England are currently working to provide the M23 Smart Motorway project, with work due to be completed by Spring 2020. This will add an extra running lane between M23 Junctions 8 and 10 and on the westbound M23 Spur from Junction 9 to 9a.
- 4.4.2 Improvements to Gatwick Station are the subject of a separate consenting process, with consent granted in March 2019. The application includes an upgrade to almost double the size of the station concourse and provides additional lifts and escalators, improving access to platforms and the passenger experience. The enhancement would provide for further growth in rail passengers and mode share. These improvements are proposed to be in place prior to operation of the Project.

4.5 Predicted Future Changes in Passenger and Cargo Throughput

- 4.5.1 As set out in Chapter 3, it is anticipated that by 2038, improvements could increase the airport passenger to approximately 61 mppa. Three main factors influencing the predicted change in future passenger numbers include:
- Slots per hour: Whilst GAL is anticipating only minor changes in the number of daily aircraft movements during current peak summer months (July to September), during the off peak periods – the shoulder months of summer (April to June and October) and in the winter (November to March) – the number of daily aircraft movements are expected to increase by greater amounts.
 - Up-gauging of aircraft fleets with larger aircraft: reflecting the trend for airlines to up-gauge their fleets with larger aircraft and more seats.
 - Increased load factors: an increase in the average occupancy levels of flights.
- 4.5.2 These changes are illustrated in Diagram 4.5.1, Diagram 4.5.2 and Diagram 4.5.3. These diagrams are based on financial year figures for 2018, with predictions made for 2026 and 2038. The predicted figures are forecasts provided by GAL's forecasting consultant ICF, and assume a third runway at Heathrow becomes operational in 2030.
- 4.5.3 Diagram 4.5.1 shows the number of Air Transport Movements (ATMs) per month in comparison to August for 2018 (existing) and for the future baseline situations in 2026 and 2038. It can be seen that growth in monthly ATMs will occur during the November to March period, combined

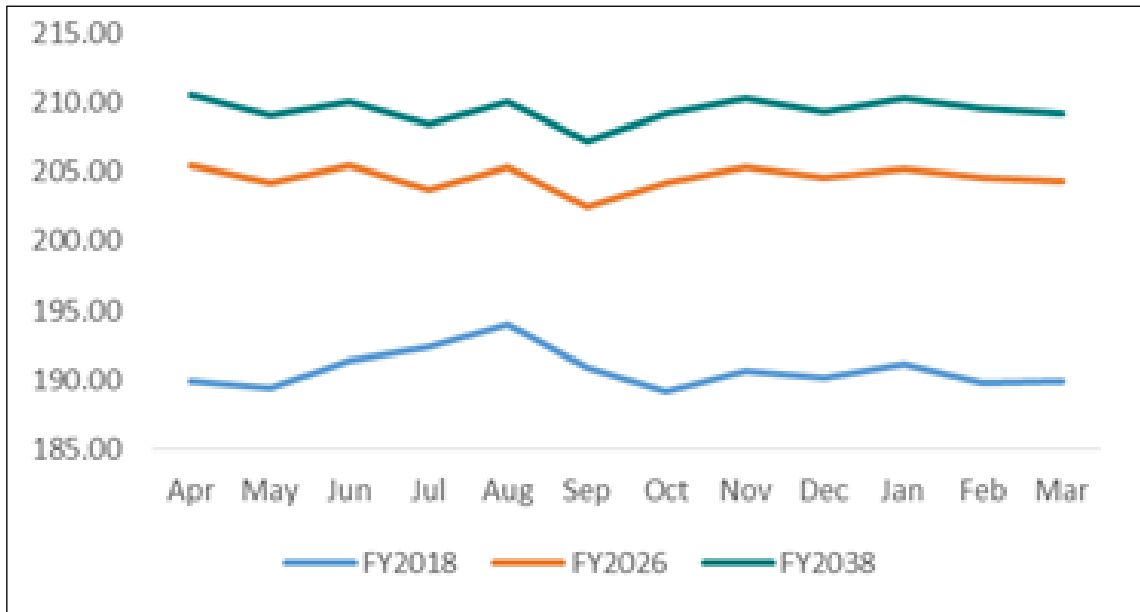
with some greater utilisation of spare capacity in the shoulder months of October and April, May and June.

Diagram 4.5.1: ATMs per Month



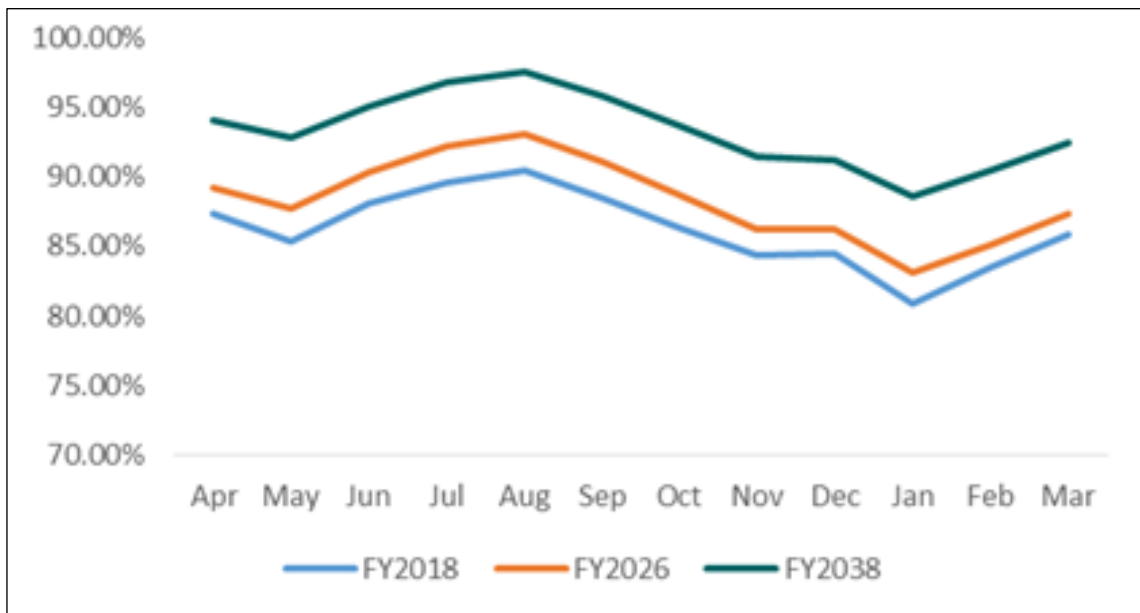
4.5.4 Diagram 4.5.2 shows the number of seats per ATM on a monthly basis. The predicted growth in the number of seats per plane is supported by changes to aircraft fleet, with an increase in the average number of seats per ATM rising from 190 in 2018 to 210 by 2038. This growth is forecast to be driven by the fleet plans of operators. For example, easyJet moving towards a fleet comprising the larger the A320 and A321 (with 186 and 235 seats respectively) from the current A319 (156 seats) and A320 fleet. Similarly, British Airways is likely to continue densifying their fleet configuration on Boeing 777 fleet from the current 220/275 seat aircraft towards a 336 seat configuration.

Diagram 4.5.2: Average Number of Seats per ATM (Monthly)



4.5.5 Alongside the increased average aircraft size, Diagram 4.5.3 shows the predicted increases average in load factors. Current average load factors in the range of 80-90% (averaging 93.8%) in 2038.

Diagram 4.5.3: Average Aircraft Passenger Load Factors



4.5.6 In addition to the changes in passenger numbers, cargo throughput is also predicted to increase. Based on the future predicted mix of aircraft types and the amount of cargo that is carried in the belly holds of passenger aircraft, it is predicted that cargo throughput will increase from 157,500 tonnes in 2018 to some 227,100 tonnes in 2038.

4.6 Summary of Key Parameters

4.6.1 Table 4.6.1 provides a summary of the key parameters associated with the existing airport.

Table 4.6.1: Summary of Key Parameters

Element	Key Parameter
Existing Gatwick Airport land ownership	760 hectares
Existing airport passenger throughput (2018)	46 mppa
Airport passenger throughput (with proposed/consented projects)	61 mppa
Existing air transport movements	284,000
Passenger air transport movements (with proposed/consented projects: 2038)	312,400
Utilisation of existing northern runway (number air transport movements - 2018)	3,543
Existing cargo	157,500 tonnes
Cargo (with proposed/consented projects: 2038)	227,100 tonnes
Main runway	3.3 km x 45 m (plus shoulders)
Existing northern runway	2.6 km x 45 m (plus shoulders)
Existing number of piers	6
Number of piers (with proposed/consented projects)	6 (with extension to existing Pier 6)
Approx. existing on airport car parking (including staff parking)	46,700 spaces
Approx. airport car parking (with proposed/consented projects)	53,450 spaces
Existing terminal floorspace: North Terminal	98,100 m ²
Existing terminal floorspace: South Terminal	119,300 m ²
Maximum height of terminal building: North Terminal	32 metres
Maximum height of terminal building: South Terminal	40 metres
Existing hotel rooms	3,000
Hotel bed spaces (with proposed/consented projects)	3,250 (additional 250 beds)
Existing office floor space (in main office buildings)	31,770 m ²
Office floor space (with proposed/consented projects)	31,770 m ²

5 Project Description

5.1 Introduction

5.1.1 This chapter provides a description of the Project, as far as it is known to date, and forms the basis for the scoping process. It provides a description of the key components of the Project, including an overview of the approach to construction.

5.2 Overview of the Project

Key Components of the Project

5.2.1 The Project proposes alterations to the existing northern runway which, along with lifting the current restrictions on its use, would enable dual runway operations. This would allow a higher overall throughput so that Gatwick can make best use of its existing runways. The airfield elements include alterations to the existing northern runway to enable dual runway operations, and corresponding enhancements to the taxiway system and parking stands to accommodate more aircraft movements. Other elements of the Project enable the increased airfield capacity to be realised so that passengers can access the airport efficiently, with good levels of customer service and so that environmental effects are mitigated.

5.2.2 As described in Section 1.3, the Project includes the following key components:

- Amendments to the existing northern runway, including repositioning its centreline 12 metres further north to enable dual runway operations;
- Reconfiguration of taxiways;
- Pier and stand alterations (including a proposed new pier);
- Reconfiguration of other airfield facilities;
- Extensions to the North and South Terminals;
- Provision of additional hotel and office space;
- Provision of reconfigured car parking, including new surface and multi-storey car parks;
- Surface access (including highway) improvements;
- Reconfiguration of existing utilities, including surface water, foul drainage and power; and
- Landscape/ecological planting and environmental mitigation.

5.2.3 The land subject to the application for development consent extends to approximately 838 hectares, of which approximately 760 hectares lies within the ownership of GAL. The Project site boundary is shown on Figure 1.3.1. The key elements of the Project are shown on Figure 5.2.1 (a to g). Further details of the key components are provided below.

Changes to Enable Dual Runway Operations

5.2.4 The resulting operation would result in:

- All arrivals using the existing main runway;
- Shared departures between the existing main runway and the northern runway; and
- Controlled dependency between the two runways to enable safe crossing of the northern runway by arrivals.

- 5.2.5 It is anticipated that by 2038 this could increase Gatwick's passenger throughput to approximately 74 mppa, compared to a maximum potential passenger throughput based on existing facilities (with proposed/consented projects) of 61 mppa. This represents an increase in capacity of approximately 13 mppa.

Alterations to the Existing Northern Runway

- 5.2.6 The existing northern runway would be adjusted to reposition the centreline 12 metres further north and ensure a separation distance of 210 metres between it and the main runway, the distance required to meet European Aviation Safety Agency standards for closely spaced parallel runways. The altered northern runway would retain a width of 45 metres with 7.5 metre wide shoulders.
- 5.2.7 The redundant 12 metre strip to the south of the altered northern runway would be removed. The 33 metre wide section of retained existing runway, together with the 12 metres to the north, would be resurfaced and provided with new markings to form the altered northern runway.

Reconfiguration of Taxiways

- 5.2.8 The existing taxiways would require amendment and realignment in order to accommodate the altered northern runway and to provide sufficient room for safe manoeuvre of aircraft associated with both runways. These works (see Figure 5.2.1a) are anticipated to include:
- Relocation of the existing Taxiway Juliet to the north of its existing location in order to allow aircraft to use this taxiway independently of northern runway operations;
 - Provision of a new spur to the north of Taxiway Juliet in order to provide a passing lane and allow air traffic control to effectively sequence aircraft for departure;
 - Reconfiguration of an existing apron area to the north of Taxiway Juliet to provide a holding area for aircraft, creating a hold point for the northern runway and removing aircraft from busy taxiways;
 - Modifications to the existing Taxiways Lima and Tango in order to create independence from the northern runway for large aircraft;
 - Reconfiguration of Taxiways Whiskey, Victor and Zulu;
 - Four additional new runway exits between the northern runway and Taxiway Juliet to allow aircraft to be able to move from the main and northern runways to Taxiway Juliet;
 - Eight new exit taxiways from the main runway, including seven to allow arriving aircraft to hold before crossing the northern runway, under the direction of air traffic control and a new exit taxiway to the end around taxiway west; and
 - Amendments to existing infrastructure in order to provide end around taxiways (at the end of both runways) to allow large aircraft to cross the end of the runway under the direction of air traffic control.
- 5.2.9 Redundant areas of hardstanding would be removed.

Pier and Stand Amendments

- 5.2.10 Gatwick Airport currently supports six piers (Piers 1, 2 and 3 at the South Terminal and Piers 4, 5 and 6 at the North Terminal; Figure 5.2.1a). As part of already committed airport improvements,

construction work on a western extension to Pier 6 is expected to commence towards the end of 2019.

- 5.2.11 As part of the Project, a new Pier 7 is proposed to the north west of Pier 6, adjacent to the existing cargo facility. The new Pier 7 building would consist of a ground floor plus two levels (arrivals and departure), including inbound and outbound autonomous transport lobbies (ground level) and a gate room at each gate together with limited commercial and goods in/waste away facilities.
- 5.2.12 Pier 7 would occupy an area of approximately 10.1 hectares, with a maximum building height of approximately 18 metres.
- 5.2.13 New stands would be provided to serve Pier 7. In addition, amendments would be made elsewhere within the airfield layout to provide a new area of remote stands, additional intermediate hold stands and reconfiguration of existing stand areas to accommodate the changes to the airfield.

Reconfiguration of Existing Airport Facilities

- 5.2.14 A number of existing facilities would require reconfiguration, relocation or additional facilities to be provided, to accommodate the proposed changes to the airport. This would comprise construction of new facilities and demolition of existing facilities, including:
- Central airfield maintenance and recycling facilities;
 - Cargo facilities;
 - Fire training ground and satellite airport fire service provision;
 - Hangars;
 - Provision of perimeter boundary treatments to mitigate noise (eg noise walls and bunding); and
 - Internal access routes and forecourts.
- 5.2.15 These are described further in turn below.

Central Airfield Maintenance and Recycling Facilities

CARE Facilities

- 5.2.16 The existing Central Area Recycling Enclosure (CARE) facilities are located within an area of the existing airfield to the north of Taxiway Juliet. Facilities include the existing waste processing building, compound area and bin store.
- 5.2.17 The CARE facility is proposed to be relocated to the north western part of the airport. The relocated CARE facility would process airport waste and is likely to include:
- One replacement/relocated and one additional biomass boiler or alternative on-site process to manage organic matter;
 - A material recovery facility (MRF) to allow sorting of waste;
 - Card baling facilities;
 - Vehicle weigh in/weigh out platform;
 - Office accommodation and welfare facilities; and

- Hard standing area for recycling storage, quarantine area and manoeuvring area for supplier collection vehicles and vehicle movements.

5.2.18 The proposed CARE building is likely to occupy an area of approximately 4,300 m², within a compound of approximately 21,600 m². The building would be up to approximately 22 metres in height above ground level and could be up to approximately 5 metres below ground level. The biomass boiler flue heights are likely to be up to approximately 50 metres above ground level.

Motor Transport Facilities

5.2.19 The existing motor transport (MT) maintenance facilities are also located to the north of Taxiway Juliet and are proposed to be relocated to the north western part of the airport.

5.2.20 The proposed replacement motor transport facility would provide facilities for vehicle servicing and maintenance, including an HGV refuelling area and vehicle wash area. The building(s) and compound would occupy an area of approximately 15,600 m², with a maximum building height of approximately 15 metres above ground level and could be up to approximately 5 metres below ground level.

Grounds Maintenance Facilities

5.2.21 The existing grounds maintenance facility would be relocated to an area of hardstanding in the south eastern part of the airport. New buildings would include an open vehicle storage shed, closed tool shed, hazardous substances unit and a portacabin style office/welfare area. The new buildings would be demountable. A yard would be required with sufficient space to park and turn vehicles, together with a green compost area. This would be located within an area of approximately 1,230 m², with a maximum building height of 8 metres.

Airfield Surface Transport Facilities

5.2.22 The existing surface transport (ST) facility would be relocated to an area of hardstanding in the south eastern part of the airport. New buildings would include open storage and vehicle sheds, a grit and salt store, together with a parking and vehicle manoeuvring area. This would be located within an area of approximately 1,440 m², with a maximum building height of approximately 15 metres above ground level and could be up to approximately 5 metres below ground level.

Emergency Air Traffic Control Tower

5.2.23 The former/emergency air traffic control tower is currently located within the Cuckoo area south of the existing Virgin hangar and to the west of the surface transport and grounds maintenance facility. This former tower is proposed for demolition.

Cargo

5.2.24 The existing cargo facility (including cargo hall) occupies an area of approximately 10 hectares, including approximately 23,000 m² of cargo sheds, with office accommodation and areas for HGV loading, unloading and parking. It is not currently used to its maximum potential efficiency.

5.2.25 The existing facility has sufficient area to accommodate the existing and increased cargo throughput that the Project is forecast to generate, although some internal operational changes

within the facility are proposed to improve efficiency. These would not require changes to the external appearance, height or floor area of any existing buildings or structures.

Engine Running Areas

- 5.2.26 Aircraft engine running for test and maintenance purposes is facilitated in a number of locations around the airport, two of which would be affected by the reconfigured airfield facilities forming part of the Project. Alternative locations for engine ground running are proposed on the Taxiway Juliet West Spur and on Taxiway Juliet close to the current areas.

Fire Training Ground

- 5.2.27 The Project requires the relocation of the existing fire training ground in order to allow for the reconfigured Taxiway Juliet. The fire training ground currently occupies an area of approximately 13,050 m² in the western part of the airfield, to the north of the existing northern runway. The facility allows for rescue and firefighting training to ensure maintenance of competency and skills.
- 5.2.28 It is proposed that the fire training ground be re-provided to the north of its existing location, occupying a consolidated area of approximately 12,000 m². The maximum building height is anticipated to be up to approximately 9 metres, with tank depths of up to approximately 5 metres below ground level.

Satellite Airport Fire Service Provision

- 5.2.29 Dependant on safety case requirements, the Project may require a satellite Airport Fire Service (AFS) facility to the south of the main runway in order to meet aerodrome licensing conditions. The facility would include hardstanding provision for a fire appliance with direct access to the taxiway system to meet response objectives. The facility would be located within an area of approximately 8,000 m², with a maximum built height of approximately 15 metres.

Hangars

- 5.2.30 A hangar is currently being constructed by Boeing in the north west part of the airport and is expected to be completed later in 2019. One additional hangar would be required as part of the Project. This is also proposed to be located in the north western part of the airport. The hangar would be located within an area of approximately 8,160 m² and would be up to approximately 32 metres high (the same height as the Boeing hangar).
- 5.2.31 In addition, the existing Virgin hangar in the north west part of the airport would require minor modifications to its existing infrastructure and pavement.

Perimeter Boundary Treatments to Mitigate Noise

- 5.2.32 The Project would remove an existing noise bund in the western end of the airfield which attenuates noise from taxiing aircraft to external areas. The functionality of the bund would be re-provided in the proposed design, potentially in the form of a new bund or barrier in this area.

Internal Access Routes

- 5.2.33 The existing Larkins Road within the airport boundary would require realignment to accommodate the extension to Taxiway Lima. The realigned route would remain within the existing airport boundary.
- 5.2.34 A safe airside route for autonomous vehicles would be provided to allow travel to the new Pier 7 from the terminal buildings.
- 5.2.35 A new east-west access track is proposed between the main runway and the altered northern runway, suitable for use by light vehicles in order to allow aerodrome compliance inspections.
- 5.2.36 In addition, existing exit lanes from the secure airside area may require reconfiguration to allow vehicular entry, in order to ensure there are sufficient vehicle entry points from landside to airside.

Extensions to North and South Terminals

- 5.2.37 Extensions to the existing North and South Terminals would be required to accommodate passenger growth. In addition, some internal changes are proposed within the terminals to allow for changes in technology and innovative approaches to passenger experience and baggage handling.

North Terminal

- 5.2.38 Works to the North Terminal would include:
- An extension to the International Departure Lounge (IDL), occupying a footprint of approximately 4,150 m² and resulting in additional floorspace of approximately 9,000 m² over three levels to provide a mix of retail, catering and general circulation space. The extension would be up to approximately 27 metres in height (above ground level);
 - An extension to the baggage hall (providing baggage handling facilities), occupying a footprint of approximately 3,500 m² across two storeys. The extension would be up to approximately 12 metres in height (above ground level);
 - An extension to baggage reclaim with a footprint of approximately 650 m². The extension would be up to approximately 7 metres in height (above ground level);
 - Internal reconfiguration works to facilities such as check in zones, baggage systems and security; and
 - Provision of a two-storey transition space to allow passengers to connect to a new autonomous vehicle facility, providing connections to the new Pier 7.

South Terminal

- 5.2.39 Works to the South Terminal would include:
- An extension to the IDL, occupying a footprint of approximately 3,640 m² and resulting in additional floorspace of approximately 14,000 m² over four levels to provide a mix of retail, catering and general circulation space. The extension would be up to approximately 29 metres in height (above ground level);
 - Internal reconfiguration works to facilities such as check in zones, baggage systems and security; and

- Provision of a two-storey transition space to allow passengers to connect to a new autonomous vehicle facility, providing connections to the new Pier 7.

Forecourts

- 5.2.40 The forecourts and approaches to both existing terminals would be enhanced, with routes providing access to the terminal frontage, multi-storey and long stay car parks, hotels and pick-up and drop-off areas for different transport modes. The way in which access is managed for different modes may change in order to optimise the use of available capacity.

Hotel and Commercial Facilities

- 5.2.41 In order to accommodate the increase in passenger numbers, the following hotel and commercial facilities are proposed:
- One new South Terminal hotel (up to 400 bedrooms);
 - One new North Terminal hotel (up to 400 bedrooms);
 - One new hotel at the current car rental location (South Terminal); and
 - Up to two new office blocks to serve internal airport uses. These would be up to approximately 27 metres high within an area of approximately 3,774 m². The new offices would provide approximately 8,920 m² of floor space.

Car Parking

- 5.2.42 As set out in Chapter 4, additional parking is proposed in the absence of the Project (including new multi-storey car park provision and the use of robotics technology). This would take the future car parking provision to approximately 53,450 spaces in the absence of the Project.
- 5.2.43 New car parking would be required on site in order to meet additional parking demand generated by the proposed increase in passengers, and to replace existing parking spaces that would be lost due to development associated with the Project. The plans also take into account an anticipated reduction in the number of spaces currently provided in unauthorised car parking sites away from the airport. The overall net increase in car parking spaces would be approximately 17,500. The maximum height of the proposed new multi-storey car parking is anticipated to be approximately 27 metres.

Surface Access Improvements

- 5.2.44 In order to accommodate the proposed increase in passenger numbers, and taking into account other known and planned developments in the area, improvements are likely to be required to both the South Terminal and North Terminal roundabouts to add capacity. The design and details of any improvements will be subject to road traffic assessment and detailed engagement with highway authorities, including Highways England. Potential solutions will be designed to accommodate both airport and non-airport traffic and could include, over the lifetime of the Project, grade separation or other enhancement schemes.
- 5.2.45 The locations where an increase in road traffic volumes is likely to be greatest are at the South Terminal and North Terminal junctions (see Figure 5.2.1.d).

South Terminal Junction Improvements

- 5.2.46 The South Terminal roundabout (also known as the Welcome Roundabout) is the sole entry point into the South Terminal area and for local access roads, including the terminal forecourt, long stay car parks and commercial premises. It is served by the M23 Gatwick Spur to the east (leading from the M23 Junction 9) and Airport Way from the west (leading from North Terminal Roundabout). The majority of Gatwick traffic accesses the airport from the M23 and traffic for both North Terminal and South Terminal must pass through this roundabout.
- 5.2.47 The M23 Gatwick Spur is currently undergoing an upgrade as part of the Highways England M23 Smart Motorway Project, due to be completed in Spring 2020. The hard shoulder of the westbound carriageway will become a permanent running lane, providing a total of three lanes approaching the airport. Further local improvements, involving signalisation and minor widening of entries/exits, are proposed in the absence of the Project.
- 5.2.48 In order to cater for additional road traffic demand associated with the Project, together with traffic growth predicted to arise in the absence of the Project, it is assumed that a significant improvement scheme will be required at South Terminal roundabout. Any improvement scheme will need to be subject to detailed assessment work and discussion with Highways England and the local highway authorities. The development of options to improve this junction will also need to take account of other development proposals that may come forward in the local area. For the purpose of this Scoping Report, it is assumed that schemes up to and including grade separation of the roundabout may be considered. It is noted that this scale of improvement could also serve the planned business park on land to the north of the roundabout as identified in the Reigate and Banstead Local Plan (subject to planning consent for the business park). Consideration of grade separation options would take account of the following:
- A new flyover taking M23 Gatwick Spur to Airport Way traffic over the existing roundabout would be approximately 8 metres above existing ground level allowing for Highways England's safety and design standards;
 - Grade separation solutions would increase the area over which the roundabout and associated slip roads would sit; and
 - There are structures either side of South Terminal Roundabout, where the M23 Gatwick Spur crosses B2036 Balcombe Road and where Airport Way crosses the Brighton Main Line Railway. Improvements to the bridges may require widening and strengthening or replacement.

North Terminal Junction Improvements

- 5.2.49 The North Terminal roundabout is the entry point to the North Terminal and local access roads, including the northern and east perimeter roads. The existing layout consists of a circular five-arm at-grade roundabout to the north east of the North Terminal, to the south west of the A23. There is currently no direct entry to the roundabout southbound from Horley and no direct exit from the roundabout on to the A23 southbound towards Crawley. Local improvements are proposed in the absence of the Project.
- 5.2.50 In order to cater for additional road traffic demand associated with the Project, together with traffic growth that is expected to arise as a result of background growth and other developments, it is

assumed that a significant improvement scheme will be required at North Terminal roundabout. As for the South Terminal junction improvements, any improvement scheme will be subject to detailed assessment work and discussion with Highways England and the local highway authorities. For the purpose of this Scoping Report it is assumed that the improvement scheme could include grade separation or other enhancement work to the roundabout. Consideration of options would take account of the following:

- Adding capacity may include increasing the size of the roundabout as well as placing through-traffic on to an elevated flyover under grade separation options;
- The elevated links would sit approximately 8 metres above the roundabout to provide the required clearances as stipulated by Highways England's safety and design standards;
- Roundabout improvement options that involve grade separation would include additional slip roads, in particular to ensure connections between Airport Way, the A23 London Road and access to the airport;
- Not all movements are currently catered for at North Terminal Roundabout (eg from the airport to the A23 southbound). Options will seek to include all movements where practicable in order to improve the flow of traffic;
- This Scoping Report assumes that options would exist to accommodate all works within the existing highway boundary or to take additional land where this provides alternative solutions to meeting safety and design standards. These would be subject to further design and approval by Highways England; and
- Works may also be required to improve capacity at the Longbridge Roundabout and to provide better integration with improvements at North Terminal Roundabout.

Rail Improvements

- 5.2.51 Improvements to Gatwick Station are the subject of a separate consenting process, with a planning application submitted by Network Rail to Crawley Borough Council in April 2018 and consented in March 2019. These improvements are proposed to be operational prior to operation of the Project.
- 5.2.52 Studies will be undertaken to explore the need for further improvement to the rail station, but taking into account the improvements that are currently planned, it is not currently considered that any further improvements will be required to the rail station platforms or concourse.

Shuttle Service

- 5.2.53 The ITTS provides a dedicated, elevated people mover system connecting the North Terminal and South Terminal. At the South Terminal, the station is located adjacent to Gatwick Station.
- 5.2.54 The ITTS capacity is governed by the size of vehicle, frequency of service and journey time (including the dwell time at each end station). Further work will determine the scale of intervention necessary to adequately cater for demand, noting that some improvements can be made within the existing operation. Options to increase capacity could include changing the number and length of the existing shuttle trains (which may require extending platforms) or amending the infrastructure to include crossovers. This Scoping Report allows for those potential options that assume no changes to the extent of the track but includes the possible extension of platforms.

Surface Water Drainage

- 5.2.55 The existing airport drains to local watercourses via balancing ponds and attenuation lagoons. In order to accommodate the alterations to the northern runway, to allow for the areas of new development and to meet current planning requirements (including an allowance for climate change), revisions to the existing surface water drainage strategy are proposed (see Figure 5.2.1.e). These are likely to include:
- Works to realign existing surface water drainage infrastructure along Taxiway Yankee, providing a connection to Pond D;
 - Creation of additional runoff treatment and storage area (including runoff from de-icing areas) to complement the existing capacity provided by Pond D. This new treatment/storage area would take the form of underground storage; and
 - Relocation of the existing Pond A and provision of additional floodplain capacity for the River Mole to the north and east of the Taxiway Juliet Spur.
- 5.2.56 In addition, the existing culvert beneath the existing main and northern runways would require extension northwards to accommodate the realigned runway.
- 5.2.57 A surface water drainage strategy will be developed for the Project in consultation with the Environment Agency and the Lead Local Flood Authority. The strategy will include potential modifications to allow for changes in hardstanding associated with the Project, with an allowance for climate change.

Foul Water

- 5.2.58 In order to provide for the new and improved facilities, including wastewater from the extended terminals, hotels and Pier 7, changes would be required to the foul drainage system to improve capacity and resilience. These are anticipated to include:
- Provision of three new pumping stations to accommodate flows from the reconfigured system, with associated pipeline connections; and
 - Upgraded capacity to existing pipelines and decommissioning of a number of existing pumping stations.
- 5.2.59 In the event that there is not sufficient capacity within the existing Thames Water Treatment Works or that improvements cannot be made to provide this capacity, on-site treatment capacity may be required. This may include construction of a new wastewater treatment facility within the airport boundary. Such a facility is likely to include:
- Additional treatment capacity for wastewater;
 - A digester for sewage sludge, producing renewable energy;
 - Associated pipeline connections between existing infrastructure (North Terminal and airfield) and the new facility; and
 - A pipeline connection for treated water.
- 5.2.60 It is anticipated that this new facility, if required, would occupy an area of approximately 12,000 m² with a height of up to 15 metres above ground level. An alternative option could be construction of a new facility adjacent to the existing Crawley Sewage Treatment Works on land owned by GAL.

Power Strategy

- 5.2.61 In order to ensure sufficient capacity and that power is provided to the required locations, a number of adjustments would be required to the existing facilities, including relocation of a number of existing services, cables and substations. Part of the existing airfield high voltage ring would be repositioned to the north to allow for the alterations to the existing northern runway and to Taxiway Juliet.
- 5.2.62 Existing substations would be relocated to accommodate the new facilities. In addition, two new substations are likely to be required. It is envisaged that the new substations would each require an area of approximately 25 m², with a maximum height of approximately 5 metres above ground level and 3 metres below ground level.
- 5.2.63 The relocation of substations and provision of additional capacity would allow for additional loads and would ensure that substations are located away from areas required for other purposes or at risk of flooding. Two existing substations would be demolished and not replaced.

Lighting Strategy

- 5.2.64 A lighting strategy will be prepared to accompany the application for development consent, setting out the principles and parameters within which lighting associated with the Project would be designed. The strategy will identify the type of lighting to be used and measures to be implemented to reduce light spill, taking into account effects on nearby sensitive receptors and the safety of ongoing aircraft operations. The strategy will take into account relevant good practice guidance, where appropriate, including the Guidance Notes for the Reduction of Obtrusive Light (Institution of Lighting Professionals, 2011).

Appearance and Design

- 5.2.65 Many of the components of the Project are relocated airfield elements and it is anticipated that the appearance of the relocated facilities would be similar to the existing facilities. In some cases, the demolition of ageing facilities and replacement with more modern buildings is likely to result in an overall improvement in terms of appearance.
- 5.2.66 Extensions to the airport terminals are anticipated to be designed to 'tie in' and be in keeping with the design of the existing terminal buildings. Works to be undertaken within the terminals would result in a more modern appearance through reconfiguration and installation of new facilities.

Sustainability

- 5.2.67 A sustainability statement will be prepared for the Project. Gatwick Airport's six sustainability policy goals and ten sustainability objectives will be at the heart of the sustainability framework. In addition, the framework will reflect both the objectives used by the government in the Airports National Policy Statement (Department for Transport, 2018a) and the sustainability priorities relevant to the host local authorities within the context of the local natural capital themes/aspects.
- 5.2.68 Gatwick's ongoing sustainability objectives are:
- Air quality: improve air quality impacts using new technology, processes and systems;
 - Biodiversity: have an award-winning biodiversity approach;

- Carbon and climate change: continue to reduce GAL's operational carbon emissions in line with GAL's commitment to be net zero by 2050;
- Community: demonstrate that GAL is a valued and trusted neighbour;
- Economy: fulfil GAL's role as an economic driver of local, regional and national significance;
- Water quality: improve the quality of water leaving the airport and invest in flood resilient infrastructure;
- Noise: reduce the impact of operational noise;
- Surface access: increase sustainable access options for passengers and staff;
- Waste: generate no untreated waste to landfill and maximise reuse and recycling; and
- Energy and water: continue to reduce energy and water consumption by investing in efficient technology and working with airport partners.

Operation and Maintenance

- 5.2.69 GAL is the operator of Gatwick Airport for the purposes of the Civil Aviation Act 2012. GAL therefore has overall responsibility for the management of Gatwick Airport, excluding aircraft maintenance. This would remain the case throughout the construction phase and during operation of the airport, with the Project in place.
- 5.2.70 A number of specific maintenance areas exist within the airport, including the Hangar 6, Hangar 7 and Hangar 9 maintenance areas. These areas are the responsibility of the airlines (BA, Virgin Atlantic and easyJet respectively) and it is anticipated that the same would apply to the Boeing hangar (currently under construction) and to the proposed new hangar, once operational.
- 5.2.71 As is currently the case, Gatwick Airport would remain operational on a 24-hour, seven days per week basis throughout the construction and operation of the Project. All terminal and hotel buildings and airport car parks are available on this basis.
- 5.2.72 Flights are subject to night time restrictions between 23.00 to 07.00 local time in accordance with a Noise Restrictions Notice published on behalf of the Department for Transport. Within the core hours of 23:30 to 06:00 a limited number of flights are permitted in accordance with a noise and movements quotas. This is assumed to remain the case with the Project in place.

5.3 Construction

- 5.3.1 The details of construction methods, timing and phasing are necessarily broad at this stage. The details will be refined throughout the EIA process. Where options remain, the limits of the assessment will be set sufficiently wide to allow a robust assessment to be undertaken of a realistic worst-case scenario.

Indicative Phasing of Construction Works

- 5.3.2 The timing of the Project would be dependent on securing development consent and the discharge of the associated requirements. The indicative construction programme is based on construction commencing in 2022, although some preliminary works may commence in 2021. The programme for the core airfield construction works would be of approximately four years duration enabling the altered northern runway and taxiways to be complete in 2025 and fully

operational in combination with the main runway in 2026. During the construction period the northern runway would not be available as a standby runway for periods of time.

5.3.3 Timings are indicative at this stage and would be dependent on the timing of development consent and any pre-commencement requirements. The indicative phases of the Project are described below.

5.3.4 Core activities are likely to be undertaken during the period 2022 to 2026 and this is considered to be the peak construction period. Any changes to the sequence of events after opening of the altered northern runway in 2026 are not anticipated to give rise to significantly different environmental effects.

Table 5.3.1: Indicative Phasing

Component of the Project	Anticipated Phasing
Pre-construction activities (including surveys for any unexploded ordnance and any necessary pre-construction surveys)	2021/2022
Early works, including establishment of compounds, fencing, early clearance and diversion works and re-provision of essential replacement services.	2022
Alterations to the existing northern runway	2023-2025
Works to existing taxiways and construction of new taxiways	2022-2025
Amendments to stand arrangements	2023-2025
Pier 7	2032-2034
Reconfiguration of existing airfield facilities (Phase 1)	2024-2025
Further improvements to airfield facilities	2026-2034
Extensions to North and South Terminals	2025-2029
Hotel and commercial facilities	2027-2032
Car parking	2022-2033
Surface access improvements	2025-2030
Surface water drainage and management of foul water	2026-2034

5.3.5 During early 2025, a closure of the northern runway would be made, allowing paving, drainage and above ground works to be undertaken. Following completion of these works, the redundant pavement would be removed. By this time, it is anticipated that all core airfield works would be complete, including Taxiway Juliet (East and West), the Taxiway Juliet West Spur, works to Taxiways Lima and Tango and all runway exits and end around taxiways. The altered northern runway would be open for aircraft operations. In addition to the early works, the following components would be completed by 2025:

- Northern runway;
- Taxiway Juliet, Taxiway Juliet West Spur and aircraft holding area;
- Extensions to Taxiways Tango and Lima;
- Works to Taxiways Whiskey, Victor and Zulu;
- Runway exits and end around taxiways;
- East-west track (between runways);

- New pumping stations and satellite Airport Fire Service;
- Phase 1 of CARE, grounds maintenance, surface transport and motor transport facilities;
- Early car parking; and
- Noise mitigation (noise wall).

2026 Onwards

5.3.6 Following completion of the above works, the following works would be undertaken over the period 2026 to 2034:

- Pier 7;
- New hangar;
- Relocation of CARE and motor transport facilities (Phase 2);
- A new area of remote stands;
- Terminal extensions;
- Provision of North Terminal and South Terminal autonomous vehicles stations and vehicle route;
- Final relocation of Larkins Road;
- Underground surface water runoff storage and wastewater treatment works (if required);
- Hotel and commercial facilities;
- Remaining car parking; and
- Surface access improvements.

Demolition Activities

5.3.7 In order to allow for the construction of the proposed facilities and reconfiguration of existing facilities, a number of existing facilities would be subject to demolition. These would include:

- Former airfield operations building;
- CARE (recycling area) and motor transport, surface transport and ground maintenance facilities;
- Former air traffic control tower;
- Former TCR Snowbase building;
- A number of existing substations;
- A number of existing pumping stations;
- Part of Purple Parking decked structure;
- Pond A (removal and infill); and
- Parts of the existing fire training area.

5.3.8 In addition to the above, redundant areas of hardstanding would be removed.

Environmental Management During Construction

5.3.9 It is the applicant's intention that the site would be registered under the Considerate Constructors Scheme or a locally recognised certification scheme.

5.3.10 Construction would be undertaken in accordance with a Code of Construction Practice (CoCP). The CoCP will set out the key management measures that contractors would be required to adopt and implement. These measures will be developed based on those identified during the EIA

process. They include strategies and control measures for managing the potential environmental effects of construction and limiting disturbance from construction activities as far as reasonably practicable. An Outline CoCP will be included with the application for development consent.

- 5.3.11 The CoCP would form the basis of more detailed plans and method statements, to be prepared during the pre-construction period once a Principal Contractor has been appointed.

Construction Working Areas

- 5.3.12 The precise locations of compounds would be determined by the Principal Contractor. However, at this stage, the following main compounds are anticipated (see Figure 5.2.1f):

- Main contractor compound;
- Airfield satellite compound (and laydown area); and
- Surface access satellite contractor compounds.

- 5.3.13 In addition, a number of smaller compounds would be associated with construction of each of the elements of the Project.

Construction Logistics Consolidation Centre

- 5.3.14 A temporary logistics facility may be required in order to allow scheduling of deliveries to the appropriate work sites. This would comprise an existing secure fenced area, including a warehouse type facility with loading/unloading docks, secure airside screening area, material laydown area, HGV parking, electric vehicle charging stations, driver welfare facilities and some limited parking.

- 5.3.15 The use of a logistics facility would allow HGV deliveries to the airport to be consolidated, reducing the overall number of deliveries on the local road network.

- 5.3.16 If such a facility is required, it is likely that the location would be an existing facility or a site with an existing consent for such use. At the current time, traffic modelling is being undertaken assuming no consolidation centre is in place, which represents a worst case in terms of total traffic numbers at the site access points. However, if a location is identified, this will be assessed within the EIA process and included within the ES.

Construction Working Hours

- 5.3.17 In order to maintain safety and minimise disruption to the operation of the airport, work in close proximity to existing runways and taxiways would require closures of facilities as operationally necessary and hence is likely to be scheduled overnight.

- 5.3.18 During construction, the airport would continue to operate on a 24 hour, seven days per week basis. This would include use of the construction compounds and construction working areas on a daily 24-hour basis. It is acknowledged that the use of specified construction equipment and construction processes in sensitive locations, in close proximity to residential properties, and at noise sensitive times, may need to be subject to restrictions in relation to operating hours and limits for operating noise levels, or other mitigation measures, as necessary and practicable. Potential restrictions would be discussed with the relevant regulator.

- 5.3.19 Where necessary, closures and lane restrictions on the highways network would be undertaken outside peak periods (in terms of traffic flow). To ease congestion on the public highways, deliveries of some materials and movement of workforce may require to be outside of standard day time peak hours (eg overnight and at weekends).

Construction Workforce

- 5.3.20 It is anticipated that construction would require an average workforce of approximately 700 personnel, with up to approximately 2,000 personnel at times during the peak construction period.

Construction Access

- 5.3.21 Construction access routes will be considered during the assessment process in order to minimise disruption, where practicable. The HGV routing for deliveries to the site will seek to maximise use of the 'A' road network, making use of 'B' roads and minor roads where required and will avoid sensitive receptors, where practicable. The preferred construction traffic routing and associated traffic management measures will be set out in a Construction Traffic Management Strategy and identified in consultation with the relevant highway authority.

Cut and Fill Strategy

- 5.3.22 An earthworks strategy will be prepared. The objectives of the earthworks strategy will be to maximise the re-use of material, to reduce the amount of material taken off site for disposal and to minimise vehicle movements as far as practicable.

5.4 Summary of Key Parameters

- 5.4.1 Table 5.4.1 provides a summary of the key parameters that will inform the assessment.

Table 5.4.1: Summary of Key Parameters

Element of the Project	Key Parameter
Development consent application area	838 hectares
Works within existing GAL land ownership	760 hectares
Permanent land take (third party)	73 hectares
Temporary land take (third party)	4 hectares
Passenger throughput	
Future airport throughput (without Project)	61 mppa
Project additional throughput	13 mppa
Proposed new airport throughput (with Project)	74 mppa
Passenger Air Transport Movements	
Future passenger air transport movements (2038 without Project)	312,400
Project additional passenger air transport movements	62,400
Proposed new passenger air transport movements (with Project)	373,800

Element of the Project	Key Parameter
Cargo	
Future cargo throughput (2038 without Project)	227,100 tonnes
Project additional cargo	72,000 tonnes
Proposed cargo (with Project)	300,000 tonnes
Phasing	
Commencement of preliminary works	2021/2022
Commencement of main construction phase	2022
Year of opening	2026
Completion of construction work	2028-2034

5.5 Decommissioning Phase

5.5.1 The Project is proposed to form a long-term part of Gatwick Airport, providing an integral part of the improved airport in order to allow an increase in flight and passenger numbers through making best use of Gatwick's existing runways. Although some elements of the Project would have a defined design life, it is proposed that all elements would be subject to continued maintenance/replacement in line with the management of the airport as a whole. Therefore, the Project, once operational, would form part of a permanent airport and no activities are proposed that would require decommissioning or associated decommissioning plans.

6 Approach to EIA

6.1 Scoping Process

6.1.1 Scoping is the process of identifying the issues to consider within an ES (establishing the scope of the assessment). As set out in Chapter 1 of this report, scoping is therefore an important preliminary procedure, which sets the context for the EIA process. Through scoping, the key environmental issues are identified at an early stage, which permits subsequent work to concentrate on those environmental topics for which significant effects may arise as a result of a proposed development.

6.1.2 The scoping process is an iterative one, informed by increasing knowledge acquired through the EIA process. Diagram 6.1.1 highlights some of the key inputs to the scoping process. These inputs include the identification of an initial project description, including the key components of the Project and their likely maximum parameters. Taking this into account, alongside the characteristics of the environment in the vicinity of the site, the requirements of the EIA Regulations can be reviewed to provide an initial indication of the topics likely to be relevant to the Project. From this point, the scope of assessment can be refined through the use of scoping workshops, consultation and the findings of initial assessment by topic specialists.

Diagram 6.1.1: Overview of Scoping Process



6.1.3 This Scoping Report presents the findings of the scoping process undertaken to date. Taking into account the work undertaken to date, it identifies the effects that are proposed to be considered

within the EIA process for the Project. Each topic area is considered, setting out the proposed scope of assessment and identifying any sub-topics that are proposed to be scoped out of the assessment (where no significant effects are considered likely).

- 6.1.4 A Scoping Opinion is requested from the Planning Inspectorate (on behalf of the Secretary of State), which will inform the final scope of the ES (and PEIR). It is noted that the scoping process is an iterative one. As assessment work continues and surveys are completed, new issues may arise, or it may become apparent that some potential impacts are not likely to result in significant effects. Where this is the case, the findings of the assessment process will be discussed with consultees in order that the scope of the assessment may be refined as appropriate throughout the EIA process.

6.2 Proposed Approach to the EIA Process

Relevant EIA Guidance

- 6.2.1 The EIA process will take into account relevant government or institute guidance, including:
- Ministry of Housing, Communities & Local Government (2019) Planning Practice Guidance;
 - Department of the Environment, Transport and the Regions (DETR) (1997) Mitigation Measures in Environmental Statements;
 - Highways Agency *et al.* (2008) Design Manual for Roads and Bridges, Volume 11, Section 2, Part 5. HA 205/08;
 - Institute of Environmental Management and Assessment (2004) Guidelines for Environmental Impact Assessment;
 - Institute of Environmental Management and Assessment (2015a) Environmental Impact Assessment: Guide to Shaping Quality Development;
 - Institute of Environmental Management and Assessment (2015b) Climate Change Resilience and Adaptation;
 - Institute of Environmental Management and Assessment (2016) Environmental Impact Assessment: Guide to Delivering Quality Development;
 - Institute of Environmental Management and Assessment (2017a) Environmental Impact Assessment: Assessing Greenhouse Gas Emissions and Evaluating their Significance;
 - Institute of Environmental Management and Assessment (2017b) Health in Environmental Impact Assessment: A Primer for a Proportional Approach;
 - Ministry of Housing, Community and Local Government (2015) Planning Act 2008: Guidance on the pre-application process for major infrastructure projects;
 - Planning Inspectorate (2017b) Advice Note Three: EIA Notification and Consultation;
 - Planning Inspectorate (2016) Advice Note Six: Preparation and submission of application documents;
 - Planning Inspectorate (2017a) Advice Note Seven: Process, Preliminary Environmental Information, and Environmental Statements;
 - Planning Inspectorate (2018a) Advice Note Nine: Using the Rochdale Envelope;
 - Planning Inspectorate (2018b) Advice Note Twelve: Transboundary Impacts; and
 - Planning Inspectorate (2015a) Advice Note Seventeen: Cumulative Effects Assessment.

- 6.2.2 Other topic-specific specialist methodologies and good practice guidelines will be drawn on as necessary.

Methodology and Assessment Criteria

- 6.2.3 Each topic chapter of the PEIR and ES will provide details of the methodology for baseline data collection and the approach to the assessment of effects. A summary of the proposed approach for each topic is provided in Chapter 7 of this Scoping Report. Each identified environmental topic will be considered by a competent expert who is a specialist in that area. The identification and evaluation of effects will take into account relevant topic-specific guidance where available.

Baseline Conditions

Existing Baseline Conditions

- 6.2.4 The existing and likely future environmental conditions in the absence of the Project are known as 'baseline conditions'. Each topic-based chapter will include a description of the current (baseline) environmental conditions. The baseline conditions at the site and within the study area form the basis of the assessment, enabling the likely significant effects to be identified through a comparison with the baseline conditions.

Future Baseline Conditions

- 6.2.5 As set out in Chapter 4, a number of improvements are proposed at Gatwick Airport to accommodate the predicted increase in passenger numbers in the absence of the Project. The likely timing of these improvements will be taken into account through the use of future baseline scenarios and assessment years (see below).
- 6.2.6 The consideration of future baseline conditions will also take into account the likely effects of climate change, as far as these are known at the time of writing. This will be based on information available from the UK Climate Projections project, developed by the Met Office and Environment Agency (Met Office, 2018), which provides information on plausible changes in climate for the UK and on published documents such as the UK Climate Change Risk Assessment 2017 (HM Government, 2017b) and subsequent updates.
- 6.2.7 Topic authors will also consider other factors relevant to identification of future baseline conditions, such as trends in population size of protected species or changes in socio-economic conditions over time.

Assessment of Effects

- 6.2.8 The EIA Regulations require the identification of the likely significant environmental effects of the Project. The overarching approach to this assessment is set out below.

Assessment Years

- 6.2.9 The approach to assessment will incorporate the use of identified assessment years to allow for evaluation of the likely effects during the phased construction process and during operation of the Project. At this stage, the following assessment years are under consideration:

- Construction phase: currently anticipated to occur during period 2022 to 2034;
- Airfield first full year of opening: currently anticipated to be 2026;
- An interim assessment year: currently anticipated to be 2029; and
- Design year (with all elements in place): currently anticipated to be 2038.

6.2.10 For some of these assessment scenarios, construction and operational activities will overlap and this will be taken into account in the assessments.

6.2.11 There are two potential scenarios for growth in passenger throughput numbers that will be included within the assessments in the ES, which take into account the potential opening date of Heathrow's third runway. The central case for the assessment is based on the current expected opening date of Heathrow's third runway in 2026 and this will be presented within the ES. However, in the event that the third runway cannot be delivered in 2026, the implications of a potential later opening date will also be assessed.

6.2.12 Each topic-based chapter may also identify additional years to be included in the assessment work, in accordance with topic-specific good practice guidance.

Assessing the Likely Effects of the Project

6.2.13 Each topic chapter will clearly define its approach to the evaluation of significance. This section provides details of the overarching methodology proposed for the EIA process. This will be used to inform the approach to assessment for each environmental topic, except where topic-specific guidance or usual practice for that topic indicates otherwise.

6.2.14 The overarching approach proposed takes into account both the sensitivity of receptors affected and the magnitude of the likely impact in determining the significance of the effect. In all cases, the evaluation of significance will be underpinned by a narrative approach and professional judgement.

Sensitivity or Importance of Receptors

6.2.15 Receptors are defined as the physical resource or user group that would be affected by a proposed development. The baseline studies will identify potential environmental receptors for each topic and will evaluate their sensitivity to the Project. The sensitivity or importance of a receptor may depend, for example, on its frequency or extent of occurrence at an international, national, regional or local level.

6.2.16 Sensitivity will be defined within each PEIR/ES topic chapter, where appropriate, and will take into account factors including:

- Vulnerability of the receptor;
- Recoverability of the receptor; and
- Value/importance of the receptor.

6.2.17 Sensitivity will generally be described using the following scale:

- High;
- Medium;
- Low; and
- Negligible.

6.2.18 In some cases, a further category of very high may be used.

6.2.19 As a general rule, the above receptor sensitivity levels will be defined as set out in Table 6.2.1.

Table 6.2.1: Definitions of Receptor Sensitivity

Sensitivity	Typical Descriptors
Very High	Very high importance and rarity, international scale and very limited potential for substitution.
High	High importance and rarity, national scale, and limited potential for substitution.
Medium	High or medium importance and rarity, regional scale, limited potential for substitution.
Low	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

Magnitude of Impact

6.2.20 Impacts are defined as the physical changes to the environment attributable to the Project. For each topic, the likely environmental impacts will be identified. The magnitude of the impact will be described using criteria defined within each topic chapter.

6.2.21 The categorisation of the impact magnitude will take into account the following four factors:

- Extent;
- Duration;
- Frequency; and
- Reversibility.

6.2.22 Impacts will be defined as either adverse or beneficial. They may also be described as:

- Direct: Arise from activities associated with the Project. These tend to be either spatially or temporally concurrent; or
- Indirect: Impacts on the environment which are not a direct result of the Project, often produced away from the Project site or as a result of a complex pathway.

6.2.23 Impacts will be divided into those occurring during the construction phase and those occurring during operation. Where appropriate, chapters may refer to temporary and permanent impacts. The impacts related to land take will be assessed as part of the construction phase as this is when the impact would occur. These impacts could be considered either temporary or permanent depending on whether the land would be restored following completion of the construction phase.

6.2.24 Magnitude will generally be described using the following scale:

- High;
- Medium;
- Low; and
- Negligible.

6.2.25 In some cases, a further category of 'no change' may be used.

6.2.26 As a general rule, the above magnitude of impact levels will be defined as set out in Table 6.2.2.

Table 6.2.2: Definitions of Impact Magnitude

Magnitude	Typical Descriptors
High	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse).
	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).
Medium	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements (Adverse).
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
Low	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse).
	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse).
	Very minor benefit to or positive addition of one or more characteristics, features or elements (Beneficial).
No change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Significance of Effects

- 6.2.27 Effect is the term used to express the consequence of an impact (expressed as the 'significance of effect'), which is determined by considering both the magnitude of the impact and the sensitivity of the receptor affected.
- 6.2.28 The magnitude of an impact does not generally directly translate into significance of effect. For example, a significant effect may arise as a result of a relatively modest impact on a resource of national value, or a large impact on a resource of local value. In broad terms, therefore, the significance of the effect can depend on both the impact magnitude and the sensitivity or importance of the receptor.
- 6.2.29 Significance levels will be defined separately for each topic, taking into account relevant topic-specific guidance, based on the following scale and guidance:
- Substantial: Only adverse effects are normally assigned this level of significance. They represent key factors in the decision making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity.
 - Major: These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision making process.

- Moderate: These beneficial or adverse effects may be important, but are not likely to be key decision making factors. The cumulative effects of such factors may influence decision making if they lead to an increase in the overall adverse effect on a particular resource or receptor.
- Minor: These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision making process, but are important in enhancing the subsequent design of the project.
- Negligible: No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

6.2.30 Table 6.2.3 sets out the general approach proposed to inform the assessment of significance based on the sensitivity of the receptor and the magnitude of impact. This matrix will inform the topic-specific methodologies. For some topics, a simplified approach is considered appropriate or the approach may be informed by topic-specific guidance.

Table 6.2.3: Assessment Matrix

Sensitivity	Magnitude of Impact				
	No Change	Negligible	Low	Medium	High
Negligible	No change	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	No change	Negligible or Minor	Negligible or Minor	Minor	Minor or Moderate
Medium	No change	Negligible or Minor	Minor	Moderate	Moderate or Major
High	No change	Minor	Minor or Moderate	Moderate or Major	Major or Substantial
Very high	No change	Minor	Moderate or Major	Major or Substantial	Substantial

6.2.31 In all cases, the evaluation of receptor sensitivity, impact magnitude and significance of effect will be informed by professional judgement and will be underpinned by narrative to explain the conclusions reached.

Addressing Uncertainty

6.2.32 There is some degree of inherent uncertainty within the EIA process, in relation to factors such as future improvements to construction and design, the potential effects of climate change on existing receptors and in terms of the margin of error within forecasting or modelling tools. The text below sets out the proposed approach to addressing uncertainty. In all cases, where uncertainty exists, this will be identified within the relevant chapter of the PEIR/ES, together with details of the measures that have been taken to reduce uncertainty as far as reasonably practicable.

Project Parameters

- 6.2.33 The PEIR and ES will include a Project Description chapter, which will set out the parameters on which the assessment of effects will be based.
- 6.2.34 The scoping process has been undertaken based on the description set out in Chapter 5 of this Scoping Report. The existing airport provides a number of constraints that have informed the Project design, including constraints with regard to location, available space and phasing, given the need to ensure continued use of the airport during construction of the Project. In addition, GAL's experience in operating Gatwick Airport has ensured that the design of many components of the Project is well understood. This will limit the number of options likely to be carried forward through the EIA process. However, it is possible that flexibility will need to be retained with regard to the detailed design of some elements of the Project, particularly for those elements that will be constructed later in the construction programme or that will be operated by third parties (such as hotels).
- 6.2.35 Where flexibility is required, guidance produced by the Planning Inspectorate with regard to the use of the 'Rochdale envelope' approach (Planning Inspectorate, 2018a) will inform the key parameters identified for assessment. This will include identifying the 'worst case' option from the realistic and likely options that might be developed. If this assessment shows that no significant effect is anticipated, it can be assumed that other (lesser) options would also have no significant effect.
- 6.2.36 Any such assumptions will be clearly set out within the Project Description chapter of the PEIR/ES and within the topic chapters. The draft DCO will be prepared in conjunction with the ES in order to ensure that the key parameters applied for are consistent with those assessed through the EIA process.

Future Baseline and Assessment Years

- 6.2.37 The approach to assessment of future baseline conditions and the use of assessment years is set out under the 'Baseline Conditions' section above. There will be some element of uncertainty regarding future trends in environmental conditions and climate. The assessments made will be based on the most up to date information available at the time of assessment, including information available from the UK Climate Projections project and on published documents such as the UK Climate Change Risk Assessment 2017 (HM Government, 2017b) and subsequent updates.

Forecasting and Modelling

- 6.2.38 Where forecasting and modelling tools are used, care will be taken to ensure that the tool selected is appropriate for the assessment, taking into account topic-specific good practice and guidance. Calibration will be used to ensure a reasonable degree of accuracy in measurements. Topic chapters within the PEIR/ES will set out measures taken to address any uncertainty with regard to modelling inputs and outputs and any assumptions made.

Mitigation and Monitoring

- 6.2.39 The EIA Regulations require that where significant effects are identified ‘a description of any features of the Project, or measures envisaged in order to avoid, prevent or reduce or, if possible, offset likely significant adverse effects on the environment’ should be included in the ES.
- 6.2.40 The development of mitigation measures is part of an iterative EIA process. Therefore, measures will be developed throughout the EIA process in response to the findings of initial assessments. The Project that forms the subject of the application for development consent will include a range of measures designed to reduce or prevent significant adverse environmental effects arising, where practicable. In some cases, these measures may result in enhancement of environmental conditions. The assessment of effects will take into account all measures that form part of the Project and to which GAL is committed.
- 6.2.41 The topic chapters of the PEIR/ES will therefore take into account all measures that form part of the Project, including:
- Measures included as part of the Project design (sometimes referred to as primary or embedded mitigation);
 - Measures proposed to avoid effects occurring or to minimise environmental effects, such as measures to control light spillage (sometimes referred to as secondary mitigation). Where these measures relate to the construction phase, they would be set out within the CoCP and implemented through the CoCP; and
 - Measures required as a result of legislative requirements or standard good practice (sometimes referred to as tertiary mitigation). Although many of these measures are regulated separately, these measures will also be included within the CoCP for completeness.
- 6.2.42 Where required, further mitigation measures will be identified within topic chapters. These are measures that could further prevent, reduce and, where possible, offset any residual adverse effects on the environment.
- 6.2.43 In some cases, monitoring measures may be appropriate, for example, to ensure that proposed planting becomes established. Where appropriate, monitoring measures will be set out within each topic chapter of the PEIR/ES.
- 6.2.44 Mitigation and monitoring measures identified to control construction effects would be implemented through the CoCP. Where necessary, for example in relation to future management of any ecological mitigation areas, draft operational management plans will be developed. The draft DCO will be developed to be consistent with the measures identified in the ES, CoCP and any draft management plans, in order to ensure consistent implementation of the measures identified through the EIA process.

Cumulative and Inter-related Effects

- 6.2.45 Cumulative effects with other proposed developments will be assessed as part of the EIA process. This will include consideration of whether the Project, when considered together with other proposed developments, may result in any greater effects on a receptor than the effects of the Project alone.

6.2.46 In addition, inter-relationships between topic areas will be considered, in order to ensure that effects on a receptor arising from more than one environmental topic area are considered.

6.2.47 The approach to assessment of cumulative and inter-related effects is set out in Section 7.15.

Transboundary Effects

6.2.48 For the purposes of the EIA Regulations, transboundary effects are the effects of a project on the environment of another European Economic Area (EEA) member state. The approach to assessment of transboundary effects is set out in Section 7.16.

6.3 Structure of the Environmental Statement

6.3.1 Although there is no statutory provision as to the form of an ES, it must contain the information specified in Regulation 14(2), including any information specified in Schedule 4 of the EIA Regulations.

6.3.2 The information to be supplied in the ES will provide a clear understanding of the likely significant effects of the Project upon the environment.

6.3.3 The PEIR and ES will be structured logically, enabling all relevant environmental information to be found quickly and easily. The PEIR/ES will describe the EIA process and its findings, and will include the following sections:

- Non-Technical Summary (as a standalone document);
- Written Statement;
- Figures; and
- Appendices.

6.3.4 The following chapters of this Scoping Report set out the proposed scope of assessment, together with details of any topics to be scoped into/out of the EIA process. Following this, the proposed structure of the ES is set out in Chapter 10 of this report. It is anticipated that the PEIR will follow a similar structure to the final ES (but with a focus on the preliminary findings available at that time).

6.4 Other Assessments and Reports

6.4.1 Alongside the EIA process, a number of other assessments will be undertaken, including the following:

- Work to inform the Habitat Regulations Assessment under the Conservation of Habitats and Species Regulations 2017; and
- Economic Assessment.

6.4.2 The reports setting out the findings of the above assessments will be provided alongside the ES as part of the application for development consent. Although these documents will form separate reports, corresponding to separate legislative or good practice requirements, the authors will work alongside the authors of relevant assessments forming part of the EIA process to ensure consistency of data use and to allow the findings of each assessment to inform the other, as appropriate.

- 6.4.3 Sustainability will form a key part of the design process and preparation of the application for development consent. A Sustainability Statement will be prepared to accompany the application. Key elements of the sustainability strategy will be included within the PEIR/ES, where relevant (eg within the Project Description chapter) and all authors involved in the EIA process will feed into and inform the sustainability strategy. It is proposed that the Sustainability Statement will be provided as a separate report to accompany the application. A separate ES chapter relating to sustainability is not considered to be required.

7 Proposed Scope of Assessment

7.1 Historic Environment

Relevant Policy, Legislation and Guidance

Legislative and Policy Context

7.1.1 The following key legislation and policy documents relevant to the historic environment will be considered within the assessment process:

- Ancient Monuments and Archaeological Areas Act 1979 (amended by National Heritage Act (1983) and the National Heritage Act (2002));
- Planning (Listed Buildings and Conservation Areas) Act (1990) and the Town and Country Planning Act (1971);
- Airports NPS (Department for Transport, 2018a);
- NPS for National Networks (Department for Transport, 2014);
- NPPF (Ministry of Housing, Communities and Local Government, 2019a);
- Crawley 2030: Crawley Borough Local Plan 2030 (Crawley Borough Council, 2015) - Policies CH2 Principles of Good Urban Design, CH12 Heritage Assets, CH13 Conservation Areas, CH15 Listed Buildings & Structures, CH16 Locally Listed Buildings and CH17 Historic Parks & Gardens;
- Emerging Crawley 2035: Draft Crawley Borough Local Plan 2020-2035 (Crawley Borough Council, 2019) - Policies HA1, HA2, HA3, HA4, HA5 and HA6;
- Reigate and Banstead Local Plan 2005 (Reigate and Banstead Borough Council, 2005) - Policies – Pc8 Ancient Monuments & Archaeology, Pc9 Buildings of Historic Interest, Pc10 Buildings of Local Interest, Pc11 Historic Gardens, Pc12-14 Conservation Areas;
- Reigate and Banstead Local Plan: Core Strategy 2014 (Reigate and Banstead Borough Council, 2014) – Policy CS4 Valued Townscapes & the Historic Environment;
- Emerging Reigate and Banstead Borough Development Management Plan 2018-2027 (Reigate and Banstead Borough Council, 2018) - Emerging policy NHE9 Heritage Assets;
- Mole Valley Core Strategy 2009 (Mole Valley District Council, 2009) - Policy CS14 Townscape, Urban Design and the Historic Environment;
- Mole Valley Local Plan 2000 (Mole Valley District Council, 2000) – Policy ENV23 Respect for Setting, ENV39 - ENV47 Conservation Areas, Listed Buildings, Historic Parks & Gardens;
- Horsham District Planning Framework (excluding South Downs National Park) 2015 (Horsham District Council, 2015) - Policy 34 Historic Assets and Managing Change in the Historic Environment.
- Tandridge District Core Strategy 2008 (Tandridge District Council, 2008) - Policy DP20 Heritage Assets;
- Tandridge Local Plan Part 2: Detailed Policies 2014-2029 (Tandridge District Council, 2014);
- Emerging Our Local Plan 2033 (Regulation 22 Submission) 2019 (Tandridge District Council, 2019) TLP43 Historic Environment (emerging policy);
- Mid Sussex District Plan 2014-2031 (Mid Sussex District Council, 2018) Policies DP34 Listed Buildings & Heritage Assets, DP35 Conservation Areas, DP36 Historic Parks & Gardens; and

- Saved Policies from the Mid Sussex Local Plan 2004 (Mid Sussex District Council, 2004) Policy B12 Conservation Areas, B17 Historic Gardens, B18 Archaeological Sites.

Guidance Documents

- 7.1.2 Guidance documents relevant to the historic environment that will be considered within the assessment process include the following:
- Planning Policy Guidance: Conserving and Enhancing the Historic Environment (Ministry of Housing, Communities & Local Government, 2018);
 - Aviation Noise Metric - Research on the Potential Noise Impacts on the Historic Environment by Proposals for Airport Expansion in England (Fiumicelli *et al*, 2014);
 - Managing Significance in Decision-Taking in the Historic Environment: Historic Environment Good Practice Advice in Planning Note 2 (Historic England, 2015);
 - The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3 (Historic England, 2017);
 - Standard and guidance for historic environment desk-based assessment (Chartered Institute for Archaeologists (CIfA), 2014a);
 - Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment (CIfA, 2014b);
 - Standard and guidance for archaeological geophysical survey (CIfA, 2014c);
 - Standard and guidance for archaeological field evaluation (CIfA, 2014d);
 - Standard and guidance for the collection, documentation, conservation and research of archaeological materials (CIfA, 2014e); and
 - Standard and guidance for the collection, compilation, transfer and deposition of archaeological archives (CIfA, 2014f).

Baseline Information

Data Collated to Date

- 7.1.3 A considerable amount of historic environment baseline data has previously been collated. This includes data held in the Historic Environment Records (HERs) maintained by West Sussex County Council and Surrey County Council. Baseline data is presented in Figure 7.1.1.
- 7.1.4 Information regarding previous archaeological investigations within and adjacent to the land required for the Project has been acquired and examined and a review of all available aerial photographic material for archaeological cropmarks/soilmarks has been undertaken by a specialist company.
- 7.1.5 The relevant historic maps held at the West Sussex Record Office and the Surrey History Centre, including Tithe Maps (and Apportionments), have been digitised. Information regarding the published Historic Landscape Character of the land adjacent to Gatwick has been acquired and reproduced in mapped form. Relevant LiDAR data have been acquired from the Environment Agency and have been reprocessed, with a report on potential archaeological and historic landscape features prepared by a specialist company.

7.1.6 A walkover survey has been undertaken to examine the current settings of designated heritage assets where those settings may be subject to change as a result of visual or ground-based noise impacts during construction or operation of the Project.

7.1.7 Taking the above into account, a summary of the existing baseline conditions is provided below.

Existing Baseline Conditions

7.1.8 A brief history of the Project site from the late 1870s is summarised in Section 7.4.

7.1.9 Some areas within the Project site boundary have previously been subject to archaeological investigation, whilst other areas may have been heavily disturbed as a result of the establishment and use of the operational airport.

7.1.10 Figure 7.1.1 shows designated heritage assets and identified areas of archaeological interest or potential within 1 km of the Project site boundary. The land within the Project site boundary contains one Grade II* listed building and two Grade II listed buildings, although no works are proposed that would physically affect the fabric of any of these buildings.

7.1.11 Three Grade I listed buildings and a number of other Grade II* and Grade II listed buildings are located within 1 km of the Project site boundary (Figure 7.1.1), along with several 'locally listed' buildings. There are also other historic buildings recorded on the county HERs but not included on the statutory or local list.

7.1.12 There are no Scheduled Monuments within the land required for the Project. One Scheduled Monument is located just outside of the Project site boundary (at Tinsley Green), with one further Scheduled Monument within 1 km (Figure 7.1.1).

7.1.13 There are no Registered Parks and Gardens of Historic Interest within the land required for the Project or within several kilometres of the Project site boundary.

7.1.14 There is one Conservation Area partially within the land required for the Project (at Church Road, Horley) and three other Conservation Areas within 1 km of the Project site boundary (Figure 7.1.1).

7.1.15 There is one defined Area of High Archaeological Potential (Surrey County Council) partially within the land required for the Project, along with four defined Red Archaeological Notification Areas (Crawley Borough Council). Two further Areas of High Archaeological Potential are located immediately to the north of the Project site boundary, whilst three further Red Archaeological Notification Areas are located just to the south of the Project site boundary (Figure 7.1.1).

7.1.16 Archaeological investigation has previously taken place at several locations within the land required for the Project. The most extensive area of such works was the Gatwick North West Zone, where the investigations identified evidence for settlement activity during the Late Bronze Age and Early Iron Age. Archaeological work undertaken in connection with the Flood Storage Reservoir in the south eastern part of the land required for the Project found artefacts of Palaeolithic and Mesolithic date along with evidence for Iron Age settlement including roundhouses.

Proposed Scope of the Assessment

- 7.1.17 It is proposed that the findings of the assessment of effects on the historic environment would be set out as a topic chapter within the ES, supported by technical appendices where appropriate. The PEIR will include a draft chapter, including as much of the information set out below as is available at the time of writing.

Proposed Scope of Baseline Studies

- 7.1.18 The HER data will be updated and collated and will be presented within a detailed historic environment desk-based assessment. This assessment will include a review of previous archaeological investigations and may (where necessary) utilise the acquisition of information not yet in the public domain.
- 7.1.19 The review of HER data and other source information regarding previous archaeological work will enable an understanding of the known and potential archaeological resource base that could be affected by the construction of the Project. This understanding will also be informed through consideration of the geology and topography of the area along with the historic maps and published documents. There will also be examination of: the evidence from the previous study of aerial photographs; the previous appraisal of LiDAR data; and new photogrammetric Digital Terrain and Digital Surface Models produced from aerial imagery specifically for the Project.
- 7.1.20 The historic environment desk-based assessment will identify designated heritage assets whose importance may be affected through changes in their settings resulting from the construction and operation of the Project. This will include locally listed buildings. It will also include a review of the structures proposed for demolition as part of the Project in order to establish whether any of these structures include identified heritage values. For each heritage asset, examination will be made regarding the importance of the asset and how the setting contributes to that importance.
- 7.1.21 In addition, baseline data will be collated to inform the assessment of airborne noise effects in relation to the setting of heritage assets. That will include data in relation to listed buildings and registered parks and gardens within the tranquillity study area.
- 7.1.22 The Historic Environment chapter of the PEIR/ES will include consideration of potential airborne noise impacts that may occur as a result of increased flight numbers and changes in the volume of flights along the established flight paths. This could impact on the importance of heritage assets as a result of loss of tranquillity. The study will include reference to the tranquillity mapping undertaken by the Campaign to Protect Rural England (CPRE). The types of heritage asset included within this study and the methodology to be used would be identified with regard to consultation with Historic England and the heritage advisors to the local authorities.

Proposed Approach to Identifying Future Baseline Conditions

- 7.1.23 The potential for future change in baseline conditions will be described, taking into account the assessment years identified in Chapter 6. Changes to the baseline conditions in the future could include amendments to the list of designated assets, eg additional designations of scheduled monuments, listed buildings (including locally listed buildings), Registered Parks and Gardens, Conservation Areas, or amendments to the extent and description of any of these asset types.

- 7.1.24 Additional changes could occur as a result of proposed development in the area occurring in the absence of the Project, or as a result of increased knowledge through archaeological investigations undertaken by other developments within the study area or as part of more extensive programmes of research in the area.
- 7.1.25 Climate change is unlikely to affect the historic environment baseline in this area.

Study Area

- 7.1.26 The study area for the archaeological element of the historic environment desk-based assessment will extend to 1 km from the Project site boundary. This is considered to be a sufficient area to provide a reasonable understanding of the likely nature and date of archaeological resources within the Project site. It has been selected on the basis of previous experience and knowledge of the general area. Consideration of the archaeological potential within the study area will take general account of the known archaeology and history of a much wider area of the Weald.
- 7.1.27 The study area for the identification of designated heritage assets will extend for 3 km from the Project site boundary. Examination will be made of the Zone of Theoretical Visibility (ZTV). This may result in some of the designated heritage assets within the defined study area being removed from the assessment as a result of a lack of potential for visual impacts, although other possible impacts (such as noise) will also be considered within this process. It is possible that designated heritage assets beyond the defined study area will need to be included within this review. These may be assets which include designed views towards the airport, or possibly ones which have a particular iconic status that may be affected by the Project. Such assets would be identified through consultation with Historic England and the heritage advisors to the local authorities.
- 7.1.28 For potential airborne noise impacts on tranquillity of heritage assets, the study area will be determined based on the findings of the noise assessment and will take into account the study area used for the assessment of effects on tranquillity within the landscape, townscape and visual assessment.

Effects Proposed to be Assessed

- 7.1.29 The following potential effects will be considered within the EIA process:

Table 7.1.1: Potential Effects to be Considered – Historic Environment

Activity	Potential Effects
Construction Phase (including Demolition): Buried Archaeology	
Construction and demolition activities (generally)	Loss of, or damage to, heritage assets as a result of construction activity (eg physical removal or disturbance of archaeological remains, where these are still present).
Construction of updated highways junctions	Loss of, or damage to, heritage assets as a result of construction of upgraded highway junctions (eg physical removal, disturbance, damage of potential archaeological remains).

Activity	Potential Effects
Use of construction compounds and creation of mitigation areas beyond existing airport boundary	Loss of, or damage to, heritage assets as a result of instigation and use of construction compounds and creation of environmental mitigation/enhancement areas beyond the existing airport boundary. This would include works associated with drainage, such as excavation for new ponds or ground reduction for flood alleviation. Works to prepare the proposed construction compounds may result in loss of or damage to heritage assets. However, the site of the proposed main contractor compound is already developed (predominantly for surface parking), whilst the site of the proposed airfield satellite compound has been subject to previous archaeological examination as part of the Gatwick North West Zone development.
Construction Phase (including Demolition): Built Heritage and Historic Areas	
Construction and demolition activities	Effects resulting from changes within the settings of designated and non-designated heritage assets as a result of demolition and construction activity (including light and noise), construction of upgraded highway junctions and use of construction compounds. Effects resulting from demolition of un-designated buildings with identified heritage values.
Construction Phase (including Demolition): Historic Landscape	
Construction and demolition activities	Effects on the wider historic landscape as a result of construction activity, including construction of upgraded highway junctions, use of construction compounds and creation of mitigation/enhancement areas.
Operational Phase: Built Heritage and Historic Areas	
Use of airport, including upgraded highway junctions	Effects resulting from changes within the settings of designated and non-designated heritage assets as a result of operational activity (including light and noise). This will include consideration of potential airborne noise impacts that may occur as a result of increased flight numbers, changes in distribution of volumes of aircraft along established flight paths.
Operational Phase: Historic Landscape	
Use of airport, including upgraded highway junctions	Effects on the wider historic landscape.

Approach to Assessment of Effects

- 7.1.30 The identification of heritage assets whose importance could be affected by the Project will facilitate input into the design process. This could include input into landscape design and also structure design, as well as informing the physical location of Project elements. This will be undertaken alongside the assessment of impacts resulting from changes within the settings of heritage assets and will be undertaken in liaison with the consultant team undertaking the assessment of effects on landscape, townscape and visual resources (see Section 7.2). Aspects where a joint approach is proposed include establishment and review of the ZTV and also the locations and extent of viewpoints from which visualisations (eg photomontages, wirelines etc) may be produced. Final selection of viewpoint locations for the historic environment assessment will be agreed following consultation with Historic England and the heritage advisors to the local authorities.
- 7.1.31 Any land considered to have potential for the presence of buried archaeological remains and which will be impacted by the Project will require archaeological investigation to an appropriate

level in order to fully inform the assessment presented within the ES. Such land includes 'greenfield' land, such as the proposed Pentagon Field car park at the eastern edge of the Project site and the land at the western edge of the Project site that may be required for the relocation of Pond A. The land required for the construction compound associated with the North Terminal and South Terminal junction works is also likely to be included depending on the methodology required for the establishment of this compound. Other potential areas that can be identified at this stage include land required for environmental mitigation/enhancement (depending on the nature of the proposed works) and also the site of the proposed wastewater treatment works (if required). Further areas where archaeological investigation may be required will be identified following consideration of the baseline data along with a review of the extent to which the area has previously been disturbed and the works required for the Project.

- 7.1.32 The nature and extent of the programme of archaeological investigation will be agreed through a consultation process with the heritage advisors to the local authorities. Currently, it is envisaged that a staged approach combining geophysical survey and intrusive archaeological evaluation (trial trenches, test pits etc) will be undertaken, but this will be confirmed through the consultation process.
- 7.1.33 Each stage of archaeological investigation will be carried out in accordance with a Written Scheme of Investigation (WSI) agreed in advance with the heritage advisors to the local authorities. The WSIs will describe the nature and extent of the proposed archaeological investigation, along with the approach towards the appropriate reporting of results, treatment of artefacts and deposition of the resultant archive.
- 7.1.34 The assessment of the likely effects on the historic environment will include the following:
- Identification of heritage assets that could be affected by the Project along with a description of the importance of those assets including the contribution made by their setting;
 - Identification of the likely impacts of the Project on the importance of heritage assets within the site and the defined study areas; and
 - Assessment of significance of effects, taking into account measures proposed to avoid, reduce or remedy adverse effects, or to enhance existing conditions.
- 7.1.35 The assessment would follow the approach set out in Chapter 6 with regard to identification of receptor sensitivity, impact magnitude and evaluation of significance of effects. The criteria used to describe the significance of heritage assets and receptor sensitivity will be defined separately for buried archaeology, built heritage and historic landscape.
- 7.1.36 The evaluation of significance will be underpinned by a narrative approach, particularly with regard to the impacts resulting from changes within the settings of heritage assets. This approach is in line with guidance published by Historic England in Planning Note 3 (Historic England, 2017). The assessment will include consideration of harm to, and loss of, the significance of heritage assets, and will seek to identify any benefits to the significance of heritage assets that may arise from the Project.

Approach to Mitigation, Enhancement and Monitoring

- 7.1.37 It is possible that the programme of archaeological investigation described above could lead to the recognition of areas where further, more detailed, archaeological work is required ahead of

construction. If this is the case, the extent of any such areas will be agreed with the heritage advisors to the local authorities and these areas will be clearly identified within the ES.

- 7.1.38 Any further archaeological investigation required after the granting of the DCO will be carried out in accordance with a WSI agreed in advance with the heritage advisors to the local authorities. The WSI will describe the nature and extent of the proposed archaeological investigation, along with the approach towards the appropriate reporting of results, treatment of artefacts and deposition of the resultant archive. Consideration will be given to any situation where the Project will lead to effects on the importance of heritage assets as a result of change within their settings. It may be possible that mitigation could be proposed that would eliminate or reduce any adverse effects. This mitigation could be in the form of physical barriers within or close to the Project site boundary, or possibly adjustments to the heritage asset or within its immediate vicinity. Some monitoring of the effects of change within the setting of heritage assets may be necessary.

Issues Proposed to be Scoped Out

- 7.1.39 No assessment is proposed to be undertaken with regard to the potential effects on the importance of designated heritage assets located within the more urbanised areas of Horley and Crawley. It is very unlikely that the construction and/or operation of the Project would result in a significant effect on such assets as a result of change within their settings. This is because their settings are predominantly urban and this aspect will not change.
- 7.1.40 Any effects on buried archaeological remains would occur during the construction phase, as it is during this phase that ground disturbance, including excavation and tracking of vehicles would occur. This could lead to loss of or damage to archaeological resources. Such effects are considered to be permanent and irreversible. No further groundworks are proposed during the operational phase and no new areas would be affected by operational activities including vehicle movements. Therefore, no further effects on buried archaeology would occur during operation of the Project, and such effects have been scoped out of the assessment process.

7.2 Landscape, Townscape and Visual Resources

Relevant Policy, Legislation and Guidance

Legislative and Policy Context

- 7.2.1 The following key legislation and policy documents relevant to landscape, townscape and visual effects will be considered within the assessment process:
- Airports National Policy Statement (Department for Transport, 2018a);
 - National Policy Statement for National Networks (Department for Transport, 2014);
 - NPPF (Ministry of Housing, Communities and Local Government, 2019a);
 - Crawley 2030: Crawley Borough Local Plan 2030 (Crawley Borough Council, 2015) – Policies CH2 Principles of Good Urban Design CH3 Normal Requirements for New Development, CH7 Structural Landscaping, CH8 Important Views, CH9 Development Outside the Built Up Area, CH10 High Weald AONB and ENV1 Green Infrastructure;

- Emerging Crawley 2035: Draft Crawley Borough Local Plan 2020-2035 (Crawley Borough Council, 2019) - Policies SD1, CD1, CD2, CD3, CD4a, CD4b, CD5, CD6, CD7, CD10, LC1, LC2, LC3, LC4, LC5 and LC6;
- Reigate and Banstead Local Plan (Reigate and Banstead Borough Council, 2005) – Policies Pc4 Tree Protection, Pc6 Urban Open Land HR37 Gatwick Area Open Setting;
- Reigate and Banstead Local Plan: Core Strategy (Reigate and Banstead Borough Council, 2014) – Policies CS2 Valued Landscapes & the Natural Environment, CS3 Green Belt and CS12 Infrastructure Delivery;
- Emerging Reigate and Banstead Borough Development Management Plan 2018-2027 (Reigate and Banstead Borough Council, 2018) - Policies NHE1 Landscape Protection, NHE4 Green/ Blue infrastructure (emerging policy);
- Mole Valley Core Strategy 2009 (Mole Valley District Council, 2009) – Policies CS13 Landscape Character, CS14 Townscape, Urban Design and the Historic Environment;
- Mole Valley Local Plan 2000 (Mole Valley District Council, 2000) – Policy ENV4 Landscape Character, ENV23 Respect for Setting, RUD27 Airport Related Development;
- Horsham District Planning Framework (excluding South Downs National Park) 2015 (Horsham District Council, 2015) - Policy 25 District Character & the Natural Environment, Policy 26 Countryside Protection, Policy 27 Settlement Coalescence, Policy 30 Protected Landscapes;
- Tandridge District Core Strategy 2008 (Tandridge District Council, 2008) - Policy CSP21 Landscape & Countryside;
- Tandridge Local Plan Part 2: Detailed Policies 2014-2029 (Tandridge District Council, 2014) – Policy DP10 Green Belt;
- Emerging Our Local Plan 2033 (Regulation 22 Submission) 2019 (Tandridge District Council, 2019) – Policy TLP03 Green Belt, TLP32 Landscape Character, TLP33 Surrey Hills & High Weald AONB (emerging policy);
- Mid Sussex District Plan 2014-2031 (Mid Sussex District Council, 2018) – Policies DP18 Setting of the South Downs National Park, DP16 High Weald AONB;
- Saved Policies from the Mid Sussex Local Plan 2004 (Mid Sussex District Council, 2004) - Policies CO1 Green Belt, C2 Strategic Gaps, C3 Local Gaps, C4 AONB, B16 Areas of Townscape Character;
- High Weald Area of Outstanding Natural Beauty Management Plan 2019-2024 (High Weald Joint Advisory Committee, 2019);
- Surrey Hills Area of Outstanding Natural Beauty Management Plan 2014-2019 (Surrey Hills Board, 2014);
- Kent Downs Area of Outstanding Natural Beauty Management Plan 2014 – 2019 (Kent Downs AONB Partnership, 2014); and
- South Downs National Park Partnership Management Plan 2014 – 2019 (South Downs National Park Authority, 2013).

Guidance Documents

- 7.2.2 The assessment will be undertaken with reference to published guidance including:
- Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (Landscape Institute and the Institute of Environmental Management and Assessment, 2013);

- Landscape Character Assessment: Guidance for England and Scotland (Countryside Agency and Scottish Natural Heritage, 2002); and
- Airspace Design: CAP 1616 (Civil Aviation Authority, 2018).

Baseline Information

Data Collated to Date

7.2.3 The following forms a summary of the data collated and work undertaken to date and is illustrated in Figures 7.2.1 to 7.2.17:

- Preliminary review of legislative and policy context;
- Review of landscape designations;
- Preliminary review of national, regional and local landscape character assessments including landscape character areas and types;
- Preparation of existing ZTV and preliminary proposed ZTV; and
- Field surveys to capture daytime and night time winter photography.

7.2.4 An existing ZTV has been prepared based on heights of all the main buildings and infrastructure within Gatwick Airport (Figure 7.2.1). This covers an area of approximately 43 km² within the 163 km² (5 km) radius of search. A preliminary proposed ZTV has also been prepared based on the main new buildings and infrastructure only. Initial analysis shows that the proposed ZTV is smaller than the existing ZTV, indicating that the tallest buildings and structures are existing and would continue to form the most visually prominent elements of the airport.

Existing Baseline Conditions

7.2.5 A preliminary appraisal of the existing baseline situation at the Project site and within the surrounding area has been undertaken. The Project site currently comprises the large-scale buildings, extensive hardstanding, aircraft, associated facilities, transport infrastructure and natural and green infrastructure of Gatwick Airport. Smaller areas of public open space and farmland are located within the Project site boundary, beyond the existing airport boundary.

7.2.6 At a national scale, the National Character Area profile defines the Project site and the surrounding rural landscape and urban townscape as lying within the Low Weald. At a county level, land to the west, south and east of the Project site lies within the West Sussex Northern Vales character area, whilst Gatwick Airport itself, due to its largely developed nature, lies outside of this landscape characterisation, effectively forming a separate and distinct subdivision of the local character. The surrounding area is divided between the large urban centres of Crawley to the south and Horley to the north and the Open Weald character area of Surrey County to the north west.

7.2.7 There are no designated landscapes within the Project site (Figure 7.2.14). The High Weald Area of Outstanding Natural Beauty (AONB) lies approximately 3 km to the south east, separated from the airport by the town of Crawley. The Surrey Hills AONB lies approximately 8 km to the west of the airport at its closest point. The Kent Downs AONB lies approximately 15 km to the north east, while the South Downs National Park lies approximately 22 km to the south of the Project site. These landscapes are valued for their scenic beauty.

- 7.2.8 Tall buildings and structures at Gatwick Airport are currently visible in views from the edges of local settlements, transport corridors, public rights of way and open space. Overflying aircraft are also visible from locations throughout the study area. Due to a combination of the relatively flat landform and mature vegetation, the airport is relatively well contained in mid to long distance views. The Landscape, Townscape and Visual Resources chapter of the PEIR/ES will include consideration of potential airborne noise and visual impacts that may occur as a result of increased flight numbers and changes in the volume of flights along defined flight paths. This could impact on landscape character and visual receptors as a result of a reduction in the perception of tranquillity. The study will include reference to the tranquillity mapping undertaken by the CPRE (CPRE, 2007).
- 7.2.9 Receptors likely to have views of the Project site include:
- Walkers, equestrians and cyclists using the public rights of way network within and around the Project site;
 - Users of public open space at the Riverside Garden Park;
 - Occupiers of residential properties, for example at Horley, Lowfield Heath and Tinsley Green;
 - Occupiers of vehicles travelling on the A23 Airport Way and London Road, M23, Balcombe Road, Charlwood Road and Lowfield Heath Road;
 - Passengers on trains on the London to Brighton mainline railway;
 - Passengers, staff and visitors to Gatwick Airport using terminal buildings, car parks, hotels, circulation space and transport corridors;
 - Residents and walkers at local high points at Norwood Hill and Turners Hill; and
 - Residents, walkers, equestrians and cyclists beneath flight paths within the High Weald AONB, Surrey Hills AONB, Kent Downs AONB and South Downs National Park.

Proposed Scope of the Assessment

- 7.2.10 It is proposed that the findings of the assessment of effects on landscape, townscape and visual resources would be set out as a topic chapter within the ES, supported by technical appendices where appropriate. The PEIR will include a draft chapter, including as much of the information set out below as is available at the time of writing.

Proposed Scope of Baseline Studies

- 7.2.11 The scope of work will include the following core activities:
- A review of relevant planning policy related to landscape/townscape and visual issues;
 - A desktop study and web search of relevant background documents and maps, including reviews of aerial photography, web searches, Local Planning Authority publications and relevant landscape character assessments for the site and surroundings; and
 - Field assessment and photographic survey of the character and fabric of the site and its surroundings, and of the views available to and from the site. Field surveys allow a better understanding of the landscape, to determine its character, condition, value and intrinsic sensitivity and identify visual receptors and visual barriers.
- 7.2.12 The baseline assessment will include an appraisal of the landscape and townscape (landscape within the built-up area) within the study area. The studies will identify the landscape/townscape

resources and character, including individual features, key characteristics and the wider landscape/townscape character.

- 7.2.13 Baseline information on the landscape/townscape will be gathered through a combination of desk studies, consultation and field surveys. Documents used to inform the assessment may include aerial photographs, Ordnance Survey maps and published landscape character assessments.
- 7.2.14 Relevant national, county and district landscape character assessments will be reviewed. Particular attention will be paid to the key landscape characteristics of the relevant landscape types / character areas and special qualities of the High Weald AONB, Surrey Hills AONB, Kent Downs AONB and South Downs National Park. Valued landscape resources will be identified at national and local levels.
- 7.2.15 Field surveys will be carried out to gain a better understanding of the landscape and townscape, to determine its character, condition and identify visual receptors and visual barriers. The surveys will establish the landscape and townscape resources that combine to give the landscape and townscape a distinct sense of place.
- 7.2.16 An initial series of representative daytime and some night time winter views has been identified and these are shown on Figure 7.2.1 with panoramic photography at Figures 7.2.2 to 7.2.13. The representative viewpoints will be used to assess the potential visual impacts of the Project on the different range of views towards the site. The selected viewpoints will include views from close quarters through to distant views in which the Project site is part of a wider landscape. Further viewpoints will be identified and added to the assessment process, as required in consultation with local authorities and Natural England.
- 7.2.17 An existing ZTV has been prepared based on heights of key buildings and infrastructure at Gatwick Airport to establish the baseline situation. A preliminary proposed ZTV has also been prepared to inform identification of the study area and to define the extent of further studies.

Proposed Approach to Identifying Future Baseline Conditions

- 7.2.18 The landscape, townscape and visual assessment process will identify the existing 'baseline' and projected 'future baseline' condition, value and character of the landscape/townscape and its visual relationship with its surroundings, building on the initial appraisal of existing baseline conditions. The future baseline within the identified assessment years (see Chapter 6) as a result of committed or consented developments will be described.
- 7.2.19 A future baseline scenario may also include additional visual receptors of high sensitivity associated with other proposed developments (eg residential developments) or changes in the extent of nationally designated landscapes such as AONBs and National Parks. Significant changes in landscape character as a result of climate change are considered unlikely.

Study Area

- 7.2.20 The existing and preliminary proposed ZTVs have informed the extent of the study area to ensure that all landscape, townscape and visual receptors that may experience significant effects are captured.

7.2.21 A 5 km radius area of search from the Project site boundary has been identified, as the ZTV indicates that the vast majority of land that may be potentially intervisible with development at Gatwick Airport lies within this area. This has defined an appropriate study area to capture the relevant landscape, townscape and visual receptors that are likely to be affected by the Project and to ensure that all likely significant effects will be identified.

7.2.22 A separate study area will be established to coincide with overflying aircraft at height profiles up to 7,000 feet to address effects on landscape tranquillity and visual receptors. This study area is considered appropriate to capture receptors in the wider rural landscape, including the High Weald AONB, Surrey Hills AONB Kent Downs AONB and South Downs National Park.

Effects Proposed to be Assessed

7.2.23 The assessment will consider two key areas:

- Landscape/townscape character: A review of the character of the site and its surroundings will be undertaken with reference to published landscape assessment documents and field survey, including summer and winter and day and night time situations; and
- Visual resources: Taking into account the findings of the site visits and field appraisal, a range of viewpoint locations will be identified that are considered representative of views towards the site from surrounding areas, including summer and winter and day and night time situations.

7.2.24 The following potential effects will be considered within the EIA process:

Table 7.2.1: Potential Effects to be Considered – Landscape, Townscape and Visual Resources

Activity	Potential Effects
Construction Phase (including Demolition): Landscape/Townscape Characters	
Construction and demolition activities (generally)	Change in character (to landscape designations/ types/areas) as a result of construction activity (including lighting).
Construction of updated highways junctions	Change in character (to landscape designations/ types/areas, specifically Riverside Garden Park) as a result of construction of upgraded highway junctions (including lighting).
Use of construction compounds and creation of mitigation areas	Change in character (to landscape designations/ types/areas) as a result of use of construction compounds and creation of mitigation/enhancement areas (including lighting) beyond the existing airport boundary. Specifically, effects of new Pond A (Figure 5.2.1e) excavation/River Mole floodplain.
Construction Phase (including Demolition): Visual Effects	
Construction and demolition activities	Effects on views as a result of demolition and construction activity (including lighting), construction of upgraded highway junctions and use of construction compounds.
Operational Phase: Landscape/Townscape Character	
Use of airport, including upgraded highway junctions	Change in character as a result of operational activity (including tranquillity). Likely scope of assessment to focus on the following elements of the Project that have some potential to result in significant effects on landscape/townscape or visual resources: Pier 7, CARE facility, hangars, noise mitigation, extension to North and South Terminals, new hotels, new office block, multi-storey and surface car parks, surface access improvements, relocation of Pond A/River Mole floodplain, new pumping stations, wastewater treatment works and lighting.

Activity	Potential Effects
Operational Phase: Visual Effects	
Use of airport, including upgraded highway junctions	Effects on views as a result of airport and operational activities and moving and stationary aircraft (including effects on tranquillity). To include consideration of day time and night time effects. Likely scope of assessment to focus on the following elements of the Project that have some potential to result in significant effects on landscape/townscape or visual resources: Pier 7, CARE facility, area for engine ground runs, hangars, noise mitigation, extension to North and South Terminals, new hotels, new office block, multi-storey and surface car parks, surface access improvements, relocation of Pond A/Rover Mole floodplain, new pumping stations, wastewater treatment works and lighting.

Approach to Assessment of Effects

- 7.2.25 The principal objectives of the assessment will be:
- To identify the existing landscape/townscape character and visual receptors with views of the Project; and
 - To assess the significance of the effects on landscape/townscape character and visual resources, taking into account the measures proposed to mitigate any of the effects identified.
- 7.2.26 An assessment of landscape and visual effects against future baseline scenarios will be incorporated to accommodate the combination of developments proposed in the absence of the Project, together with the phased development of the Project. The assessment will take into account the phasing of the Project through to the design year of 2038. Assessment years are proposed to be in accordance with those defined in Chapter 6. For some of these assessment scenarios, construction and operational activities will overlap and this will be taken into account in the assessment.
- 7.2.27 Both daytime and night time effects will be considered, taking into account the proposed lighting and light sources within the site. This will take into account the Lighting Strategy for the Project, which will form part of the application for development consent.
- 7.2.28 The sensitivity of each landscape and visual receptor will be identified, together with the predicted magnitude of impact on that receptor. Taking this into account, the significance of effect will be described for each receptor during the construction and operational phases, and upon maturity of landscape planting, where relevant (up to 15 years establishment).
- 7.2.29 The assessment would follow the approach set out in Chapter 6 with regard to identification of receptor sensitivity, impact magnitude and evaluation of significance of effects. The terms used to describe the receptor sensitivity and impact magnitude will be defined separately for landscape/townscape character and visual resources.
- 7.2.30 The evaluation of significance will be underpinned by a narrative approach, based on professional judgement.

Approach to Mitigation, Enhancement and Monitoring

- 7.2.31 The provision of suitably designed strategic green infrastructure will be considered to mitigate effects on landscape and visual resources, complement and extend the existing green estate

within Gatwick Airport and link with the surrounding rural landscape. Hard and soft landscape proposals together with a vegetation retention strategy will seek to integrate the Project with existing and proposed buildings and infrastructure to improve the character and quality of Gatwick Airport and mitigate any effects on landscape and visual resources within the study area. Opportunities for advanced planting in the early stages of construction will be sought, where practicable. The vegetation retention strategy and soft landscape mitigation will be designed in consultation with the ecological consultant and the aerodrome safeguarding team to ensure a co-ordinated approach to biodiversity for the Project and which does not compromise aerodrome safety standards.

Issues Proposed to be Scoped Out

- 7.2.32 All landscapes and townscapes located outside of the ZTV and all visual receptors within those locations are proposed to be scoped out of the assessment as the Project would not be visible from these locations and no change to views or character would occur.
- 7.2.33 A preliminary proposed ZTV has been prepared. The ZTV indicates that the vast majority of land that may be potentially intervisible with development at Gatwick Airport lies within 5 km of the Project site boundary. Based on the ZTV, all landscapes, townscapes and visual receptors located outside of a 5 km radius of the Project site boundary are proposed to be scoped out of the assessment (except for the assessment of tranquillity – see below) as significant effects are considered highly unlikely due to the limited potential intervisibility or visual influence and the effects of distance. This is illustrated on Figure 7.2.1.
- 7.2.34 A separate, wider study area coinciding with overflying aircraft at height profiles up to 7,000 feet has been identified to assess effects on landscape tranquillity and visual receptors as a result of overflying aircraft. This study area has been defined using guidance within the CAA's CAP1616 for how tranquillity effects should be assessed. It captures overflying aircraft following established Noise Preferential Routes (NPRs) and arrival flight paths, where significant effects on tranquillity due to an intensification of existing noise or visual impacts may occur. Receptors within the landscape outside of these NPRs and routes have been scoped out of the assessment as there are no proposed changes to routing and therefore these areas would not be overflowed (and no effect on tranquillity is likely). No impacts are anticipated beyond this wider study area and effects on designated landscapes outside these areas are proposed to be scoped out of the assessment.
- 7.2.35 The West Sussex coastline is approximately 35 km from Gatwick Airport and lies outside the proposed study areas. Therefore, there would be no change or impact on receptors within this area. Seascape character effects are proposed to be scoped out of the assessment.

7.3 Ecology and Nature Conservation

Relevant Policy, Legislation and Guidance

Legislative and Policy Context

7.3.1 The following key legislation and policy documents relevant to ecology and nature conservation will be considered within the assessment process:

- Directive 92/43/EEC (the Habitats Directive);
- Directive 2009/147/EC (the Birds Directive);
- The Conservation of Habitats and Species Regulations 2017;
- Wildlife and Countryside Act 1981 (as amended);
- Countryside and Rights of Way Act 2000;
- The Natural Environment and Rural Communities Act 2006 (as amended);
- The Wild Mammals (Protection) Act 1996;
- Protection of Badgers Act 1992;
- Airports NPS (Department for Transport, 2018a);
- NPS for National Networks (Department for Transport, 2014);
- NPPF (Ministry of Housing, Communities and Local Government, 2019a); and
- Crawley 2030: Crawley Borough Local Plan 2030 (Crawley Borough Council, 2015) – Policies CH6 Tree Planting & Replacement Standards, CH7 Structural Landscaping, ENV2 Biodiversity, ENV10 Pollution Management & Land Contamination;
- Emerging Crawley 2035: Draft Crawley Borough Local Plan 2020-2035 (Crawley Borough Council, 2019) - Policies SD1. GI1, GI2, GI3 and GI4;
- Reigate and Banstead Local Plan 2005 (Reigate and Banstead Borough Council, 2005) – Policy Pc2G Local Nature Conservation Interest;
- Reigate and Banstead Local Plan: Core Strategy 2014 (Reigate and Banstead Borough Council, 2014) - Policy CS2 Valued Landscapes & the Natural Environment;
- Emerging Reigate and Banstead Borough Development Management Plan 2018-2027 (Reigate and Banstead Borough Council, 2018) – Policies NHE2 Protecting and Enhancing Biodiversity and areas of Geological Importance, NHE3 Protecting Trees, Woodland and Natural Habitats, NHE4 Green/ Blue Infrastructure (emerging policy);
- Mole Valley Core Strategy 2009 (Mole Valley District Council, 2009) – Policy CS15 Biodiversity & Geological Conservation;
- Mole Valley Local Plan 2000 (Mole Valley District Council, 2000) - Policy ENV9-15 Nature Conservation;
- Horsham District Planning Framework (excluding South Downs National Park) 2015 (Horsham District Council, 2015) - Policy 32 Green Infrastructure & Biodiversity;
- Tandridge District Core Strategy 2008 (Tandridge District Council, 2008) - Policy CSP17 Biodiversity;
- Tandridge Local Plan Part 2: Detailed Policies 2014-2029 (Tandridge District Council, 2014) – Policy DP19 Biodiversity, Geological Conservation & Green Infrastructure;
- Emerging Our Local Plan 2033 (Regulation 22 Submission) 2019 (Tandridge District Council, 2019) – Policies TLP35 Biodiversity, Ecology & Habitats, TLP36 Ashdown Forest SPA (emerging policy);

- Mid Sussex District Plan 2014-2031 (Mid Sussex District Council, 2018) – Policies DP17 Ashdown Forest SPA and SAC, DP37 Trees, Woodland & Hedgerows DP38 Biodiversity; and
- Saved Policies from the Mid Sussex Local Plan 2004 (Mid Sussex District Council, 2004) - Policy C6 Ancient Woodland & Hedgerows, C5 SSSIs, SINC's, Local Nature Reserves, C6 Trees & Woodland.

Guidance Documents

- 7.3.2 The assessment of ecological effects for the ES chapter will be undertaken in accordance with the ecological impact assessment guidelines published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018). The effect of the Project on European designated sites will be assessed following the method set out in the Planning Inspectorate Advice Note Ten: Habitats Regulations Assessment Relevant to Nationally Significant Infrastructure Projects (Planning Inspectorate, 2017c). This will be presented either as a No Significant Effects Report or (if Appropriate Assessment is required following screening) or as a Habitats Regulations Assessment Report (in accordance with the Conservation of Habitats and Species Regulations 2017, which transpose the requirements in the Habitats Directive (92/43/EEC) and the European Birds Directive (2009/147/EC) into UK law).
- 7.3.3 Surveys will be undertaken in accordance with best practice guidance relevant to each survey type.

Baseline Information

Data Collated to Date

- 7.3.4 This section forms a summary of the data collated to date, relevant information is presented on Figures 7.3.1 and 7.3.2.
- 7.3.5 Data with respect to statutory designated sites have been collected from the MAGIC website (www.magic.defra.gov.uk). This provides the current boundaries for such sites. The locations of, and boundaries for, Ancient Woodland have also been obtained from the MAGIC website.
- 7.3.6 Parts of the Project site and surrounding area have been subject to various ecology studies during the recent past, the results of which have been collated.
- 7.3.7 In addition, a rolling programme of ecological studies has been undertaken by Gatwick Airport's Biodiversity Officer between 2012 and 2018 within two 'biodiversity areas' as part of Gatwick's commitment to their Biodiversity Action Plan (BAP). This has included a rolling programme of surveys (both formal and informal) covering the full suite of ecological interest. These data have been made available to help inform survey design and to provide background data for the Project.
- 7.3.8 Based on a review of the available desk study information and previous survey results, surveys have commenced, including:
- Phase 1 habitat survey;
 - Great crested newts;
 - Terrestrial and aquatic invertebrates;
 - Foraging/commuting bats;
 - Roosting bats;

- Reptiles;
- Breeding birds.
- Aquatic mammals;
- Dormice; and
- Botanical interest.

Existing Baseline Conditions

- 7.3.9 No part of the Project site has been designated for its nature conservation value at a statutory level and no part of the site directly borders such a designated site. The following European designated sites are located within 20 km of the Project site (Figure 7.3.1):
- Ashdown Forest Special Area of Conservation (SAC) and Special Protection Area (SPA); and
 - Mole Gap to Reigate Escarpment SAC.
- 7.3.10 In addition, following consultation with Natural England, the following European sites designated for their bat populations beyond 20 km from the Project site boundary have been identified for consideration:
- Ebernoe Common SAC; and
 - The Mens SAC.
- 7.3.11 The following UK statutory designated sites are within 5 km of the Project site (Figure 7.3.2):
- House Copse Site of Special Scientific Interest (SSSI);
 - Glover's Wood SSSI;
 - Buchan Hill Ponds SSSI;
 - Hedgecourt SSSI;
 - Edolph's Copse Local Nature Reserve (LNR);
 - Grattons Park LNR;
 - Tilgate Forest LNR; and
 - Target Hill Park LNR.
- 7.3.12 An additional site known as Willoughby Fields is located within 5 km of the Project site and is listed on the Crawley Borough Council website as an LNR but does not appear on national databases. The designation status of Willoughby Fields will be clarified through consultation and included in the PEIR/ES.
- 7.3.13 Data with respect to locally designated sites within 5 km of the Project site has been requested from both the Sussex and Surrey Biological Records Centres and will be included within the PEIR/ES.
- 7.3.14 Additionally, following industry best practice, records of protected or otherwise notable species have also been requested from the records centres and will be included within the PEIR/ES.
- 7.3.15 Much of the land within the Project site comprises the operational airport and associated hardstanding/buildings, which is generally of little ecological value. Habitats of ecological interest are generally located towards the Project site boundary, away from the operational area of the airport. Such habitats include grasslands of varying quality (from more species-rich to agriculturally-improved pasture), blocks of woodland (including several parcels of Ancient Woodland – Brockley Wood, Horleyland Wood and Lower Picketts Wood) and water features

(both highly-engineered surface water management basins and more natural ponds, some of which have been dug/planted to be of ecological benefit, including the River Mole diversion corridor to the north east of the airport).

- 7.3.16 Agricultural fields occur within the Project site boundary (but outside of the existing airport), which are bounded by hedgerows of varying quality.
- 7.3.17 Three main watercourses flow through the Project site:
- The River Mole runs from the south and is culverted under both the main runway and existing northern runway. Upon exiting the culvert, it forms the western and northern boundary of the airport before heading north away from the airport at Hookwood.
 - The Gatwick Stream runs along the eastern airport boundary between the eastern end of the airside operational area and the London to Brighton mainline railway. It is culverted under the South Terminal before running north through Riverside Garden Park and joining the River Mole in Hookwood.
 - Crawler's Brook enters the airport to the east of the industrial area of Lowfield Heath and is canalised along the southern edge of the airside operational area. It joins the River Mole shortly before the culvert under both existing runways.
- 7.3.18 Surveys to date (both historic and ongoing) have identified populations of the following fauna of conservation interest:
- Great crested newt breeding in ponds in woodland adjacent to Horleyland Wood and to the north of the River Mole near to the Bear & Bunny Nursery;
 - Bat assemblage including Bechstein's bat *Myotis bechsteinii* roosting in Brockley Woods;
 - Terrestrial invertebrate assemblage;
 - Dormice *Muscardinus avellanarius* in the Ancient Woodland;
 - Range of breeding birds of varying status;
 - Small badger setts to the north and south of the runways; and
 - Grass snake *Natrix* in grasslands along the River Mole corridor.
- 7.3.19 Additionally, a range of invasive plant species have been recorded around the site, including Himalyan balsam *Impatiens glandulifera* along the River Mole Corridor.

Proposed Scope of the Assessment

- 7.3.20 It is proposed that the findings of the assessment of effects on ecology and nature conservation would be set out as a topic chapter within the ES, supported by technical appendices where appropriate. The PEIR will include a draft chapter, including as much of the information set out below as is available at the time of writing.

Proposed Scope of Baseline Studies

- 7.3.21 The desk study results, including details of protected species records, designated sites and the results of the Phase 1 habitat survey will be presented within a Preliminary Ecological Appraisal (PEA), which will form an appendix to the PEIR/ES.
- 7.3.22 As set out above, a number of surveys are currently being undertaken on site, including:
- Great crested newts;

- Terrestrial invertebrates;
- Aquatic invertebrates;
- Bat activity (foraging/commuting) via static monitoring and manual transects;
- Bat roosting;
- Reptiles;
- Breeding birds;
- Aquatic mammals (otter & water vole);
- Dormice; and
- Botanical interest (where appropriate).

7.3.23 Additionally, in order to ensure that the assessment takes full account of the potential presence of Bechstein's bat, which is impossible to distinguish from other *Myotis* species using bat detection techniques, the bat surveys will include trapping and subsequent radio tracking to identify roosts and foraging/commuting routes around the Project site. Further, collision risk surveys, using thermal imaging techniques, will be undertaken to identify the potential for increased bat strike risk as a result of increasing air traffic movements.

7.3.24 Data relating to these species/groups will be gathered throughout the survey season in 2019 and, if necessary, spring 2020. Depending on the outcome of consultation and the extent of works proposed to watercourses, surveys for fish will also be undertaken if required. Circumstances that may necessitate fish survey work would include substantial alterations to watercourses, such as changes to flow and/or alignment.

Proposed Approach to Identifying Future Baseline Conditions

7.3.25 Future ecological baseline conditions for each of the assessment scenarios will also be described, taking into account projected trends in Important Ecological Features (IEFs) such as species populations dynamics and changes to flow rates of watercourses. In addition, predicted consequences arising from climate change and changes occurring as a result of other proposed developments (that will occur in the absence of the Project) will be considered.

Study Area

7.3.26 The initial search area for European designated sites (including SACs, SPAs and Ramsar sites) was 20 km from the Project site boundary to allow for effects arising from vehicle emissions. This buffer may be extended for SACs designated for bats, should such species be identified as present on the Project site.

7.3.27 An initial buffer of 5 km for other sites (SSSIs, National Nature Reserves (NNRs), LNRs and locally-designated sites) has been used for the data search to allow for effects arising from works at the Project site and effects arising from changes to surface access arrangements. An initial 5 km buffer is considered appropriate since this recognises that effects due to surface access arrangements may occur at some distance from the Project site. However, with the exception of effects from traffic (see below), significant effects are not considered likely to occur beyond this distance.

7.3.28 However, as the traffic modelling is undertaken, the search area for internationally, nationally and locally designated sites will be refined to ensure that any designated site within 200 metres of

significant surface access routes where significant increases in traffic flow (according to the Institute of Environmental Assessment (IEA) thresholds – see Section 7.6) are predicted or where the airport operations model suggests that effects may occur will be included within the study area (even where these sites lie outside the initial 20 km and 5 km search areas).

- 7.3.29 Records of protected or otherwise notable species have been requested from the local records centres within a 2 km radius of the Project site boundary, except for bats where a larger 10 km radius has been used in accordance with guidance from the Bat Conservation Trust (2016).
- 7.3.30 The survey area for the majority of surveys will be within the Project site boundary. However, it is recognised that effects on ecological receptors can occur beyond such limits, especially for mobile species such as bats. Therefore, the survey area will include, as necessary, areas of woodland in the surrounding landscape if they are considered to support bat roosts or if their inclusion would help to elucidate the use of the surrounding landscape by bats. The survey area will also include up to 500 metres both up and down stream of the major watercourses that flow through the Project site to identify any potential sign of otter/water vole. A similar survey area would be used for fish, should such surveys be required.

Effects Proposed to be Assessed

- 7.3.31 Based upon the information collated to date, although none occur on or immediately adjacent to the Project site, the following statutory designated sites are likely to be IEFs requiring detailed assessment:
- Ashdown Forest SAC and SPA;
 - Ebernoe Common SAC;
 - Mole Gap to Reigate Escarpment SAC;
 - The Mens SAC;
 - House Copse SSSI;
 - Glover's Wood SSSI;
 - Buchan Hill Ponds SSSI;
 - Hedgecourt SSSI;
 - Edolph's Copse LNR;
 - Grattons Park LNR;
 - Tilgate Forest LNR; and
 - Target Hill Park LNR.
- 7.3.32 In addition, locally designated sites such as Willoughby Fields, will be included where an impact pathway can be identified.
- 7.3.33 Habitats that will be assessed as IEFs include:
- Ancient Woodland (both on site and in the surrounding landscape);
 - Other areas of mature broadleaved woodland;
 - Species-rich grasslands;
 - River Mole;
 - Gatwick Stream;
 - Crawter's Brook;
 - Various ponds; and

- Hedgerows and associated field boundaries.

7.3.34 Fauna that will be assessed as IEFs include:

- Great crested newt;
- Bechstein’s bat;
- Wider bat assemblage;
- Terrestrial invertebrate assemblage;
- Aquatic invertebrate assemblage;
- Dormice;
- Grass snake; and
- Breeding bird assemblage.

7.3.35 In the event that surveys identify other features of ecological value, these will be considered for inclusion within the assessment.

Table 7.3.1: Potential Effects to be Considered – Ecology and Nature Conservation

Activity	Potential Effects
Construction Phase (including Demolition): Ecology and Nature Conservation	
Construction and demolition activities	Effects on designated sites and habitats (set out above) as a result of construction activity including habitat severance and loss of ecological connectivity, habitat disturbance (eg light, noise pollution/ introduction of toxic pollutants), changes to water quality and changes in air quality (emissions from traffic and dust). Effects on species valued as important features of designated sites.
	Effects on habitats (set out above) as a result of construction activity (eg habitat loss, habitat severance and loss of ecological connectivity, habitat disturbance (eg dust, light, noise pollution/ introduction of toxic pollutants), through changes to air and water quality.
	Effects on species as a result of construction activity within airport boundary (eg direct killing or injuring of fauna, disturbance and displacement of species (particularly to those sensitive to noise and light disturbance), introduction or spread of invasive species, changes to water quality).
Construction of updated highways junctions	Effects on habitats as a result of construction of upgraded highway junctions (eg habitat loss, habitat severance and loss of ecological connectivity, habitat disturbance (eg dust, light, noise pollution/introduction of toxic pollutants), changes to air and water quality).
	Effects on species as a result of construction of upgraded highway junctions (eg direct killing/injury through activity/pollution, disturbance by increased noise/light, loss of foraging/commuting habitat).
Use of construction compounds and creation of mitigation areas	Effects on habitats as a result of use of construction compounds and creation of mitigation areas beyond the airport boundary (eg habitat loss, habitat severance and loss of ecological connectivity, habitat disturbance (eg dust, light, noise pollution/ introduction of toxic pollutants), introduction or spread of invasive species (in particular along the water courses within the airport and surrounding land), changes to air/water quality).
	Effects on species as a result of use of construction compounds and creation of mitigation areas beyond the airport boundary (eg direct killing or injuring of fauna, disturbance and displacement of species (particularly to those sensitive to noise and light disturbance), introduction or spread of invasive species)

Activity	Potential Effects
Operational Phase: Ecology and Nature Conservation	
Use of airport, including upgraded highway junctions	Effects on designated sites (set out above) as a result of changes to air quality both from airport operations and traffic emissions.
	Effects on habitats as a result of operational activity, including light and noise, as well as from changes to air quality both from airport operations and traffic emissions (air traffic movements and surface access) (eg habitat loss, habitat severance and loss of ecological connectivity, habitat disturbance (eg dust, light, noise pollution/introduction of toxic pollutants)).
	Effects on species as a result of operational activity (including light and noise) (eg direct killing or injuring of fauna (including bird/bat strike from increased air traffic movements and road traffic collisions), disturbance and displacement of species (particularly to those sensitive to noise and light disturbance), introduction or spread of invasive species).

Approach to Assessment of Effects

- 7.3.36 The ecological assessment will include an evaluation of the IEFs present on the site and surrounding area, which may include protected sites, protected species, priority habitats and priority species. The evaluation will identify features on a geographical scale, based on that provided in the CIEEM guidance, as follows: International > National > County > District > Local > Site > Negligible.
- 7.3.37 In accordance with the CIEEM guidance, the purpose of the ecological assessment is to focus on those features that are most likely to be affected and are either protected or are of sufficient value to merit consideration in the EIA process, rather than consider effects upon every feature that may be present, many of which will be common, widespread and robust. Accordingly, those features that are likely to be affected and which are statutorily protected, or are deemed to be of at least local nature conservation value, or are agreed to be worthy of consideration in consultation with consultees, will be taken forward for detailed assessment.
- 7.3.38 The likely impacts of the Project will be identified, including likely positive and negative impacts on the IEFs present. Such impacts may include direct habitat loss, changes in habitat quality or disturbance, for example through changes in lighting or noise.
- 7.3.39 The likely magnitude of the impacts will be assessed during the construction and operational stages. Both the magnitude of the predicted impact and the value of the feature will be taken into consideration in determining the significance of the effect.
- 7.3.40 The assessment will follow the approach set out in Chapter 6 with regard to identification of receptor sensitivity (value), impact magnitude and evaluation of significance of effects. The terms used to describe the receptor sensitivity take into account their geographical scale, based on that provided in the CIEEM guidance.
- 7.3.41 The evaluation of significance will be underpinned by a narrative approach, based on professional judgement.

Approach to Mitigation, Monitoring and Enhancement

- 7.3.42 Mitigation will be determined based on the outcome of the assessment of effects. The EIA process is iterative and, therefore, opportunities will be sought to avoid impacts arising and to incorporate measures to avoid or reduce impacts into the design of the Project.
- 7.3.43 At this stage, mitigation is likely to include (but not be limited to):
- Avoidance of designated sites, areas of recognised habitat value or areas supporting protected species, where practicable;
 - Replacement habitat for that lost where such habitat is either of conservation significance in its own right or supports a protected or otherwise notable species. For example, any loss of scrub/tree lines around the fire training area could be mitigated through new planting in appropriate locations. The management of such habitats will be described within a suitable management plan; and
 - Protection of habitats during construction activities from pollution/disturbance etc through adoption of the CoCP.
- 7.3.44 Further mitigation, such as the provision of new commuting routes for bats or new foraging habitat for birds, may also be incorporated, based on the findings of the assessment as required, noting that any new habitat provided may be influenced by wildlife hazard safeguarding considerations.
- 7.3.45 Monitoring of the success of mitigation measures will be undertaken through the continuation of the surveys completed by the Gatwick Biodiversity Officer. Such monitoring will be described within the PEIR/ES chapter and implemented through an appropriate management plan, secured by appropriate requirement within the DCO. Given the volume of historic data relating to the site, this will help demonstrate the efficacy of mitigation over time.

Issues Proposed to be Scoped Out

- 7.3.46 Based on the desk study and the site surveys, the following are proposed to be scoped out of the EIA process:
- Direct habitat loss effects within the boundary of designated sites (no habitat loss would occur within any of the identified designated sites, at European, national or local level). Therefore, no impact pathway would exist; and
 - Effects of dust on, or changes in water quality at, European designated sites. The closest European site is Ashdown Forest SAC/SPA, located approximately 12 km to the south east of the Project site and no European designated sites are hydrologically linked to the project site. Therefore, no impact pathway would exist.

7.4 Geology and Ground Conditions

Relevant Policy, Legislation and Guidance

Legislative and Policy Context

- 7.4.1 The following key legislation and policy documents relevant to geology and ground conditions will be considered within the assessment process:

- Water Framework Directive 2000;
- The Groundwater Directive 2006;
- Environmental Liability Directive 2004;
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017;
- Groundwater (England and Wales) Regulations 2009;
- The Water Supply (Water Quality) Regulations 2016;
- The Private Water Supplies (England) Regulations 2016, as amended;
- The Water Resources Act 1991 (as amended);
- The Water Act 2014;
- The Environment Act 1995;
- Environmental Protection Act (EPA) 1990 (as amended);
- Contaminated Land (England) Regulations 2006 (as amended);
- Environmental Permitting (England and Wales) Regulations 2016 (as amended);
- Wildlife and Countryside Act 1981 (as amended);
- Airports NPS (Department for Transport, 2018a);
- NPS for National Networks (Department for Transport, 2014);
- NPPF (Ministry of Housing, Communities and Local Government, 2019a);
- NPPG (Ministry for Housing, Communities and Local Government, 2019b);
- Crawley 2030: Crawley Borough Local Plan 2030 (Crawley Borough Council, 2015) – Policy ENV10 Pollution Management and Land Contamination;
- Emerging Crawley 2035: Draft Crawley Borough Local Plan 2020-2035 (Crawley Borough Council, 2019) - Policy EP3;
- Horsham District Planning Framework (excluding SDNP) 2015 (Horsham District Council) - Policy 24 Environmental Protection;
- Reigate and Banstead Local Plan 2005 (Reigate and Banstead Borough Council, 2005) - Policy Pc2F Regionally Important Geological Sites;
- Reigate and Banstead Local Plan: Core Strategy 2014 (Reigate and Banstead Borough Council, 2014) - Policy CS10 Sustainable Development;
- Emerging Reigate and Banstead Borough Development Management Plan 2018-2027 (Reigate and Banstead Borough Council, 2018) - Policies NHE2 Protecting Area of Biodiversity & Geological Importance DES8 Construction Management, DES9 Pollution & Contaminated Land;
- Mole Valley Core Strategy 2009 (Mole Valley District Council, 2009) - Policy CS15 Biodiversity & Geological Conservation;
- Mole Valley Local Plan 2000 (Mole Valley District Council, 2000) – Policy ENV16 Regionally Important Geological / Geomorphological Sites;
- Tandridge District Core Strategy 2008 (Tandridge District Council, 2008) – Policy CSP15 Environmental Quality;
- Tandridge Local Plan Part 2: Detailed Policies 2014-2029 (Tandridge District Council, 2014) – Policies DP19 Biodiversity, Geological Conservation & Green Infrastructure, DP21 Sustainable Water Management, DP22 Minimising Contamination, Hazards & Pollution; and
- Emerging Our Local Plan 2033 (Regulation 22 Submission) 2019 (Tandridge District Council, 2019) – Policy TLP46 Pollution & Air Quality (emerging policy).

Guidance Documents

- 7.4.2 The following guidance documents will be used to inform the assessment:
- Model Procedures for the Management of Contaminated Land (CLR 11) (Environment Agency, 2004);
 - Land Contamination: Risk Management (Environment Agency, 2019c);
 - British Standard BS 10175 Investigation of Potentially Contaminated Sites (BSI, 2011a and amended 2017);
 - Construction Industry Research and Information Association (CIRIA) Document C665: Assessing Risks Posed by Hazardous Ground Gases to Buildings (CIRIA, 2007a);
 - British Standard requirements for the 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings' (BS8485:2015+A1:2019) (BSI, 2015);
 - Defra Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (Defra, 2012); and
 - CIRIA Document C681 – Unexploded Ordnance (UXO): A guide for the construction industry (CIRIA, 2009).

Baseline Information

Data Collated to Date

- 7.4.3 This section presents a summary of the baseline information collated to date. The relevant information is presented in Figures 7.4.1 to 7.4.4.
- 7.4.4 Information collected to date includes the following:
- Natural England: Location of any geological Sites of Special Scientific Interest (SSSIs) within the vicinity of the Project site;
 - Sussex Geodiversity Partnership: Location of any Local Geological Sites (LGSs) in the vicinity of the Project;
 - Groundsure GeoInsight Report (via information provided by the British Geological Survey (BGS) and Environment Agency): Geological and hydrogeological conditions beneath the Project site; and
 - Groundsure EnviroInsight Report (via information provided by the Environment Agency, local planning authorities and BGS): Known licensed and historical landfills in the vicinity of the Project site.
- 7.4.5 A large number of ground investigations/environmental assessments have previously been undertaken for specific areas of Gatwick Airport (eg existing aircraft hangars, the fire training ground, multi-storey car parks and piers). An initial review of the information collected as part of these ground investigations/environmental assessments has been undertaken to assess whether any of these areas relate to components of the Project.

Existing Baseline Conditions

- 7.4.6 From an initial review of information included in previous reports, a brief history of the Project site is provided as follows:

- From 1879, the site comprised numerous fields bound by trees and hedgerows. An unnamed road bisected the site, running in a north-south direction.
- By approximately 1896, Gatwick Race Course had been constructed in the north east of the site.
- By approximately 1913, the race course was labelled as Gatwick Race Course Golf Course and residential dwellings were present along the unnamed road.
- Gatwick was first developed as an aerodrome in the 1930s. The Air Ministry approved commercial flights from the site in 1933. Major development work at the airport took place during the 1950s.
- From the late 1960s onwards, industrial and commercial land uses were indicated to be present around the airport area.

7.4.7 Based on BGS mapping (1:50,000-scale) and the Environment Agency Groundwater Vulnerability mapping (1:100,000-scale), the stratigraphic sequence and aquifer classifications beneath the site are indicated to be as follows:

Table 7.4.1: Descriptions of Geological Strata

Strata	Description & Approximate Thickness	Aquifer Classification
Alluvium	This stratum is indicated to comprise clay, silt, sand and gravel. Indicated to be present across parts of the west and north of the site (likely associated with the River Mole) and also in the east (likely associated with Gatwick Stream). Likely to be up to several metres in thickness, where present.	Secondary A Aquifer
Head Deposits	This stratum is indicated to comprise clay, silt, sand and gravel. Only indicated to be present in a small area in the centre of the site. Likely to be of very limited thickness, where present.	Secondary Undifferentiated Aquifer
River Terrace Deposits (Mole)	This stratum is indicated to comprise sand and gravel and is indicated to be present across parts of the west, centre and east of the site. Likely to be up to several metres in thickness, where present.	Secondary A Aquifer
Weald Clay Formation	This stratum is indicated to comprise mudstone with seams of clay-ironstone in the southeast and far east of the site. It is indicated to be absent in the far south of the site. Likely to be of significant thickness beneath the site.	Unproductive Stratum
Upper Tunbridge Wells Sand Formation	This stratum is indicated to comprise sandstone and mudstone and is only indicated to be present in the far south of the site. Likely to be of significant thickness.	Secondary A Aquifer

7.4.8 Figure 7.4.1 indicates the spatial extent of superficial deposits across the Project site. Figure 7.4.2 indicates bedrock geology beneath the site. The aquifer classifications are shown on Figure 7.4.3 (relating to superficial deposits) and Figure 7.4.4 (for the bedrock geology).

7.4.9 Further details in relation to groundwater resources are set out in Section 7.5 of this report.

7.4.10 Following an initial review of existing ground investigations/environmental assessments, made ground is also known to be present beneath the Project site.

- 7.4.11 Information obtained from Natural England indicates that there are no geological SSSIs within 1 km of the Project site. Information provided by the Sussex Geodiversity Partnership indicates that there are also no LGSs located within 1 km of the site.
- 7.4.12 Data provided by the Environment Agency, local planning authority and BGS indicate that there is one recorded licensed or known historical landfill site located within 250 metres of the Project site. This is named Gatwick Brickworks and located approximately 175 metres to the west of the Project site. The site operated between 1983 and 1984 and accepted inert waste.
- 7.4.13 From an initial review of the existing ground investigation/environmental assessments, it is understood that a degree of potential contamination is present beneath parts of the Project site.
- 7.4.14 One of the existing environmental reports comprises an unexploded ordnance (UXO) risk assessment undertaken prior to the construction of the Boeing Hanger, located in the west of Gatwick Airport. The assessment identified a low risk from UXO across the area of the proposed hanger. However, reference was made to items of ordnance having been previously encountered during works at Gatwick Airport, in and around the historic boundary of RAF Gatwick (central southern areas of the current airport).
- 7.4.15 A review of the West Sussex Joint Mineral Local Plan (West Sussex County Council and South Downs National Park Authority, 2018) has been undertaken. Information provided as part of the document indicates that the Project is located within a Brick Clay Resource Mineral Safeguarding Area, relating to the Weald Clay Formation.

Proposed Scope of the Assessment

- 7.4.16 It is proposed that the findings of the assessment of effects on geology and ground conditions would be set out as a topic chapter within the ES, supported by technical appendices where appropriate. The PEIR will include a draft chapter, including as much of the information set out below as is available at the time of writing.

Scope of Baseline Studies

- 7.4.17 A desk based Phase 1 Preliminary Risk Assessment will be undertaken to inform the geology and ground conditions chapter and will be included as a technical appendix. This will include an assessment of potential sources of contamination at the site, associated with any historical and current land uses both on site and in the surrounding area. A preliminary conceptual site model will be produced, indicating how any contamination may impact the identified receptors via pollutant linkages.
- 7.4.18 As part of the Phase 1 Preliminary Risk Assessment, a full review of the existing ground investigation data pertaining to the Project site will be undertaken. This information, together with the findings of the preliminary conceptual site model, will be used to determine the requirement for any additional intrusive investigation at the site. The scope of any recommended intrusive investigation will be discussed and agreed in advance with the Environment Agency and Crawley Borough Council.
- 7.4.19 The assessment will include an evaluation of ground conditions and the nature of any contamination present. A generic quantitative risk assessment will be carried out in accordance with current guidance and best practice. Chemical analytical data will be compared to published

assessment criteria and exceedances will be identified. The conceptual site model will be developed to identify potentially active source-pathway-receptor pollutant linkages. If the conceptual site model identifies a potential for significant harm to sensitive receptors through active pollutant linkages, further investigation or more detailed risk assessment may be recommended. If residual risk remains, then remediation or mitigation measures may be recommended.

- 7.4.20 Given that the Project is located within a Mineral Safeguarding Area, a minerals resource assessment will be undertaken. The assessment will include a variety of data sources (including BGS mapping and findings from previous site investigations carried out across Gatwick Airport) together with a review of the relevant planning policy context.

Proposed Approach to Identifying Future Baseline Conditions

- 7.4.21 The future baseline conditions in relation to geology and ground conditions are unlikely to differ significantly from the current baseline. As part of the assessment, consideration will be given to any predicted changes in baseline conditions as a result of proposed developments at Gatwick Airport that will occur in the absence of the Project.
- 7.4.22 The likely ranges of change in climatic parameters, including precipitation, temperature, wind speed, humidity and frequency of extreme weather, are not considered to materially affect the future baseline conditions for geology and ground conditions.

Study Area

- 7.4.23 The scope of the proposed assessment will include the Project site and an additional buffer of up to 500 metres. This will enable the identification of off-site potential sources of contaminants of concern, other factors which may have influenced site conditions and/or sensitive off-site receptors that require consideration.

Effects Proposed to be Assessed

- 7.4.24 Table 7.4.2 sets out the effects proposed to be assessed within the EIA process.

Table 7.4.2: Potential Effects to be Considered – Geology and Ground Conditions

Activity	Potential Effects
Construction Phase (including Demolition): Geology and Ground Conditions	
Construction and demolition activities	Runoff from construction areas to soils (and subsequent leaching into groundwater, including effects on any private water supplies if present)
	Contamination risk to construction workers, including dermal contact and ingestion; or inhalation of any accumulated ground gases
	Contamination risk to public, eg airborne migration and subsequent dermal contact and ingestion
Construction of updated highways junctions	Runoff from construction areas to soils and subsequent leaching into groundwater

Activity	Potential Effects
	Contamination risk to construction workers including dermal contact and ingestion; or inhalation of accumulated ground gases
	Contamination risk to public, eg airborne migration and subsequent dermal contact and ingestion
Use of construction compounds and creation of mitigation areas	Runoff from construction areas to soils and subsequent leaching into groundwater, including effects on any private water supplies if present
	Contamination risk to construction workers including dermal contact and ingestion; or inhalation of accumulated ground gases
	Contamination risk to public eg airborne migration and subsequent dermal contact and ingestion
	Effects on mineral resources
Operational Phase: Geology and Ground Conditions	
Use of airport, including upgraded highway junctions	Contamination risk from spillages during re-fuelling operations/ fuel storage leakage/spills etc.
	Contamination risk to airport workers
	Contamination risk to public and local public water supply

7.4.25 Effects on groundwater quality will be considered within the PEIR/ES chapter. Effects on groundwater resources will be considered as part of the water environment ES/PEIR chapter (see Section 7.5).

Approach to Assessment of Effects

7.4.26 The likely adverse and beneficial impacts of the Project on geology and ground conditions will be identified. Such impacts may include the risk of introducing new sources of contamination, remediation of any existing contamination and/or effects on existing mineral safeguarded areas.

7.4.27 The likely magnitude of the impacts will be assessed during the construction and operational stages. Both the magnitude of the predicted impact and the value of the feature will be taken into consideration in determining the significance of the effect.

7.4.28 The assessment will follow the approach set out in Chapter 6 with regard to identification of receptor sensitivity, impact magnitude and evaluation of significance of effects. The evaluation of significance will be underpinned by a narrative approach, based on professional judgement.

Approach to Mitigation and Monitoring

7.4.29 The ES will make recommendations, where required, based on the assessment of the baseline conditions and the identification of any potential impacts. This is likely to include measures to be employed by contractors to control spillage, runoff and effects associated with existing contamination, together with a procedure to be followed should any previously unidentified contamination be encountered during the construction phase.

- 7.4.30 A number of mitigation measures are likely to be embedded into the design of the Project. It is envisaged that this will include standard construction practices implemented through the CoCP eg appropriate stockpiling of soils, segregation of contaminated material, dust suppression measures and appropriate storage of hazardous materials.
- 7.4.31 Given that cut and fill works are likely to be required as part of the Project, it is also envisaged that a Materials Management Plan (MMP) will be adopted. Should any soils be excavated and proposed for re-use at the site, measures will be recommended to ensure suitability for use.
- 7.4.32 It is anticipated that a UXO risk assessment will be undertaken in advance of any construction works starting on site. The report will include an evaluation of the risk posed by any existing or potential explosive ordnance and risk mitigation measures will be recommended, if deemed necessary.

Issues Proposed to be Scoped Out

- 7.4.33 There are no geological SSSIs or LGSs within 1 km of the site. The underlying Weald Clay Formation is of low permeability and would therefore limit the potential for any off-site lateral migration of potential contaminants of concern (if present) sourced from beneath the Project site to any geological SSSIs or LGS at this distance. Therefore, there is not considered to be a viable pathway from the Project site to any geological designated site and the designated features would not be considered to be vulnerable to any impacts from any contamination sourced from the Project site. Effects on geological SSSI and LGSs are therefore proposed to be scoped out of the assessment.
- 7.4.34 Effects on groundwater resources (eg effects on groundwater availability/flow) are not proposed to be included within the Geology and Ground Conditions chapter but will be considered within the Water Environment chapter (see Section 7.5 below).

7.5 Water Environment

Relevant Policy, Legislation and Guidance

Legislative and Policy Context

- 7.5.1 The following key legislation and policy documents relevant to the water environment will be considered within the assessment process:

European Union Legislation

- Water Framework Directive (2000/60/EC);
- Urban Wastewater Treatment Directive (91/271/EEC);
- Nitrates Directive (91/676/EEC);
- Groundwater Directive (2006/118/EC);
- Floods Directive (2007/60/EC); and
- Drinking Water Directive (2015/1787/EU).

UK and Local Legislation and Policy

- Reservoirs Act 1975;
- Environmental Protection Act 1990;
- Land Drainage Act 1991 (as amended);
- Water Resources Act 1991 (as amended);
- Environment Act 1995;
- Control of Pollution (Oil Storage) (England) Regulations 2001;
- Climate Change Act 2008;
- Flood Risk Regulations 2009;
- Flood and Water Management Act 2010;
- Water Act 2014;
- The Private Water Supplies (England) Regulations 2016, as amended;
- The Water Supply (Water Quality) Regulations 2016;
- The Environmental Permitting (England and Wales) Regulations 2016 (as amended);
- Water Supply (Water Quality) Regulations 2016;
- Water Environment (Water Framework Directive) (England and Wales) Regulations 2017;
- Airports NPS (Department for Transport, 2018a);
- NPS for National Networks (Department for Transport, 2014);
- NPPF (Ministry of Housing, Communities and Local Government, 2019a);
- Crawley 2030: Crawley Borough Local Plan 2030 (Crawley Borough Council, 2015) – Policies ENV8 Development & Flood Risk, ENV9 Tackling Water Stress and ENV10 Pollution Management & Land Contamination;
- Emerging Crawley 2035: Draft Crawley Borough Local Plan 2020-2035 (Crawley Borough Council, 2019) - Policies EP1, EP2, EP3 and SDC3;
- Reigate and Banstead Borough Local Plan 2005 (Reigate and Banstead Borough Council, 2005) – Policies Ut4 Flooding Ut3 Foul and Surface Water;
- Reigate and Banstead Local Plan: Core Strategy 2014 (Reigate and Banstead Borough Council, 2014) - Policy CS10 Sustainable Development;
- Emerging Reigate and Banstead Borough Development Management Plan 2018-2027 (Reigate and Banstead Borough Council, 2018) - Policy CCF2 Flood Risk (emerging policy);
- Mole Valley Core Strategy 2009 (Mole Valley District Council, 2009) - Policy CS20 Flood Risk Management;
- Mole Valley Local Plan 2000 (Mole Valley District Council, 2000) – Policies ENV64 Flood Protection, ENV65-66 Drainage and Run Off, ENV67 Groundwater Quality;
- Horsham District Planning Framework (excluding SDNP) 2015 (Horsham District Council) - Policy 38 Flooding
- Tandridge District Core Strategy 2008 (Tandridge District Council, 2008) – Policy CSP15 Environmental Quality;
- Tandridge Local Plan Part 2: Detailed Policies 2014-2029 (Tandridge District Council, 2014) – Policy DP21 Sustainable Water Management; and
- Emerging Our Local Plan 2033 (Regulation 22 Submission) 2019 (Tandridge District Council, 2019) – Policy TLP47 Sustainable Urban Drainage and Reducing Flood Risk (emerging policy).

Guidance Documents

- 7.5.2 The assessment will be undertaken with reference to the following guidance documents:
- Planning Practice Guidance (Department for Communities and Local Government, 2014 (as updated));
 - Designing for Exceedance in Urban Drainage – Good Practice (C635) (CIRIA, 2006c);
 - Design Manual for Roads and Bridges. Volume 11.3.10. Road Drainage and the Water Environment (HD45/09) (Highways Agency *et al.* (2009));
 - Environment Agency – former Pollution Prevention Guidance Notes (PPGs);
 - Flood risk assessments: Climate Change Allowances (Environment Agency, 2019a);
 - The SuDS manual (C753) (CIRIA, 2007a);
 - Site Handbook for the Construction of SuDS (C698) (CIRIA, 2007b);
 - Control of Water Pollution from Construction Sites (C532) (CIRIA, 2001);
 - Control of Water Pollution from Linear Construction Projects – Technical Guidance (C648) (CIRIA, 2006a);
 - Control of Water Pollution from Linear Construction Projects – Site Guide (C649) (CIRIA, 2006b);
 - Environmental Good Practice on Site (third edition) (C692) (CIRIA, 2010); and
 - Environment Agency Groundwater Protection Policy (The Environment Agency’s Approach to Groundwater Protection) (Environment Agency, 2018a).

Baseline Information

Data Collated to Date

- 7.5.3 This section presents a summary of the baseline information collated to date. The relevant information is presented in Figures 7.5.1 to 7.5.8. A desk study is being undertaken to inform the assessment. Data have been requested from the sources listed in Table 7.5.1.

Table 7.5.1: Summary of Data Collected

Source	Dataset
.gov.uk Open Data	Shapefile of Water Framework Directive (WFD) water bodies Main River network Source Protection Zones* Consented discharges* Flood Zones 2 and 3 / Flood Map for Planning Flood defences* Flood storage areas* Risk of Flooding from Surface Water* Flood risk from reservoirs (online)
Environment Agency	Licensed abstractions and consented discharges* Water quality monitoring locations* Landfill locations and types* Abstraction licence strategy (Catchment Abstraction Management Strategy) (CAMS) Pollution incidents Upper Mole hydraulic model

Source	Dataset
	Middle Mole hydraulic model (including the Burstow Stream to the north east of the airport) Historic Flood Information (to be requested) Thames River Basin Management Plan (including waterbody classification data)
Ordnance Survey	1:50,000 and 1:25,000 mapping MasterMap (properties & infrastructure and rivers network layers) OS Open Rivers
British Geological Survey	1:50,000 digital geology mapping (superficial and bedrock)* Groundwater flood susceptibility mapping* Web based information from GeoIndex Onshore (British Geological Survey, n.d.)
MAGIC Website	Designated sites* Aquifer designations* Nitrate vulnerable zones*
Natural England	Aerial photography (to be collected)
National River Flow Archive	Daily average river flow data at gauging stations
Lead Local Flood Authorities/Local Authorities	Unlicensed groundwater and surface water abstractions Groundwater and surface water flood management plans (SWMPs etc) (to be collected) Records of local flood history
Crawley Borough Council	Strategic Flood Risk Assessment (SFRA) (Crawley Borough Council, 2014)

Note: Data marked* has been obtained from GroundSure

- 7.5.4 GAL has recently completed the development of a fluvial hydraulic model of the Upper River Mole catchment. This includes other watercourses in the vicinity of the airport (see paragraph 7.5.7 below), with the exception of the Burstow Stream which is included in the Middle Mole hydraulic model (see Table 7.5.1). These models will be used to confirm the baseline situation and assess the impact of the Project on fluvial flood risk.
- 7.5.5 GAL is developing a surface water drainage hydraulic model of the airport that, once completed, will be used to assess the impact of the Project upon surface water (pluvial) flood risk.

Existing Baseline Conditions

Flood Risk

- 7.5.6 Key surface water bodies are shown on Figure 7.5.1. An assessment of the existing flood risk to the Project site has been commenced using publicly available information. Figures 7.5.2 to 7.5.4 show the predicted flood risk at the Project site.

Fluvial Flood Risk

- 7.5.7 Gatwick Airport is located within the Upper Mole catchment and the River Mole flows through the airport, passing under the main and existing northern runways in a culvert. Tributaries of the River Mole, including Crawter's Brook, the Gatwick Stream, Man's Brook and Westfield Stream all run through or close to the Project site.

7.5.8 The Flood Map for Planning (Environment Agency, undated) indicates that there are areas of Flood Zone 3 (areas at risk of flooding in a 1 per cent (1 in 100) annual exceedance probability (AEP) event) and Flood Zone 2 (area at risk of flooding in between a 1 per cent and 0.1 per cent (1 in 100 to 1 in 1000) AEP event) within the Project site boundary (Figure 7.5.2). These are associated with the River Mole, Westfield Stream and Man's Brook on the western side of the airport, the Gatwick Stream on the eastern side, and small areas at risk associated with the River Mole and Crawter's Brook on the southern side of the airport.

Surface Water Flood Risk

7.5.9 The online Risk of Flooding from Surface Water (RoFSW) mapping (HM Government, undated) predicts surface water flood risk to several areas of the airport. As shown in Figure 7.5.3, areas at high risk (greater than 3.3 per cent (1 in 30) AEP of flooding) are predominantly associated with areas around existing watercourses or drainage features, although there are isolated pockets of high risk likely to be the result of rainfall filling local depressions (rather than an overland flow path). Areas at medium risk (between 3.33 per cent and 1 per cent (1 in 30 and 1 in 100) AEP of flooding) are generally small and adjacent to the areas at high risk. There are larger areas predicted to be at low risk (between 1 per cent and 0.1 per cent (1 in 100 to 1 in 1000) AEP of flooding), particularly to the south of the main runway and in proximity to the existing terminal buildings.

Groundwater Flood Risk

7.5.10 Lead Local Flood Authorities (LLFAs) are responsible for retaining records of groundwater flooding. This information will be requested and used to inform the assessment.

7.5.11 Crawley Borough Council's SFRA (Crawley Borough Council, 2014) states that there is '*no conclusive evidence of elevated susceptibility to groundwater flooding within the Borough*'. There are no known records of groundwater flooding within the vicinity of the Project site based on the SFRA and the BGS Groundwater Emergence Maps.

7.5.12 The BGS provides mapping of areas susceptible to groundwater flooding. This information is provided in Figure 7.5.4. The mapping suggests there is a degree of susceptibility to groundwater flooding from the River Terrace Deposits that occur beneath the airport. The likely hydraulic continuity between the River Terrace Deposits and the surface watercourses is such that groundwater flooding may often be associated with fluvial flooding.

Reservoir Flood Risk

7.5.13 Much of the western side of the airport would be at risk of flooding in the event of failure of the Ifield Mill Pond, while the eastern side, including sections of both terminal buildings, would be at risk from a failure of the pollution lagoons adjacent to Crawley Sewage Treatment Works. As large raised reservoirs, these structures are maintained and operated in accordance with the Reservoirs Act (1975) and therefore the risk of failure is considered very low due to their monitoring and inspection regime.

Sewer/Water Supply Flood Risk

- 7.5.14 The failure of sewer or water supply infrastructure within or upstream of the Project site could result in flooding, although the risk of this is likely to be low given the maintenance activities undertaken by water companies to avoid this.

Factors Influencing the Baseline

- 7.5.15 Baseline conditions for flood risk could change over the anticipated lifetime of the Project as a consequence of climate change, land use changes, changes in groundwater recharge, the implementation of flood mitigation schemes and measures to improve watercourses in line with WFD objectives. It is likely that flood events could increase in frequency and magnitude. Current Environment Agency guidance (Environment Agency, 2019a) predicts increases in peak rainfall intensity within the period 2015 to 2039 of up to 10% (based on the 90% percentile prediction), rising to 40% within the period 2070 to 2115. The assessment of effects on fluvial flood risk to third parties will incorporate the predicted impact of climate change in accordance with a 35% increase in peak river flow for the 1 in 100 AEP event. A sensitivity test will also be undertaken to test the impact of a larger potential increase in peak river flow of 70% for the 1 in 100 AEP event. These projections may be updated as a result of the UK Climate Projections 2018 (UKCP18) (Met Office, 2018).

Surface Water Drainage

- 7.5.16 There are eight surface water drainage catchments within the Project site that directly receive airport runoff. Generally, four of these serve the main airfield, discharging to Pond A, Pond M, the Dog Kennel Pond and Pond D. During cold weather, de-icer is regularly used which, together with other pollutants, enters the surface water drainage system. The four ponds provide a degree of treatment through aeration and settlement. Refer to Figure 7.5.8 for the layout of the surface water drainage network.
- 7.5.17 In general, when runoff meets the required water quality standard of below a biochemical oxygen demand of 10 mg/l, the ponds discharge to the River Mole. When water quality falls below the required standard, the ponds discharge to the 'dirty' water pumped main which conveys runoff for further treatment and temporary storage at two pollution lagoons with storage capacities of 220,000 m³ and 100,000 m³ and then ultimately to Crawley Sewage Treatment Works operated by Thames Water. There are restrictions placed on the peak flow that can be transferred to the Sewage Treatment Works under a trade effluent consent agreed with Thames Water. In very heavy rainfall, contaminated water diluted by rainfall may be pumped directly to the River Mole from Pond D if the incoming runoff is greater than the capacity of Pond D and there is insufficient capacity in the pumping system that transfers it to the pollution storage lagoons.
- 7.5.18 Pond D is the key drainage pond receiving the majority of runoff from Gatwick including that transferred from the 'dirty' side of the Dog Kennel Pond. Runoff from the Pond D catchment drains to Pond D (lower) and is then raised by three Archimedes Screws. If the water quality meets the required standard, or if there is no capacity in the downstream storage lagoons, runoff enters Pond D (upper) via a series of separator channels and discharges to the River Mole. Discharge to the River Mole is at a consented rate, controlled by a series of hydrobrakes and

pumps. The actual rate of discharge is determined by the volume of flow in the River Mole. Higher flow rates in the River Mole permit a higher discharge rate from Pond D (upper).

- 7.5.19 Existing access roads to the North and South Terminals (including the A23) are drained via a gravity network to the Gatwick Stream and potentially Burstow Stream. It is understood that drainage network records are limited. Available information will be sought by the highway drainage designers to inform the new road layout design.

Factors Influencing the Baseline

- 7.5.20 The nature of rainfall events that the surface water drainage network will have to deal with is predicted to change through the lifetime of the Project. In general terms, while acknowledging local variability, UKCP18 predicts that summers will be drier in future years but with increased frequency of short-duration, high-intensity rainfall events that could result in a corresponding increase in flood risk. Current Environment Agency guidance suggests a climate change allowance for an increase in peak rainfall intensity of 20% up to 2069 and suggests that in certain cases it may be necessary to test the impact of, but not necessarily design for, an increase of 40% which would be agreed via liaison with the LLFA.

Geomorphology

- 7.5.21 An initial exercise has been undertaken to identify the WFD water bodies potentially impacted by the Project within the study area, both directly and indirectly. An initial assessment has then been made to determine whether the WFD water bodies should be screened in for further assessment or whether, due to likelihood of limited impacts, they can be screened out of further assessment.
- 7.5.22 Table 7.5.2 provides a summary of the WFD screening exercise. In total, eight surface waterbodies were initially identified, of which four have been screened in for further assessment. The spatial extent of these can be seen in Figure 7.5.7.

Table 7.5.2: Screening Summary (note: screening shown as ‘in’ or ‘out’)

River Basin Management Plan	Operational Catchment	WFD Water Body	ID	Overall Status (2016)	In/Out	Reasoning
Thames river basin district RBMP: 2015	Mole Upper Trib	Mole upstream of Horley	GB106039017481	Good	In	Water body is within study area extent and will be impacted directly by the Project.
Thames river basin district RBMP: 2015	Mole Upper Trib	Tilgate Brook and Gatwick Stream at Crawley	GB106039017500	Moderate	In	Water body is within study area extent and will be impacted directly by the Project
Thames river basin district RBMP: 2015	Mole Upper Trib	Burstow Stream	GB106039017520	Bad	In	Potential for impacts on the Burstow Stream tributary which forms part of the Burstow Stream WFD water body,

River Basin Management Plan	Operational Catchment	WFD Water Body	ID	Overall Status (2016)	In/Out	Reasoning
						therefore screened in for further assessment.
Thames river basin district RBMP: 2015	Mole Lowe and Rythe	Mole (Horley to Hersham)	GB106039017621	Moderate	In	Water body is within study area extent and will be directly impacted by the Project. This includes potential impacts on the Withy Brook and the River Mole which form part of this WFD water body.
Thames river basin district RBMP: 2015	Mole Upper Trib	Baldhorns Brook	GB106039017470	Poor	Out	Water body is located 5km upstream of the study area and there are not anticipated to be any direct impacts. It is also not anticipated that any of the proposed works (change in flows between catchments) will lead to potential effects migrating upstream
Thames river basin district RBMP: 2015	Mole Upper Trib	Ifield Brook	GB106039017460	Moderate	Out	Water body is located 5km upstream of the study area and there are not anticipated to be any direct impacts. It is also not anticipated that any of the proposed works (change in flows between catchments) will lead to potential effects migrating upstream
Thames river basin district RBMP: 2015	Mole Upper Trib	Stanford Brook	GB106039017450	Moderate	Out	Water body is located 4 km upstream of the study area and there are not anticipated to be any direct impacts. It is also not anticipated that any of the proposed works (change in flows between catchments) will lead to potential

River Basin Management Plan	Operational Catchment	WFD Water Body	ID	Overall Status (2016)	In/Out	Reasoning
						effects migrating upstream
Thames river basin district RBMP: 2015	Mole Lowe and Rythe	Mole (Hersham to R. Thames conf at East Molesey)	GB106039017622	Moderate	Out	Water body is out of the area of direct impacts and over 40 km downstream from the study area, therefore changes in flow and sediment regime are not expected to extent this far

7.5.23 The four surface WFD waterbodies that have the potential to be affected are in the Thames River Basin District. Many of these waterbodies contain smaller watercourses that the Project may also impact. These include:

- River Mole (upstream of Horley) WFD waterbody – consisting of the River Mole, Crawter’s Brook and Man’s Brook;
- River Mole (Horley to Hersham) WFD waterbody – consisting of the River Mole and Withy Brook;
- Tilgate Brook and Gatwick Stream at Crawley WFD waterbody – consisting of Gatwick Stream and Tilgate Brook; and
- Burstow Stream WFD waterbody- consisting of Burstow Stream and Burstow Stream Tributary.

7.5.24 Table 7.5.3 summarises the surface waterbody catchment information and baseline WFD status of the waterbodies.

Table 7.5.3: Surface Waterbody WFD Summary Information

WFD Waterbody	Mole (upstream of Horley)	Mole (Horley to Hersham)	Tilgate Brook and Gatwick Stream	Burstow Stream
River Basin Management Plan (RBMP)	Thames river basin district RBMP: 2015	Thames river basin district RBMP: 2015	Thames river basin district RBMP: 2015	Thames river basin district RBMP: 2015
Operational Catchment	Mole Upper Trib	Lower Mole and Rythe	Mole Upper Trib	Mole Upper Trib
Waterbody ID	GB106039017481	GB106039017621	GB106039017500	GB106039017520
Classed as heavily modified waterbody	Yes	No	Yes	No
WFD Overall Status (2016)	Good	Moderate	Moderate	Bad
Physicochemical status	Not assessed	Moderate	Moderate	Moderate

WFD Waterbody	Mole (upstream of Horley)	Mole (Horley to Hersham)	Tilgate Brook and Gatwick Stream	Burstow Stream
Chemical status	Good	Good	Good	Good
Hydromorphological quality elements	Supports Good	Supports Good	Supports Good	Supports Good
Hydrological regime	Supports Good	Supports Good	Supports Good	Supports Good
Morphology	N/A	Supports Good	N/A	Supports Good

Factors Influencing the Baseline

7.5.25 Baseline hydromorphology conditions are expected to improve over time as a result of the implementation of wider catchment measures within the waterbodies to improve WFD ecological status of UK water bodies. Therefore, it is anticipated that all waterbodies with a hydromorphological status/potential currently less than good (ie poor or moderate) will move towards good status/potential by 2017.

Water Quality

7.5.26 The control system of water management at Gatwick Airport permits regulated discharge of clean water into the Mole from a number of balancing ponds depending on the rate of flow in the river. At times of high flow more water is discharged than in periods of low flow in the watercourse. Pond D receives the bulk of contaminated and clean water from runway runoff. Water is automatically tested for its biochemical oxygen demand and contaminated water is separated from clean water and is then pumped through a 3.5 km pipe to the two long term pollution storage lagoons. After aeration in the lagoons, it is treated at Crawley Sewage Treatment Works at Tinsley Green and then released into the Gatwick Stream. Clean water from Pond D and Pond M is separated and enters the River Mole directly.

7.5.27 There are several discharges of runoff from hard standing with a low risk of pollution (such as car parks) direct to watercourses. The runoff from such areas has at least one stage of treatment (oil interceptors) prior to discharge to the receiving watercourse.

7.5.28 The Mole and Burstow Stream water bodies are achieving Good chemical status under the WFD (Water Framework Directive River Waterbody Cycle 2. Environment Agency, 2019b). Gatwick Stream is also achieving Good chemical status under the WFD. Nickel and associated compounds within the watercourse are known to have been an issue in the past. The Gatwick Stream and Burstow Stream waterbodies are achieving Moderate for physico-chemical quality elements, primarily due to Phosphate (noted as Moderate).

7.5.29 The study area is located within a Surface Water Nitrate Vulnerable Zone (NVZ) and a Surface Water Safeguard Zone (SgZ). A NVZ is an area of land draining into water known to be polluted by nitrates. A SgZ is an area that influences the water quality at water abstraction sites at risk of failing the drinking water protection objectives.

7.5.30 There is one historic surface water abstraction consent (Licence No: 28/39/32/0089) identified by data searches within the study area. This site (National Grid Reference 528800 137800) is approximately 1.7 km south of the Project site boundary and related to a transfer licence from the

Gatwick Stream. Given both the licence historic status and its upstream location it is not considered necessary to consider this further.

- 7.5.31 The Project could impact the water quality of four WFD surface waterbodies across the Thames River Basin District. These include: River Mole (upstream of Horley), River Mole (Horley to Hersham), Tilgate Brook and Gatwick Stream, and Burstow Stream. Table 7.5.3 summarises the baseline WFD status of the waterbodies.

Factors Influencing the Baseline

- 7.5.32 Baseline conditions for water quality could change over the anticipated lifetime of the Project, as a consequence of land use changes and measures to improve waterbodies in line with WFD objectives. It is likely that water quality would generally improve, as historical pollution sources are removed and better water quality measures are put into place.

Groundwater Resources

- 7.5.33 An overview of the geology and hydrogeology of the study area is provided in Section 7.4. This section describes the groundwater resources and levels, including the interaction with surface water.
- 7.5.34 The Environment Agency aquifer designations for the bedrock strata and superficial deposits underlying the study area are provided in Table 7.4.1 and in Figure 7.5.6. The site is underlain by Secondary A Aquifers and Unproductive strata.
- 7.5.35 Secondary A aquifers are described by the Environment Agency (Environment Agency n.d.) as ‘*permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers*’. These are generally aquifers formerly classified as minor aquifers, presenting a range of permeability and storage capacity.
- 7.5.36 Unproductive strata are described as ‘*rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow*’. (Environment Agency n.d.)
- 7.5.37 According to the records provided by the Groundsure reports, there is one active groundwater abstraction (for “general use”) approximately 1 km south of the southern airport perimeter. The licence details are provided in Table 7.5.4. It is considered (to be confirmed) that this extracts groundwater from the Tunbridge Wells Sand Formation, that lies beneath the Weald Clay Formation.

Table 7.5.4: Active Groundwater Abstractions

Licence no	NGR	Annual licence Quantity	Daily Max	Source	Start/(Expiry)
TH/039/0032/016	526681 138924	47450 m ³	130 m ³	Groundwater (Borehole)	17/10/12 (31/03/2029)

- 7.5.38 There are no public water supplies or associated Source Protection Zones (SPZ) in the immediate vicinity of the Project site. The nearest public water supply with a SPZ is over 8 km to the north and extracts water from different strata (The Lower Greensand Group) to that (immediately) underlying Gatwick.

- 7.5.39 The Mole Abstraction Licensing strategy (Environment Agency, 2013) identifies that there is currently little pressure from abstraction on the Tunbridge Wells Sand Formation aquifer and that groundwater resources from this unit are available for licensing.
- 7.5.40 The occurrence of unlicensed abstractions (sources utilising less than 20 m³/day) has yet to be determined. Details of such sources will be sought from the local authorities.
- 7.5.41 The Tunbridge Wells Sand is a WFD groundwater body, part of the Thames River Basin District. Table 7.5.5 summarises the WFD groundwater body information and baseline status.

Table 7.5.5: WFD Groundwater Body Information

River Basin Management Plan	Thames River Basin District RBMP: 2015
Operational Catchment	Tunbridge Wells Sand and Kent Weald Upper
WFD Waterbody	Copthorne Tunbridge Wells Sand
Waterbody ID	GB40602G602400
WFD Overall Status (2016)	Good
Quantitative status	Good
Qualitative status	Good

- 7.5.42 Shallow groundwater occurrence beneath the study area will primarily be in the River Terrace Deposits. Existing data available in ground investigation reports and various monitoring programmes within the airport boundary will be collated and analysed.
- 7.5.43 Based on mapping available from the MAGIC website, there are no statutory designated sites of nature conservation interest that may rely on groundwater supply (such as wetlands) within the area around the Project site. However, groundwater flow might support, for example, local wetlands (eg adjacent the River Mole) that have a local interest. Further information will be sought to determine the occurrence and value of any such features.

Factors Influencing the Baseline

- 7.5.44 Baseline conditions for groundwater could change over the anticipated lifetime of the Project, for example, because of climate change influencing groundwater recharge. This is most likely to impact the superficial deposits. Although locally these currently have low importance for groundwater supply, there may be some impact on future use remote from the study area. Changes to recharge to the underlying Upper Tunbridge Wells Sand Formation are likely to be minimal in the study area as there is only a small subcrop (to the extreme south), with the aquifer mostly overlain by impermeable Weald Clay Formation. The Tunbridge Wells Sand is much more widespread to the south and west. If there is future demand for significant groundwater resources development from within the Tunbridge Wells Sand it is likely that these areas (ie south and west) would be developed preferentially over any groundwater resource within or adjacent to the study area as both the airport and (associated) urban areas represent a higher potential for pollution of the groundwater. On this basis, although there may be a resource available, it is considered unlikely that any such development would occur near the airport.

Wastewater

- 7.5.45 The airport foul sewerage system comprises two discrete systems: one serving the North Terminal and discharging to Thames Water's Crawley Sewage Treatment Works, and a second network serving the South Terminal and a hotel development on the North Terminal site discharging to Thames Water's Horley Sewage Treatment Works approximately 6 km to the north via the trunk sewerage system. Refer to Figure 7.5.8 for the layout of the surface water drainage network.
- 7.5.46 The foul sewerage network currently has sufficient capacity to deal with the flows arising from the airport, although some of the pumping stations have long running times during peak periods indicating stress on the system which is undesirable as more frequent maintenance inputs are required and there is a higher risk of failure.

Factors Influencing the Baseline

- 7.5.47 Increasing passenger numbers (in the absence of the Project) would result in an increase in wastewater flows.

Water Supply

- 7.5.48 Gatwick uses potable water supplied by the Sutton and East Surrey Water Company (SESW) via a water ring main that encircles the airport for use in terminal buildings, hotels, restaurants, airfield buildings, firefighting, vehicle and aircraft wash-downs and de-icer application to aircraft.
- 7.5.49 Water usage is currently equivalent to 16 litres per passenger (GAL, 2019a). This is a significant reduction since 2010 when water consumption averaged 31 litres per passenger.

Factors Influencing the Baseline

- 7.5.50 The baseline demand required by GAL and the security of water supply will be influenced by various factors. These include increases in consumption due to increasing numbers of passengers and increase of trade (hotel occupancy, etc) and increase in green technologies (water recycling, more economical water consumption, toilets, etc) which will reduce demand, and restrictions on supply from SESW (drought conditions, seasonal demand variation). These items can be predicted and accounted for in any design decisions through consultation with GAL and SESW.

Proposed Scope of the Assessment

- 7.5.51 It is proposed that the findings of the assessment of effects on the water environment would be set out as a topic chapter within the ES, supported by technical appendices where appropriate. The PEIR will include a draft chapter, including as much of the information set out below as is available at the time of writing.

Proposed Scope of Baseline Studies

Flood Risk and Surface Water Drainage

- 7.5.52 A baseline assessment of flood risk and surface water drainage will be undertaken and the findings will be reported in a Flood Risk Assessment (FRA) for the Project. The FRA will be undertaken in accordance with the planning practice guidance and the NPPF. This will incorporate the findings of a desk study and the hydraulic modelling.
- 7.5.53 A surface water drainage strategy will be developed for the Project which will include potential modifications to the existing drainage of the A23 and other access roads in the vicinity of the North and South Terminals.
- 7.5.54 The FRA and drainage strategy documents will be provided as appendices to the ES. The ES chapter will summarise the findings of the FRA and provide an overview of the proposed drainage strategy.

Geomorphology

- 7.5.55 The following watercourses have been identified as receptors that could be affected by the Project:
- River Mole (upstream of Horley) WFD waterbody – consisting of the River Mole, Crawler's Brook and Man's Brook;
 - River Mole (Horley to Hersham) WFD waterbody – consisting of the River Mole, Withy Brook
 - Tilgate Brook and Gatwick Stream at Crawley WFD waterbody – consisting of Gatwick Stream and Tilgate Brook; and
 - Burstow Stream WFD waterbody- consisting of Burstow Stream and Burstow Stream Tributary.
- 7.5.56 The baseline studies will include a fluvial geomorphology baseline assessment undertaken at two scales.
- 7.5.57 At a high level, the WFD operational catchment extents will be used for a desk-based review of existing information at a catchment scale (Figure 7.5.5). This will provide an overview of the catchments and how they currently function, and this information will feed into the more detailed baseline. The following are the key data sources proposed for this desk study:
- Environment Agency Catchment Explorer;
 - Thames River Basin Management Plan;
 - Ordnance Survey mapping;
 - Geology maps (BGS);
 - Soils maps (BGS);
 - Historical maps;
 - Designated areas (Natural England); and
 - Hydrological information (Centre for Ecology and Hydrology (CEH)).
- 7.5.58 A more detailed study will be undertaken on the watercourses stated above. This will involve a geomorphological walkover survey documenting fluvial features, processes and existing pressures and will include a photographic record. The extent of the walkover survey will include

the areas directly impacted, plus at least 2 km upstream and downstream of the impacted areas. However, these extents may be refined during the assessment when more details of the Project are provided and the hydraulic modelling results available. The extent needs to be large enough to cover the change to flows, sediment transport and geomorphological process that may occur as part of the Project, and unlike for other disciplines these can cover a much greater area.

Water Quality

- 7.5.59 An integrated computer model of the surface water drainage and river catchments is currently being developed by GAL. This will be calibrated using observed flow and depth data from a flow survey, and water quality data from Gatwick and the Environment Agency's routine monitoring. This tool will be used to determine the current operation of the system and the impact on the system from any future development. It will also be used to derive solutions to any identified detriment taking in to account any future phasing of the airport development.
- 7.5.60 The modelling approach will be developed taking into account the outcomes of consultation with the Environment Agency, and the outputs will inform the WFD assessment and the assessment of the impact of the Project on surface water quality.
- 7.5.61 Where appropriate, existing protocols and pollution control measures, including measures currently adopted to control runoff from the fire training ground and de-icing areas would be applied to any areas created/modified by the Project.

Groundwater Resources

- 7.5.62 Further desk studies will be required to collect and collate groundwater level and groundwater quality information, in particular data from ground investigations and local groundwater monitoring. A site visit will be undertaken if considered necessary, for example, to focus on particular impacts
- 7.5.63 Information already collected will be used and consultations will be undertaken with statutory and non-statutory bodies to ensure that the datasets are up-to-date, including information on private water supplies and licensed abstractions.
- 7.5.64 A groundwater assessment will be carried out through development of a (qualitative) conceptual site model which will be used to support a groundwater impact assessment. This assessment will be supported by further desk study and, as necessary, through data collected during ground investigations, if these are required to investigate the potential impacts of contaminated land on groundwater quality. The conceptual site model will further establish the sensitivity of groundwater as a resource, evaluate potential impacts (both from construction and during operation) and determine the significance of environmental effects.
- 7.5.65 Further integration with flood and surface water studies will be undertaken as necessary.

Wastewater

- 7.5.66 A detailed hydraulic model of the foul sewerage system serving the North and South Terminals and associated areas is currently being developed. This will be calibrated using observed flow and depth data from a flow survey to supplement the existing flow management system data to

produce a robust tool that can be used to determine the current operation of the system and the impact on the system from any future development, and to identify mitigation measures.

7.5.67 The assessment will be undertaken for the current case, and assessment years to 2038 as set out in Chapter 6 and stressed areas of the network will be identified for each, which will inform the nature and timing of mitigation measures.

7.5.68 The impact on the Thames Water wastewater sewerage network will be considered in a similar manner using computer models of the Crawley and Horley sewerage networks. This drainage assessment will identify the impact of increasing flows from the airport on the existing networks: suitable mitigation measures to address any detriments to the networks will be derived using the same models.

Water Supply

7.5.69 An assessment will be carried out on the current network to identify any existing issues, before completing models through to 2038 to assess any required future works. A mitigation strategy will be developed subsequently to meet the projected changes in demand due to the Project, if required.

7.5.70 Following completion of the models, required water demand will be communicated with SESW to confirm any potential impact on their assets and confirm that the requested water demand is feasible with their current sources and infrastructure. It is anticipated that the existing infrastructure would be able to cope with the demand as a result of the Project, although this would need to be confirmed through the assessment. Impacts to water supply infrastructure within the Project boundary would be assessed as part of the PEIR/ES.

Proposed Approach to Identifying Future Baseline Conditions

7.5.71 The assessment will consider baseline conditions for each assessment scenario, including future baseline years. Changes from the existing baseline conditions to future baseline may be caused by climate change or other development, either within Gatwick Airport or within the wider study area, and/or any likely changes in baseline conditions due to ongoing natural/man-made processes, such as changes in water quality or watercourse conditions. These changes can be difficult to quantify and therefore, where clearly quantifiable evidence of the likely future baseline is not available, professional judgement will be used to predict likely changes to baseline conditions.

Study Area

7.5.72 The study area will generally be defined by a 2 km radius beyond the Project site boundary. Taking into account the nature of the Project, impacts are predicted to occur in close proximity to the Project site and it is considered that a 2 km study area would be sufficient to identify any significant effects. This study area could be extended where a hydrological pathway is identified as part of the assessment phase when further data has been collected, the Project design evolves, site surveys have been undertaken or in response to consultation with stakeholders.

7.5.73 For geomorphology, a study area has been defined that covers the catchments of the receptors that could be directly impacted by the Project plus at least 2 km upstream and downstream of the

impacted areas. However, these extents may be refined during the assessment when more details of the Project are provided and the hydraulic modelling results available. The extent needs to be large enough to cover the change to flows, sediment transport and geomorphological process that may occur as part of the Project, and unlike for other disciplines these can cover a much greater area. Figure 7.5.5 provides an overview of the geomorphology study area.

Effects Proposed to be Assessed

7.5.74 The effects proposed to be assessed are summarised in Table 7.5.6. It is noted that many of these potential effects are inter-related, and therefore there is overlap between categories.

Table 7.5.6: Potential Effects to be Considered – Water Environment

Activity	Potential Effect
Construction Phase (including Demolition): Water Environment	
Flood Risk	Temporary storage of materials reduces the volume of floodplain storage increasing flood risk.
	Increased flood risk due to existing surface water flow paths being interrupted, diverted or created by construction works, or due to increased compaction of ground or increase in impermeable area.
	Failure of temporary over-pumping arrangements of the surface water drainage and foul networks resulting in flooding.
	Dewatering for foundations, basement and other sub-surface structures resulting in changes to groundwater levels and flow routes and altering flood risk, exacerbated due to potential hydraulic connectivity between groundwater and surface water resources.
	Temporary works for outfalls etc within river channels leading to increase in flood risk.
	Change in drainage strategy altering flows to receiving watercourses affecting flood risk, geomorphology and water quality.
Surface Water Drainage	Discharges from construction activities leading to increased flows to the surface water network increasing the risk of flooding from the surface water drainage.
Geomorphology	Sediment from construction areas washed off into watercourses increasing turbidity and impacting on morphology
	Damage and loss of riparian vegetation.
	Damage and loss of natural bed and banks.
	Changes in flow (discharge and velocity) in channel and on floodplain.
	Changes in river continuity.
	Change in drainage strategy altering flows to receiving watercourses affecting flood risk, geomorphology and water quality.
Water Quality	Modifications to groundwater recharge or flow paths could affect surface water flows due to connection via river terrace deposits.
	Contaminated runoff or spillage from construction areas impacting surface water (groundwater quality is considered in Section 7.4).
	Dewatering for foundations/sub-surface structures resulting in changes surface water quality (groundwater quality is considered in Section 7.4).
	Change in drainage strategy altering flows to receiving watercourses affecting flood risk, geomorphology and water quality.

Activity	Potential Effect
	Dewatering for foundations, basement and other sub-surface structures resulting in changes to groundwater flow and quality (including any private water supplies, if present).
Wastewater	Increased flows during construction due to additional workers at the airport and discharging to the wastewater network
Water Supply	Increased demand on existing water supply / water resources to support construction activities.
Operational Phase: Water Environment	
Flood Risk	Increased runoff due to additional impermeable areas increases flood risk.
	Changes to channel structures (eg culverts) reduces capacity and increases flood risk.
	Changes in drainage strategy – increased runoff leading to an increase in flood risk.
	Increased fluvial flood risk due to loss of floodplain storage arising from elements of Project within the floodplain.
	Increased flood risk due to existing surface water flow paths being interrupted, diverted or created by the Project, or due to increased impermeable area.
	New development placing more people (working and using the airport) in path of potential reservoir failure flow path.
	Foundation/box structures intercepting/diverting groundwater flow leading to waterlogging and/or groundwater flooding.
Surface Water Drainage	Increased runoff due to additional impermeable areas increases flood risk.
	Changes to the A23 resulting in increased surface water runoff increasing flood risk.
Geomorphology	Narrowing of channel width with new/replacement concrete floodwalls. Potential increase in stream energies locally and damage to channel bed form and substrate.
	Homogeneity of channel cross-section with new culverts and new/replacement concrete floodwalls. Potential for loss of natural variance in velocities and secondary flows cells, leading to changes in velocity and geomorphological processes.
	Disruption of quantity and dynamics of flow and sediment supply, due to changes in bed and bank form, channel planform, cross-section and gradients. Potential effects due to new/replacement floodwalls, culverts, river realignment and creation of flood storage area.
	Increased sediment supply. Damage to channel bank form.
	Change in sediment dynamics due to changes in runoff.
	Change in physicochemical quality due to changes to natural bed and banks.
	Loss and damage to riparian zone due to new structures and/or additional access requirements for maintenance
	Loss of natural bank form and material.
Reduction in channel -floodplain coupling due to new/replacement floodwalls and culverts.	
Water Quality	Additional de-icer being used to address increase in air traffic movements, with potential impact on surface water quality if not appropriately stored and if contaminated runoff is not treated effectively.
	Runoff from increased impermeable areas increasing sediment loading in watercourses.

Activity	Potential Effect
	Potential for air quality effects on surface water quality.
	Runoff from upgraded junctions – DMRB assessment water quality (eg long-term use of herbicides/chemicals on hardstanding).
Groundwater Resources	Discharges to ground, eg from road drainage impacting groundwater flows or levels (groundwater quality is considered in Section 7.4).
	Foundation/box structures, piling or cuttings /underpasses intercepting/diverting groundwater flow leading to impacts on groundwater levels and/or flow (groundwater quality is considered in Section 7.4).
	Increased impermeable areas (such as car parks) leading to a reduction in recharge to shallow groundwater, impacting both groundwater levels and quality and associated increased surface water flood risk. The assessment would consider effects on flow of any private water supplies, if present.
	Change in groundwater flow paths from sub-surface structures affecting groundwater fed ecological features (such as wetlands).
Wastewater	Additional treated effluent from increase in passenger and staff numbers impacting surface water quality if appropriate treatment is not provided.
	Increased discharges to the existing foul sewerage system leading to flooding if insufficient capacity is unavailable.
	The provision of new pumping stations creating a risk of flooding within the airport, both landside and airside (in event of failure).
Water Supply	Increase in potable water demand, requiring new infrastructure and affecting sustainability of supply from local water resource zone.

Approach to Assessment of Effects

- 7.5.75 The likely beneficial and adverse effects of the Project on the water environment will be identified and assessed. The approach to assessment will take into account the guidance set out in Highways England’s DMRB (2009), Volume 11: Environmental Assessment Section 3: Part 10 HD45/09: Road Drainage and the Water Environment (Highways Agency, 2009). The likely magnitude of the impacts will be assessed during the construction and operational stages. Both the magnitude of the predicted impact and the sensitivity of the receptor will be taken into consideration in determining the significance of the effect. The assessment will follow the approach set out in Chapter 6 with regard to identification of receptor sensitivity, impact magnitude and evaluation of significance of effects. Professional judgement will be used to inform the assessment methodology, primarily in geomorphology, where there is a lack of guidance to date.
- 7.5.76 The effects on flood risk will be assessed in accordance with the requirements of the NPPF, its supporting guidance and the Airports NPS.
- 7.5.77 The assessment of effects on fluvial flood risk will incorporate the predicted impact of climate change in accordance with national guidance published by the Environment Agency. The assessment of effects on fluvial flood risk to third parties will incorporate the predicted impact of climate change in accordance with a 35% increase in peak river flow for the 1 in 100 AEP event. A sensitivity test will also be undertaken to test the impact of a larger potential increase in peak river flow of 70% for the 1 in 100 AEP event.

- 7.5.78 A preliminary WFD assessment will be used as a basis to inform consultation with the Environment Agency to agree the scope of the subsequent detailed WFD assessment. A detailed WFD Compliance Assessment will be undertaken to determine the potential effects of the Project on the WFD designated waterbodies (surface and groundwater), where these may be impacted by the Project).

Supporting Detailed Assessments

- 7.5.79 The ES will be supported by detailed technical reports as required to support the assessment of impact by water disciplines, including an FRA and WFD Assessment.
- 7.5.80 The FRA will be undertaken in accordance with the NPPF and the associated online Planning Practice Guidance. It will consider the baseline flood risk to the Project from all sources in more detail and assess the potential impact of the Project in terms of change in flood risk, as well as any mitigation measures required. Consultation will be undertaken with the Environment Agency, LLFAs and other relevant stakeholders.
- 7.5.81 A WFD Compliance Assessment will be undertaken in accordance with The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. The WFDs' overarching objective of requires all water bodies in Europe to attain Good or High Status/Potential. The overall Status/Potential of a WFD waterbody comprises a series of quality elements which should not be allowed to deteriorate in the event of modifications being made to the WFD waterbody. The purpose of the WFD Compliance Assessment will be to evaluate the impact of the Project on the immediate water bodies and any linked waterbodies, and whether the Project complies with the River Basin Management Plan.

Approach to Mitigation, Enhancement and Monitoring

- 7.5.82 Mitigation measures will be developed in collaboration with the design team and in consultation with stakeholders. Development of mitigation will consider effects beyond the Project site boundary, including the effect of the Project upon the wider water environment. Construction mitigation will be implemented through the CoCP.

Flood Risk and Surface Water Drainage

- 7.5.83 Flood risk mitigation will be developed once a further understanding of the baseline flood risk and potential impacts of the Project are developed. However, it is anticipated that mitigation may include floodplain compensation areas and that the drainage strategy will incorporate sustainable drainage systems (SuDS). The impact of the surface water drainage strategy for the Project will be assessed as part of the FRA.

Geomorphology

- 7.5.84 The effect of the Project on the watercourses and waterbodies in the study area will be assessed, particularly with regard to any requirement for their realignment or works within the river corridor, though works on the floodplain will also be considered. Mitigation may include influencing the design of elements within the watercourse corridor to reduce their impact and, potentially, naturalisation of watercourses.

Water Quality and Groundwater Resources

- 7.5.85 Groundwater and water quality mitigation will include adoption of best practice guidance including that set out in the DMRB, guidance from the CIRIA and guidance provided in the Environment Agency's former PPGs. Although the PPGs have now been withdrawn, they contain measures that are still considered good practice within the industry. Where required, discharge consents and/or abstraction licenses (needed for dewatering) will be obtained.

Wastewater

- 7.5.86 Mitigation to address any lack of capacity in the current wastewater system is envisaged to be dealt with through the design of new and upgraded gravity and pumped sewers. The design is expected to include a factor of safety to ensure that any future variation in inflows, particularly at peak periods, can be accommodated. New pumping facilities would be designed to incorporate standby pumping capacity, emergency storage and emergency power generation capability to ensure that time to respond to any incident is sufficient before the onset of flooding, and suitable alarms will be added to the control system to alert operational staff of plant failures or other operational incidents which require a prompt response.

Water Supply

- 7.5.87 The effect on the existing water supply infrastructure of increased passenger throughput and higher staff numbers as a result of the Project will be assessed. Consultation was undertaken by GAL with SESW in 2015, which indicated that SESW's long term water resources planning takes into account the potential for future airport development and the higher water demand that would produce. The assessment may require liaison with SESW to reaffirm that their network has sufficient capacity to meet the potential increase in demand as a result of the Project.

Monitoring

- 7.5.88 Gatwick Airport already has an extensive monitoring system to assess the quality of runoff from the airport, particularly for the management of de-icer runoff. This system would continue to be used. It is not anticipated that the Project would necessitate changes to the monitoring regime.

Issues Proposed to be Scoped Out

- 7.5.89 It is proposed that tidal/coastal flooding be scoped out from the assessment. The watercourses that flow through the study area are the River Mole and its tributaries and are ultimately a tributary of the River Thames. The River Mole confluence with the River Thames is upstream of the tidal extent of the Thames at Teddington Lock. The airport is approximately 35 km north of the nearest coastline and ground levels are generally above 55 m above ordnance datum (AOD) and therefore are not at tidal/coastal flood risk. No impact pathway has therefore been identified that could lead to a significant effect.
- 7.5.90 With the exception below, impacts on public water supplies from groundwater are proposed to be scoped out as none occur within the study area. The nearest SPZ is over 8 km away, in a different and separate hydrogeological unit, and would not therefore be affected as there would be no impact pathway.

7.5.91 There is one licensed supply extracting groundwater from the Upper Tunbridge Wells Sand (approximately 2 km to the east), which could potentially be affected by activities in the proposed bulk materials storage areas. There may also be further unlicensed private water supplies (yet to be identified), either in the Tunbridge Wells Sand or in the superficial deposits, that may be impacted by the Project. Private water supplies (licensed or unlicensed) are therefore proposed to be scoped in to the assessment.

7.6 Traffic and Transport

Relevant Policy, Legislation and Guidance

Legislative and Policy Context

7.6.1 The following key legislation and policy documents relevant to traffic and transport will be considered within the assessment process, including but not limited to:

- Airports NPS (Department for Transport, 2018a);
- NPS for National Networks (Department for Transport, 2014);
- NPPF (Ministry of Housing, Communities and Local Government, 2019a);
- Shaping the Future of England's Strategic Roads (RIS2) (Department for Transport, 2018c)
- Draft Road Investment Strategy 2: Government Objectives (Department for Transport, 2018d)
- Strategic Business Plan 2019 – 2024 (Network Rail, 2018); and
- Periodic Review 2018 (PR18) (Network Rail, n.d) – PR18 will establish outputs and funding for Control Period 6 (CP6) from 1 April 2019 to 31 March 2024.
- The London Plan 2016 (Greater London Authority, 2016);
- The Mayor's Transport Strategy 2018 (Greater London Authority, 2018);
- South East Route - Sussex Area Route Study Final (Network Rail, 2015);
- Strategic Economic Plan (2018-2030) (Coast to Capital, 2018); and
- Transport Strategy (being developed) (Transport for the South East, n.d).
- West Sussex Transport Plan 2011-2026 (LTP3);
- West Sussex Infrastructure Studies (AECOM, 2016);
- West Sussex Walking and Cycling Strategy 2016-2026 (West Sussex County Council, 2016);
- West Sussex County Council Highway Infrastructure Policy and Strategy 2018 (West Sussex County Council, 2018);
- Mid Sussex Infrastructure Delivery Plan 2016 (Mid Sussex District Council, 2016);
- Surrey Local Transport Plan 2011-2026 (LTP3) (Surrey County Council, 2011);
- East Sussex Local Transport Plan 2011-2026 (East Sussex County Council, 2011);
- Kent Local Transport Plan 2016-2031 (Kent County Council, 2017);
- Crawley 2030: Crawley Borough Local Plan 2030 (Crawley Borough Council, 2015) – Policies IN3 Development & Requirements for Sustainable Transport, IN4 Car & Cycle Parking Standards, IN5 The Location & Provision of New Infrastructure, GAT1 Development of the Airport with a Single Runway and GAT3 Gatwick Airport Related Parking;
- Emerging Crawley 2035: Draft Crawley Borough Local Plan 2020-2035 (Crawley Borough Council, 2019) - Policies SD1, ST1, ST2, ST3, ST4, GAT3 and SD2;

- Reigate and Banstead Borough Local Plan 2005 (Reigate and Banstead Borough Council, 2005) – Policies Mo4 Development Related Funding for Highways Schemes, Mo5 Design of Roads, Mo6 Servicing Provision, Mo7 Car Park Strategy & Standards;
- Reigate and Banstead Local Plan: Core Strategy 2014 (Reigate and Banstead Borough Council, 2014) – Policy CS17 Travel Options & Accessibility;
- Emerging Reigate and Banstead Borough Development Management Plan 2018-2027 (Reigate and Banstead Borough Council, 2018) Policies TAP1 Access, Parking and Servicing, TAP2 Airport Car Parking (emerging policy);
- Mole Valley Core Strategy 2009 (Mole Valley District Council, 2009) – Policy CS18 Transport Options & Accessibility;
- Mole Valley Local Plan 2000 (Mole Valley District Council 2000) – Policies RUD28 Off Airport Carparking, MOV1 Managing Travel by Car, MOV2 The Movement Implications of New Development, MOV5 Parking Standards;
- Horsham District Planning Framework (excluding South Downs National Park) 2015 (Horsham District Council, 2015) Policy 40 Sustainable Transport, Policy 41 Parking;
- Tandridge District Core Strategy 2008 (Tandridge District Council, 2008) – Policy CSP12 Managing Travel Demand;
- Tandridge Local Plan Part 2: Detailed Policies 2014-2029 (Tandridge District Council, 2014) – Policy DP5 Highway Safety & Design;
- Emerging Our Local Plan 2033 (Regulation 22 Submission) 2019 (Tandridge District Council, 2019) – Policies TLP50 Sustainable Transport & Travel, TLP51 Airport Related Parking (emerging policy);
- Mid Sussex District Plan 2014-2033 (Mid Sussex District Council, 2018) – Policy DP21 Transport; and
- Saved policies from the Mid Sussex Local Plan 2004 (Mid Sussex District Council, 2004) - Policies T4 Public Transport, T5 Parking Standards, Transport G3.

Guidance Documents

7.6.2 The following guidance will be considered:

- Design Manual for Roads and Bridges (DMRB) Standards for Highways, with particular reference to HA 205/08 (Highways Agency *et al.*, 2008);
- WebTAG (Transport Analysis Guidance) (Department for Transport, 2019);
- Station Capacity Planning Guidance (Network Rail, 2016); and
- Local highway authority standards, where relevant if these differ from DMRB.

7.6.3 Consideration of the environmental effects of traffic and transport will be undertaken with reference to published guidance including the 'Guidelines for the Environmental Assessment of Road Traffic' (IEA, 1993) and 'Guidelines for Environmental Impact Assessment' (Institute of Environmental Management and Assessment (IEMA), 2004) and the DMRB, in particular Volume 11, Section 2, General Principles of Environmental Impact Assessment (HA 205/08).

Baseline Information

Data Collated to Date

- 7.6.4 GAL already holds a number of models generated as part of the Airports Commission process into additional runway capacity in the UK. Data from these models has been used to help define the scope of the assessment for this Project, in particular the likely scale and extent of impact.
- 7.6.5 In order to update GAL's modelling tools, a significant amount of baseline data has been collected, including:
- Traffic count data from:
 - WebTRIS data – Highways England have an extensive count database for the Strategic Road Network (SRN) available online, which measures the volume of traffic on the network and provides continuous outputs;
 - Department for Transport manual classified counts (MCCs);
 - South East Regional Traffic Model (SERTM) count data – an extensive data collection exercise was undertaken when SERTM was developed, which will be provided with the model; and
 - Gatwick 2016 traffic counts – Gatwick undertook an extensive count data collection exercise in June 2016 which included automatic traffic counts, manual classified link and turning counts and automatic number plate recognition (ANPR) counts.
 - INRIX journey time data collected in 2016 which represents an estimated road speed at different times of the day based on real time GPS feeds.
 - Mobile phone-based survey, which comprised a comprehensive mobile phone-based survey of origin and destination movements in the area surrounding Gatwick Airport.
 - OS Open Roads data set to inform network attributes such as link length and road type.
 - Rail timetable information has been obtained from the Network Rail schedule database in CIF (Common Interface File) format. This provides the arrival and departure time at each station for each train service.
 - Underground, Tramlink and Docklands Light Railway (DLR) timetables have been obtained from the Transport for London website.
 - The national General Transit Feed Specification (GTFS) dataset, which includes published timetable / schedule data for all public transport services across the UK.
 - Office of Rail and Road (ORR) station entries and exits – ORR publishes annual estimates of the total numbers of passengers entering, exiting and interchanging at each UK rail station.
 - Gatwick passenger data from three sources:
 - CAA data is a national survey of departing passengers at each UK airport to understand passenger characteristics and trends. Access to this dataset has been secured through GAL.
 - Profiler data - GAL surveys departing passengers to support further analysis on passenger trends and characteristics. This dataset is similar to the CAA data; however, Profiler has a substantially higher response rate to the post code question, which will be important for developing air passenger matrices, and more detail on parking location.
 - A profile of arriving and departing passengers, by year, month, day and hour.

- Gatwick employee data from the latest employee survey which was undertaken in 2016.
- Airport-related cargo and goods movement data.
- Previous modelling from the Airports Commission process including:
 - M25 Dartford Free Flow Crossing Model (SATURN) developed by Highways England and endorsed by the Department for Transport for that process;
 - PLANET South model as provided by the Department for Transport, outputs of which were shared with Network Rail;
 - VISSIM models related to the operation of the highway corridor and terminal forecourts.

Existing Baseline Conditions

7.6.6 Just over 80% of Gatwick's passengers travel to or from destinations in London and the South East. Greater London is the largest source market (42%), but nearby the counties of Kent, Surrey and Sussex account for a further 27%. Of the 19% of passengers travelling to/from destinations outside the South East, the majority travel to/from the East or South West of England.

Rail and Public Transport

7.6.7 A total of 39% of passengers arrive at Gatwick Airport by rail and another 5% by bus and coach, providing a current public transport mode share of 44%. GAL aim to increase this to 48% by 2022.

7.6.8 Gatwick Airport is well connected by rail. The airport has a seven platform railway station at its South Terminal and a short shuttle ride via the inter-terminal transit system to the North Terminal. It has regular, direct daily services from over 120 stations. Over 800 stations are accessible with one interchange. In addition to the stopping services, the airport has a dedicated airport express service, Gatwick Express, operating non-stop to and from London Victoria four times per hour. The majority of the Gatwick Express services also serve Brighton. Gatwick is part of London's Oyster and contactless fare payment network.

7.6.9 From Gatwick Airport station, it is possible to travel directly to the City of London via the Thameslink route (with interchange to Docklands from London Bridge station currently and at Farringdon on the Elizabeth Line from 2021) and to the West End via London's Victoria station. These services also directly connect the airport to key interchanges at Croydon, Clapham Junction and Brighton.

7.6.10 The cross-London Thameslink route provides direct services to stations between London's St Pancras station and Bedford, Peterborough and Cambridge via Welwyn Garden City, Stevenage and Hitchin. Other services provide good connections to a range of towns and cities on the South Coast. There are also a small number of direct services via the North Downs Line to Guildford and Reading.

7.6.11 Gatwick Airport therefore enjoys a very high level of rail connectivity, with 20 trains to and from central London in the morning peak hour (10 to London Bridge and 10 to London Victoria, of which four are Gatwick Express services).

7.6.12 Train services can be busy in peak periods in the peak direction, into London in the morning and towards Brighton and the South Coast in the evening. However, with completion of the Thameslink Programme, train services between Gatwick and London provide nearly 14,000 seats

per direction per hour, with room for nearly 30,000 passengers (including standing passengers) per direction per hour overall. Train capacity serving Gatwick has more than doubled since 2014, with new rolling stock on most of the services calling at the airport. This provides sufficient overall capacity for Gatwick to continue to grow its rail mode share over the next decade.

- 7.6.13 The current railway station at Gatwick Airport can be congested at peak times. Accordingly, Gatwick, the Government, Network Rail and the Coast to Capital Local Enterprise Partnership (LEP) has provided joint funding for a station improvement project which will provide a new concourse above Platforms 5/6 and 7. The new concourse will allow additional vertical circulation (escalators and lifts) to be provided between the platforms and concourse level. These improvements will add extra capacity in the station.
- 7.6.14 Gatwick is served by express coach services operated by National Express and other operators. On average there are approximately 450 to 500 daily arrivals and departures respectively, offering services to destinations throughout the UK, either directly or via Heathrow, Victoria or Birmingham. Gatwick also has an extensive, 24 hour, local bus network provided by Metrobus.
- 7.6.15 Gatwick has recently improved the customer experience at the airport through provision of a new waiting area at South Terminal for bus and coach passengers. Gatwick is also developing a proposal to increase the capacity of bus and coach facilities on Furlong Way at the North Terminal and has improved pedestrian access between South Terminal and local bus stops located on the A23.

Highways

- 7.6.16 Gatwick Airport can be directly accessed from the national strategic road network via the M23 motorway, which runs north-south adjacent to the airport. Junction 9 of the M23 is the main access point with an onward link of dual carriageway motorway to Junction 9a at the airport's South Terminal roundabout.
- 7.6.17 The typical journey time from Gatwick Airport to the M25 via the M23 is less than 10 minutes. From the M25, there is access to the wider UK strategic road network.
- 7.6.18 The A23, which runs parallel to the M23, continues north beyond the M25 into London via Croydon and Brixton to the heart of the West End and the City. It connects south London and Croydon, through Redhill then Horley and Gatwick Airport, through Crawley and providing a connection to the south through Pease Pottage to Brighton.
- 7.6.19 South of Gatwick, the M23/A23 continues as a strategic highway corridor from London to Brighton on the South Coast. Brighton is approximately 30 to 45 minutes from the airport by road in the off-peak and peak periods respectively. The A23 connects with the A272 and A27 east - west routes, placing the whole of the South Coast between Southampton and Folkestone within approximately 1 hour and 20 minutes of the airport.
- 7.6.20 Highways England's M23 Smart Motorway project, due to be completed in Spring 2020, will add additional running lane capacity to the strategic network serving Gatwick. In addition, GAL has allocated funding in its Capital Investment Programme to improve South and North Terminal roundabouts to cater for predicted growth over the next decade and beyond.

- 7.6.21 The M25 is busy and can be slow-moving and congested at peak times. Highways England is committed to improving conditions on the M25, through a variety of committed enhancements as well as the M25 South West Quadrant study, which is looking at ways to enhance capacity from Junctions 7 (for the M23) – 16 (for the M40) of M25.

Forecourts and Car Parks

- 7.6.22 Surface transport facilities within the airport boundary are made up of on-airport roads, forecourts and car parks, including facilities for coaches, taxis and car rental companies. GAL has recently completed works to improve the North Terminal forecourt.
- 7.6.23 There are currently approximately 46,700 car parking spaces ‘on airport’, including staff parking, and a further 21,196 authorised spaces ‘off-airport’.

Walking and Cycling

- 7.6.24 There is a designated cycling and walking route serving Gatwick, Crawley and Horley, forming part of National Cycling Route 21 (London to Brighton).

Staff Travel

- 7.6.25 Over the last two decades Gatwick has grown its public transport mode share and supported sustainable staff travel through a variety of projects and initiatives. GAL is committed to achieving 42% of staff journeys to work by sustainable modes (public transport, active travel modes and group travel provided by individual employers for their staff, referred to as “company transport”) and 45% including other sustainable travel initiatives (car share and zero emission vehicles) by 2022.

Proposed Scope of Assessment

- 7.6.26 It is proposed that the findings of the assessment of effects on traffic and transport would be set out as a topic chapter within the ES, supported by a Transport Assessment and other technical appendices where appropriate. The PEIR will include a draft chapter, including as much of the information set out below as is available at the time of writing.
- 7.6.27 The following section describes the scope of assessment as it relates to traffic and transport. All modes of surface transport will be considered including the following, which cover passenger, staff, goods, construction and operational journeys:
- Construction traffic movements;
 - Private vehicle movements;
 - Freight and deliveries;
 - Rail;
 - Public buses and coaches;
 - Private hire and taxis; and
 - Walking and cycling

Proposed Scope of Baseline and Modelling Studies

7.6.28 Further additional data will be collated, including:

- Passenger counts at Gatwick Airport requested from Govia Thameslink Railway (GTR);
- Passenger counts for trains in/out of Central London requested from the Department for Transport;
- Access to road traffic vehicle counts (automatic traffic flow) data on roads at Gatwick Airport;
- West Sussex model data, including the network for the Crawley Local Transport Model, traffic counts, signal timings and details on future infrastructure and development assumptions;
- Traffic counts, signal timings and future development and infrastructure assumptions from other local authorities within the area of detailed modelling which includes Surrey, East Sussex and Kent;
- Model data from Transport for London including the latest South London Highway Assessment Model (SoLHAM) networks and traffic counts;
- Additional traffic surveys in local areas, including automatic traffic counts, manual classified turning counts and automatic number plate recognition, which are being undertaken currently; and
- Bus boarding and alighting survey at Gatwick Airport to be undertaken in June 2019.

7.6.29 If any further gaps are identified during the assessment, these will be filled by undertaking further surveys, analysing existing data sets including 2016 mobile phone data capture from previous GAL surveys, desktop studies and research, together with advice and input from transport planning specialists.

Demand Model

7.6.30 A variable demand model will be used to identify the background (non-Gatwick) trips. A different model will be required for Gatwick Airport trips for two main reasons:

- More model detail is required – more modes (eg taxi), different segmentation (eg UK/overseas), and potentially more or different time periods customised to the specific circumstances of Gatwick Airport; and
- There are different choices and sensitivities – eg air passengers have limited flexibility to change destination (airport) and have different values with regard to journey time compared to general background trips.

7.6.31 Therefore, the development of the airport mode choice model will enable the assessment of the relevant access/egress modes taken across the day for both passengers and employees. The mode choice model includes appropriate assumptions for the availability and performance of both the highway and public transport networks. This will require the model to be integrated with both the public transport (rail, bus and coach) and highway (car (kiss and fly, park and fly), taxi, light goods and heavy goods vehicle (HGV)) models.

Public Transport

7.6.32 The public transport assignment model will use the PLANET South model as a basis for the rail assignment model and a new model will be developed for bus/coach travel. The rail assessment will include the impacts of crowding, which will be important in demonstrating the effects of growth

at Gatwick with and without the Project. Given the adaptability of bus and coach provision, and the inherent differences to the impact of rail crowding in terms of demand and amenity, it is not considered necessary to model crowding on these services explicitly within the modelling framework. Therefore, the bus/coach model will be developed as a standard public transport frequency-based assignment using the inbuilt modules of the EMME software and applying a standard generalised journey time function with weight on the components of time as recommended in WebTAG.

Highways (Strategic)

- 7.6.33 The strategic highway model will use SATURN, which is the software used for strategic highway modelling by all the source highway models. It will be developed using Highways England's SERTM as the basis for generating a sub-regional highway assignment model that can be used to test strategic network effects as well as providing input into any environmental analysis for noise and air quality.
- 7.6.34 SERTM is a strategic highway model developed to focus on the strategic road network and therefore it will be refined locally to add additional network detail and zoning. The model is likely to use West Sussex's Crawley Transport model and Transport for London's SoLHAM network coding for Crawley and the area of South London that is required in the area of detailed modelling (AoDM).

Highways (Local)

- 7.6.35 Local to Gatwick, Gatwick has developed three VISSIM traffic simulation models, comprising the detailed models of the North and South Terminal forecourts and a model of the wider network known as the Corridor Model.
- 7.6.36 The Corridor Model includes south Horley from the junction at Massetts Road and A23 Brighton Road, down through Longbridge Roundabout, east through North and South Terminal Roundabouts, along the M23 Spur to Junction 9 of the M23. The model also extends down the A23 London Road into North Crawley, including roads connecting to the Manor Royal estate and the A2011 Crawley Avenue to Hazelwick Roundabout.
- 7.6.37 In 2016, the Corridor Model was recalibrated based on an extensive data collection exercise. Calibration of the 2016 Corridor Model shows that the model satisfies WebTAG requirements, with 90% calibration over the 24 hour simulation for turning counts and with 87% to 100% validation in terms of known journey times by route within one minute or a 15% variance.
- 7.6.38 Given this high degree of calibration and validation, the updated 2016 Corridor Model is considered a robust base to take forward and uplift for future analysis of impacts. The calibrated and validated Corridor Model will therefore be used as the basis for modelling forecast years with and without the Project.

Station and Inter-Terminal Shuttle

- 7.6.39 In order to test the effects of future passenger growth on the railway station, South Terminal departures and the inter-terminal shuttle system, Gatwick is using the Legion model developed,

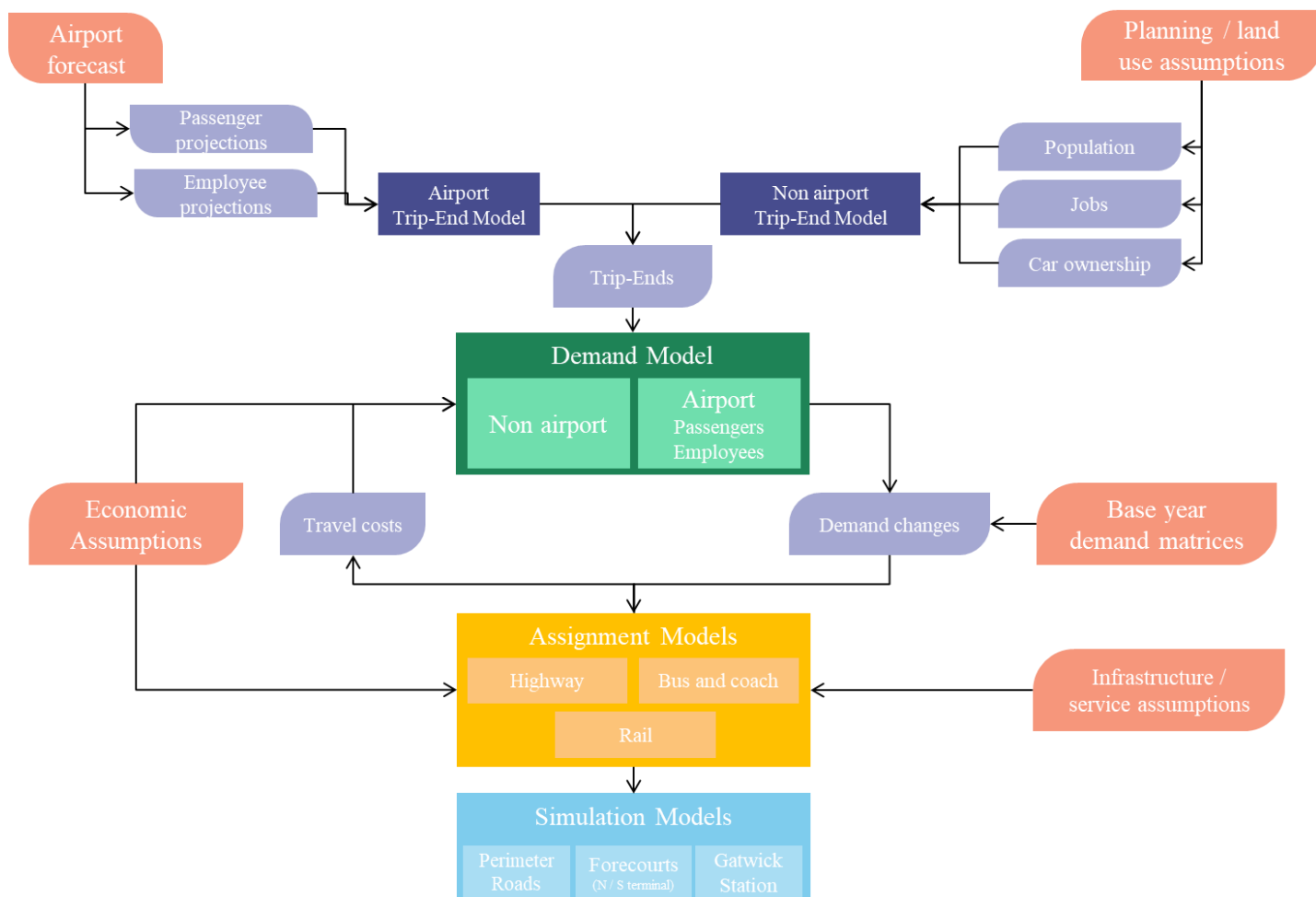
validated and calibrated by Network Rail for the proposed railway station improvements (see paragraph 7.6.13) to test the effects of the Project on passenger densities and crowding.

Study Areas

7.6.40 An overall model architecture is being developed to agree with the Department for Transport, Highways England, National Rail and other stakeholders. Diagram 7.6.1 outlines the proposed overall modelling structure that the Gatwick Strategic Model will follow. This aligns with the approach in WebTAG (Unit M1.1). It outlines three core model components:

- The demand model – capable of reflecting changes in the distribution and mode of non-airport demand and the mode of travel for airport demand (employees and passengers).
- Assignment models – capable of establishing the likely routes taken by airport and non-airport demand and producing costs for the demand model.
- Simulation models – used for the detailed operational assessment of key pieces of infrastructure at and adjacent to the airport, including the impacts of proposed mitigation.

Diagram 7.6.1: Proposed Model Architecture



7.6.41 The extent of the AoDM required for assessing the effects of Gatwick’s growth on the transport network, including an estimate of the affected road and rail network, will be determined using the original SERTM (highway) and PLANET South (railway) models. This model coverage will be

agreed with key stakeholders based on confirmed assessment criteria. The extents will be informed by previous experience and understanding of Gatwick’s transport effects (informed by assessments undertaken as part of the Airports Commission process). An indicative coverage for the highways assignment model (HAM) is shown in Figure 7.6.1 subject to completion of the assessment using SERTM. The AoDM is shown in the centre with the wider simulation area outlined in pink. It is proposed to keep SERTM level of model detail between the AoDM and simulation area boundary. Outside the simulation area, the network will be represented as a less detailed network of key feeder roads.

7.6.42 The affected rail network in PLANET South shows that the minimum extent of rail network coverage should be from the Sussex coast to central London plus the North Downs Line between Gatwick and Reading. It is proposed to retain the full coverage of PLANET South that includes this and a far wider area, including origins that are now directly linked to Gatwick by Thameslink such as Stevenage, Peterborough and Cambridge. A plan showing the PLANET South model area is shown in Figure 7.6.2.

Effects Proposed to be Assessed

7.6.43 Table 7.6.1 sets out the effects proposed to be considered within the EIA process.

Table 7.6.1: Potential Effects to be Considered – Traffic and Transport

Activity	Potential Effects	Receptor
Construction Phase (including Demolition): Traffic and Transport		
Construction and demolition activities	Traffic generation and % change for local highway network (including construction materials, cut/fill, staff)	Highway users (all modes)
	Severance – local highway network	Highway users (all modes)
	Driver delay – local highway network, including during construction of highway junctions	Highway users (all modes)
	Driver stress, in relation to proposed highway mitigation	Highway users (all modes)
	Pedestrian and cyclist delay – local highway network, including during construction of highway junctions	Pedestrian and cycle modes
	Pedestrian and cyclist amenity – local highway network, including during construction of highway junctions	Pedestrian and cycle modes
	Accidents and safety	Highway users (all modes)
	Hazardous loads	Highway users (all modes)
	Effects on rail network and rail users, such as amenity and crowding	Rail users
	Effects on other public transport services and users (eg bus and coach, such as amenity)	Public transport users
Operational Phase: Traffic and Transport		

Activity	Potential Effects	Receptor
Use of airport, including upgraded highway junctions	Traffic generation and % change for local highway network (staff and passengers)	Highway users (all modes)
	Severance – local highway network	Highway users (all modes)
	Driver delay – local highway network	Highway users (all modes)
	Driver stress, in relation to proposed highway mitigation	Highway users (all modes)
	Pedestrian and cyclist delay – local highway network	Pedestrian and cycle modes
	Pedestrian and cyclist amenity – local highway network	Pedestrian and cycle modes
	Accidents and safety	Highway users (all modes)
	Hazardous loads	Highway users (all modes)
	Effects on rail network and rail users, such as crowding	Rail users
	Effects on other public transport services and users (eg bus and coach, such as amenity)	Public transport users

Approach to Assessment of Effects

- 7.6.44 The approach set out below applies to both the construction and operational phases of the Project.
- 7.6.45 In line with IEA Guidelines, consideration of the environmental effects of traffic and transport will be undertaken for the following factors:
- Driver delay;
 - Severance;
 - Public transport user effects
 - Pedestrian delay;
 - Pedestrian amenity;
 - Accidents and safety; and
 - Hazardous loads.
- 7.6.46 The above list has been augmented with criteria from the DMRB to include for modes other than car. The assessment process will include work with Highways England to assess the impact the Project would have on flows on the M25. The assessment will include modelling of committed schemes which provide additional capacity in the future. In addition, consultation will be undertaken with Network Rail with regard to rail capacity and rail mode share.
- 7.6.47 The effects to be assessed within the PEIR/ES chapter will include:
- Severance and driver delay – considering how changes in traffic flow associated with the Project or the impact of design changes to the highway network will affect severance and delay on the highway network for both private trips (all vehicle types) and public transport (bus and coach). The IEA Guidelines will be taken into account for this, including:

- Test 1: include all highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and
- Test 2: include any other specifically sensitive areas where traffic flows have increased by 10% or more.
- Driver stress– considering how changes to the road network during construction and operation will impact on driver stress. This assessment will be undertaken in line with DMRB guidance. Effects in relation to the view from the road will be considered within the Landscape and Visual Resources chapter.
- Pedestrian and cyclist delay – considering how changes in traffic flow associated with the Project or the impact of design changes to the highway network will impact on pedestrian and cyclist delay.
- Pedestrian and cyclist amenity – considering the quantum and quality of walking and cycling routes and facilities.
- Accidents and safety – considering safety and the number of accidents.
- Hazardous loads – considering changes to the transporting or routing of hazardous loads, if relevant (none of these are anticipated at this stage).
- Effects on rail network and rail users, such as amenity and crowding – an assessment of capacity and crowding on the rail network and in the Gatwick Airport station as well as an assessment of the quantum and quality of rail services.
- Effects on other public transport services and users (eg bus and coach, such as amenity) - an assessment of the quantum and quality of bus and coach services.

7.6.48 The approach to assessing the effects of traffic and transport will take into account the guidance defined in the DMRB Volume 11, Environmental Assessment, Section 2, Environmental Impact Assessment specifically Part 5 (HA 205/08, Highways England *et al*, 2008).

7.6.49 The receptors considered in the assessment will include other road users, rail users, bus and coach passengers, pedestrians and cyclists (where these are using roadside footways or cycle routes), as well as local communities. Effects on public rights of way (including their use by walkers, cyclists and equestrians will be considered within the Agricultural Land Use and Recreation chapter of the PEIR/ES – see Section 7.12 of this report).

7.6.50 The traffic and transport activities which will be included within the assessment include:

- Construction
 - Delivery of material to and removal from site, in particular HGV movements;
 - Construction workforce access; both by public transport and road;
 - Sequencing of highway works, temporary traffic measures (such as reduced lane availability); and
 - Movement of hazardous materials (if required).
- Operation
 - Increased movement of passengers to and from the airport by rail, public transport and road;
 - Increased movement of staff to and from the airport by rail, public transport, road, cycling and walking;

- Increased movement of freight to and from the airport by rail, public transport, road, cycling and walking;
- Impact on other users of the transport network around Gatwick; and
- Upgrades to the highway network to support airport growth.

- 7.6.51 The assessment will follow the approach set out in Chapter 6 with regard to identification of receptor sensitivity, impact magnitude and evaluation of significance of effects.
- 7.6.52 The evaluation of significance will be informed by the level of change in demand and detailed transport modelling, which has been agreed with the Department for Transport, Highways England, Network Rail and local authorities. The evaluation of significance will be underpinned by a narrative approach, based on professional judgement.
- 7.6.53 Cumulative effects will also be considered, taking into account other proposed developments (committed developments as advised by Highways England, Network Rail and the Department for Transport as being pertinent to the strategic modelling of the impacts from the Project will already be included within transport models).

Assessment Years

- 7.6.54 The baseline year for the traffic and transport chapter of the PEIR/ES will be 2016, which matches the base year of the modelling tools being used and reflects an extensive data collection exercise undertaken by GAL in that year, including mobile phone data capture, collected over a two month period and comprising upwards of 2.5 million devices and 170 million events per day for the busiest days giving a wealth of information to inform the modelling.
- 7.6.55 The baseline scenario will be used to describe existing transport infrastructure and the performance of the transport network in the absence of the Project. The calibrated and validated model base year is 2016, which corresponds to the comprehensive dataset available for that year. The 2016 data will be extrapolated to provide data to represent the 2018 baseline year scenario, which will be used to inform the assessment of effects of traffic and transport and will feed into the assessments undertaken for air quality and noise.
- 7.6.56 The airfield's first full year of operation after opening is anticipated to be 2026, accordingly this will be the first operational year modelled and tested.
- 7.6.57 An interim assessment year, currently anticipated to be 2029, will be tested which is when peak slots on the northern runway are likely to have been filled. This horizon will be tested both without and with the Project. This assessment year will include construction effects.
- 7.6.58 The design year (with all airside and landside work completed) is currently anticipated to be 2038. This assessment year will be tested both without and with the Project.
- 7.6.59 There are two potential scenarios for growth in passenger throughput numbers that will be included within the assessments, which take into account the potential opening date of Heathrow's Third Runway. The central case for the assessment is based on the current expected opening date of Heathrow's third runway in 2026. However, in the event that the third runway cannot be delivered in 2026, the implications of a potential later opening date (assumed to be 2030) will also be assessed within the ES.

- 7.6.60 TEMPRO Version 7.2 will be used to determine background traffic growth factors from the base year to the years of assessment.

Wider Assessment of Traffic and Transport

- 7.6.61 Traffic and transport is an important consideration for the operation of Gatwick Airport and this Project, providing the onward or arrival travel modes for passengers and staff using the Airport. The PEIR/ES chapter will be supported by a number of technical studies:
- A Transport Assessment (TA) to provide an assessment of the transport implications of the Project, including details of proposed mitigation. This will include Gatwick's Airport Surface Access Strategy (ASAS), which will set targets for the mode share of passengers and staff by sustainable modes and the packages of measures required to deliver this.
 - Transport modelling, both strategic and local, developed in consultation with key stakeholders and following best practice guidance including WebTAG (the Department for Transport, 2019). The transport modelling will inform the assessment of impacts and effects related to the Project and demonstrate the effectiveness of any proposed mitigation to reduce the impact.
 - A design component related to the development and evaluation of mitigation proposals.

Approach to Mitigation and Monitoring

- 7.6.62 The assessment will consider the environmental effect related to both the permanent or end state condition once the Project is fully operational as well as temporary impacts related to construction (including consideration of an assessment year where construction and operational activities will overlap).
- 7.6.63 The approach to developing mitigation during operation is likely to include the following, with mitigation measures set out in the ASAS:
- Working with a wide range of stakeholders and business partners to achieve a co-ordinated approach against shared and sustainable transport objectives. The main consultative group will be the Gatwick Area Transport Forum consisting of GAL, local authorities, transport providers and agencies, business, airlines and other interested parties.
 - Mitigating the effects of Gatwick's increasing role as a regional transport hub, including managing the impacts of 24 hour connections serving passengers, staff, local communities and businesses.
 - Ensuring that commitments to increasing passenger and staff mode share by rail and public transport are achievable with the additional demand created by the Project. Mitigation will be developed in conjunction with Network Rail, Train Operating Companies and other service providers on timetabling, capacity enhancements and GAL's role supporting improvements of wider benefit for the region.
 - Reviewing the extent to which the Sustainable Transport Fund, which will be increased in value as a result of this Project, provides benefits in terms of improved service frequencies and network coverage.
 - Making public transport easier to use by creating an integrated travel application for passengers and staff to enable to choose from a range of surface transport modes, facilitating Mobility-as-a-Service.

- Reducing staff travel by car through a series of incentives and reducing the rate of provision of car parking for staff as the airport expands.
- Encouraging healthier travel options, in particular for staff, such as recent upgrades to on-airport cycling and walking routes serving Gatwick, Crawley and Horley, forming part of National Cycling Route 21 (London to Brighton), which offers a safe and sustainable travel option, particularly for airport-based staff
- Mitigating the impacts of increased car parking on the airport. GAL is committed to providing all of the car parking required for the Project on Gatwick land whilst working with local planning authorities such as Crawley Borough Council to reduce unauthorised off-airport parking and to re-provide this on-airport in line with GAT3 commitments¹. This will result in additional passenger car parking within the Project site and development of a range of car parking products.
- Embracing new technologies including Electric Vehicles and Connected Autonomous vehicles. A higher percentage of future car journeys will be made by zero or low emission vehicles as a direct result of initiatives led by Gatwick.
- Developing and carrying out monitoring of pedestrian, cyclist and traffic levels by mode in order to be able to respond to changes in demand. GAL will also monitor those surface access impacts as required by Highways England, Network Rail and the Department for Transport to demonstrate the successful mitigation of the effects of the Project.

7.6.64 Maintenance and improvement of cycling and walking facilities around Gatwick will be an important part of the airport surface access strategy.

7.6.65 Mitigation during construction is anticipated to include the following:

- A Construction Traffic Management Strategy (CTMS) which:
 - Includes measures to ensure the transport of construction materials and waste is managed as sustainably as possible noting the impacts of transporting this by road, including the use of rail via facilities close to the airport, where this is appropriate and feasible;
 - Times construction material and logistics traffic movements that need to come by road to use roads and highways outside of peak periods and to use designated routes into construction sites on the airport which are suitable for this type of traffic;
 - Considers the use of consolidation centres and Delivery Management Zones to consolidate materials onto the least number of vehicles and to hold vehicles away from sensitive areas until deliveries are required;
 - Encourages the highest possible public transport use for the construction workforce; and
 - Time shift patterns such that those workers who do need to come by road to use roads and highways outside of peak periods.
- The CTMS will be referenced in and coordinated with the CoCP.

7.6.66 Gatwick is committed to delivering as much of the construction associated with the Project as is practicable by sustainable modes and is therefore exploring opportunities for bringing

¹ GAT 3 limits the provision of any further car parking to serve airport demand to be provided for by GAL on-airport rather than off-airport by a third party.

construction materials to and from site by rail. In addition, the waste management strategy will aim to reduce transport associated with construction waste, as far as practicable.

Issues Proposed to be Scoped Out

- 7.6.67 No issues or effects have been scoped out of the assessment.
- 7.6.68 Assessment of effects on users of public rights of way will be provided within the Land Use and Recreation chapter of the PEIR/ES. Similarly, air quality (including dust) and noise effects of traffic will be included in EIA process but considered within noise and air quality chapters of the PEIR/ES.

7.7 Air Quality

Relevant Policy, Legislation and Guidance

Legislative and Policy Context

- 7.7.1 The following key legislation and policy documents relevant to air quality will be considered within the assessment process:
- Environment Act 1995;
 - The Air Quality Standards Regulations 2010 (amended in 2016);
 - Airports NPS (Department for Transport, 2018a);
 - NPS for National Networks (Department for Transport, 2014);
 - NPPF (Ministry of Housing, Communities and Local Government, 2019a);
 - Aviation 2050: The Future of UK Aviation – A Consultation (HM Government, 2018d);
 - The UK plan for tackling roadside nitrogen dioxide concentrations (Defra and Department for Transport, 2017);
 - Clean Air Strategy (Defra, 2019);
 - Crawley 2030: Crawley Borough Local Plan 2015-2030 (Crawley Borough Council, 2015) - Policies ENV12 Air Quality and GAT1 Development of the Airport with a Single Runway;
 - Emerging Crawley 2035: Draft Crawley Borough Local Plan 2020-2035 (Crawley Borough Council, 2019) - Policies SD1, EP3 and EP5;
 - Reigate and Banstead Local Plan: Core Strategy 2014 (Reigate and Banstead Borough Council, 2014) - Policy CS10 Sustainable Development;
 - Emerging Reigate and Banstead Borough Development Management Plan 2018-2027 (Reigate and Banstead Borough Council, 2018) - Policies DES8 Construction Management, DES9 Pollution & Contaminated Land (emerging policy);
 - Horsham District Planning Framework (excluding South Downs National Park) 2015 (Horsham District Council, 2015) - Policy 24 Environmental Protection;
 - Tandridge Local Plan Part 2: Detailed Policies 2014-2029 (Tandridge District Council, 2014) - Policy DP22 Minimising Contamination, Hazards & Pollution;
 - Emerging Our Local Plan 2033 (Regulation 22 Submission) 2019 (Tandridge District Council, 2019) – Policy TLP46 Pollution & Air Quality (emerging policy),
 - Mid Sussex District Plan 2014-2031 (Mid Sussex District Council, 2018) - Policy DP29 Noise, Air & Light Pollution; and

- Saved Policies from the Mid Sussex Local Plan 2004 (Mid Sussex District Council, 2004) - Policies B23, 24, CS22 Pollution.

Guidance Documents

7.7.2 The following guidance documents relevant to air quality will be considered in the assessment process:

- Local air quality management technical guidance TG16 (Defra, 2018);
- Guidance on the assessment of dust from demolition and construction (Institute of Air Quality Management, 2014);
- Guidance on the assessment of odour for planning (Institute of Air Quality Management, 2018);
- Land-use planning and development control: planning for air quality (Institute of Air Quality Management and Environmental Protection UK, 2017);
- Airport Air Quality Manual (International Civil Aviation Organization, 2011);
- Project for the Sustainable Development of Heathrow (Department for Transport, 2006);
- Design Manual for Roads and Bridges HA 207/07 (Highways England, 2007a);
- Interim Advice Note 174/13 Evaluation of significant local air quality effects (Highways England, 2013); and
- Natural England’s approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (Natural England, 2018).

Air Quality Standards

7.7.3 The European legislation has set air quality limit values which have been transposed into national law (UK objectives) and are quality standards for clean air. For the purposes of the air quality assessment, the term ‘air quality standard’ has been used to refer to both the UK objectives and European limit values. A number of different pollutants contribute to local air quality issues. These are generally produced during combustion processes and include, amongst others, oxides of nitrogen (NO_x), including nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}). In addition, pollutants such as NO_x and sulphur dioxide (SO₂) contribute to acid and nutrient nitrogen deposition at natural ecosystems.

7.7.4 Table 7.7.1 presents the air quality standards for the main pollutants of concern for local air quality in relation to human health and the natural environment.

Table 7.7.1: Air Quality Standards

Pollutant	Averaging period	Air quality standard
Human health		
Nitrogen dioxide (NO ₂)	Annual mean	40 µg/m ³
	1-hour mean	200 µg/m ³ not to be exceeded more than 18 times a year
Particulate matter (PM ₁₀)	Annual mean	40 µg/m ³
	24-hour mean	50 µg/m ³ not to be exceeded more than 35 times a year

Pollutant	Averaging period	Air quality standard
Fine particulate matter (PM _{2.5})	Annual mean	25 µg/m ³
Natural environment		
Oxides of nitrogen (NO _x)	Annual mean	30 µg/m ³

Baseline Information

7.7.5 This section presents the baseline information collated to date. The relevant baseline information is presented in Figure 7.7.1.

Data Collated to Date

7.7.6 A review of the following data sources has been undertaken to date:

- Annual Status Reports and monitoring data from local authorities;
- Monitoring data from the London air quality network;
- Monitoring data from GAL;
- Monitoring data from the Sussex Air Quality Partnership;
- Air quality management areas (AQMA) declared by local authorities; and
- Gatwick Airport Consultative Committee (GATCOM) annual air quality reports.

7.7.7 A monitoring survey using diffusion tubes for measuring NO₂ concentrations has been ongoing around the airport since 2016. The survey focuses on two key areas: the A23 Brighton Road to the north of the airport; and the area around Hazelwick roundabout to the south of the airport (Figure 7.7.1).

Existing Baseline Conditions

7.7.8 Existing or baseline ambient air quality refers to the concentration of relevant substances that are already present in the environment.

7.7.9 The airport is located within the administrative area of Crawley Borough Council at the boundary with Reigate and Banstead Borough Council. Both councils have declared AQMA in their areas and have identified road traffic as the main source of pollution. The Horley AQMA was declared in 2002 and encompasses an area of the south west quadrant of Horley near the airport. The residents in the southern part of the AQMA are the closest to the airport and therefore receive the highest contribution from airport emissions, in combination with non-airport emissions from the local road network. The Hazelwick AQMA was declared in 2015 and encompasses the Hazelwick roundabout and areas along the adjoining roads; the A2011 Crawley Avenue, Hazelwick Avenue, the A2004 Northgate Avenue and Gatwick Road. Both AQMA have been designated for exceedances of the annual mean NO₂ air quality standard.

7.7.10 There are five continuous monitoring sites within 1 km of Gatwick Airport and a wide network of diffusion tubes operated by the local authorities. The locations of the continuous monitoring sites are mainly urban background sites and there is one airport site (LGW3, Figure 7.7.1) at the eastern end of the main runway. Monitoring data for the continuous monitors over the past five years are presented in Table 7.7.2. In the years 2014 to 2018 the annual mean NO₂

concentrations have consistently been well below the air quality standard of 40 µg/m³ at these sites. There were also no exceedances of the 1-hour mean standard of 200 µg/m³.

- 7.7.11 Diffusion tube measurements of NO₂ concentrations at roadside locations operated by the local authorities along the A23 Brighton Road and around Hazelwick roundabout have exceeded the air quality standard over the past few years. Exceedances of the NO₂ air quality standard of 40 µg/m³ were also recorded in 2018 during the air quality monitoring survey undertaken at these locations on behalf of GAL.
- 7.7.12 Measurements of PM₁₀ concentrations are undertaken at the RG1 continuous monitoring site. Measurements of PM₁₀ have been well below the air quality standard of 40 µg/m³ at this site in the years 2014 to 2018 as shown in Table 7.7.2. There were also no exceedances of the 24-hour mean standard of 50 µg/m³.

Table 7.7.2: Continuous Monitoring Data

Site	2014	2015	2016	2017	2018
Annual mean NO₂ (µg/m³)					
RG1 Horley	20.2*	21.1	20.3	20.4	19.6*
RG2/RG6 Horley South East**	28.5	26.4	28.7	26.7	24.9
RG3 Poles Lane	17.5	14.0	16.7	13.9	15.5
CA2 Gatwick East	37.5*	23.4*	29.0	28.3	24.5
LGW3 Airport	31.0	28.2	30.0	29.5	29.8
Annual mean PM₁₀ (µg/m³)					
RG1 Horley	19.3	19.3*	16.6	16.1	17.1

* data capture below 90%

** The RG2 Horley South monitoring site closed in 2017. It was replaced by the RG6 Horley South East site which was installed at the end of 2016 approximately 30 m away from the RG2 site.

Data sources: London Air Quality Network; Sussex Air Quality Partnership; Gatwick Airport Ltd

- 7.7.13 Background data on nitrogen and acid deposition will be obtained from the Air Pollution Information System (APIS) for those ecological sites that are sensitive to nutrient nitrogen and acid deposition (such as Glover's Wood SSSI, Mole Gap to Reigate Escarpment SSSI/SAC and Ashdown Forest SSSI/SAC/SPA).

Proposed Scope of the Assessment

- 7.7.14 It is proposed that the findings of the assessment of effects on air quality would be set out as a topic chapter within the ES, supported by technical appendices where appropriate. The PEIR will include a draft chapter, including as much of the information set out below as is available at the time of writing.

Proposed Scope of Baseline Studies

- 7.7.15 The ES will include a desk-based study of the existing baseline conditions. This will include detailed information on AQMAs, air quality action plans, local monitoring data, background concentrations and other pollution sources, such as industrial processes.

- 7.7.16 An air quality diffusion tube survey along the A23 Brighton Road and in the vicinity of the Hazelwick roundabout is ongoing. Measurements from this survey will be used in the air quality assessment.

Proposed Approach to Identifying Future Baseline Conditions

- 7.7.17 The ES will include an assessment of baseline conditions for the future assessment years. This will include predictions of background pollutant concentrations. Further detail regarding the proposed approach to modelling future emissions is provided at paragraphs 7.7.29 onwards.

Study Area

- 7.7.18 The study area for the assessment of construction dust will be 350 m from any dust generating activity and up to 500 m along construction traffic routes from the site entrance(s), as defined in the Institute of Air Quality Management Guidance (IAQM, 2014). No significant effects from dust generating activities would be anticipated further away from these distances.
- 7.7.19 The study area for emissions from construction traffic will be based on the routes assessed within the ADMS-Roads dispersion model.
- 7.7.20 Changes to road traffic due to the operation of the Project will be screened using the criteria in the land-use planning and development control: planning for air quality guidance (Institute of Air Quality Management and Environmental Protection UK, 2017). This will define the extent of the road network to be included in the modelling (ie the affected road network). All roads with significant volumes of traffic within 200 m of the affected road network will also be included in the modelling.
- 7.7.21 Pollutant concentrations during operation will be predicted using the ADMS-Airport dispersion modelling software. Pollutant concentrations will be predicted on a grid of receptors around the airport for the generation of contour plots. The grid is likely to be 11 km by 10 km centred on the airport, but this will be amended if required to ensure all significant effects are captured. Pollutant concentrations will also be predicted at discrete sensitive human and ecological receptors where significant effects are likely to occur; this may be beyond the contour grid area.

Effects Proposed to be Assessed

- 7.7.22 The potential effects to be considered for air quality are detailed in Table 7.7.3. These relate to the construction phase (including demolition) and the operational phase of the Project. The pollutants included in the air quality assessment will be NO_x, NO₂, PM₁₀ and PM_{2.5}. These are the main pollutants of concern for local air quality and likely to cause impacts due to the Project. Emissions of carbon dioxide (CO₂) will be calculated for use in the assessment of greenhouse gases.
- 7.7.23 Sensitive receptors for air quality are defined as those residential properties, schools, hospitals and care homes that are likely to experience a change in pollutant concentrations. Sensitive ecological receptors for air quality are defined as those sites whose features have been designated as sensitive to air pollutants, either directly or indirectly. High levels of NO_x can adversely affect vegetation, including leaf or needle damage and reduce plant growth. Deposition

of pollutants derived from NO_x emissions contribute to acidification and/or eutrophication of sensitive habitats leading to loss of biodiversity (APIS, n.d.).

- 7.7.24 Sensitive ecological receptors will include nationally and internationally ecologically designated sites. Further details are provided in Section 7.3.

Table 7.7.3: Potential Effects to be Considered – Air Quality

Activity	Potential Effects
Construction Phase (including Demolition): Air Quality	
Construction and demolition activities, including upgraded highway junctions, earthworks, land preparation, construction sites and airside development	Dust generation causing annoyance due to dust soiling, human health impacts due to increased PM ₁₀ concentrations and harm to ecological receptors
	Emissions from construction vehicles and non-road mobile machinery causing human health impacts due to increased NO _x , PM ₁₀ and PM _{2.5} concentrations
Construction vehicle movements using the public highway network	Emissions from road traffic causing human health impacts due to increased NO _x , PM ₁₀ and PM _{2.5} concentrations, and harm to ecological receptors due to increased NO _x concentrations and nitrogen deposition
Operational Phase: Air Quality	
Use of airport, including upgraded highway junctions	Emissions from road traffic causing human health impacts due to increased NO _x , PM ₁₀ and PM _{2.5} concentrations, and harm to ecological receptors due to increased NO _x concentrations and nitrogen deposition
	Aircraft emissions causing human health impacts due to increased NO _x , PM ₁₀ and PM _{2.5} concentrations, and harm to ecological receptors due to increased NO _x concentrations and nitrogen deposition
	Emissions from airport operations/combustion plant causing human health impacts due to increased NO _x , PM ₁₀ and PM _{2.5} concentrations, and harm to ecological receptors due to increased NO _x concentrations and nitrogen deposition
	Increased emissions of odours from operations (eg aircraft fuel, wastewater facility, other airport operations/plant) causing annoyance

Approach to Assessment of Effects

Construction

- 7.7.25 The assessment of dust emissions during construction will be assessed following the guidance on the assessment of dust from demolition and construction (Institute of Air Quality Management, 2014).
- 7.7.26 Emissions from construction plant and non-road mobile machinery will be screened for their potential to cause significant effects.
- 7.7.27 The assessment of road traffic emissions during construction will be assessed using the ADMS-Roads dispersion modelling software. Pollutant concentrations (NO₂, PM₁₀ and PM_{2.5}) will be predicted at sensitive discrete receptors along the roads likely to be used by construction traffic. Road traffic emissions will be calculated using the online Defra Emissions Factors Toolkit (Defra, n.d.). The impacts from road traffic emissions will be assessed following the Land-Use Planning

and Development Control: Planning for Air Quality Guidance (Institute of Air Quality Management and Environmental Protection UK, 2017). The evaluation of significance of effects will also be undertaken in accordance with this guidance document, based on the predicted impact and professional judgement.

Operation

- 7.7.28 A detailed emissions inventory will be built which will include the spatial, temporal and emissions data for each source of air pollutants, as follows:
- Aircraft main engines in the landing and take-off (LTO) cycle², both at ground level and at height up to 3,000 feet;
 - Aircraft auxiliary power units (APUs);
 - Ground support equipment (GSE), namely vehicles operating airside which are associated with the aircraft turn-around and runway maintenance;
 - Other airport sources, such as energy and heating plant, the fire training ground, and aircraft engine testing; and
 - Vehicles on the road network and car parks (landside).
- 7.7.29 Aircraft engine emissions will be calculated using ICAO aircraft engine emissions databank (ICAO, 2019), the Swedish Defence Research Agency (2018) confidential database for turboprop engines and the online guidance from the Swiss Federal Office of Civil Aviation (2015) on the determination of helicopter emissions. The assessment will follow the guidance of the airport air quality manual (International Civil Aviation Authority, 2011), the Project for the Sustainable Development of Heathrow (Department for Transport, 2006) and previous assessments of Gatwick Airport for the years 2005/06 (AEA Energy & Environment, 2008), 2010 (Ricardo-AEA, 2013) and 2015 (Arup, 2018). Emissions from APUs will be calculated using the US Federal Aviation Administration (n.d.) Aviation Environmental Design Tool (AEDT) and the Project for the Sustainable Development of Heathrow (Department for Transport, 2006). Emissions from ground support equipment and other airport sources will be calculated using the European Environment Agency EMEP/EEA air pollutant emission inventory guidebook (European Environment Agency, 2016) and the National Atmospheric Emissions Inventory (n.d.).
- 7.7.30 Emissions from road vehicles will be calculated using the Defra Emissions Factor Toolkit. Changes to road traffic due to the Project will be screened using the criteria in the land-use planning and development control: planning for air quality guidance (Institute of Air Quality Management and Environmental Protection UK, 2017).
- 7.7.31 Emissions from the other sources listed in paragraph 7.7.28 above will be included in the air quality model.
- 7.7.32 The assessment scenarios during operation for air quality will be:
- Existing baseline year (currently anticipated to be 2018);
 - Future baseline years (currently anticipated to be 2026, 2029 and 2038);

² The landing and take-off cycle is defined by the International Civil Aviation Organization up to 3,000 feet for local air quality concerns.

- Airfield first full year of opening (currently anticipated to be 2026);
- Interim assessment year (currently anticipated to be 2029); and
- Design year with all elements in place (currently anticipated to be 2038).

- 7.7.33 Pollutant concentrations for these scenarios will be predicted using the ADMS-Airport dispersion modelling software. The model takes account of all relevant emissions sources on and off the airport and can allow for variations of each of the emission sources with time. Pollutant concentrations will be predicted on a grid of receptors around the airport for the generation of contour plots, as described in the study area section above.
- 7.7.34 The initial air quality modelling will be a verification of model-predicted concentrations for the existing base year against monitored values to determine whether the model output for future scenarios requires any adjustment to take account of any systematic over- or under-predictions. Any required adjustment would be undertaken in accordance with the local air quality management technical guidance TG16 (Defra, 2018).
- 7.7.35 The future predicted annual mean concentrations will be compared against the relevant air quality standards. The assessment of impacts will be undertaken following the land-use planning and development control: planning for air quality guidance (Institute of Air Quality Management and Environmental Protection UK, 2017). The evaluation of significance of effects will also be undertaken in accordance with this guidance document, based on the predicted impact and professional judgement.
- 7.7.36 The future predicted annual mean concentrations will also be compared against the predictions of the Pollution Climate Mapping model from Defra to assess compliance with the European limit values.
- 7.7.37 NO_x and nitrogen deposition rates will be predicted for sensitive habitats at the designated ecological sites in the 11 km by 10 km grid study area. In addition, Mole Gap to Reigate Escarpment SSSI/SAC and Ashdown Forest SSSI/SAC/SPA will be included in the assessment due to the sensitive nature of the habitats. The assessment of impacts and significance of effects will be undertaken following guidance in the Design Manual for Roads and Bridges HA 207/07 (Highways Agency *et al*, 2007a), the Interim Advice Note 174/13 Evaluation of significant local air quality effects (Highways England, 2013) and Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (Natural England, 2018).
- 7.7.38 The assessment of any odour effects during operation will be assessed following the guidance on the assessment of odour for planning (Institute of Air Quality Management, 2018) using the source-pathway-receptor approach and an analysis of historic odour complaints.

Approach to Mitigation and Monitoring

- 7.7.39 Where significant effects are identified, appropriate mitigation measures will be recommended. The mitigation for construction will follow best practice guidance from the Institute of Air Quality Management for dust and odour emissions, as well as monitoring during construction if required. This will be included in the CoCP for the Project. The mitigation for operational effects is likely to include further electrification of airside vehicles, energy efficiency measures, further use of fixed

electric ground power at stands, road traffic measures and monitoring of pollutant concentrations at key areas of concern around the airport.

Issues Proposed to be Scoped Out

- 7.7.40 Pollutants that are listed in the Air Quality Standards Regulations 2010 (amended in 2016) other than NO_x, NO₂, PM₁₀ and PM_{2.5} have been scoped out of the air quality assessment. The Defra TG16 guidance notes that the only relevant pollutants for road traffic and airports are NO₂ and particulate matter. Emissions of other regulated pollutants are very unlikely to be significant and concentrations of these pollutants have not been identified in the local authority review and assessments as likely to exceed their respective air quality standards.
- 7.7.41 It is not anticipated that any odorous materials will be excavated or used during the construction phase. Any emissions of odorous materials would be controlled through the CoCP, such that they would not have a significant impact on amenity. Therefore, an assessment of odour emissions during construction is proposed to be scoped out of the air quality assessment.
- 7.7.42 The impacts from jettisoning of fuel from aircraft have been scoped out of the air quality assessment. The jettisoning of fuel from aircraft is only undertaken in emergency situations when an aircraft is required to undertake an emergency landing and jettisoning of fuel will usually occur over water and at high altitude in order to vaporise the fuel and facilitate dispersion. These events are very infrequent, and it is not considered that there would be any potential significant effects from this activity.

7.8 Noise and Vibration

7.8.1 This section describes the scope of the noise and vibration assessment, which includes the following types of noise:

- Air noise – noise from aircraft in the air or departing or arriving on a runway;
- Ground noise – noise generated from airport activities at ground level including aircraft taxiing and traffic within the airport boundary;
- Road traffic noise – noise from road traffic vehicles outside the airport; and
- Construction noise and vibration – noise and vibration from temporary construction of the Project, including the use of construction compounds.

Relevant Policy, Legislation and Guidance

Legislative and Policy Context

- 7.8.2 The following key legislation and policy documents relevant to noise will be considered within the assessment process:
- Regulation (EU) No 598/2014 of the European Parliament and of the Council of 16 April 2014 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Union airports within a Balanced Approach and repealing Directive 2002/30/EC;

- Environmental Noise Directive 2002/49/EC (Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise);
- Land Compensation Act 1973;
- Control of Pollution Act 1974;
- Airports Act 1986;
- Noise Insulation Regulations 1975 and Noise Insulation (Amendment) Regulations 1988;
- Environmental Protection Act 1990;
- Noise and Statutory Nuisance Act 1993;
- Noise Act 1996;
- Environmental Noise (England) Regulations 2006;
- The Airports (Noise-related Operating Restrictions) (England and Wales) Regulations 2018;
- Airports NPS (Department for Transport, 2018a);
- NPS for National Networks (Department for Transport, 2014);
- Aviation Strategy 2050, The Future of UK Aviation, A Consultation (Department for Transport 2018b);
- NPPF (Ministry of Housing, Communities and Local Government, 2019);
- Noise Policy Statement for England (NPSE) (Defra, 2010);
- Crawley 2030: Crawley Borough Local Plan 2030 (Crawley Borough Council, 2015) – Policies GAT1 Development of the Airport with a Single Runway, ENV11 Development & Noise, Appendix C Crawley Local Plan Noise Annex;
- Emerging Crawley 2035: Draft Crawley Borough Local Plan 2020-2035 (Crawley Borough Council, 2019) - Policies SD1, EP4 and GAT2;
- Reigate and Banstead Local Plan 2005 (Reigate and Banstead Borough Council, 2005) – Policies Hr19 Development Affected by Noise;
- Reigate and Banstead Local Plan: Core Strategy 2014 (Reigate and Banstead Borough Council, 2014) – Policy CS10 Sustainable Development;
- Emerging Reigate and Banstead Borough Development Management Plan 2018-2027 (Reigate and Banstead Borough Council, 2018) - Policies DES8 Construction Management, DES9 Pollution & Contaminated Land (emerging policy);
- Horsham District Planning Framework (excluding South Downs National Park) 2015 (Horsham District Council, 2015) - Policy 24 Environmental Protection;
- Tandridge Local Plan Part 2: Detailed Policies 2014-2029 (Tandridge District Council, 2014) – Policy DP22 Minimising Contamination, Hazards & Pollution;
- Emerging Our Local Plan 2033 (Regulation 22 Submission) (Tandridge District Council, 2019) - Policy TLP46 Pollution & Air Quality (emerging policy).
- Mid Sussex District Plan 2014-2029 (Mid Sussex District Council, 2018) - Policy DP29 Noise, Air & Light Pollution; and
- Saved policies from the Mid Sussex Local Plan (Mid Sussex District Council, 2004) Policy B23, 24, CS22 Pollution, B23 Noise.

Guidance Documents

- 7.8.3 The following key guidance documents relevant to noise will be considered within the assessment process:

- Calculation of Road Traffic Noise (Department of Transport Welsh Office, 1988);
- Design Manual for Roads and Bridges, Volume 11 Environmental Assessment Section 3 Environmental Assessment Techniques, Part 7 HD 213/11 – Revision 1: Noise and Vibration (Highways Agency *et al.*, 2011);
- Planning Noise Advice Document Sussex, July 2015 (West Sussex County Council *et al.*, 2015);
- BS5228-1:2009+A1:2014, Code of Practice for Noise and Vibration Control on Construction and Open Sites, (BSI, 2014a);
- BS4142:2014 Methods for rating and assessing industrial and commercial sound (BSI, 2014b);
- Professional Practice Guidance: Planning and Noise (Association of Noise Consultants *et al.*, 2017);
- CAP1616 Airspace Design: Guidance on the regulatory process for changing airspace design including community engagement requirements (CAA, 2017a);
- Environmental Noise Guidelines for the European Region (World Health Organization Europe, 2018); and
- CAP 1731 Aviation Strategy: Noise Forecasts and Analyses (CAA, 2018a).

7.8.4 Appendix 7.8.1 provides a brief summary of the most recent policy and guidance that dictates the methodology (described later in this section) that will be used to quantify and assess Air Noise.

7.8.5 A glossary of the acoustic terms and metrics used in this section is provide in Appendix 7.8.2.

[CAP1616 Airspace Design: Guidance on the Regulatory Process for Changing Airspace Design including Community Engagement Requirements, 2018](#)

7.8.6 Government has been developing aviation policy, and hence aviation noise policy, since the completion of the Airports Commission work in 2015 because the industry is growing and, as confirmed in the Airports NPS, major changes are planned. In particular, a new runway at Heathrow is supported, maximising the use of existing infrastructure is promoted, and a future aviation strategy is being developed to modify UK airspace. Some of these projects will bring about changes to flight paths which will be regulated and assessed separately under the CAA's Airspace Change process. CAP1616 (CAA, 2017a) describes the requirements for airspace change and its Appendix B Environmental Metrics and Assessment Requirements includes guidance on noise assessment processes and metrics. The noise metrics used to assess the Project will take account of this guidance. However, it is important when considering the noise impacts of the Project to note that the Project does not require the routings of aircraft to or from the airport to be changed except close to the airport as discussed below.

7.8.7 The existing northern runway is used when the main runway is unavailable, for example due to maintenance work at night. In 2018 the northern runway was used by 3,534 flights. The Project would make alterations to the existing northern runway, resulting in increased use of this runway using the same flight paths. Only smaller 'Code C' aircraft (ie <36 m wingspan (not Boeing 767 and larger)) would use the northern runway. Consequently, any noise impacts of the Project will be the result of increases in noise due to the increased number of flights on the northern runway, rather than new noise impacts over areas previously unaffected. This will therefore avoid the noise impacts often associated with new flight paths. Nonetheless, the noise metrics

recommended in CAP1616 will be adopted, as discussed below under Approach to Assessment of Effects.

Baseline Information

Data Collated to Date

- 7.8.8 The following forms a summary of the data collated and work undertaken to date. The locations of noise surveys are illustrated in Figure 7.8.1. Figures 7.8.2 and 7.8.3 present the 2018 baseline standard mode Leq day and Leq night contours, along with the Noise Preferential Routes.
- 7.8.9 The Gatwick Airport Noise and Track Keeping (NTK) system monitors noise and flight path data in community locations around the airport. In recent years, 32 locations have been used with typically eight in use at any one time. In April 2019 the system was upgraded to improve functionality and ease of access for the public online. At the end of June 2019, the following 15 sites were live with others at various stages of planning and installation: Rusper, Orltons, Russ Hill, Oaklands Farm, Favgate, South Holmwood, Newdigate, Charlwood (all to the west), and Moat House, Bellwood (Burstow), Lingfield, Cowden, Hever Castle, Withyham (Crowborough) and Rusthall (all to the east). The NTK data are used by GAL to respond to complaints, and to engage with the public over noise and track keeping performance, and to carry out studies to improve noise management. It is also used by the CAA to calibrate the ANCON 2 noise model used to produce annual noise contours for the airport.
- 7.8.10 The baseline for the air noise assessment will be the 2018 summer season (16 June to 15 September) noise exposure, as quantified by the ANCON 2 model (as discussed below).
- 7.8.11 Other baseline data available include the SONA survey, which was a major social survey into people's response to aircraft noise. It used modelled aircraft noise data and carried out social surveys at 184 locations around Gatwick. In 2017, the airport also commissioned the University of Sussex to carry out social surveys under arrivals routes several miles from the airport to better understand how aircraft height and noise was perceived (University of Sussex, 2018).
- 7.8.12 For the ground noise assessment, baseline noise level measurements were conducted in August 2016 at 16 locations, 12 of which are considered to be relevant to the current Project (see Figure 7.8.1). Measurements were conducted continuously throughout a period of just over two weeks.

Existing Baseline Conditions

- 7.8.13 The air noise baseline in 2018 can be summarised in general terms using the primary noise metrics (described below) in the following table (CAA, 2019a).

Table 7.8.1: Summary of 2018 (Standard Mode) Air Noise Baseline

Noise Metric	Noise Contour Area (km ²)	Residential Population (1000s)
Leq 16 hr:		
>51dB	140.9	25,300
>54dB	77.1	10,200
> 57dB	40.0	2,700

Noise Metric	Noise Contour Area (km ²)	Residential Population (1000s)
>60dB	23.2	1,400
>63dB	13.1	500
>66dB	6.9	300
>69dB	3.6	100
Leq 8 hr night:		
>45dB	161.1	27,500
>48dB	91.6	12,200
>51dB	47.4	5,400
>54dB	25.2	1,500
>57dB	14.1	800
>60dB	7.4	300
>63dB	3.9	200

7.8.14 Figures 7.8.2 and 7.8.3 show the 2018 standard mode Leq day and Leq night contours, along with the Noise Preferential Routes.

7.8.15 For the assessment of ground noise, including road traffic, around the perimeter of the airport, LAeq noise levels over the day (07:00 – 19:00), evening (19:00 – 23:00) and night (23:00 – 07:00) periods have been calculated from the results of baseline noise measurements in 2016 (assuming no change to 2018). The overall measured LAeq sound levels are shown at Table 7.8.2. The pattern of ground operations on the airfield is different between the two runway modes operation (runway 26 and runway 08) so the survey results for the two runway modes are reported separately. The survey locations are shown in Figure 7.8.1.

Table 7.8.2: Summary of Ground Noise Baseline

Descriptor	Location (LAeq, T dB)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Runway 26 Daytime	56	60	61	58	51	55	61	60	68	61	56	62	54	53	56	55
Runway 26 Evening	54	58	59	54	49	54	59	58	65	59	54	60	52	51	54	52
Runway 26 Night	43	49	51	49	41	51	56	56	55	51	50	55	43	44	50	48
Runway 08 Daytime	52	56	57	57	48	57	60	62	66	60	59	68	50	53	60	55
Runway 08 Evening	54	57	58	54	48	56	58	60	65	60	57	66	51	52	58	53
Runway 08 Night	47	51	51	51	45	53	54	55	56	53	51	56	43	46	52	48

Community Consultation on Noise

- 7.8.16 GAL is committed to reducing noise at and around the airport and has significantly increased the level of focus in addressing the challenges arising from aircraft noise over recent years. However, noise continues to remain an area of concern for local communities. The airport recognises that, while it can't eliminate aircraft noise completely, its goal should be to limit effects as far as practicable. The Noise Action Plan sets out how Gatwick Airport plans to manage and where possible reduce the impact of aircraft noise. A revised Noise Action Plan will be developed as part of the consenting process for the Project.
- 7.8.17 Gatwick Airport regularly engages with stakeholders on noise management including airlines, air navigation service providers, local community groups, local authorities and government bodies. This is done through various engagement forums including the following:
- Gatwick Airport Consultative Committee (GATCOM);
 - GATCOM Steering Group;
 - Noise Management Board (NMB);
 - Noise and Track Monitoring Advisory Group (NaTMAG);
 - Section 106 Steering Group; and
 - The Gatwick Noise Monitoring Group.
- 7.8.18 Much of this engagement concerns the day to day management of noise, but also in some cases concerns regarding growth in air traffic and noise impacts from expansion projects. The NMB in particular has been concerned about what has been termed 'growth and noise' and this will inform the assessment of air noise, as follows.
- 7.8.19 The NMB was formed in 2016 following the completion of the Independent Arrival Review. The structure of the NMB is under review following its first two year term, but has to date comprised members including the Civil Aviation Authority, Department for Transport, NATS, Air Navigation Services, airlines and the following local authorities and community groups:
- Chair of GATCOM;
 - East Sussex and West Sussex County Councils;
 - Surrey and Kent County Councils;
 - The High Weald Councils Aviation Action Group and Association of Parish Councils Action Group;
 - East Sussex Communities for Control of Aircraft Noise and Tunbridge Wells Anti-Aircraft Noise Group;
 - Communities against Gatwick Noise Emissions and Plane Wrong; and
 - Gatwick Obviously Not and People against Gatwick Noise Emissions.
- 7.8.20 The NMB has held 14 board meetings (up to June 2019), together with a number of workshops on projects undertaken and public meetings in December 2017 and December 2018. The community noise groups represented were generally formed at the time that Gatwick was proposing a wide spaced second runway and share a common concern, not just over noise as it is now, but how it may get worse in the future. The NMB embraced this theme with a series of work streams concerned with future noise impacts. In 2018 Gatwick carried out a review of noise policy to demonstrate that its noise management processes were compliant. Two key themes from this were the interplay between growth and noise, and the quantification of noise impacts.

Two workshops were completed in 2018 to allow NMB members to learn how aircraft noise and its effects can be measured, modelled and reported. Gatwick commissioned a review of noise metrics in consultation with the community noise groups, which sought views as to what features noise metrics should include and reviewed the available options. This led to research into the effect of ambient noise on aircraft noise perception and a final report presented to the NMB (ERM, 2018). Details of the noise metrics that will be used to describe the air noise impacts of the Project are given later in this section

Proposed Scope of the Assessment

- 7.8.21 It is proposed that the findings of the assessment of effects on noise and vibration would be set out as a topic chapter within the ES, supported by technical appendices where appropriate. The PEIR will include a draft chapter, including as much of the information set out below as is available at the time of writing.

Scope of Baseline Studies

- 7.8.22 Baseline studies are largely complete, as described above, and will be reported in full in the PEIR/ES. Additional baseline noise levels will be measured in the Riverside Garden Park in the vicinity of the North and South Terminal roundabouts.

Proposed Approach to Identifying Future Baseline Conditions

- 7.8.23 Future baseline conditions will be modelled for the do-minimum scenario for each future assessment year as discussed in the Approach to Assessment of Effects section, below. This will provide details on a future baseline scenario without the Project taking into account likely changes to baseline environment.

Study Area

- 7.8.24 The study area for noise and vibration effects includes all receptors that may experience potentially significant adverse impacts. The specific area cannot be determined until noise levels resulting from the Project have been modelled. Details of the noise metrics and levels that will be used to quantify adverse impacts are described below.

Effects Proposed to be Assessed

- 7.8.25 The assessment of noise and vibration considers the likely significant effects arising from the construction and operation of the Project on:
- People, primarily where they live ('residential receptors') on an individual dwelling basis and on a community basis, including any shared community open areas; and
 - Community facilities such as schools, hospitals, places of worship, and commercial properties such as offices and hotels, collectively described as 'non-residential receptors'.
- 7.8.26 Impacts may be adverse from increased noise, or beneficial from decreased noise, and may arise in the vicinity of the Project site or, in the case of traffic on the highway network, in locations remote from the Project site. The Noise Insulation Regulations 1975 (as amended) only apply to 'new' or 'altered' roads, which may require mitigation under the regulations. Traffic noise

changes on unaltered roads will be predicted but are not subject to the regulations.

7.8.27 Table 7.8.3 summarises the effects to be considered.

Table 7.8.3: Potential Effects to be Considered – Noise and Vibration

Activity	Potential Effects
Construction Phase (including Demolition): Noise and Vibration	
Construction and demolition activities, including upgraded highway junctions and use of construction compounds	Construction noise
	Traffic noise
	Construction traffic vibration
Operational Phase: Noise and Vibration	
Use of airport, including upgraded highway junctions	Aircraft noise (air noise)
	Airside ground noise (eg aircraft manoeuvring, engine ground running)
	Noise emissions from airport operations/plant (ground noise – fixed sources)
	Traffic noise (surface access)

7.8.28 Impacts on tranquillity in the relevant AONBs and National Parks will be assessed and reported in the Landscape, Townscape and Visual Resources chapter (see Section 7.2 of this report).

Approach to Assessment of Effects

Air Noise

7.8.29 Air noise will be modelled using the CAA's ANCON v2.4 model as used to produce Gatwick's noise exposure contours annually and validated for Gatwick on an annual basis. The summer season contours for 2018 will be used as the baseline, as reported above. Air traffic will be modelled for the three forecast years as described in Chapter 6 of this report; 2026, 2029 and 2038. For the 2029 and 2038 scenarios base case (do-minimum) and with Project noise modelling will be undertaken to allow comparisons between with and without Project cases in these years.

7.8.30 The basis of these models will be the 2018 ANCON model. For current aircraft types, ANCON uses source noise levels, climb rates and dispersion within NPRs based on those measured in the NTK system at Gatwick. Noise emission levels from future aircraft types will be taken from the CAA's latest estimates and reported in the noise assessment, along with all other relevant input data.

7.8.31 The following noise metrics will be used to assess air noise in accordance with CAP 1616:

- Primary Noise Metrics
 - Leq 16 hour 51 to 69 dB;
 - Leq 8 hour night 45 to 69 dB.
- Secondary Noise Metrics:

- N65 Day 20, 50, 100, 200, 500;
- N60 Night 10, 20, 50, 100.
- Secondary Non-Noise Metrics
 - Overflight (<7,000 ft) >48.5 degrees to the horizontal (CAA, 2017b).

- 7.8.32 All noise metrics relate to the 92 day summer period from 16 June to 15 September as used conventionally in the UK because it represents the busiest, and hence noisiest, season.
- 7.8.33 Leq 16 hour day and 8 hour night will be used as the primary metrics to quantify impacts in terms of the areas and population within the various 3 dB noise contour bands in the ranges above. Noise difference contours will also be plotted to show areas where noise levels are expected to increase and decrease.
- 7.8.34 In addition to noise contours, more detail will be provided on the changes to be expected at a selection of specific locations that represent communities most affected, including north Crawley, south Horley, Lingfield and Charlwood. This will include the changes in the numbers of aircraft above the day Lmax 65 dB and night Lmax 60 dB levels.
- 7.8.35 In addition to assessing impacts on residential properties, air noise will be modelled and assessed at schools, hospitals, and places for worship.
- 7.8.36 Aircraft will fly along already used flight paths. Flight paths to and from the main runway will not be affected. Only departures would use the northern runway. These will fly straight ahead until they turn onto the relevant Standard Instrument Departure Route within the Noise Preferential Route approximately 5-7 km from the end of the runway. These flight paths will be 210 metres north of the equivalent flight paths from the main runway. Within the turn and beyond, flights are not expected to be distinguishable from those on the main runway. Areas to the north of the existing extended runway centreline, to the east and the west of the airport by up to about 5-7 km from the runway ends, will experience more aircraft closer to them. The CAA's overflight metrics will be used to assess this.

Ground Noise

- 7.8.37 Changes to airport ground noise will be assessed by modelling the baseline noise and the development case noise. Predictions will be carried out using CadnaA noise modelling software to implement environmental noise propagation predictions according to the methodology outlined in ISO9613-2 (ISO, 1996).
- 7.8.38 A key factor in the ground noise model is the input data and in particular the sound power levels of the taxiing aircraft. Obtaining sound power levels for taxiing aircraft is not particularly easy since aircraft manufacturers are not required to measure noise levels during taxiing operations. For this reason, a comprehensive noise survey of aircraft taxiing noise levels has recently been carried out (March – May 2019) and the results of this will feed in to the ground noise model.
- 7.8.39 For ground noise, there are two types of comparisons that can be made in the evaluation and assessment of future predicted environmental noise, as follows:
- Type 1: Comparison against calculated present day noise levels; and
 - Type 2: Comparison against absolute noise level benchmarks.

- 7.8.40 It is proposed that both comparisons are used in order to fully describe the likely effects of ground noise. In the absence of any specific guidance relating to ground noise, this is the most robust approach.
- 7.8.41 The absolute noise level benchmarks (comparison type 2) that will be used are 55 dB LAeq for the day and evening and 45 dB LAeq for the night-time. These benchmarks for outdoor noise levels are consistent with guidance on noise levels provided in BS8233:2014 (BSI, 2014c). Additional benchmarks of 65 dB and 60 dB LAmax outdoors will be used for the daytime and night-time periods respectively in line with the approach used for air noise. The 60 dB LAmax night-time benchmark is referred to in ProPG: Planning and Noise (Acoustic and Noise Consultants *et al*, 2017) where it is stated that the number of noisy events exceeding 60 dB LAmax may be inversely related to the quality of sleep.

Road Traffic Noise

- 7.8.42 The road traffic noise changes that are related to the Project will be assessed by modelling the noise both with and without the Project. Predictions will be carried out using the Calculation for Road Traffic Noise (CRTN) (Department of Transport and Welsh Office, 1988), and appropriate factors to derive night-time noise levels. The assessment methodology will follow the guidance in the DMRB. The DMRB describes different levels of assessment and includes a scoping stage that can be used to establish the study area and the level of detail required in the assessment. It is expected that the assessment will include modelled day and night noise changes and an assessment of the effects accordingly. The modelling will include the new or altered roads as well as existing roads where traffic flows may change, or where they contribute significantly to total noise levels.
- 7.8.43 Although the focus of studies into road traffic projects is mainly on noise at dwellings, the DMRB requires the effects of changes at open spaces or sensitive receptors such as public rights of way to be considered. The effects of changes in noise on Riverside Garden Park, which lies to the north east of the A23, will be predicted and reported.
- 7.8.44 The assessment of construction traffic noise will be based on a period of peak traffic flow. The effects of construction noise will be predicted and assessed using BS 5228 (BSI, 2014a). BS 5228 provides a method of calculating and assessing the significance of noise and vibration from construction works. It includes source emission data, a method of construction noise propagation, example assessment criteria and methods of mitigating significant effects.

Approach to Mitigation and Monitoring

- 7.8.45 Through engagement with the local community, GAL is aware of the level of concern that aircraft noise might increase as a result of the Project. The draft master plan gave an initial assessment of noise impacts based on preliminary air traffic forecast and noise modelling carried out at that time. This enabled preliminary mitigation to be developed.
- 7.8.46 As set out above, the Project does not require changes to the existing flight paths to or from the airport, other than the adjusting of the flightpath to and from the northern runway 12 metres further north. A formal 'airspace change process' is unlikely to be required to enable the dual runway operation.

- 7.8.47 During routine operations, only departures would use the northern runway. The majority of these would be above 1,000 ft before they leave the airfield. Gatwick would operate flights from the northern runway using procedures designed to minimise noise impacts, in line with its current processes and the commitments of the Noise Action Plan.
- 7.8.48 Since 2014 noise policy and the need for mitigation has been tested in the following applications for new airport infrastructure:
- Birmingham International Airport Runway Extension, 2014;
 - London City Airport Development Plan, 2015-2016; and
 - Cranford Agreement Secretary of State's Decision, February 2017.
- 7.8.49 The main mitigation measure relied upon for homes affected by high noise levels in all three airport cases was noise insulation. In the Birmingham case only properties above Leq 63 dB were offered noise insulation, consistent with the policy requirement to 'avoid' significant adverse effects. The 'avoid' requirement for significant effects is much stronger than the requirement to minimise adverse effects. Transport infrastructure projects (eg HS2) have used noise insulation as a mitigation measure where necessary to comply with the avoid requirement, and this has been accepted by the relevant authorities³.
- 7.8.50 The current government consultation document Aviation 2050 proposes improvements to noise insulation schemes as follows:
- "3.121 The government is also:*
- *proposing new measures to improve noise insulation schemes for existing properties, particularly where noise exposure may increase in the short term or to mitigate against sleep disturbance*
- 3.122 Such schemes, while imposing costs on the industry, are an important element in giving impacted communities a fair deal. The government therefore proposes the following noise insulation measures:*
- *to extend the noise insulation policy threshold beyond the current 63dB LAeq 16hr contour to 60dB LAeq 16hr;*
 - *to require all airports to review the effectiveness of existing schemes. This should include how effective the insulation is and whether other factors (such as ventilation) need to be considered, and also whether levels of contributions are affecting take-up;*
 - *the government or ICCAN [Independent Commission on Civil Aviation Noise] to issue new guidance to airports on best practice for noise insulation schemes, to improve consistency;*
 - *for airspace changes which lead to significantly increased overflight, to set a new minimum threshold of an increase of 3dB LAeq, which leaves a household in the 54dB LAeq 16hr contour or above as a new eligibility criterion for assistance with noise insulation."*
- 7.8.51 The current Gatwick Noise Insulation Scheme is based on a historic 60 dB Leq contour predicted

³ See also Cranford Appeal report, §1087 *"Against this background I consider that the proffered mitigation between SOAEL and UAEL [Unacceptable Effects Level of 69dBAeq] is consistent with the APF and would be sufficient to avoid significant observed adverse effects."*

in 2014, and under the Noise Action Plan 2019-2024 is currently being reviewed.

- 7.8.52 The final bullet point of the Aviation 2050 consultation proposes that where an airspace change leads to *'significantly increased overflight, to set a new minimum threshold for an increase of 3dB LAeq, which leaves a household in the 54dB LAeq 16hr contour or above'*, noise insulation should be offered in some form. The Gatwick Airport Master Plan 2019, in paragraph 5.5.26 notes that, based on preliminary noise modelling for use of the altered northern runway, in 2028 and 2032, *'compared to a single-runway scenario, we expect the increases to be less than 3 dB in nearly all cases'*. Based on preliminary modelling, the area where a 3 dB change could arise is generally within the airport boundary or within the area covered by the existing Noise Insulation Scheme. This is because, as mentioned above, the Project would not change flightpaths. Instead the Project will generate small noise increases (<3 dB) to those already affected, as well as some small decrease (to the south). Nonetheless, as the refined noise modelling progresses, based on the refined air traffic forecasts, Gatwick will consider whether the Noise Insulation Scheme should be enhanced as part of a package of noise mitigation measures. This package will include consideration of review of the Home Relocation Assistance Scheme and relocation offers.
- 7.8.53 With regards to ground noise, consideration of potential noise impacts will influence the layout of some airfield facilities, such as those used for ground running. If significant effects are predicted from the ground noise assessment noise bunds would provide screening to affected areas.
- 7.8.54 The road traffic noise assessment will be carried out by predicting noise levels and assessing them against the relevant standards mentioned above. Some inherent features of the Project may lead to noise reductions, such as the use of parapets on the edges of any elevated road sections associated with highways improvements and these will be included in the modelling. Mitigation will be considered where significant effects have been identified, and the potential options for noise mitigation are likely to include:
- Provision of low noise road surfacing;
 - Reductions in speed; and
 - Traffic noise barriers.
- 7.8.55 Construction noise mitigation will include the measures described in BS 5228 and options will include:
- Restricting the use of noisy plant to daytime where practicable;
 - Use of low noise plant;
 - Location of plant further from noise sensitive receptors;
 - Temporary noise barriers; and
 - Enclosure of stationary plant.

Issues Proposed to be Scoped Out

- 7.8.56 No 'Quiet Areas' designated within Local Plans or Neighbourhood Development Plans as Local Green Spaces or areas identified as Quiet Areas through implementation of the Environmental Noise (England) Regulations 2006 have been identified that could be affected by the Project. No impact pathway has been identified and, therefore, consideration of Quiet Areas is proposed to be scoped out of this assessment.

- 7.8.57 Some previous ground noise studies have included noise from APUs as a source of ground noise. However, the most recent ground noise studies at Gatwick Airport have excluded this source for two main reasons. Firstly, operational reports demonstrate that it is rare for an aircraft to use the APU whilst on any of the stands as ground power is generally available. Secondly, the sound power of a taxiing jet aircraft is typically in the region of 130 – 140 dB whilst the sound power of an APU is typically around 115 dB which means that when both sources are operating together, this creates a maximum increase of 0.1 dB to the overall sound power. Contributions of noise from APUs are therefore considered insignificant and scoped out.
- 7.8.58 Construction works within the airport would be sufficiently far from noise sensitive receptors off site that vibration impacts are not expected. Similarly, during operation, sources of on-site vibration will be sufficiently distant from off-site receptors that vibration impacts are not likely to occur and are proposed to be scoped out.
- 7.8.59 Vibration from operational road traffic on the roads to be altered by the Project is expected to be below the scoping thresholds set out in the DMRB (0.3 mm/s peak particle velocity), road surfaces will be maintained in good condition and the nearest houses to the Project highway works are approximately 50 metres from the carriageway. Therefore, operational traffic vibration is proposed to be scoped out of the assessment.

7.9 Climate Change and Carbon

- 7.9.1 This section describes the proposed approach to the assessment of:
- The potential for significant effects to arise from the Project in terms of greenhouse gas (GHG) emissions over its lifetime ('GHG assessment');
 - How the physical effects of future climate change will affect the significance of the environmental effects being considered by other topics ('In-combination Climate Change Impacts' (ICCI)); and
 - The resilience of the Project itself to the physical effects of future climate change ('Climate Change Resilience' (CCR) assessment).
- 7.9.2 The above assessments are required to meet the requirements of the EIA Regulations. Schedule 4, Article 5(f) requires:
- 'A description of the likely significant effects of the development on the environment resulting from, inter alia-*
- ...
- (f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;*
- ...'
- 7.9.3 The first point is proposed to be considered within the GHG assessment. The second point will be considered within the CCR and ICCI assessments.
- 7.9.4 Additionally, Schedule 3, Article 1(f) of the EIA Regulations requires that:
- 'The characteristics of development must be considered with particular regard to –*
- ...

(f) the risk of major accidents and/or disasters relevant to the development concerned, including those caused by climate change, in accordance with scientific knowledge;

...'

7.9.5 The requirement relating to the climate change impacts will be considered within the ICCI assessment.

7.9.6 In this Scoping Report, the ICCI and CCR assessments are referred to collectively as the Climate Change Adaptation and Resilience (CCAR) assessment.

Relevant Policy, Legislation and Guidance

7.9.7 In addition to the requirements of the EIA Regulations, the following key legislation, policy and guidance documents relevant to the GHG and CCAR assessments will be considered in the assessment process.

Legislative and Policy Context

7.9.8 The following legislation and policy documents relevant to both the CCAR and GHG assessments will be considered:

- UK Climate Change Act (2008);
- Airports NPS (Department for Transport, 2018a);
- NPS for National Networks (Department for Transport, 2014);
- National Planning Policy Framework (Ministry of Housing, Communities and Local Government, 2019);
- Crawley 2030: Crawley Borough Local Plan 2030 (Crawley Borough Council, 2015) – Policy GAT1 Development of the Airport with a Single Runway, ENV6 Sustainable Design & Construction;
- Emerging Crawley 2035: Draft Crawley Borough Local Plan 2020-2035 (Crawley Borough Council, 2019) - Policy SD1;
- Reigate and Banstead Local Plan: Core Strategy 2014 (Reigate and Banstead Borough Council, 2014) – Policy CS10 Sustainable Development, CS11 Sustainable Construction;
- Reigate and Banstead Borough Local Plan 2005 (Reigate and Banstead Borough Council, 2005) Hr2B Quality & Sustainable Development (within Horley);
- Emerging Reigate and Banstead Borough Development Management Plan 2018-2027 (Reigate and Banstead Borough Council, 2018) – Policy CCF1 Climate Change Mitigation (emerging policy);
- Mole Valley Local Plan 2000 (Mole Valley District Council, 2000);
- Mole Valley Core Strategy 2009 (Mole Valley District Council, 2009) – Policy CS19 Sustainable Construction, Renewable Energy and Energy Conservation;
- Horsham District Planning Framework (excluding South Downs National Park) 2015 (Horsham District Council, 2015) Policy 35 Climate Change, Policy 36 Appropriate Energy Use, Policy 37 Sustainable Design & Construction;
- Tandridge District Core Strategy 2008 (Tandridge District Council, 2008) – Policy CSP14 Sustainable Construction, CSP 15 Environmental Quality;
- Tandridge Local Plan (Part 2) Detailed Policies 2014-2029 (Tandridge District Council, 2014);

- Emerging Our Local Plan 2033 (Regulation 22 Submission) 2019 (Tandridge District Council, 2019) – Policy TLP45 Energy Efficient & Low Carbon Development (emerging policy);
- Mid Sussex District Plan 2014-2031 (Mid Sussex District Council, 2018) Policy DP39 Sustainable Design & Construction; and
- Saved Policies from the Mid Sussex Local Plan 2004 (Mid Sussex District Council, 2004) Policy G1 Sustainable Development.

7.9.9 The following legislation and policy documents relevant to only the CCAR assessment will be considered:

- Aviation Policy Framework (Department for Transport, 2013);
- A Green Future: Our 25 Year Plan to Improve the Environment (HM Government, 2018); and
- Keeping the Country Running: Natural Hazards and Infrastructure (Cabinet Office, 2011).

7.9.10 The following legislation and policy documents relevant to only the GHG assessment will be considered:

- EU Emission Trading Scheme (ETS), (EU 2005);
- The Greenhouse Gas Emissions Trading Scheme Regulations 2012;
- Paris Agreement (United Nations Framework Convention on Climate Change (UNFCCC), 2016);
- Carbon Offsetting Reduction Scheme for International Aviation (CORSA) (International Civil Aviation Organisation (ICAO), 2016);
- Airports NPS – Appraisal of Sustainability (Department for Transport, 2018e);
- Aviation 2050: the future of UK aviation (Department for Transport, 2018b);
- Our Green Future: Our 25 Year Plan to Improve the Environment (HM Government, 2018); and
- Climate Change Act 2008 (2050 Target Amendment) Order 2019 (UK Govt, June 2019) reducing UK emissions target to ‘net-zero’ by 2050.

Guidance Documents

7.9.11 The following guidance documents relevant to the CCAR assessment will be considered:

- Institute of Environmental Management and Assessment. Climate Change Resilience and Adaptation (IEMA, 2015b);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Keeping the Country Running: Natural Hazards and Infrastructure (Cabinet Office, 2011);
- International Civil Aviation Organization: Environmental Report 2010. Chapter 6: Adaptation (ICAO, 2010);
- Airports Cooperative Research Programme: Climate Change Adaptation Planning: Risk Assessments for Airports (ACRP, 2012);
- Review of Operational Resilience at Heathrow and Gatwick (CAA, 2014);
- Climate Change Adaptation Report. CAP 1363 (CAA, 2015);
- Climate Change Adaptation Report – At Gatwick Airport (Gatwick Airport Ltd 2011);
- Climate Change Adaptation Progress Report (Gatwick Airport Ltd 2016);
- ICAO (2010) Environmental Report Chapter 6: Adaptation;

- IPCC 5th Assessment Report. Reports of Working Groups I and II;
- Committee on Climate Change, 2017, UK Climate Change Risk Assessment Evidence Report;
- Willows, R.I. and Connell, R.K. (Eds.). (2003). Climate adaptation: Risk, uncertainty and decision-making. UKCIP Technical Report. UKCIP, Oxford. [online];
- Chartered Institution of Building Services Engineers (CIBSE) (2014) Technical Memorandum 49: Design Summer Years for London;
- Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, 2013);
- Climate Change 2014: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fifth Assessment Report of the IPCC (2014); and
- UKCP18 Science and user guidance reports.
<https://www.metoffice.gov.uk/research/collaboration/ukcp/guidance-science-reports>.

7.9.12 The following guidance documents relevant to the GHG assessment will be considered:

- The Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2017);
- The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (World Business Council for Sustainable Development (WBCSD) and World Resources Institute (WRI));
- Net Zero – the UK’s contribution to stopping global warming (Committee on Climate Change (CCC), 2019);
- PAS 2080 Carbon Management in Infrastructure (BSI 2017);
- BS EN 15978 Sustainability of construction works (BSI, 2011);
- The RICS Methodology to calculate embodied carbon (RICS, 2014);
- Methodology to calculate embodied carbon (RICS, 2018);
- Scope of carbon budgets: Statutory advice on inclusion of international aviation and shipping (CCC, 2012);
- EMEP/EEA Air Pollution Inventory Guidebook: 2016;
- Aircraft Engine Emissions Databank (AEED) (ICAO); and
- Fifth Assessment Report (AR5) Synthesis Report (Intergovernmental Panel on Climate Change (IPCC), 2014).

Baseline Information

Climate Change Adaptation and Resilience

7.9.13 Information regarding current and projected future climate conditions will be required for the ICCI and CCR assessments. The assessments will use three sets of climate data:

- Current climate conditions – based on weather observations;
- 2030s future climate scenario – based on UKCP18 projections; and
- 2080s future climate scenario – based on UKCP18 projections.

7.9.14 These climate data sets are described in more detail below.

7.9.15 For the ICCI assessment, baseline conditions will be assessed under the current climate conditions and each of the future climate scenarios. These assessments will be desk based and no surveys are anticipated to be required.

7.9.16 A baseline CCR assessment will not be carried out as the resilience of the existing airport has been previously assessed by GAL through its Adaptation Reporting to Defra under the Climate Change Act 2008 (GAL, 2011; GAL, 2016). These reports also describe Gatwick Airport's current approach to climate change adaptation and resilience. The key climate change risk highlighted is flooding and in response GAL has in place a detailed flood management plan working alongside other stakeholders including the Environment Agency. Additionally, GAL has in place an Adverse Weather Plan, which covers: snow, flood, wind, heat, low visibility, and volcanic ash (GAL, 2016).

Current Climate Conditions

7.9.17 The nearest UK Met Office weather station to Gatwick is Charlwood (51.150 N, -0.233 W). Data from Charlwood are summarised in Table 7.9.1.

Table 7.9.1 Monthly Climate Averages from the Charlwood Weather Station for 1981-2010

Month	Max. temp (°C)	Min. temp (°C)	Days of air frost (days)	Sunshine (hours)	Rainfall (mm)	Days of rainfall >= 1 mm (days)	Monthly mean wind speed at 10m (knots)
Jan	7.4	1.2	11.2	56.4	78.9	13.5	6.7
Feb	7.9	1.0	11.5	76.5	58.0	9.8	7.0
Mar	10.9	2.8	7.7	104.1	64.2	10.5	7.8
Apr	13.7	3.7	4.3	166.6	60.2	9.4	5.6
May	17.4	6.8	0.7	200.7	55.4	8.9	5.7
Jun	20.5	9.6	0.0	217.1	44.3	9.4	5.0
Jul	22.9	11.7	0.0	210.9	53.0	6.7	4.7
Aug	22.6	11.4	0.0	200.1	58.7	9.0	6.0
Sep	19.2	9.3	0.0	154.2	68.5	8.8	4.7
Oct	15.2	6.6	2.1	112.8	94.0	12.9	5.3
Nov	10.7	3.6	6.6	71.5	90.3	12.3	4.9
Dec	7.8	1.6	11.6	47.3	93.1	12.5	5.9
Annual	14.7	5.8	55.7	1618.1	818.8	123.6	5.8

(source: Met Office, <https://www.metoffice.gov.uk/public/weather/climate/gcpffxw47> (last accessed 9/5/2019))

7.9.18 Gatwick Airport / Charlwood is one of three sites in and around London for which design weather data is provided by the Chartered Institution of Building Services Engineers (CIBSE) in Technical Memorandum 49 (CIBSE, 2014). This guidance document indicates that Gatwick Airport does not experience a detectable urban heat island effect and the airport has a climate that is characteristic of its rural surroundings.

7.9.19 Additional information regarding historical climate conditions and occurrence of extreme climate events will be sourced from other available sources (eg the HadUK-Grid gridded climate observations).

Future Climate Conditions

- 7.9.20 The Airports NPS states that:
- ‘Where transport infrastructure has safety-critical elements, and the design life of the asset is 60 years or greater, the applicant should apply the latest available UK Climate Projections, considering at least a scenario that reflects a high level of greenhouse gas emissions at the 10%, 50% and 90% probability levels, to assess the impacts of climate change over the lifetime of the development.’*
- 7.9.21 Projections for future climate change will be sourced from the UKCP18 climate change projections, which are the latest available UK climate change projections. Data are provided for different time periods until 2100 under different storylines (‘scenarios’) for greenhouse gas emissions and with different probability levels within each scenario. The assessments will focus on the highest GHG emissions scenario (RCP8.5). Where probabilistic projections are available, the 10%, 50% and 90% probability levels will be considered. For some variables (eg wind and climate extremes) probabilistic projections are not available but data are available from an ensemble of climate model simulations under the RCP8.5 emissions scenario. For these variables the full range of the projections will be considered.
- 7.9.22 The Airports NPS additionally states that:
- ‘The applicant should demonstrate that there are no critical features of infrastructure design which may be seriously affected by more radical changes to the climate beyond those projected in the latest set of UK Climate Projections. Any potential critical features should be assessed, taking account of the latest credible scientific evidence on, for example, sea level rise, and on the basis that necessary action can be taken to ensure the operation of the infrastructure over its estimated lifetime through potential further mitigation or adaptation’.*
- 7.9.23 To address this requirement, other sources of climate change projection information, eg lower probability, high impact scenarios (Met Office, 2015) and IPCC data, will also be used in the assessments where these data are found to provide additional relevant and useful information.
- 7.9.24 In general terms, the UKCP18 scenarios indicate that in southern England winters will be warmer and wetter and summers will be warmer and drier. There will be an increased probability of extreme climate events (winds, heatwaves, droughts, intense rainfall events).
- 7.9.25 The PEIR/ES will set out the assumptions and uncertainties in the projections and explain how these have informed the climate change risk and resilience assessments and influenced the design of the Project.

Greenhouse Gas Emissions

- 7.9.26 Data collected to inform the scoping of the GHG assessment includes:
- Corporate reporting of GHG emissions by Gatwick Airport (Decade of Change Report 2017) (Gatwick Airport Limited, 2017)
- 7.9.27 The baseline year for the Project will be the calendar year 2018. GAL has published its annual GHG emissions as part of its ‘Decade of Change’ corporate reporting since 2010. Table 7.9.2 shows the corporate reported emissions for past years up to 2018.

Table 7.9.2: Baseline GHG Emissions

GHG Tonnes of CO ₂ e	2010	2014	2015	2016	2017	2018
Scope 1 'direct' emissions	16,499	10,759	11,332	11,364	11,020	11,931
Scope 2 'electricity indirect emissions'	79,106	48,711	44,627	41,765	36,536 ⁴	29,224
Scope 3 emissions	625,897	692,888	693,910	719,837	724,286	716,459
TOTAL GHG Emissions	721,502	752,358	749,869	772,966	771,842	757,613
Scope 3 emissions breakdown				2016	2017	2018
Aircraft Landing and Take-off cycle (LTO)				428,194	432,345	433,385
Passenger surface transport				204,153	214,625	206,894
Staff commuting				53,561	46,029	46,282
Other Scope 3				33,929	31,287	29,898
TOTAL Scope 3				719,837	724,286	716,459

7.9.28 The aircraft Landing and Take Off (LTO) cycle is defined as including activities below 3,000 ft (915 m): taxiing, hold, take-off roll, initial climb, descent (approach) and landing.

7.9.29 The emissions reported in Table 7.9.2 above do not include Climb, Cruise, Descent (CCD) aircraft emissions (those above 3,000 ft) although these will form part of the GHG assessment for the Project. For the GHG assessment only emissions from outward CCD activities will be included (see paragraph 7.9.46).

7.9.30 The emissions reported above exclude land owned by third parties located within the Project site boundary who do not procure energy through GAL. These emissions or estimates of these will be included in the calculated baseline for the assessment.

7.9.31 A review of the baseline emissions reported in Table 7.9.2 is required to confirm that the corporate reported emissions have been calculated based on the same methodology (and using

⁴ Gatwick purchases 100% renewable electricity to run the airport. This figure represents the carbon emission associated with purchasing electricity from the local national grid – referred to as 'location-based' method in the GHG Protocol. This calculates GHG emissions from electricity consumption using a national grid average emissions factor.

the same carbon intensities) as will be used for the assessment of the Project. If the review identifies any difference between methodologies or scope, these will be recalculated and restated in the 2018 baseline within the PEIR/ES chapter.

- 7.9.32 The baseline emissions set out above will be augmented to include an estimate of departing CCD emissions for the baseline year 2018. This will be based on a quantification of aircraft movements provided by GAL which will then be converted to emissions using the EMEP/EEA Air Pollution Inventory Guidebook. Emissions from third parties not already included in Table 7.9.2 will also be included in the 2018 baseline to inform the assessment.

Proposed Approach to Identifying Future Baseline Conditions

- 7.9.33 The future baseline GHG emissions, without the Project, will be calculated to incorporate:
- Aircraft emissions arising from forecast changes to passenger numbers and air traffic movements without the Project;
 - Changes to surface access emissions arising from changes in passenger, staff and freight transport without the Project; and
 - Changes in energy use for buildings and infrastructure at the airport under already consented development.

Proposed Scope of the Assessment

- 7.9.34 It is proposed that the findings of the assessment of effects on climate change and carbon would be set out as a topic chapter within the ES, supported by technical appendices where appropriate. The PEIR will include a draft chapter, including as much of the information set out below as is available at the time of writing.

Study Area

- 7.9.35 The study area for the CCR assessment will be the Project site boundary. The construction assessment will also include any areas of land required temporarily for construction.
- 7.9.36 The study area for the ICCI will correspond to the study area identified for each of environmental topic considered in the EIA process.
- 7.9.37 The GHG assessment will consider the emissions of GHG arising from construction and operation of the Project, some of which are emitted within the site boundary, but the majority of which are emitted outside the boundary (eg in the form of aircraft emissions).

Effects Proposed to be Assessed

Climate Change Adaptation and Resilience

- 7.9.38 The requirement in the EIA Regulations to assess the vulnerability of a project to climate change is relatively new and methodologies through which such an assessment can be carried out are still evolving. However, guidance has been provided by IEMA (2015b). The methodology for the CCAR assessments will take this guidance into account.
- 7.9.39 The IEMA guidance indicates that the CCAR assessment can be separated into two parts: (i) Climate Change Resilience (CCR) and (ii) In-combination Climate Change Impact (ICCI).

- CCR: This assessment will consider the resilience of the Project to the physical impacts of future climate change. The IEMA guidance defines climate change resilience as the ‘ability to respond to changes in climate. If a receptor or project has good climate change resilience, it is able to respond to the changes in climate in a way that ensures it retains much of its original function and form. A receptor or project that has poor climate change resilience will lose much of its original function or form as the climate changes.’ The CCR assessment differs from other EIA topics in that it considers how resilient the Project itself is to future climate change (ie the impact of climate change on the Project, rather than the impact of the Project on the environment). The impact of the Project with climate change on existing and future receptors will be considered in the ICCI assessment (see below).
- ICCI: This assessment will consider how the impacts of the Project on the receiving environment will be affected by future climate change, either directly or indirectly. The ICCI assessment can be considered to be an assessment of impacts against a future baseline that includes climate change. The ICCI assessment is most relevant to environmental receptors that are sensitive to weather and climate. The criteria for identifying significant effects in the ICCI assessment will be the same as the criteria applied under each topic for impacts under current climate conditions.

7.9.40 The scope of the proposed assessment is set out in Table 7.9.3.

Table 7.9.3: Potential Effects to be Considered – CCAR

Activity	Potential Effects
Construction Phase (including Demolition): Climate Change Adaptation and Resilience	
Construction and demolition activities including construction of upgraded highway junctions	Climate change – extreme weather/climatic events (winds, heatwaves, droughts, intense rainfall events) exacerbating safety of construction workers and impacts on nearby sensitive community receptors (CCR and ICCI assessments)
	Climate change – extreme weather/climatic events (winds, heatwaves, droughts, intense rainfall events) exacerbating environmental impact effects to air, land, biodiversity and water (ICCI assessment)
Delivery of construction and demolition activities, including construction of upgraded highway junctions	Climate change – extreme weather/climatic events (winds, heatwaves, droughts, intense rainfall events) exacerbating performance of construction equipment/ delays to construction programme (CCR assessment)
Operational Phase: Climate Change Adaptation and Resilience	
Performance of airport, including upgraded highway junctions	Climate change - change in seasonal patterns (rainfall and temperatures) affecting soil moisture, flora growing season, green infrastructure (ICCI and CCR assessments)
	Climate change – extreme weather/climatic events (winds, heatwaves, droughts, intense rainfall events) exacerbating environmental impacts to air, land, biodiversity and water (ICCI assessment)
	Climate change - change in seasonal patterns (rainfall and temperatures) affecting safety (CCR assessment)
	Climate change - high temperatures /heatwave/ high intensity rainfall events/ snowfall/flooding etc affecting aircraft operations, airport

Activity	Potential Effects
	infrastructure (eg drainage), utilities/service resilience and upgraded highway junctions (CCR assessment)
Mitigation areas beyond existing airport boundary	Climate change - change in seasonal patterns (rainfall and temperatures) affecting soil moisture, flora growing season, green infrastructure (ICCI assessment)
	Climate change – extreme weather/climatic events (winds, heatwaves, droughts, intense rainfall events) exacerbating environmental impacts to air, land, biodiversity and water (ICCI assessment)

Greenhouse Gas Emissions

- 7.9.41 The terms ‘carbon’ and ‘greenhouse gases’ are often used interchangeably. GHGs are gases in the atmosphere which absorb heat in the form of infrared radiation and thereby create a ‘greenhouse effect’ which keeps the Earth warmer than it would be otherwise. Anthropogenic climate change is caused by an increase in the strength of the greenhouse effect due to increased GHG concentrations in the atmosphere. Carbon dioxide (CO₂) is present in the highest concentration among all greenhouse gases. Other key GHGs include methane (CH₄), nitrous oxide (N₂O), and man-made fluorinated gases (F-gases). The contribution to the greenhouse effect provided by a unit mass of GHG differs according to GHG type. To provide a single quantification of the contribution of a GHG to the greenhouse effect, the emissions of GHGs other than CO₂ are converted into an equivalent mass of CO₂ and are reported as CO₂-equivalent (CO₂e).
- 7.9.42 For the purpose of this document the terms ‘carbon’ and ‘GHG’ are used to mean the CO₂e of all greenhouse gas emissions.
- 7.9.43 The scope of the GHG assessment will be split into two main components:
- Construction-related emissions arising from the extraction, processing and manufacture of construction materials; transportation of these materials; and the energy and water used during construction processes.
 - Operational emissions comprising emissions from aircraft on the ground, in the LTO cycle, and CCD emissions of departing aircraft; surface access; and the operation of airport buildings, assets and vehicles including energy use, provision of potable water, treatment of wastewater, and waste treatment, fuel consumption, APU, GPU, Fixed Electrical Ground Power (FEGP), GSE firefighting activities, and engine testing.
- 7.9.44 The full list of relevant activities, and the scope of emissions assessed under these is provided in Table 7.9.4.

Table 7.9.4: Potential Effects to be Considered – GHG emissions

Activity	Potential Effects
Construction Phase (including Demolition)	
Construction and demolition activities within the existing airport boundary, and construction of upgraded highway junctions and any other buildings/ infrastructure outside the airport boundary included in the Project description	GHGs arising from the extraction, processing and manufacturing of construction materials
	GHGs arising from transportation of materials from factory to site
	GHGs arising from energy use in construction activities (ie operation of plant etc)
	GHGs arising from transport and disposal of construction and demolition waste
	GHGs arising from surface access for construction staff arising from the Project
Land use change	Loss of carbon sink from soil organic carbon and changes arising from removal/addition of ground vegetation
Operational Phase	
Use of airport, buildings and facilities	GHGs from aircraft in the LTO phases for: <ul style="list-style-type: none"> – Flights departing Gatwick: taxi-out; take-off roll; initial climb; climb-out (to 3,000 feet); and – Flights arriving to Gatwick: approach (from 3,000 feet); landing roll; reverse thrust; taxi-in.
	GHGs from departing flights in CCD phase
	GHGs from energy (fuel, electricity) use for airport buildings, GSE, APUs, GPU, and FEGP
	GHGs from firefighting activities
	GHGs from engine testing
	GHGs from potable water supply
	GHGs from pumping and treatment of wastewater
	GHGs from waste treatment and disposal
GHGs arising from other use of aviation fuels within the airport boundary not listed above (eg training, aero clubs, helicopter usage).	
Surface access journeys from employees, passengers, and freight	GHGs arising from passenger surface access (rail, road)
	GHGs arising from staff surface access (rail, road)
	GHGs arising from freight surface access (rail, road)

7.9.45 The GHG assessment will assess the scale of impact of the Project by estimating GHG emissions arising from construction and operation.

7.9.46 There is currently no internationally agreed way of allocating international aviation CO₂ emissions to individual countries. However, the UNFCCC provides a recommended approach which is to allocate aviation emissions to the country of departure. The UK emissions inventory does not include international aviation emissions in the emissions total for the UK, although they are included as an additional memorandum item (in line with international reporting protocols for the European Union and under the United Nations Framework Convention on Climate Change).

- 7.9.47 The requirements of the Climate Change Act to achieve a 100% reduction in the UK’s emissions by 2050 includes international aviation emissions. International aviation emissions are not, however, included within the UK carbon budgets under current arrangements, although the budgets are set at a level which aims to achieve the 100% reduction in 2050 with the inclusion of international aviation and shipping emissions at that time.
- 7.9.48 In summary the assessment will include/exclude the aviation emissions sources shown in Table 7.9.5.

Table 7.9.5: Aviation Emissions Sources for GHG Assessment

	Outward flights			Inward flights		
	Taxi out and take-off from Gatwick Airport	CCD aloft	Landing and taxi in at other airport	Taxi out and take-off from other airport	CCD aloft	Landing and taxi in at Gatwick Airport
Domestic flights	Included	Included	Excluded	Excluded	Excluded	Included
International flights	Included	Included	Excluded	Excluded	Excluded	Included

Approach to Assessment of Effects

Climate Change Resilience

- 7.9.49 The CCR assessment will be carried out using the current and future climate conditions and will be an assessment of the risk of climate change impacts to the new assets created as a result of the Project. The assessment of risk will be based on a combination of likelihood and consequence and will be ranked as low, medium or high. High risks to be identified as requiring mitigation. The information supporting the risk assessment is likely to be qualitative and based on expert judgement of the relevant specialists. However, in some cases quantitative information may be available, eg regarding flood risk (provided by the water environment topic).
- 7.9.50 Where aspects of the design remain at a high level descriptive stage that precludes a qualitative CCR assessment being carried out, a set of design commitments will be developed that will ensure that no high risks to the Project remain in terms of climate change resilience.

In-combination Climate Change Impacts

- 7.9.51 The ICCI assessment will be carried out using the current and future climate conditions. The assessments will be carried out by the topic specialists with support from the climate change topic specialist. The results of these assessments will be reported in the relevant topic chapters of the PEIR/ES and will be summarised in the climate change and carbon chapter.

Greenhouse Gas Emissions

- 7.9.52 For flights only, CO₂ emissions will be reported in line with guidance from the Committee on Climate Change and the Department for Transport.

- 7.9.53 In line with IEMA guidance, all other emissions sources in the GHG emissions assessment will be reported as tonnes of carbon dioxide equivalent (tCO₂e) which presents a single metric reflecting the varying climate change impact of the seven GHGs included in the Kyoto protocol.
- 7.9.54 The Airports NPS sets out the requirement for applicants to quantify GHG impacts for the 'do minimum' and 'do something' scenarios for opening, peak operation and worst case scenarios.
- 7.9.55 The do-minimum scenario will assume that the Project does not take place. The do-minimum scenario will assume the currently proposed future improvements take place as set out in Chapter 4. Do-minimum emissions will be modelled for the:
- Opening year (2026); and
 - Design year (2038).
- 7.9.56 For construction emissions the quantification will be carried out for:
- An interim construction year (2029); and
 - An aggregated construction emissions total between Project start and design year (2038).
- 7.9.57 For operational emissions the assessment will be carried out for the:
- Opening year (2026); and
 - Design year (2038).
- 7.9.58 Projected emissions from flights will be estimated for 2050. These will include estimated impacts from several external factors:
- UK-wide national grid decarbonisation rates; and
 - Aircraft effects: new aircraft and engine technologies; operational efficiencies; and use of sustainable fuels.
- 7.9.59 These factors will be incorporated into the assessment as follows:
- Publicly available sources on projected grid decarbonisation will be identified, and a cautious projection will be selected for assessing the impact on projected emissions; and
 - The 2050 projected emissions will be calculated by adopting pessimistic, best practice, and central projections for future aviation improvements.
- 7.9.60 The 'worst case' emissions year will be identified, based on combining construction and operation emissions estimates.
- 7.9.61 The assessment of different emissions sources during construction and operation, including flight and non-flight elements, will be calculated using bespoke analysis and estimation processes. These will be informed by the relevant guidance documents set out above.
- 7.9.62 In general, the analysis will follow the format:
- Activity data x GHG emissions factor = GHG emissions*
- 7.9.63 Data used in the assessment will be sourced from a range of Project-specific sources (for activity data) and publicly available carbon datasets (for GHG emission factors). The analysis will also draw on national and international projections for aircraft efficiencies, road fleet mix, and national decarbonisation rates.
- 7.9.64 Construction emissions will be based on construction inventory data and will include Bills of Quantities; floor areas of new development for different building areas/uses; construction site

logistics; typical construction plant usage; and the construction programme.

- 7.9.65 Operational inventory data will include: Air Traffic Movement (ATM) forecasts; aircraft fleet efficiency forecasts; ground operation protocols; surface access (transport) estimates and forecasts; forecast energy use for buildings, facilities, ground support equipment, APU, GPU, FEGP, and supply of pre-conditioned air (PCA).

Assessment of Significance: Greenhouse Gas Emissions

- 7.9.66 Guidance on assessing the significance of GHG emissions is set out in a number of guidance documents:
- Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2017);
 - Airports NPS: new runway capacity and infrastructure at airports in the South East of England (Department for Transport, 2018a); and
 - Airports NPS – Appraisal of Sustainability (Department for Transport, 2018e);
- 7.9.67 In line with IEMA guidance it is proposed that all emissions increases/reductions are considered significant due to the permanent, cumulative nature of GHG emissions. GHG emissions are inherently cumulative because:
- The environmental impact arising from GHGs is the aggregation and increased concentration of GHGs within the atmosphere;
 - The location of the emissions source is not relevant to the impact arising from them, ie development leading to GHG emissions has the same impact whether located near Gatwick or in another region/country; and
 - The climate change impacts on a given location arise from the aggregated GHG levels in the atmosphere, not from the extent of GHG emissions in the local area.
- 7.9.68 However, given the presumption of significance it is proposed that the predicted effect will be qualified and put into context against the do-nothing scenario, and against national carbon budgets.
- 7.9.69 The Climate Change Act 2008 sets the target for UK emissions targets for 2050, and carbon budgets have been developed by the CCC for four-year periods from 2008, and most recently for 2028-2032 (the fifth carbon budget). This is set at 1,725 MtCO_{2e} for 2028-2032, but this excludes emissions from international shipping and aviation. The CCC advises that future targets for GHG reduction under the Climate Change Act should include international aviation.
- 7.9.70 The CCC has also advised, in May 2019, that the UK should set and pursue a net-zero GHG target to respond to the latest climate science and fully meet the UK's obligations under the Paris Agreement. The UK Government has responded by introducing a Statutory Instrument (June 2019) to change the target from an 80% reduction against a 1990 baseline to a 100% reduction (net-zero).
- 7.9.71 Emissions will be quantified in line with the Airports NPS guidance/categorisation as domestic or international, and will be categorised as traded or non-traded emissions (under the current EU ETS).
- 7.9.72 Regarding the significance of estimated emissions, the Airports NPS notes that quantification of

the emissions sources it sets out is necessary to assess the Project against the government's carbon obligations. With regard to decision-making, the Airports NPS states that:

'any increase in carbon emissions alone is not a reason to refuse development consent, unless the increase in carbon emissions resulting from the project is so significant that it would have a material impact on the ability of Government to meet its carbon reduction targets, including carbon budgets.'

- 7.9.73 The Appraisal of Sustainability for the NPS is based on an appropriate planning assumption for CO₂ emissions from domestic and international aviation of 37.5 MtCO₂, as recommended by the CCC. Reporting of aviation emissions in units of CO₂ (rather than CO₂e as for other emissions) is in line with guidance from the CCC.
- 7.9.74 To inform the Appraisal of Sustainability the Department for Transport carried out two policy scenarios to compare potential emissions against a future without airport expansion:
- A 'carbon-capped' scenario combining both carbon pricing and specific measures to limit carbon to the CCC's planning assumption of 37.5 MtCO₂ in 2050, but without the trading of aviation emissions within the UK economy or internationally; and
 - A 'carbon-traded' scenario whereby measures are in place to ensure any increase in CO₂ emissions from flights departing the UK as a result of expansion would not lead to an increase in CO₂ at an international level, ie using European/international carbon trading mechanisms.
- 7.9.75 All of the Airport Commission's forecasts incorporated measures to ensure the CO₂ emitted by UK flights and ground movements do not lead to increased emissions overall either at international level or within the UK economy.
- 7.9.76 Predicted emissions for 2050 will be calculated and will provide forecasts for the GHG emissions arising from flights and other operational emissions.
- 7.9.77 The difference in GHG emissions from the 'do-nothing' and 'do-something' scenarios will be calculated and will be compared against the relevant carbon budgets for the period to 2038.
- 7.9.78 For aviation emissions, the evaluation will be based on estimated CO₂ emissions in 2050 for the 'do-nothing' and 'do-something' scenarios in the context of the UK planning assumption of 37.5 MtCO₂ for international and domestic aviation emissions.
- 7.9.79 Any further developments in relevant UK Government policies, or guidance stemming from the change to the UK Climate Change Act under the recently introduced Statutory Instrument (June 2019), will be incorporated into the assessment of GHGs.

Approach to Mitigation and Monitoring

Climate Change Adaptation and Resilience

- 7.9.80 Mitigation ("adaptation") measures to climate change impacts will be developed in dialogue with the design teams, environmental specialists and stakeholders with the objective of minimising the likelihood of resilience risks or significant effects on the environment.
- 7.9.81 Some of these mitigation measures will be embedded mitigation, included within the Project design, and some will be future adaptation actions to be incorporated into a Climate Change Adaptation Plan.

7.9.82 The future course of climate change is uncertain and so mitigation measures should be subject to continued monitoring and review. Additionally, mitigation measures should have sufficient “adaptive capacity” that they can be modified as the pathway of climate change develops if necessary. Mitigation measures should avoid adaptation constraining decisions, eg measures that are closely tied to a particular climate change projection and would be difficult to modify should climate change progress along a different pathway (UKCIP, 2003).

Greenhouse Gas Emissions

7.9.83 Mitigation measures or mechanisms to avoid or reduce any GHG emissions from construction and operation phases will be proposed in the PEIR/ES. This will include the findings of a review of good practice from other airports and infrastructure projects.

7.9.84 Construction stage mitigation will include a CoCP and CTMS. In addition, measures under consideration include:

- Transport of material to site by alternative modes to road;
- Increased efficiency in use of construction plant;
- Use of energy efficient site facilities;
- Construction site connection to grid electricity to avoid use of mobile fossil fuelled generation;
- Selection of lower carbon construction materials and options; and
- Sourcing of construction materials to minimise transportation distance.

7.9.85 The operational mitigation may include:

- A surface access strategy;
- Use of energy and lighting controls within the airport facilities;
- Use of renewable energy;
- Good practice on airside operating protocols to minimise fuel use; and
- Use of FEGP units using grid electricity from renewable sources.

Issues Proposed to be Scoped Out

Climate Change Adaptation and Resilience

7.9.86 The vulnerability of the Project to sea level rise is proposed to be scoped out of the assessment on the basis that the inland location of Gatwick Airport means it is not at risk of coastal flooding. The watercourses that flow through the study area are the River Mole and its tributaries and are ultimately a tributary of the River Thames. The River Mole confluence with the River Thames is upstream of the tidal extent of the Thames at Teddington Lock. The airport is approximately 20 km north of the nearest coastline and ground levels are generally above 55 m above ordnance datum (AOD) and therefore the airport is not at risk of flooding from the sea.

Greenhouse Gas Emissions

7.9.87 As set out above, there is currently no internationally agreed way of allocating international aviation CO₂ emissions to individual countries. However, the UNFCCC provides a recommended approach which is to allocate aviation emissions to the country of departure.

7.9.88 GHG emissions from the CCD stages for inward flights only (ie landing at Gatwick) are excluded

from the assessment. These emissions are outside the scope of influence of the Project as the Project does not include changes to airspace and emissions would be allocated to the country of departure.

7.9.89 LTO emissions in the vicinity of other airports are proposed to be excluded from the assessment (ie only the take-off emissions from Gatwick, and the arrival emissions at Gatwick, would be included in the assessment). This is consistent with the approach taken for other airport studies, and is appropriate given that:

- Only LTO emissions within the vicinity of Gatwick Airport are within the control of Gatwick Airport;
- It provides for a scope of assessment that is consistent with that used for the air quality assessment;
- The approach avoids the risk of double counting LTO emissions arising in the vicinity of other UK airports providing clearer alignment with the UK national GHG inventory; and
- LTO emissions in the vicinity of non-UK airports will be reported under other national GHG inventories

7.10 Socio-economic Effects

Relevant Policy, Legislation and Guidance

Legislative and Policy Context

7.10.1 The following legislation and policy documents relevant to the assessment of socio-economic effects will be considered within the assessment process:

- Airports NPS (Department for Transport, 2018a);
- NPS for National Networks (Department for Transport, 2014);
- NPPF (Ministry of Housing, Communities and Local Government, 2019a);
- Crawley 2030: Crawley Borough Local Plan 2030 (Crawley Borough Council, 2015) – Policies GAT1 Development of the Airport with a Single Use Runway and GAT4 Employment Uses at Gatwick, EC1 Sustainable Economic Growth;
- Emerging Crawley 2035: Draft Crawley Borough Local Plan 2020-2035 (Crawley Borough Council, 2019) - Policies SD2, OS1, OS2, OS3, EC1, EC2, EC3, EC4, EC6, EC10, EC12 and GAT4;
- Reigate and Banstead Local Plan 2005 (Reigate and Banstead District Council, 2005) – Policy Em11 Airport Related Activities;
- Reigate and Banstead Local Plan: Core Strategy 2014 (Reigate and Banstead District Council, 2014) – Policies CS5 Valued People & Economic Development; CS9 Gatwick;
- Emerging Reigate and Banstead Borough Development Management Plan 2018-2027 (Reigate and Banstead Borough Council, 2018) Policies HOR9 Land West of Balcombe Road EMP1 & 2 Principal & Local Employment Areas, EMP5 Secure Local Skills & Jobs (emerging policy);
- Mole Valley Local Plan 2000 (Mole Valley District Council, 2000) - Policies E1 & E2 Employment;

- Mole Valley Core Strategy 2009 (Mole Valley District Council, 2009) - Policy CS12 Sustainable Economic Development;
- Horsham District Planning Framework (excluding South Downs National Park) 2015 (Horsham District Council, 2015) - Policy 7 Economic Growth, Policy 9 Economic Development;
- Tandridge District Core Strategy 2008 (Tandridge District Council, 2008) - Policy CSP22 The Economy;
- Emerging Our Local Plan 2033 (Regulation 22 Submission) 2019 (Tandridge District Council, 2019) – Policy TLP20 Supporting a Prosperous Economy (emerging policy);
- Mid Sussex District Plan 2014-2031 (Mid Sussex District Council, 2018) - Policy DP1 Sustainable Economic Development; and
- Saved Policies from the Mid Sussex Local Plan 2004 (Mid Sussex District Council, 2004) Policy E1 Business.

Guidance Documents

7.10.2 The following guidance documents relevant to the assessment of socio-economic effects will be used in the assessment:

- Additionality Guide 4th Edition (Homes and Communities Agency (HCA), 2014); and
- Employment Densities Guide 3rd Edition (HCA, 2015).

Baseline Information

Data Collated to Date

7.10.3 The data collated to date have been collected to identify the characteristics of the local population, local economy and travel to work flows. The data primarily draw on datasets published by the Office for National Statistics (ONS) such as the 2011 Census, Business Register and Employment Survey and Small Area Mid-Year Population Estimates. These datasets are publicly-available and mainly presented at lower super output area (LSOA) and output area (OA) geographies. This allows for baseline analysis to be tailored to the different geographies applicable to specific study areas.

7.10.4 The baseline data that has been collated and analysed is presented later in this section for the specific study areas selected for assessing different types of socio-economic effects. As a summary, the analysis covers population and demographics; occupations; qualifications; households; household tenures; and travel to work flows. Further baseline analysis is currently being undertaken by Oxera for the accompanying Economic Impact Report, which will be incorporated where appropriate into the socio-economics baseline reported in the PEIR/ES at a later stage of the Project.

Existing Baseline Conditions

7.10.5 Data are being collated for the following study areas (see Figures 7.10.1 and 7.10.2):

- Project site boundary – to capture impacts upon receptors that are located within the Project site.
- Local study area – including areas falling within six local authorities (Crawley, Horsham, Mid Sussex, Mole Valley, Reigate and Banstead and Tandridge).

- Labour market area – including the following local authorities: Crawley, Mole Valley, Reigate and Banstead, Croydon, Tandridge, Wealden, Lewes, Brighton and Hove, Mid Sussex, Horsham, Eastbourne, Adur and Worthing, and Arun. This incorporates local authorities (Crawley, Horsham, Mid Sussex, Mole Valley, Reigate and Banstead and Tandridge) that are in the ‘Gatwick Diamond’ economic cooperation area.
- ‘Five authorities’ area – the area aligns with the ‘five authorities’ area proposed to be adopted in the Oxera Economic Impact Report and comprises the County areas of East Sussex, West Sussex, Kent, Surrey and Brighton and Hove (unitary authority).

- 7.10.6 In the local study area that has been defined for assessing the local socio-economic effects of the Project (see Figure 7.10.1), the population numbered 148,000 in 2017 (Small Area Mid-Year Population Estimates (ONS, 2018)). This was split 21.2%, 64.3% and 14.6% between the 0-15, 16-64 and 65+ age groups respectively. By comparison, lower proportions of South East residents were in the 0-15 and 16-64 age groups (61.8% and 19.1% respectively) and a higher proportion were in the 65+ group (19.1%). This indicates the study area has a younger population than the wider region and a greater proportion of working age.
- 7.10.7 Economic activity rates locally are relatively high, with 76.9% of residents aged 16-74 being economically active compared to 72.1% in the South East (2011 Census Data (ONS, 2011a)). A similar proportion of economically active residents in both areas were unemployed in the same year (5.3% and 4.8% respectively). The economically active residents in the local study area are less well qualified with 22.6% of all residents aged 16-74 holding NVQ4+ level qualifications compared to 29.9% in the South East. In addition, a lower proportion of employed residents aged 16-74 held jobs in standard occupational classifications (SOC) one to three than in the South East (35.3% and 44.8% respectively)⁵, indicating more jobs locally are of lower skill levels.
- 7.10.8 The household profile of the local study area is similar to the South East, in terms of proportions of both single-person (27.9% and 28.8% respectively) and family households (62.9% and 63.9% respectively). The local study area and South East differ in the tenure type of properties that households reside in. The proportion of households residing in social rented homes is higher in the local study area (20.4% and 13.7% respectively), while fewer households locally own their home compared to the regional average (62.6% and 67.6% respectively).
- 7.10.9 The largest flows of workers commuting to Gatwick Airport as shown in Figure 7.10.3 originate from the LSOAs that are located near to the airport boundary, particularly focused around the Crawley and Horley urban areas (Census Origin and Destination (ONS, 2011)). Figure 7.10.3 also highlights the LSOAs that are the main origin of workers at Gatwick Airport are situated within the local planning authority boundaries of Crawley, Mole Valley, Reigate and Banstead, Croydon, Tandridge, Wealden, Lewes, Brighton and Hove, Mid Sussex, Horsham, Eastbourne, Adur and Worthing and Arun. These authorities have been used to define the Gatwick Airport labour market area using ONS Travel-to-Work Area principles, which are outlined later in this sub-section in further detail.

⁵ SOC one to three are defined as follows: SOC one managers, directors and senior officials; SOC two professional occupations; and SOC three associate professional and technical occupations

Proposed Scope of the Assessment

7.10.10 It is proposed that the findings of the assessment of socio-economic effects would be set out as a topic chapter within the ES, supported by technical appendices where appropriate. The PEIR will include a draft chapter, including as much of the information set out below as is available at the time of writing.

Proposed Scope of Baseline Studies

7.10.11 The baseline analysis prepared to date will be expanded upon by considering the existing and future baseline position through undertaking a more detailed desktop study, utilising baseline data from supplementary reports (eg the Economic Impact Report being prepared by Oxera) and drawing upon survey data gathered for other topics included in the ES (eg agricultural land use and recreation). The desktop study will be expanded by considering the topics set out in Table 7.10.1 in further detail.

Table 7.10.1: Desktop Baseline Study Expanded Scope

Category	Elements	Existing Baseline Sources	Future Baseline Sources
Demographic and labour market profile	Age structure, economic activity, economic inactivity, unemployment, occupations, qualifications, ethnicity, earnings, benefits claimants, deprivation, employment by sector, population projections	ONS Census, Business Register and Employment Survey, Annual Population Survey, Claimant Count, Annual Survey of Hours and Earnings, Indices of Multiple Deprivation, Sub-National Population Projections	ONS Sub-National Population Projections, Household Projections, Employment Forecasts
Business profile	Enterprises by sector, enterprises by size band	UK Business Counts, Valuation Office Agency (VOA) non-domestic rates records	-
Community facilities	Early years care, primary education, secondary education, post-secondary education, primary healthcare, secondary healthcare, dental care, emergency services, community halls, places of worship, leisure facilities and libraries	NHS search portal, Government school search portal, Active Places database	Local authority plans and strategies (eg Infrastructure Delivery Plans), Department for Education School Capacity
Recreation	Parks, open and amenity spaces, play spaces, green corridors, sports pitches and courts and allotments	Council open space studies, Active Places database, Natural Green Space Standards database	Local authority plans and strategies (eg Infrastructure Delivery Plans)
Housing market conditions	Dwelling prices, affordability, supply and future need	ONS Affordability, Census and House Price datasets, MHCLG Live Tables, local authority evidence base studies (eg Strategic Housing Market Assessments)	Local authority evidence base studies (eg Strategic Housing Market Assessments)

- 7.10.12 The future baseline component of the study would draw on published projections and forecasts to consider future changes in population, employment and labour market characteristics. These would be sourced from available local authority evidence studies within the respective catchment areas or third party sources as necessary. The projections and forecasts would include data for each of the points in time proposed for assessment during the construction and operational phases of the Project, ensuring consistency across the assessment.
- 7.10.13 Future baseline information on community and recreation infrastructure and services and housing market conditions would be sourced from evidence produced by organisations including local authorities, county councils, and relevant government departments. These organisations produce different sources of evidence such as Infrastructure Delivery Plans, forecasts of future school capacity and Strategic Housing Market Assessments that can be used to develop future baseline positions for elements of the community facilities, recreation and housing market conditions categories in Table 7.10.1.

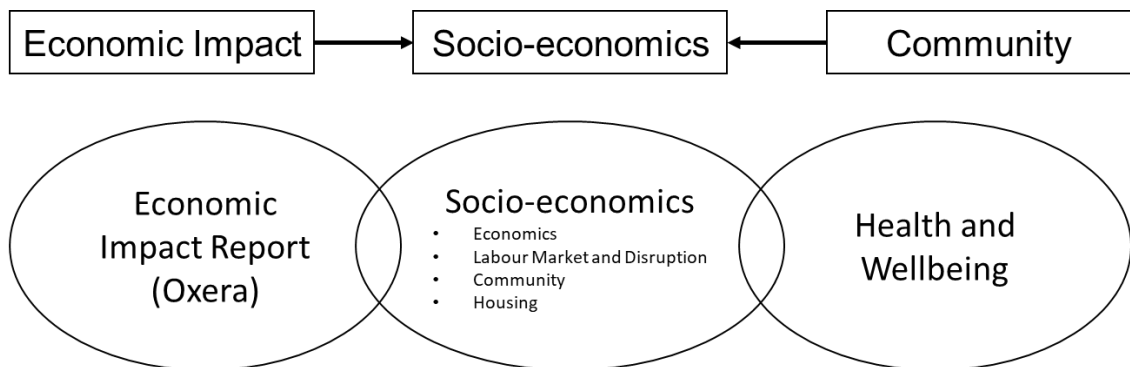
Study Area

- 7.10.14 As set out above, data are being collated for the following study areas:
- Project site boundary – to capture impacts upon receptors that are located within the Project site.
 - Local study area – this reflects the area where impacts of the Project are most likely to affect receptors across the four categories outlined in Table 7.10.3 and Table 7.10.4. The study area is based on selected output areas having regard to the location of residential neighbourhoods and business areas surrounding Gatwick Airport, transport routes and access points. The local study area contains areas falling within six local authorities (Crawley, Horsham, Mid Sussex, Mole Valley, Reigate and Banstead and Tandridge).
 - Labour market area – defined based on the application of the 75% commuting threshold used by the ONS for defining Travel-to-Work Areas (ONS, 2016), using local authority boundaries. The labour market area represents the wider extent of where impacts linked to the economic and labour market effects of the Project may impact upon receptors, as this is the area from which Gatwick Airport currently draws the majority of its operational workforce and can be expected to in the future. The labour market area includes the following local authorities: Crawley, Mole Valley, Reigate and Banstead, Croydon, Tandridge, Wealden, Lewes, Brighton and Hove, Mid Sussex, Horsham, Eastbourne, Adur and Worthing, and Arun. This incorporates the local authorities (Crawley, Horsham, Mid Sussex, Mole Valley, Reigate and Banstead and Tandridge) that are in the ‘Gatwick Diamond’ economic cooperation area.
 - ‘Five authorities’ area – this area reflects where the majority of socio-economic effects of the Project could impact on receptors. The area aligns with the ‘five authorities’ area proposed to be adopted in the Oxera Economic Impact Report and comprises the County areas of East Sussex, West Sussex, Surrey, Kent, and Brighton and Hove (unitary authority).
 - The four study areas are shown in Figures 7.10.1 and 7.10.2. The first map shows the three smaller study areas, while the second includes the larger ‘five authorities’ area. The study areas are cumulative, so the wider areas incorporate the local study areas.

Effects Proposed to be Assessed

7.10.15 Diagram 7.10.1 identifies the main elements of the socio-economic impact assessment, including the inter-relationship with the Health and Wellbeing chapter. The assessment will also be informed by the Economic Impact Report for the Project being prepared by Oxera, which will be included as an appendix to the ES.

Diagram 7.10.1: Socio-economic Assessment Components



7.10.16 On this basis, Table 7.10.2 and Table 7.10.3 set out the socio-economic effects that may arise from the construction and operational phases of the Project respectively. The tables identify the impact or impacts that could arise from each effect, the potential study areas affected, and the potential receptors.

Table 7.10.2: Effects Proposed to be Assessed during Construction

Category	Effect	Impact	Study Area	Receptor
Economic	Employment	Temporary direct employment change	Local, labour market and five authorities areas	Business and commercial activity
	Supply chain	Temporary indirect employment change	Local, labour market and five authorities areas	Supply chain businesses and commercial activity
Labour Market and Disruption	Labour market	Temporary apprenticeships, training opportunities and access to work	Local and labour market areas	Workforce and commuting patterns
	Business disruption	Access severance and environmental change	Site, local and labour market areas	Businesses and commercial activity
	Business displacement	Change of access to premises, car parking and land	Site, local and labour market areas	Businesses and

Category	Effect	Impact	Study Area	Receptor
				commercial activity
	Resident disruption	Loss of access, journey time increases and severance from locations of employment	Local and labour market areas	Workforce and residents
Community	Facilities and services	Viability, sustainability and accessibility to community infrastructure, recreational facilities and public space	Site and local areas	Existing and new residents
	Cohesion	Introduction of a temporary construction workforce	Site and local areas	Existing residents and community assets
	Compensation	Compensation measures linked to the Project	Local and five authorities areas	Existing residents

Table 7.10.3: Effects Proposed to be Assessed during Operation

Category	Effect	Impact	Study Area	Receptor
Economic	Employment	Permanent direct employment change	Local, labour market and five authorities areas	Business and commercial activity
	Supply chain	Permanent indirect employment change	Local, labour market and five authorities areas	Supply chain businesses and commercial activity
Labour market and disruption	Labour market	Permanent apprenticeships, training opportunities and access to work	Local and labour market areas	Workforce and commuting patterns
	Business disruption	Change in access, journey times, labour access and the environment	Site, local and labour market areas	Businesses and commercial activity
	Business displacement	Change of access to premises, car parking and land	Site, local and labour market areas	Businesses and commercial activity
	Resident disruption	Change in journey times and access to locations of employment	Local and labour market areas	Workforce and residents
Community	Facilities and Services	Viability, sustainability and accessibility to	Site and local areas	Existing and new residents

Category	Effect	Impact	Study Area	Receptor
		community infrastructure, recreational facilities and public spaces		
	Cohesion	Changes to community assets	Site and local areas	Existing residents and community assets
	Compensation	Compensation measures linked to the project	Local and five authorities areas	Existing residents

Approach to Assessment of Effects

- 7.10.17 The socio-economic effects of the Project will be assessed across the construction and operational phase timelines using four study areas, which will be used for the specific effects assessed as set out in Table 7.10.2 and Table 7.10.3. Four study areas have been defined having regard to existing baseline conditions and based on the anticipated scale and type of effects, as set out above.
- 7.10.18 The different potential socio-economic effects of the Project will be considered in the context of the appropriate study areas, drawing upon additional baseline studies completed that will provide a more detailed view of the receptors that may be affected by the Project.
- 7.10.19 Each socio-economic effect will be assessed based upon the sensitivity of each receptor and the potential magnitude of the impact, and the significance determined in accordance with the criteria set out in Chapter 6. Where possible, the assessments will use adopted policy, standards and other applicable guidance to measure the magnitude of the impacts on relevant receptors generated by the Project; however, this may not be possible for the assessment of all socio-economic effects, so professional judgement may be required to draw conclusions in certain circumstances. The assessment will also take account of the assessment years outlined in Chapter 6, considering how receptors could be affected in different ways over time.
- 7.10.20 The conclusions will also be considered in the context of other ES chapters where relevant to identify potential inter-relationships between effects. Where this results in any potential change to the assessment of socio-economic effects, this will be specifically identified.

Approach to Mitigation, Enhancement and Monitoring

- 7.10.21 The socio-economic assessment will identify measures that help avoid, reduce and/or mitigate the adverse effects of the Project where applicable. Measures that can enhance the beneficial effects of the Project will also be identified. The measures will be identified throughout the development of the Project before submission of the application for development consent through consultations with stakeholders and iterations of the Project design. Mitigation and enhancement measures will also be reviewed during the ongoing assessment.
- 7.10.22 Specific mitigation and enhancement measures for the different significant socio-economic effects that could be introduced by the Project have not been identified at this stage of the EIA process.

However, measures for mitigating and enhancing potentially significant adverse and beneficial effects could include the following:

- Measures to invest in supporting the viability of community assets during the construction and operational phases through mechanisms such as planning contributions and the Gatwick Airport Community Trust;
- Commitments to provide a certain number of apprenticeships and training opportunities for local residents during the construction phase; and
- Confirming compensation measures for businesses and residents adversely affected by the Project.

7.10.23 The mitigation and enhancement measures once fully identified will be included in the socio-economics chapter of the ES with accompanying plans and strategies for how the implementation of each measure would be monitored. The mitigation and enhancement measures and monitoring methods will be taken into account in the evaluation of the socio-economic effects of the Project.

Issues Proposed to be Scoped Out

7.10.24 The following effects are proposed to be scoped out of the assessment:

- Effect of the Project on the population during the construction and operational phases – the Project does not propose any residential development and therefore it is not anticipated that it would directly give rise to population effects either during construction or operation, in terms of changing population levels within the assessment areas. Future labour demand will be distributed across a wide labour catchment area so no significant impacts on population levels or housing and community infrastructure needs are expected.
- Effect of the Project on Foreign Direct Investment (FDI) and trade – there is potentially a positive relationship between investment in transport infrastructure and FDI and trade. However, Government guidance (Department for Transport, 2016) notes that there is not sufficient evidence to quantify the impact of FDI, and as such does not currently provide guidance for the analysis of such impacts. In the absence of an established methodology and guidance, it is proposed that these impacts are scoped out of the assessment.
- Effect of the Project on property value – the value of property is variable due to the multiple drivers that can influence residential and commercial property markets trends. Drivers such as macro-economic and market cycles, changes in Government fiscal policy and external events (eg Brexit) represent exogenous factors that may influence property values to varying degrees. Therefore, the effect on property values inside the Project site boundary is scoped out of the assessment. It is not considered that there are likely to be direct impacts on residential or commercial properties outside the Project site boundary and there would be no change in flight paths and therefore the potential for effects to arise is limited.

7.11 Health and Wellbeing

Relevant Policy, Legislation and Guidance

Legislative and Policy Context

7.11.1 The following key legislation and policy documents relevant to health and wellbeing will be considered within the assessment process:

- Airports NPS (Department for Transport, 2018a);
- NPS for National Networks (Department for Transport, 2014);
- NPPF (Ministry of Housing, Communities and Local Government, 2019a);
- Crawley 2030: Crawley Borough Local Plan 2030 (Crawley Borough Council, 2015) - Policies ENV4 Open Space, Sport & Recreation, ENV5 Provision of Open Space & Recreational Facilities, ENV11 Development & Noise, ENV12 Air Quality and GAT1 Development of the Airport with a Single Runway, GAT2 Safeguarded Land, GAT 3 Gatwick Airport Related Parking GAT4 Employment Uses at the Airport;
- Emerging Crawley 2035: Draft Crawley Borough Local Plan 2020-2035 (Crawley Borough Council, 2019) - Policy SD2;
- Reigate and Banstead Borough Local Plan 2005 (Reigate and Banstead Borough Council, 2005) - Chp 8 policies - Recreational Uses, Chp 9 policies - Community Facilities, Em1 Airport Related Activities;
- Reigate and Banstead Local Plan: Core Strategy 2014 (Reigate and Banstead Borough Council, 2014) - Policy CS5 Valued People & Economic Development;
- Emerging Reigate and Banstead Borough Development Management Plan 2018-2017 (Reigate and Banstead Borough Council, 2018) - Policy OSR1 -3 Open Space, INF2 Community Facilities, NHE7 Rural Surrounds of Horley (emerging policy);
- Mole Valley Local Plan 2000 (Mole Valley District Council, 2000) REC1-11 Recreation Policies, CF1&2 Community Facilities;
- Mole Valley Core Strategy 2009 (Mole Valley District Council, 2009) - Policies CS17 Adequate Infrastructure, Services & Community Facilities, CS16 Open Space, Sport, and Recreation;
- Horsham District Planning Framework (excluding South Downs National Park) 2015 (Horsham District Council, 2015) - Policy 42 Inclusive Communities, Policy 43 Community Facilities, Recreation & Leisure;
- Tandridge District Core Strategy 2008 (Tandridge District Council, 2008) - Policy CSP11 Infrastructure & Facilities, CSP13 Community, Sport & Recreation;
- Tandridge Local Plan (Part 2) Detailed Policies 2014-2029 (Tandridge District Council, 2014) - Policy DP18 Community, Sports & Recreational Facilities;
- Emerging Our Local Plan 2033 (Regulation 22 Submission) 2019 (Tandridge District Council, 2019) – Policies TLP17 Health & Wellbeing, TLP 38 Play & Open Space, (emerging policy);
- Mid Sussex District Plan 2014-2031 (Mid Sussex District Council, 2018) – Policies DP24 Leisure, Cultural & Recreational Activities, DP25 Community Facilities & Local Services;
- Saved Policies from the Mid Sussex Local Plan 2004 (Mid Sussex District Council, 2004) - Policy G3, CS6-9 Community Buildings & Facilities, B6 Open Space, G3 Playing Space, R1 Recreational Facilities; and
- Gatwick Diamond: Local Strategic Statement (Gatwick Diamond Local Authorities, 2016).

Guidance Documents

- 7.11.2 Health is a central component within the EIA process, where each of the technical disciplines seek to assess individual determinants important to health and wellbeing (such as air quality, noise, transport, water quality (hydrology and hydrogeology) and heritage). While this is the case, individual topic chapters within an ES are typically technical in nature; geared for the regulatory authorities; and follow prescribed methodologies and topic-specific guidance that, while protective of health, do not bring health considerations together to sufficiently address community health concerns.
- 7.11.3 The current EIA Regulations reinforce health within the planning and assessment process, but do not provide definitive guidance on the approach, process or methodology to follow. In the absence of any explicit guidance relating to the assessment of health and wellbeing in EIA, the proposed approach is to apply recognised Health Impact Assessment (HIA) guidance and combine this with the regulatory requirements defined for EIA to investigate, inform, assess and more effectively communicate how and where all health issues and opportunities are addressed.
- 7.11.4 Such an approach is consistent with legislative requirements, and supportive of broader government strategy regarding the importance of integrating public health into the planning process.
- 7.11.5 The following HIA guidance will be taken into account in undertaking the assessment:
- A Critical Guide to HIA (West Midlands Public Health Observatory, 2007);
 - Health Impact Assessment: A practical guide (Chadderton, et al., 2012);
 - Fair Society, Healthy Lives: The Marmot Review. Strategic review of health inequalities in England post-2010 (Marmot, et al., 2010);
 - Healthy Lives, Healthy People: Our strategy for public health in England (Department of Health, 2010);
 - Planning Policy Guidance: Health and wellbeing (Ministry of Housing, Communities & Local Government, 2014a); and
 - Reuniting Health with Planning - Healthier Homes, Healthier Communities (Ross & Chang, 2012).

Baseline Information

Data Collated to Date

- 7.11.6 For the purpose of providing an initial interpretation of local health circumstance during the scoping process, a sample of baseline health and wellbeing data has been collated to date. The geographic extent of the information focusses on the local authorities that lie in the immediate vicinity of the Project site (and would be subject to the greatest change), Crawley and Reigate & Banstead (hereafter referred to as the local study area). For the purpose of scoping, wider areas that would be subject to lower magnitudes of change have been captured using regional data (South East) and contrasted against national (England) averages as a means to gauge wider health circumstance. For the health and wellbeing assessment, a comprehensive health baseline tailored to address the issues and opportunities to be explored will be developed.

7.11.7 Table 7.11.1 shows a range of physical and mental health indicators to provide a high-level summary of local health circumstance within the anticipated local study area. All statistics are the most recent available.

Table 7.11.1: Public Health Indicators

Health Indicator	Crawley	Reigate & Banstead	South East	England
Life expectancy at birth (male) (2015-2017)	80.4	80.5	80.6	79.6
Life expectancy at birth (female) (2015-2017)	83.7	83.9	84.0	83.1
Under 75 mortality rate: all causes (per 100,000 population) (2015-2017)	322	285	294	332
Under 75 mortality rate: cardiovascular (per 100,000 population) (2015-2017)	72.3	59.0	59.9	72.5
Under 75 mortality rate: cancer (per 100,000 population) (2015-2017)	136.4	120.5	125.9	134.6
Emergency hospital admissions for intentional self-harm (per 100,000 population) (2015/2017)	203.7	167.1	195.0	185.5
Alcohol-related harm hospital stays (per 100,000 population) (2017/2018)	529	497	515	632

Source: Public Health England (PHE) Local Health Profiles (PHE, n.d.)

7.11.8 Table 7.11.2 provides a further set of physical and mental health indicators relating to prevalence statistics for the local study area. Statistics are presented at the Clinical Commissioning Group (CCG) level whereby East Surrey CCG represents Reigate & Banstead; all statistics referenced relate to 2018.

Table 7.11.2: Prevalence Statistics

Health Indicator (%)	Crawley CCG	East Surrey CCG	South East	England
Coronary Heart Disease	2.8	2.8	3.0	3.1
Hypertension	12.5	12.6	14.4	13.9
Stroke and Transient Ischaemic Attacks	1.4	1.6	1.8	1.8
Asthma	5.8	5.8	5.7	5.9
COPD	1.5	1.4	1.8	1.9
Obesity	8.4	4.9	6.4	7.8
Mental Health	0.8	0.8	0.9	0.9

Source: NHS QOF Statistics (NHS, 2018)

Existing Baseline Conditions

7.11.9 From an initial analysis of the data provided in Table 7.11.1, male and female life expectancy in the local study area is comparable to the regional and national averages. In terms of under 75 mortality rate statistics for all causes, cardiovascular disease and cancer, Reigate & Banstead

has a lower burden of poor health as opposed to Crawley, whereby Reigate & Banstead is more comparable to the regional average and Crawley more comparable to the national average.

- 7.11.10 As shown in Table 7.11.2, the prevalence of all cardiovascular diseases (Coronary Heart Disease, hypertension, stroke and Transient Ischaemic Attacks) within the local study area is lower than the regional and national averages. Respiratory diseases analysed comprise asthma and Chronic Obstructive Pulmonary Disease (COPD); asthma prevalence within the local study area is between the regional and national average, while COPD prevalence is lower than both the regional and national average.
- 7.11.11 Prevalence of mental health conditions within the local study area is lower than both the regional and national averages. Obesity prevalence shows the largest variation between Crawley CCG and East Sussex CCG, with the difference between them being 3.5 per cent; as a result, obesity prevalence within Crawley is higher than both the regional and national averages, while obesity prevalence in Reigate & Banstead is lower.
- 7.11.12 Other than hypertension prevalence, which is distinctly lower in the local study area compared to the regional and national averages, all other indicators shown in Table 7.11.2 are similar. As a result, from a high-level analysis, it can be concluded that the local burden of health is similar to the regional and national averages, which in themselves are relatively comparable. On this basis, the communities surrounding the Project site are not considered disproportionately sensitive to changes in environmental health determinants.

Proposed Scope of the Assessment

- 7.11.13 It is proposed that the findings of the assessment of effects on health and wellbeing would be set out as a topic chapter within the ES, supported by technical appendices where appropriate. The PEIR will include a draft chapter, including as much of the information set out below as is available at the time of writing.

Scope of Baseline Studies

- 7.11.14 The health baseline would complement data collected by the socio-economic and recreation technical disciplines; health-specific data will be tailored in geographic scope to the varying health determinants being assessed, and requirement of the individual health assessment protocols being applied. The data required for the health assessment relating to changes in air quality exposure differ in geographic distribution and potential health endpoints to those relating to noise or socio-economic health determinants. The health baseline will therefore comprise a range of data to determine a comprehensive summary of local health circumstances, complemented by the necessary data for any quantitative assessment.
- 7.11.15 In addition to the wealth of information publicly available from PHE and the Office for National Statistics (ONS), a key component of developing the health baseline will be engagement with local public health teams, and analysis of area-specific information contained within reports (such as the Joint Strategic Needs Assessment) to gain insight on local health burdens, priorities and needs.

Proposed Approach to Identifying Future Baseline Conditions

- 7.11.16 The approach to identifying future baseline conditions will be consistent with the demographic assumptions applied across topics, and while statistics indicate health is generally improving, a precautionary approach to future health circumstance and relative sensitivity will be applied (where it is assumed that health indicators used in the assessment do not improve and remain static). While more extreme weather conditions as a consequence of climate change have the potential to modify both hazard characteristics (particularly for emissions to air and noise), and the relative sensitivity of receptors (due to increased environmental stressors such as temperature), the potential modification of hazard profile and receptor sensitivity as a consequence of climate change is unlikely to materially influence the selection of quantitative exposure response coefficients, or the need to further adjust the precautionary assumptions applied within the assessment protocols.

Study Area

- 7.11.17 The geographic extent of the health baseline data to be collected is a function of the issues and opportunities to be explored. As an example, changes in emissions to air during construction will require the collation of health-specific hospital admission and mortality data, as well as demographic data relating to local communities which immediately surround the core construction areas. In contrast, surface transport and socio-economic outcomes have a far wider sphere of potential influence and will require different data.
- 7.11.18 The health baseline would therefore be tailored to match the potential geographic distribution of influence associated with construction and operational activities. From initial analysis, data collection will focus on the local authority districts of Crawley and Reigate & Banstead, with data for areas within the surrounding counties of West Sussex and Surrey (where appropriate), using regional (South East) and national (England) averages as comparators.

Effects Proposed to be Assessed

Construction

- 7.11.19 Construction activities associated with the Project have the potential to influence a range of environmental, socio-economic and social health determinants (both adversely and beneficially).
- 7.11.20 Environmental health determinants largely include temporary and intermittent changes in local level air quality and noise as a consequence of construction activities and changes to existing transport flow rates (due to the online road infrastructure works). The health assessment will draw from and build upon air quality and noise modelling outputs to investigate and quantitatively assess potential changes to local population health outcomes where possible (ie where the evidence base permits, and the concentration and exposure is sufficient).
- 7.11.21 The potential health consequence from changes in transport composition and flow rate from construction-related HGVs and construction workers (potentially impacting upon capacity, safety and connectivity) would be assessed as part of the assessment of road traffic and transport effects, with any significant effect summarised within the health assessment.

- 7.11.22 The potential impact upon local community facilities and areas of open space, important to supporting good health and wellbeing, is addressed within Section 7.12 (Agricultural Land Use and Recreation) and would form a separate chapter of the PEIR/ES, with any significant effects summarised within the health assessment.
- 7.11.23 Impacts on water quality (surface and sub-surface), flood risk and ground contamination, are primarily addressed within Sections 7.4 (Geology and Ground Conditions) and 7.5 (Water Environment) of this report and would form separate chapters of the PEIR/ES, with potential hazards addressed by the application of objective thresholds set to protect the environment and health. On this basis, the health chapter will clearly signpost to any significant effects identified by these technical disciplines and consider any health implications, where appropriate.
- 7.11.24 Socio-economic status is a key determinant of health, often influencing a broader range of health determinants. The health assessment will draw from and build upon the outputs of the socio-economic effects PEIR/ES chapters (see Section 7.10 of this report) to explore any potential change in income and employment, and the overall consequence to health (be it adverse and/or beneficial).
- 7.11.25 Social determinants of health are primarily associated with the introduction of a large construction workforce to deliver the Project, and the temporary impact this can have on local communities and healthcare capacity. The health assessment will provide input to and assess the residual impact on local communities and healthcare capacity from the construction workforce and occupational healthcare provision. Where appropriate, additional mitigation measures and/or health initiatives would be developed to align with local health campaigns and further manage communicable disease risk between the construction workforce and local population.

Operation

- 7.11.26 Once operational, the Project has the potential to influence a range of environmental and socio-economic health determinants (both adversely and beneficially).
- 7.11.27 Environmental health determinants include changes in air/ground-borne emissions to air as a consequence of increased capacity and physical change to airport infrastructure (altering the existing distribution of emissions). The health assessment will draw from, and build upon, air quality dispersion modelling outputs to investigate and quantitatively assess potential changes in exposure and local population health outcomes for each of the modelled scenarios.
- 7.11.28 The distribution and magnitude of air/ground-borne noise would also be subject to change. Where possible, the health assessment will quantitatively assess changes in noise exposure for a range of potential health outcomes, including annoyance, hypertension, sleep disturbance and academic performance in schools.
- 7.11.29 The potential health consequence from changes in local transport composition and flow rate (potentially impacting upon capacity, safety and connectivity), will be assessed as part of the transport assessment within the Traffic and Transport PEIR/ES chapter (see Section 7.6), with any significant effects relevant to health set out within the health assessment.
- 7.11.30 The potential impact upon local community facilities and areas of open space, important to supporting good health and wellbeing, will be assessed within the Agricultural Land Use and

Recreation PEIR/ES chapter (see Section 7.12), with any significant effects relevant to health set out within the health assessment.

- 7.11.31 Socio-economic health determinants include direct, indirect and induced employment opportunities, and associated income generation. The health assessment will draw from and build upon the outputs of the Socio-economic Effects chapter (see Section 7.10) to explore the magnitude, distribution and significance of related health outcomes (be it adverse or beneficial), and any barriers to potential uptake.
- 7.11.32 A summary of health and wellbeing determinants considered relevant and therefore scoped into the health assessment are outlined in Table 7.11.3.

Table 7.11.3: Potential Effects to be Considered – Health and Wellbeing

Activity	Potential Effects
Construction Phase (including Demolition): Health and Wellbeing	
Construction and demolition activities within existing airport boundary, including construction of upgraded highway junctions and associated changes in surface transport	Environmental (changes in air quality and noise exposure from construction activities and road traffic)
	Transport (safety, community connectivity)
	Lifestyle (access to open space, barriers to physical activity etc)
	Socio-economic (changes to employment, associated with income generation and the consequence to health and wellbeing)
	Social (introduction of a large workforce, and the potential impact upon local healthcare capacity)
Operational Phase: Health and Wellbeing	
Use of airport, including upgraded highway junctions	Environmental (changes in air quality and noise exposure from operational activities, eg aircraft/support operations/road traffic)
	Transport (safety, community connectivity)
	Lifestyle (access to open space, barriers to physical activity etc)
	Socio-economic (changes to employment, associated income generation and the consequence to health and wellbeing)

Approach to Assessment of Effects

- 7.11.33 The overarching approach to the health assessment would be that of integration with the wider technical disciplines to explore and communicate how and where health is assessed and addressed, and to set any potential significant environmental effects into a public health context (ie health protection, health promotion and health care).
- 7.11.34 The assessment approach will be quantitative where the evidence base allows, and the relative change is sufficient. With regard to the more subjective and intangible aspects of health and features important to wellbeing, a qualitative approach supported by an appropriate evidence base will be applied. In both cases, the assessment of significance will follow that defined in Chapter 6, considering the sensitivity of receptors affected and the magnitude of the likely impact in determining the significance of effect upon health for each health determinant assessed.

- 7.11.35 Assessment years used will remain consistent with the wider technical disciplines which are used to inform the health and wellbeing assessment. Further detail on proposed assessment years is provided in Chapter 6.

Approach to Mitigation and Monitoring

- 7.11.36 The overarching priority of the Project is to design out hazards with the potential to influence health and enhance any design features which support the delivery of local health priorities and objectives.
- 7.11.37 Where it is not possible to fully remove environmental, social and socio-economic hazards with the potential to influence health, mitigation would be proposed within each of the EIA topic chapters (air quality, noise and vibration, traffic and transport, water environment, geology and ground conditions, socio-economics and agriculture and recreation) based on legislative requirements and good practice guidance set to protect health.
- 7.11.38 The health assessment will consider the effect and, where appropriate, would identify additional measures to protect health and address impacts on healthcare capacity. Furthermore, the health assessment will aim to establish initiatives intended to address barriers to health benefit uptake where appropriate.
- 7.11.39 Where appropriate, the approach to monitoring will focus on environmental precursors to health, as this removes many of the confounding factors associated with multicausal health endpoints, genetic predisposition and lifestyle choices; provides a means to intervene before a manifest health outcome; and can be a more effective measure of change directly attributable to the Project (eg monitoring air quality and not respiratory disease prevalence).

Issues Proposed to be Scoped Out

- 7.11.40 Issues proposed to be scoped out of the health assessment include environmental determinants that do not constitute a significant risk to health; or are sufficiently addressed within dedicated ES technical disciplines. These are set out below.

Effects on Local Health Care Capacity during Operational Phase

- 7.11.41 During the operational phase, it is likely that the majority of the workforce would originate from within the region, with no material change in demography or associated health care requirements. Therefore, it is proposed to scope out the health effects arising from population change (and consequent demand for health services) during the operational phase of the Project.

Electric and Magnetic Fields

- 7.11.42 The Project includes the reorientation and distribution of the airport substation and grid infrastructure, with the potential to modify electric and magnetic fields (EMF). However, following the Department for Energy and Climate Change (DECC) Voluntary Code of Practice (DECC, 2012) for assessing EMF from electricity distribution infrastructure, overhead power lines or underground cables operating at ≤ 132 kV are compliant by design with guideline exposure levels set to protect public health, as are substations (at or beyond their publicly accessible perimeter) (ICNIRP, 1998). Any electricity supply infrastructure for the Project will be ≤ 132 kV and therefore

comply with the guideline exposure limit set to protect health. On this basis, potential EMF risk is not significant; modelling and assessment is not required; and it is proposed to scope out a health assessment from changes in exposure to EMF. However, should any community EMF health concerns be raised during consultation, an appropriate section will be provided within the health assessment to investigate and address the concern.

Climate Change

- 7.11.43 Climate change will be fully addressed within the Climate Change and Carbon chapter (see Section 7.9), including the effects associated with climate risk, adaptation and resilience. On this basis, no further assessment of climate change is required within the health assessment.

Extended Operational Hazards

- 7.11.44 Extended operational hazards include risk from major accidents, fuel storage, changes to Public Safety Zones, and the transmission of communicable diseases. Risk from major accidents changes in public safety zones will be assessed within the Major Accidents and Disasters technical appendix (see Section 7.14). On this basis, no further assessment of major accidents and disasters is required within the health assessment.
- 7.11.45 The potential risk from international communicable disease transmission is currently managed through a process that extends well beyond an individual airport and the influence of the UK planning regime. It is driven by the International Health Regulations which place a legally-binding requirement for 196 countries, including all Member States of the WHO, to prevent and respond to acute public health risks that have the potential to cross transnational boundaries and threaten people worldwide.
- 7.11.46 The process begins with the International Health Regulations requirement for public health surveillance to establish any potential transboundary risk, informing national travel recommendations, airlines and ports of any heightened risk and acute symptoms to screen for. Should symptoms be prevalent at the country of origin, airlines are able to refuse travel. Visual screening for acute symptoms take place during boarding and on-board flights. As per Annex 9 of the International Health Regulations, any health condition mid-flight other than air sickness is catalogued by airline staff within the health section of the General Declaration Form. This is then signed off by the pilot-in-command and relayed to the destination for instruction (be it diversion, priority landing, quarantine and/or medical assistance upon arrival).
- 7.11.47 PHE is the National Focal Point for the International Health Regulations, monitoring international communicable health risks to the UK, and provides regular epidemiological updates, assessing potential risk, offering travel advice and priming health services as to symptoms, health conditions and clinical interventions to be aware of. PHE also has various specialist advice and diagnostic units (such as the Imported Fever Service or Rare and Imported Pathogens Laboratory) to assist doctors with managing cases where travellers have returned to the UK with infectious diseases.
- 7.11.48 The Project has no influence on the approach to dealing with international communicable disease transmission and does not alter the hazard profile, international regulatory requirement, PHE duty, or measures in place to monitor, prevent, contain and respond to the transmission of international communicable disease. On this basis, it is proposed to scope out the risk from

international communicable disease transmission within the health assessment, as the evidence base does not permit forecasting, and an international regulatory regime is already in place to manage the potential risk.

Health Risk from Pests

- 7.11.49 As indicated in the Airports NPS, airport development, as with all infrastructure projects can alter habitats and food chains that might attract opportunistic species that are typically regarded as pests. For airport developments, pests can constitute an unacceptable operational hazard, and must be addressed through design and daily management to deter habitat creation or food chains.
- 7.11.50 Without management, airports could provide good year-round habitat for insects, rodents, rabbits, deer, fox and avian species that could theoretically present an aircraft maintenance hazard (with particular reference to insects refer to Koukkoullis (2016) and CASA (2018)) and can pose a direct collision hazard to aircraft moving on the ground and in flight (Dolbeer *et al.* 2000; Barras and Seamans 2002). Such species can further attract raptors presenting an associated strike hazard (Cleary *et al.* 2002).
- 7.11.51 However, the potential hazard is well known, understood and already addressed at Gatwick Airport through existing design and management measures (including habitat, waste management and staff awareness procedures) that prevent, deter and control pests, and the associated operational hazard.
- 7.11.52 All of the components of the Project would include pest prevention and control design features and, once operational, the Project would be maintained accordingly alongside existing pest control programmes and initiatives.
- 7.11.53 The construction phase, including all temporary structures, would be designed, located and managed to deter habitat creation that would attract pests, including management of construction waste. All construction staff would be briefed on the risk pests can present to operational safety, and the CoCP will feature committed actions to prevent and deter pests at construction locations.
- 7.11.54 The potential public health risk from pests directly attributable to the Project and temporary construction sites will therefore be inherently addressed through design; and managed through the CoCP and existing operational procedures. On this basis, the potential health risk associated with pests directly attributable to what is proposed, is not anticipated to constitute any material change in public health risk; is not considered significant, and further health assessment of risks from pests is proposed to be scoped out.

Health Effects from Light

- 7.11.55 The potential effects on health associated with construction related light pollution is largely associated with annoyance, reduced nightscape amenity value, and in the extreme case, may delay the onset of, or impact upon sleeping for significant levels of exposure.
- 7.11.56 The Lighting Strategy will seek to balance the lighting required to ensure the health and safety of staff and facilitate environmentally sound operations at the site, whilst limiting the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature

conservation important to health and wellbeing. Visual effects associated with lighting will be considered within the Landscape, Townscape and Visual Resources assessment in the PEIR/ES.

- 7.11.57 The potential health impact from temporary lighting presents limited opportunity for community exposure and would be insufficient to quantify any measurable risk to public health. On this basis, no further health assessment is considered necessary, and health effects from lighting are proposed to be scoped out.

Health and Wellbeing of the Workforce

- 7.11.58 The health and wellbeing of workers at Gatwick Airport during the operational phase would be managed in accordance with existing procedures and would be regulated by the Health and Safety at Work Act. Measures would include location and activity specific risk assessments and provision of appropriate personal protective equipment. The Project would not give rise to new operational effects on staff wellbeing and these matters are proposed to be scoped out of the EIA process.
- 7.11.59 Any effects on construction and operational workers arising from major accidents and disasters will be considered as part of the assessment of Major Accidents and Disasters (see Section 7.14) and is proposed to be scoped out of the health and wellbeing assessment.

7.12 Agricultural Land Use and Recreation

Relevant Policy, Legislation and Guidance

Legislative and Policy Context

- 7.12.1 The following key legislation and policy documents relevant to agricultural land use and recreation will be considered within the assessment process:
- Airports NPS (Department for Transport, 2018a);
 - NPS for National Networks (Department for Transport, 2014);
 - NPPF (Ministry of Housing, Communities and Local Government, 2019a);
 - Crawley 2030: Crawley Borough Local Plan 2030 (Crawley Borough Council, 2015) – Policies CH11 Rights of Way & Access to the Countryside, ENV4 Open Space, Sport & Recreation and ENV5 Provision of Open Space & Recreational Facilities;
 - Emerging Crawley 2035: Draft Crawley Borough Local Plan 2020-2035 (Crawley Borough Council, 2019) - Policies OS1, OS2, OS3 and EC12;
 - Reigate and Banstead Borough Local Plan 2005 (Reigate and Banstead Borough Council, 2005) – Policies CO2 Agricultural Considerations, HR36 the Rural Surrounds of Horley
 - Reigate and Banstead Local Plan: Core Strategy 2014 (Reigate and Banstead Borough Council, 2014) – Policy CS2 Valued Landscapes & the Natural Environment; and
 - Emerging Reigate and Banstead Borough Development Management Plan 2018-2017 (Reigate and Banstead Borough Council, 2018) – Policies OSR1-3 Open Space, NHE1 Landscape Protection, NHE4 Green/ Blue Infrastructure, NHE7 Rural Surrounds of Horley and TAP1 Access, Parking & Servicing (emerging policy).

Guidance Documents

7.12.2 The agricultural land use and recreation assessment would take into account of the following guidance documents:

- Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 6 Land Use (Highways Agency *et al.* 2001);
- DMRB Volume 11, Section 3, Part 8 Pedestrians, Cyclists, Equestrians and Community Effects (Highways Agency *et al.* 1993);
- Planning Practice Guidance: Environmental Impact Assessment. Published March 2014 and updated July 2017 (Ministry of Housing, Communities & Local Government, 2019b);
- Planning Practice Guidance: Natural Environment (Ministry of Housing, Communities & Local Government, 2016); and
- Code of Construction Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009).

Baseline Information

7.12.3 This section presents the baseline information collated to date. Relevant information is presented in Figures 7.12.1, 7.12.2 and 7.12.3.

Data Collated to Date: Agricultural Land Use

7.12.4 Information in relation to soils, agricultural land classification (ALC) and farm holdings has been collated from:

- Published Soil Survey and British Geological Survey information;
- Ministry of Agriculture, Fisheries and Food (MAFF) published 1 inch to 1 mile Provisional ALC Sheet;
- Defra Detailed ALC and Soil Survey work carried out in the Study area;
- Site specific climatic information taken from the Agroclimatic Datasets produced by the Meteorological Office for the MAFF ALC Guidelines (October 1988);
- Ordnance Survey maps at 1:25,000 scale to identify topographic characteristics of the survey area;
- Government Farming Statistical Data produced by Defra for Local Authority Areas to provide comparative information on agricultural land use within the Study area; and
- Site visits to publicly accessible locations.

Data Collated to Date: Recreation

7.12.5 Information has been collated in relation to the following recreational resources:

- Public rights of way from Surrey County Council's and West Sussex County Council's Interactive Definitive Maps;
- National Cycle Network routes from Sustrans;
- Walking, horse riding and cycling routes from Reigate & Banstead Borough Council website, Crawley Borough Council website, Surrey County Council website, West Sussex Council website and Gatwick Greenspace Partnership; and

- Areas of public open space from Reigate & Banstead Borough Council, Crawley Borough Council website and Horley Town Council.

7.12.6 Site visits have been undertaken in March and May 2019 but no survey work in relation to either agricultural land or recreational resources has been undertaken to date. User surveys of recreational resources are planned and will be undertaken during 2019.

Existing Baseline Conditions: Agricultural Land Use

Agricultural Land Quality and Soils

Geology

7.12.7 Geological information is provided by the BGS Internet Portal and on published geological maps. The 1:50,000 British Geological Sheet covering the area around Gatwick (Sheet 302 Horsham) identifies that the local bedrock is the Weald Clay. This is a stiff, grey mudstone weathering to a brownish grey clay at the surface. There are bands of clay ironstone within it, but these produce the same kinds of soils as the main mass of mudstone.

7.12.8 Of more consequence in affecting the nature of the soils is the presence or absence of superficial drift. This includes patches of river terrace deposits. Published information on the soils (see below) indicates that much of the Weald Clay in the area is covered by superficial drift which is too thin to be shown as a separate feature on the geological maps. This is possibly derived, at least partly, from the river terrace materials.

7.12.9 The geological map (Sheet 302 Horsham) also identifies an area of river alluvium along the course of the River Mole and its tributaries.

7.12.10 At the extreme south east of the map are the underlying deposits of the Upper Tunbridge Wells Sand, which forms part of the higher ground (the High Weald) to the south and east of Crawley.

Soils

7.12.11 There is no detailed soil map for the area and so the only published source of information is Sheet 6 (South East England) of the 1:250,000 scale National Soil Map. Figure 7.12.1 provides an extract from the published National Soil Map. It shows geographic groupings of soils called Soil Associations within the study area, usually related to specific parent materials. Within each Association there are likely to be a number of more tightly defined soil types known as Soil Series.

7.12.12 The National Soil Map shows a close correlation with the geology around the existing airport, though with simplification for reasons of scale. Also, there can be a considerable range in the kinds of soils within a particular Association, usually because of local variations in the character and thickness of the superficial drifts, including some not shown on the geological map because they are too thin.

7.12.13 The relationship between geology and soils is shown in Table 7.12.1 below:

Table 7.12.1: Study Area – Soil Associations

Geology	Soil Association Code	Soil Association Name	Brief Description
Weald Clay (with thin superficial drift and patches of thicker drift)	711e and 711i	WICKHAM 1 and WICKHAM 5	Poorly drained clayey soils with slightly more loamy surface horizons and patches of more sandy but poorly drained soils on river terrace deposits
Weald Clay (with little or no superficial drift)	712b	DENCHWORTH	Poorly drained clayey soils
River Terrace Deposits	841d	SHABBINGTON	Poorly drained sandy soils
Alluvium	813d	FLADBURY 3	Poorly drained clayey soils
Upper Tunbridge Wells Sand	572i	CURTISDEN	Poorly and imperfectly drained silty and fine sandy soils

Agricultural Land Classification

- 7.12.14 The Provisional ALC 1:63,360 scale map for the area, Sheet 170 (London SW), map and accompanying Report indicates the soils on the Weald Clay, Tunbridge Wells Sand and the various superficial deposits in the area to be graded either undifferentiated subgrade 3 or grade 4 quality land.
- 7.12.15 The accompanying report identifies that soils developed on the Weald in grade 3, ie those now shown as the WICKHAM and DENCHWORTH Associations are regarded as ‘low in the grade’ with the more clayey ones relegated to grade 4, a grading also applied to the soils on clayey alluvium. This information indicates that the soils from the WICKHAM association, which covers the majority of the Project site, would be expected to be classified as lower quality grade 3 or 4 land and would not therefore comprise the ‘best and most versatile’ agricultural land.
- 7.12.16 Since the Provisional Map was published there has been a comprehensive revision to the ALC system and the application of this requires detailed, site-specific information to determine the ALC grade accurately. A number of areas around Crawley, Gatwick and Horsham have been subject to the more detailed examination by Defra using the 1988 revised ALC system and the results of these surveys (taken from the Defra MAGIC website) are identified in Figure 7.12.2.
- 7.12.17 These surveys are useful in this area as they include surveys on most of the soil Associations described above. Virtually all of the agricultural land surveyed in detail has been found to be of lower quality subgrade 3b. This pattern confirms the more subjective assessments made for the Provisional Map of the 1970s and identifies that the land in the area in the vicinity of the existing airport is predominantly of lower quality and does not comprise the ‘best and most versatile’ agricultural land.

Baseline - Farm Holdings

- 7.12.18 Defra farming statistical data produced for Local Authority Areas from the June 2016 census data provides information on the distribution of agricultural land use within the areas likely to be

affected by the Project. The table below provides a comparison of agricultural land use within Crawley and Mid Sussex, Horsham and Mole Valley with the distribution of agricultural land use in England as a whole.

Table 7.12.2: Defra Statistics for Agricultural Land Use 2016

	Cereals and Arable Cropping (ha)	%	Fruit and Vegetables (ha)	%	Grassland (ha)	%
England	2,616,937	37	124,913	3	4,387,975	60
Crawley and Mid Sussex	2,318	19	116	<1	9,693	80
Horsham	4,220	18	235	1	18,675	81
Mole Valley	2,352	24	155	2	7,044	74
Tandridge	2,170	25	13	<1	6,403	75
Reigate and Banstead, Epsom and Ewell	794	24	0		2,575	76

7.12.19 The statistical data produced by Defra indicate that within the local authorities where agricultural land is affected by the Project it is predominantly used for grassland based livestock agricultural land use. There is a much higher percentage of this type of land use in this area than that identified within England as a whole.

Existing Baseline Conditions: Recreation

Public Rights of Way

7.12.20 The following public rights of way lie within the Project site boundary for Gatwick Airport in West Sussex (see Figure 7.12.3):

- To the north of the airport the Sussex Border Path runs along the alignment of public footpaths 346Sy, 346-2Sy, 347Sy and 355-1Sy to the south of the A23, Povey Cross Road, Charlwood Road and Horley Road.
- Public footpath 355Sy runs east-west across the railway line on a footbridge from its junction with 360Sy to its junction with the A23.
- Public footpath 358Sy runs south-westwards from the B2036 to its junction with public footpath 359Sy.
- Public footpath 359Sy runs westwards from the B2036 and then southwards adjacent to the existing car parking areas to its junction with Radford Road.
- Public footpath 360Sy runs south from Airport Way to the east of the railway line and through the existing car parking areas to its junction with 361Sy.

- Public footpath 360-1Sy runs generally south-westwards and southwards from its junction with public footpath 359Sy to its junction with Radford Road.
- Public footpath 361Sy runs to the south of the existing car parking areas between public footpaths 359Sy and 360Sy.
- To the west of M23 Junction 9, public footpath 367Sy runs to the south of the M23 spur and then turns south outside the red line boundary to meet Fernhill Road.
- To the south of the airport public bridleway runs northwards from the A23 to Church Road.

7.12.21 The following public rights of way lie within the Project site boundary for Gatwick Airport in Surrey.

- To the north of the M23 spur road the Sussex Border Path runs along the alignment of Burstow Footpath 368 and Horley Footpath 368 up to the B2036.
- West of the B2036, the Sussex Border Path runs along the alignment of Horley Footpath 362a, over the railway line and south along Horley Footpath 355a to the county boundary.
- To the east of the railway line, Horley Footpath 360 runs southwards to the county boundary to the north of Airport Way.
- To the north of the airport a short stretch of the Sussex Border Path runs in Surrey along public footpath FP346.

National Cycle Routes

7.12.22 National Cycle Route 21 (NCR21) runs south from Greenwich out of London through Lewisham (the Waterlink Way) to Crawley, and then via East Grinstead and Eridge to Heathfield and Eastbourne. From Crawley it runs northwards between the A23 London Road and the railway line as a traffic free route to the east of the main airport campus. It then follows alignment of the Gatwick Stream, crossing Airport Way to the north of the airport via a subway which exits in Riverside Garden Park in Horley. NCR21 continues to follow the Gatwick Stream within the northern area of the park, becoming an on-road route between Riverside and Crescent Way.

7.12.23 This route provides an important non-vehicular route between Horley, Cawley and Gatwick Airport for use by cyclists and walkers. The West Sussex cycle journey planner shows NCR21 crossing a local cycle route near to Horley railway station, which runs to the east over Balcombe Road and the M23 and to the west over Brighton Road and Reigate Road. It is also crossed by the Sussex Border Path, a long distance walk, just north of the South Terminal.

Walking, Cycling and Horse Riding Routes

7.12.24 The main promoted walking route close to Gatwick Airport is the Sussex Border Path. This route in total extends to approximately 240 km (150 miles) around the inland boundary of the county of Sussex, from Thorney Island, near Emsworth to Rye in East Sussex. It has been waymarked by Sussex Ramblers, who provide descriptions of each part of the route on their website.

7.12.25 Around Gatwick Airport the Sussex Border Path runs along the alignment of existing public footpaths in Surrey and West Sussex. From the M23 it runs to the north of the M23 spur road along Surrey public footpaths FP367 and 368, and then follows FP362a before crossing the railway line and joining FP355a to the west of Riverside Garden Park and running south to the county boundary to the north of Airport Way. In West Sussex it crosses Airport Way in a subway along the alignment of public footpath 355-1Sy and then follows public footpath 346-2Sy for

approximately 2.45 km around the northern perimeter of the airport to the south of the A23 and Povey Cross Road. It continues to run between the airport and Charlwood Road and Horley Road along public footpaths 346Sy and 347Sy which follow the approximate alignment of the River Mole. The Sussex Border Path then crosses Horley Road into Surrey and runs westwards along public footpath FP344 towards Charlwood.

- 7.12.26 The Millennium Trail is a 28 km long-distance path from Banstead Downs to Horley and was created by Reigate and Banstead Borough Council to mark the new century. In the vicinity of Gatwick Airport, the Millennium Trail largely follows the same route as the Sussex Border Path and finishes in Riverside Garden Park. Reigate & Banstead Borough Council published a guided walks and events programme, which includes events in Riverside Garden Park, in 2016 but this does not appear to have been published since.
- 7.12.27 The Gatwick Greenspace Partnership publishes a calendar of walks works covering the area between Horsham, Crawley, Horley, Reigate and Dorking. The project is supported by all the local councils and Gatwick Airport Limited and is managed by Sussex Wildlife Trust. The 'Gatwick Greenspace Partnership Countryside Walks April 2019 - September 2019' does not currently list any walks within the Project site boundary but there are a number in the surrounding settlements and countryside including at Charlwood, Rusper and Ifield.

Public Open Space

- 7.12.28 Riverside Garden Park in Horley is designated as urban open space of high value by Reigate and Banstead Borough Council in their Urban Open Space and Review Assessment (by Reigate and Banstead Borough Council, 2017) published in October in support of the Development Management Plan and forms part of the Riverside Green Chain. It is located on the south-western edge of Horley between areas of residential development to the north-east and the A23 and Gatwick Airport to the south-west. It is owned by Reigate & Banstead Borough Council who are responsible for the day to day management of the site.
- 7.12.29 The park, which covers an area of approximately 10 hectares, was originally part of Horley Common. The history of the site is described on the Horley Town Council website which explains that *'Later it was enclosed and farmed, before a racecourse was developed on neighbouring land. In the 1930s, the racecourse land was incorporated in the new Gatwick Aerodrome. Since then the site boundaries have been fixed by the expansion of Horley and Gatwick Airport. The adjacent residential development took place in the 1950-60s'*.
- 7.12.30 Today, Riverside Garden Park comprises public open space bounded to the north by the Gatwick Stream and with areas of woodland and a man-made lake. Despite the proximity of the A23 and the airport, these features are largely screened from view by embankments and tree planting. Horley Town Council describe the Park as being a regular local dog-walking venue, with fishing popular along the Gatwick Stream and around the lake. In addition, cyclists use NCR21 to get to and from Gatwick Airport.
- 7.12.31 Riverside Garden Park narrows to the north-west as it follows the River Mole to the A23. On the northern side of the A23 at this location, another area of open space lies within the scoping boundary. This area, which lies to the east of the River Mole, comprises the former Horley Anderson Centre and Playing Fields and is designated as Urban Open Space of high overall

value by Reigate and Banstead Council in the 2017 Development Management Plan: Urban Open Space Assessment and Review. It is also part of the Riverside Green Chain.

Proposed Scope of the Assessment

- 7.12.32 It is proposed that the findings of the assessment of effects on agricultural land use and recreation would be set out as a topic chapter within the ES, supported by technical appendices where appropriate. The PEIR will include a draft chapter, including as much of the information set out below as is available at the time of writing.

Scope of Baseline Studies

- 7.12.33 In addition to the baseline information collected as part of the desk study and described above, it is proposed to undertake a series of site visits to verify the data. In addition, site surveys would be undertaken to establish specific characteristics of agricultural land and soil structure, the nature of any farm holdings affected and to provide an understanding of the current use of recreational resources (including open space) around the airport.

Proposed Approach to Identifying Future Baseline Conditions

- 7.12.34 With respect to agricultural land use, consideration of future changes in baseline conditions would include identification of the potential for loss of agricultural land and soil resources due to changes in land use, as well as changes in the nature of farm holdings due to changes in land ownership, land interests or climate change.
- 7.12.35 The recreational baseline conditions are not anticipated to change significantly in the future although these will be reviewed in the light of any changes that come forward in relation to local planning policy, changes to the definitive map of public rights of way, recreational initiatives affecting public open space and recreational routes, and future developments and initiatives at Gatwick Airport. It is not anticipated that recreational resources within the study area will be specifically vulnerable to the effects of climate change, but it is expected that well-designed adaptation measures would reduce any potential impacts.

Study Area

- 7.12.36 The DMRB (Volume 11, Section 3, Parts 6 and 8) (Highways Agency *et al*, 2001 and 1993) does not specify a study area for the assessment of effects on recreational or community resources but references the need to establish local travel patterns by non-motorised users and to identify resources, such as land used by the community, that have the potential to be lost as a result of the project. The recreation study area therefore includes the Project site, with account taken of any resources that lie immediately adjacent to the site or link to it, together with any areas that may be required to mitigate for any temporary or permanent effects arising from the Project. Similarly, the agricultural assessment will be based on the agricultural land located within the Project site along with the wider agricultural land holding.

Effects Proposed to be Assessed

7.12.37 The potential effects on agricultural land use and recreational receptors during the construction and operational phases of the Project are set out in Table 7.12.3 below.

Table 7.12.3: Potential Effects to be Considered – Agricultural Land Use and Recreation

Activity	Potential Effects
Construction Phase (including Demolition): Agricultural Land Use and Recreation	
Construction and demolition activities within existing airport boundary, including construction of upgraded highway junctions	Permanent loss of topsoil/ best and most versatile agricultural land for temporary/ permanent land take/ Public Safety Zone; Loss and severance of land from farm holdings; loss/reduction of accessible public open space; impacts on the alignment of public rights of way and cycle routes.
Use of construction compounds and creation of mitigation areas beyond existing airport boundary	Loss of best and most versatile agricultural land; loss of topsoil; soil erosion; changes to soil structure; loss and severance of land from farm holdings; loss/reduction of accessible public open space; impacts on the alignment of public rights of way and cycle routes.
Operational Phase: Agricultural Land Use and Recreation	
Use of airport, including upgraded highway junctions	Permanent loss of topsoil/ best and most versatile agricultural land for permanent land take/ Public Safety Zone; permanent loss or severance of land from farm holdings; improvements to the nature and character of recreational resources.

Approach to Assessment of Effects

7.12.38 The agricultural land use and recreation assessment will take into account the guidance set out in the documents listed above. The assessment of the likely effects on these resources will consider the following activities:

- Identification of all agricultural land use and recreation resources that have the potential to be affected by the Project and the provision of a description of those resources and their importance and/or value;
- Identification of the likely impacts of the Project on agricultural land use and recreation resources within the Project site boundary and within the defined study area;
- Assessment of significance of effects, taking into account measures proposed to avoid, reduce or remedy adverse effects.

7.12.39 The desk-based baseline study and subsequent site visits and surveys will identify agricultural land use and recreation resources that have the potential to be affected by the Project, which will facilitate input into the design process. This could include input into highway and landscape design, along with the physical location of Project elements and the development of mitigation measures.

7.12.40 The approach to determining the significance of effects is a two-stage process that involves defining the sensitivity of the receptors and the magnitude of the impacts. The assessment would

follow the approach set out in Chapter 6 with regard to identification of receptor sensitivity, impact magnitude and evaluation of significance of effects.

- 7.12.41 The significance of the effect upon agricultural land use and recreation will be determined by considering both the magnitude of the impact and the sensitivity of the receptor. Where a range of significance levels is possible, the final assessment for each effect will be based upon expert judgement.

Approach to Mitigation and Monitoring

- 7.12.42 Whilst it is not possible to retain the agricultural land quality within the areas of land permanently lost from agricultural use, soil resources from the Project would be retained and sustainably reused as far as possible to fulfil a number of functions. These functions could, for example, include the use of soils:

- As an engineering material for construction purposes;
- For the development of the airport grassland areas;
- In the creation and planting of landscaping bunds and planting areas; and/or
- In the creation of biodiversity habitat areas.

- 7.12.43 A soil management strategy will be produced that will identify best practice methods for the stripping, storage and replacement of soils on areas of temporary land take during construction. Relevant guidance documents include:

- Defra (2000) Good Practice Guide for Handling Soils; and
- Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (including the Toolbox Talks).

- 7.12.44 The PEIR/ES chapter will explain how the design of any green infrastructure to mitigate the effects of the Project will be incorporated into the existing network of green infrastructure (including public open space) which may be used by the local community (including those working at Gatwick Airport) for recreational purposes.

- 7.12.45 Mitigation for any significant adverse effects on the existing green infrastructure network, other areas of open space, public rights of way and any other resources that are used as recreational facilities, will be clearly set out in the PEIR/ES chapter and secured through the DCO.

Issues Proposed to be Scoped Out

- 7.12.46 It is not proposed that any issues pertinent to the agricultural land use assessment would be scoped out. With regards to the recreation assessment, the assessment of effects on common land and allotments is proposed to be scoped out, as there are no such resources within the study area or proximate to it that are likely to be affected by the Project and therefore no impact pathway has been identified.

7.13 Waste

Relevant Policy, Legislation and Guidance

Legislative and Policy Context

7.13.1 The following legislation and policy documents relevant to waste management will be considered:

- Environmental Protection Act 1990
- Environment Act 1995;
- Landfill Directive (1999/31/EC);
- Hazardous Waste (England and Wales) Regulations 2005 (as amended);
- Waste Framework Directive (2008/98/EC);
- Waste Management (England and Wales) Regulations 2006;
- Waste (England and Wales) Regulations 2011 (as amended);
- The Environmental Permitting (England and Wales) Regulations 2016;
- Waste Duty of Care: Code of Practice (Defra and Environment Agency, 2016);
- Airports NPS (Department of Transport, 2018a);
- National Planning Policy for Waste (Ministry of Housing, Communities & Local Government, 2014);
- Waste Management Plan for England (Defra, 2013);
- Resources and Waste Strategy for England (Defra and EA, 2018); and
- West Sussex Waste Local Plan (West Sussex County Council and South Downs National Park Authority, 2014) – Policy W23 Waste Management within Development.

Guidance Documents

7.13.2 The following guidance documents relevant to waste management will be considered:

- Waste Duty of Care: Code of Practice (Defra and Environment Agency, 2016);
- Definition of Waste: Development Industry Code of Practice version 2 (CL:AIRE, 2011). The Code of Practice sets out procedures for the development industry to use when assessing whether excavated materials are classified as a waste or not. It also allows for the determination on a site-specific basis, when treated excavated waste can cease to be waste for a particular use; and
- Designing Out Waste: A Design Team Guide for Civil Engineering (WRAP, n.d.) provides guidance to design teams on ways to minimise waste.

Baseline Information

Data Collated to Date

7.13.3 Baseline data have been gathered from a review of the following desk-based sources:

- West Sussex County Waste Local Plan, 2014; and
- Groundsure EnviroInsight Report April 2019

Existing Baseline Conditions

- 7.13.4 The existing waste management facilities are located within an area of the existing airfield known as the Cuckoo area to the north of Taxiway Juliet. The CARE facility comprises a biomass boiler, a waste processing building, compound area and bin store. In 2017, the CARE facility processed a total of 12,943 tonnes of waste with 4,274 tonnes removed off site and the remaining 8,700 tonnes processed on site.
- 7.13.5 The CARE facility is operated under an environmental permit. A review of the Groundsure Envirolnsight report has identified other waste management facilities in the area, including metal recycling facilities and a treatment facility to produce soil from waste.
- 7.13.6 Baseline waste levels in the region are set out in the West Sussex County Waste Local Plan. The waste streams which are relevant to the Project are as follows:
- Construction, Demolition and Excavation (CDE) waste: 75% of this waste stream comprises inert materials such as concrete, soils and rubble. In 2010/11, CDE waste accounted for approximately 48% (949,000 tonnes) of all waste generated in West Sussex.
 - Commercial and Industrial (C&I) waste: this includes a wide range of waste types from shops, industrial and business premises (eg waste food and waste packaging). In 2010/11 C&I waste accounted for approximately 31% (605,000 tonnes) of all waste generated in West Sussex.
 - Hazardous waste: this includes waste which has hazardous properties or requires specialist techniques to avoid handling or disposal problems. Approximately 30,400 tonnes of hazardous waste were generated in West Sussex in 2010, of which around 25,000 tonnes was exported out of the county. It has been included in either the C&I or CDE waste figures above.

Proposed Approach and Scope

- 7.13.7 It is proposed that a waste management strategy, including a Site Waste Management Plan, will be produced and included as a technical appendix to the ES. The PEIR will include a draft of the strategy including as much of the information set out below as is available at the time of writing. A separate waste chapter is not proposed to be included within the PEIR/ES.

Approach

- 7.13.8 The technical appendix would comprise a review of published data (including baseline and projected waste data and procedures for Gatwick Airport) and Project design information. National and regional waste management policies and objectives would be reviewed to set the context for the management of waste from Gatwick Airport. A search of waste management facilities in the vicinity of Gatwick Airport would be undertaken to understand the existing and future waste management infrastructure should waste be exported from the site.
- 7.13.9 The waste arisings from the Project would be two-fold. Firstly, waste would be generated as a result of the demolition and construction processes. The project design and methodologies for demolition and construction methodologies would be reviewed to identify the types of waste and likely quantities that would be generated. This would involve working closely with the design and buildability teams to understand how waste has been taken into account in the design process to date and how this can be influenced in the future. Opportunities to design-out waste would be explored and decisions would be documented.

- 7.13.10 The key waste types generated during construction are likely to include concrete, stripped topsoil and subsoil, asphalt, metals, plastic and packaging. Hazardous waste could also be generated. A detailed inventory of wastes would be prepared for each key construction activity (eg removal of existing taxiways/runways) alongside a timeframe for when the wastes would be generated within the overall construction programme. The wastes would be quantified and measures to manage the waste would be identified. Assumptions regarding key wastes to be removed from the site would be aligned with the related assumptions in the traffic chapter. Cross referencing would also be made to the air quality chapter where relevant, eg removal and breaking up of concrete.
- 7.13.11 Secondly, waste would be generated during the operation of the Airport. The composition and quantities of waste that is currently collected would be reviewed together with the existing waste management facilities, procedures and targets. On this basis, predicted arisings and composition of waste on completion of the Project would be identified. The Project includes the relocation of the existing CARE facilities and provision of new facilities. The technical appendix would set out how these facilities would be used, and procedures would be established to maximise the quantity of waste diverted from landfill taking into account the existing waste management practices.

Scope

- 7.13.12 For the purpose of this EIA Scoping Report waste is defined by the European Waste Framework Directive (2008/98/EC) as:
'any substance or object which the holder discards or intends or is required to discard'.
- 7.13.13 The technical appendix would consider the wastes that would be generated during the construction and operational phases of the Project. The study area for the technical appendix would be the Project site boundary, including the construction working areas and laydown areas.

Approach to Management of Waste

- 7.13.14 The technical appendix would set out the proposed procedures and measures for managing any waste produced during the construction and operation of the Project and would consider all elements of the Project as set out in the project description. These measures would comprise the waste management plans for the construction and operational phases of the Project. The plans would be implemented during the construction and operational phases. The procedures and measures would follow the waste hierarchy and proximity principles and would seek to avoid waste where possible. A Site Waste Management Plan would be included in the technical appendix that would be completed during construction to record each movement of waste from the site.

Issues Proposed to be Scoped Out

- 7.13.15 Waste arising from the extraction, processing and manufacture of the construction materials and components have been scoped out of this assessment. Detailed design information on specific construction materials will not be available within the timeframe of the EIA process. However, the specification and procurement of construction materials will follow the principles within the Sustainability Strategy and will take into account the relevant requirements of BREEAM.

7.14 Major Accidents and Disasters

7.14.1 The EIA Regulations (Regulation 5(4) and Schedule 4, paragraph 8) introduced a requirement to consider the potential for significant effects deriving from the vulnerability of a project to major accidents and disasters.

7.14.2 Within the Control of Major Accident Hazard (COMAH) Regulations, a 'major accident' is defined as:

'An occurrence such as a major emission, fire, or explosion resulting from uncontrolled development, leading to serious danger to human health or the environment (whether immediate or delayed) inside or outside the establishment, and involving one or more dangerous substances.'

7.14.3 The International Federation of Red cross and Red crescent societies (IFRC) (IFRC, 2019) describes the term 'disaster' as:

'A sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources. Though often caused by nature, disasters can have human origins.'

7.14.4 The United Nations Office of Disaster Risk Management (UNDRR) (UNDRR, 2019) defines vulnerability as:

'The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.'

Relevant Policy, Legislation and Guidance

Legislative Context

7.14.5 In addition to EIA legislation, the legislation relevant to the assessment of major accidents and disasters includes the following:

- Regulation (EU) No 402/2013 on the Common Safety Method on Risk Evaluation and Assessment (as amended by Regulation EU 2015/1136);
- Health and Safety at Work etc. Act 1974;
- The Management of Health and Safety at Work Regulations 1999;
- Civil Contingencies Act 2004;
- Control of Major Accident Hazards Regulations 2015;
- The Pipeline Safety Regulations 1996;
- The Planning (Hazardous Substances) Regulations 2015;
- The Workplace (health, safety and welfare) Regulations 1992;
- The Regulatory Reform (Fire Safety) Order 2005;
- The Construction (Design and Management) Regulations 2015;
- Lifting Operations and Lifting Equipment Regulations (LOLER) 1998;
- The Control of Asbestos Regulations 2012;

- Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC Text with EEA relevance;
- Council Directive 2009/71/Euratom 2009 establishing a Community framework for the nuclear safety of nuclear installations;
- The Control of Substances Hazardous to Health Regulations 2002;
- The Building Regulations 2010;
- CAP 1223: Framework for an Aviation Security (CAA, 2018);
- CAP 393: The Air Navigation Order 2016 and Regulations (CAA, 2019); and
- Regulation on Common rules in the field of civil aviation security (EU 300/2008).

Planning Policy Context

7.14.6 The planning policy documents relevant to the assessment of major accidents and disasters include the following:

- Airports NPS (Department for Transport, 2018a);
- NPS for National Networks (Department for Transport, 2014);
- National Planning Policy Framework (NPPF) (HM Government, 2019);
- Crawley 2030: Crawley Borough Local Plan 2030 (Crawley Borough Council, 2015);
- Emerging Crawley 2035: Draft Crawley Borough Local Plan 2020-2035 (Crawley Borough Council, 2019) - Policy CD7;
- Reigate and Banstead Borough Local Plan 2005 (Reigate and Banstead Borough Council, 2005);
- Reigate and Banstead Local Plan: Core Strategy 2014 (Reigate and Banstead Borough Council, 2014);
- Mole Valley Local Plan 2000 (Mole Valley District Council, 2000);
- Mole Valley Core Strategy 2009 (Mole Valley District Council, 2009);
- Horsham District Planning Framework (excluding South Downs National Park) 2015 (Horsham District Council, 2015);
- Tandridge District Core Strategy 2008 (Tandridge District Council, 2008);
- Tandridge Local Plan (Part 2) Detailed Policies 2014-2029 (Tandridge District Council, 2014);
- Emerging Our Local Plan 2033 (Regulation 22 Submission) 2019 (Tandridge District Council, 2019) – Policy TLP17 (emerging policy).
- Mid Sussex District Plan 2014-2031 (Mid Sussex District Council, 2018);
- Reigate and Banstead Borough Development Management Plan 2018-2017 (Reigate and Banstead Borough Council, 2018) (emerging policy); and

Guidance Documents

7.14.7 There is currently no specific established guidance for the assessment of major accidents and disasters within the EIA process. The principles set out in the documents listed below include some guidance relevant to developing the proposed approach to assessment, as well as emerging best practice from recent airport projects:

- Environmental Impact Assessment of Projects, Guidance on the Preparation of the EIA Report (EC, 2017a);

- Guidance on the Interpretation of Major Accidents to the environment for the purposes of COMAH regulations (DETR, 1999);
- Guide to predicting environmental recovery durations for Major Accidents (Energy Institute, 2017);
- Guidelines in Environmental Management for Facilities Storing Bulk Quantities of Petroleum Products and Other Fuels, 3rd edition (Energy Institute, 2015);
- Safety and Environmental Standards for Fuel Storage Sites Process Safety Leadership Group (Health and Safety Executive (HSE), 2009);
- Guidance: Hazardous Substances (Ministry of Housing, Communities & Local Government, 2019d);
- CIRIA C736 Containment Systems for the Prevention of Pollution: Secondary, Tertiary and Other Means for Industrial and Commercial Premises (CIRIA, 2014);
- Reducing Risks Protecting People (R2P2) (HSE, 2001);
- Air Navigation Guidance (Department for Transport, 2017d);
- CAP760: Guidance on the Conduct of Hazard Identification, Risk Assessment and the Production of Safety Cases (CAA, 2010);
- CAP 670: ATS Safety Requirements (CAA, 2014b);
- CAP1616: Airspace Design: Guidance on the regulatory process for changing airspace design including community engagement requirements (CAA, 2017a);
- Guidance on Regulations (L153): Managing health and safety in construction: Construction (design and management) Regulations (HSE, 2015);
- Hazardous Installation Directive (HID) Regulatory Model: Safety Management in Major Hazard Industries (HSE, 2013);
- Control of Development in Airport Public Safety Zones, Department for Transport Circular 01/2010 (Department for Transport, 2010);
- CAP 795: Safety Management Systems - Guidance to Organizations (CAA, 2015b);
- CAP 168: Licensing of Aerodromes (CAA, 2019b);
- CAP 1273: Implementing a Security Management System (CAA, 2018c);
- CAP 738: Aerodrome Safeguarding (CAA, 2006);
- European Action Plan for the Prevention of Runway Incursions EAPPRI edition (EUROCONTROL, 2017);
- CAP 791: Procedures for changes to aerodrome infrastructure (CAA, 2016);
- CAP 493: Manual of Air Traffic Services MATS Part 1 (CAA, 2017c);
- European Union Aviation Safety Agency (EASA) Commission Regulation (EU) No 139/2014 - specifically ADR.OR.D.005 and associated AMC/GM (EASA, 2014);
- Doc 9859 Safety Management Manual (ICAO, 2013);
- Annex 14 to the Convention on International Civil Aviation – Aerodromes, Volume 1: Aerodrome Design and Operations (ICAO, 2018); and
- Guideline Environmental Risk Tolerability for COMAH establishments (Chemicals and Downstream Oil Industry Forum (CDOIF), n.d.).

Baseline Information

Data Collated to Date

- 7.14.8 Receptors that may be affected by major accidents and disasters include human and environmental receptors. Initial work has involved identification of the receptors identified within each of the topic assessments, for example biodiversity, water and community receptors.
- 7.14.9 For human receptors, the following receptor groups within the study area are likely to be relevant:
- Population and human health:
 - local residents within a 10 km study area;
 - operational staff (Gatwick Airport staff and any other persons legally employed within the Project area);
 - construction workers;
 - travellers and other customers using airport facilities and onboard aircraft; and
 - users of local transport (road and rail).
- 7.14.10 For environmental receptors, the CDOIF Guideline document identifies the broad groups of environmental receptors that are likely to be relevant to the assessment:
- Designated area (land/water):
 - nationally important;
 - internationally important;
 - other designated land, and
 - scarce habitat.
 - Widespread habitat (land/water):
 - non-designated land; and
 - non-designated water.
 - Groundwater:
 - groundwater bodies - source of public or private drinking water, and
 - groundwater bodies - non-drinking water source.
 - Soil or sediment (land/water);
 - Built environment (land/man-made);
 - Species of flora and fauna (land/water/air);
 - Marine (water); and
 - Freshwater (water).

Proposed Scope of the Assessment

- 7.14.11 It is proposed that the consideration of potential major accidents and disasters will be included as a technical appendix to the ES. The PEIR will include a draft of the technical appendix. A separate chapter relating to major accidents and disasters is not proposed to be included within the PEIR/ES.

Proposed Scope of Baseline Studies

7.14.12 Data will continue to be collated, based on the receptors identified within each topic assessment at the PEIR and ES stage. This will include information on the current and future baseline conditions.

7.14.13 Table 7.14.1 illustrates the sources of the baseline information from other EIA topic assessments for each receptor group.

Table 7.14.1: Sources of Information for Receptors (based on CDOIF, 2015)

Receptor Group	ES topic area
Nationally important designated areas (statutory designations)	Ecology and nature conservation (see Section 7.3)
Internationally important designated sites (statutory designations)	Ecology and nature conservation (see Section 7.3)
Other designated land	Historic environment (see Section 7.1) Landscape, townscape and visual resources (see Section 7.2) Ecology and nature conservation (see Section 7.3) Socio-economic effects (see Section 7.10) Agricultural land use and recreation (see Section 7.12)
Scarce habitat	Ecology and nature conservation (see Section 7.3)
Widespread habitat	Ecology and nature conservation (see Section 7.3) Agricultural land use and recreation (see Section 7.12)
Groundwater (drinking water and non-drinking water)	Water environment (See Section 7.5)
Soil or sediment	Ecology and nature conservation (see Section 7.3) Geology and ground conditions (see Section 7.4)
Built environment (designated buildings /sites)	Historic environment (see Section 7.1)
Particular species	Ecology and nature conservation (see Section 7.3)
Freshwater	Water environment (see Section 7.5)
Population and human health	Air quality (see Section 7.7) Traffic and transport (see Section 7.6) Noise and vibration (see Section 7.8) Socio-economic effects (see Section 7.10) Health and wellbeing (see Section 7.11)

7.14.14 The assessment will include all sources that have been relied upon in establishing the baseline conditions.

7.14.15 The susceptibility and sensitivity of the environmental and human receptors to major accidents and disasters will be assessed through information derived from the other relevant environmental

topic assessments.

Study Area

- 7.14.16 The proposed study areas for the identification of receptors (baseline environment) are (see Figure 7.14.1):
- 10 km from the Project site boundary for ground-based events and receptors including: human populations outside of the airport (including workers and public), inside the airport (workers, third parties, the public and occupants of aircrafts), internationally designated sites (SPAs, SACs and Ramsar Sites) and other statutory designated sites (SSSIs and LNRs) and where water bodies could act as pathways to more distant receptors; and
 - 1 km from the Project site boundary for all other environmental receptor groups (eg other designated land, biodiversity and heritage assets).
- 7.14.17 The proposed study areas for the assessment of effects are (see Figure 7.14.1):
- 10 km from the Project site boundary for wider events such as those related to airspace; and
 - 1 km from the Project site boundary for ground-based/on-site events.
- 7.14.18 The distances and buffers used for the study area are based on consideration of the nature of potential major accidents and disasters at Gatwick and have been informed by expert judgement. The selected study areas are consistent with the assessment of major accidents and disasters for similar facilities. Should the assessment process identify that the study area for the identification of environmental receptors needs to be expanded, the study areas will be amended.

Effects Proposed to be Assessed

- 7.14.19 Currently, there is no well-established guidance or standard for assessment of major accidents and disasters within EIA and various approaches have been adopted in recent practice. This section outlines the proposed approach to the assessment, which has been developed based on principles set out primarily in the 2015 COMAH Regulations and the Health and Safety Executive (HSE) document *'Reducing Risk, Protecting People'* guidance (HSE, 2001) and the *'Chemicals and Downstream Oil Industry Forum (CDOIF) Environmental risk tolerability'* guideline for COMAH establishments (CDOIF, 2015). Emerging best practice for evaluation of major accidents and disasters assessment from other recent airport projects has been reviewed and integrated into the proposed approach.
- 7.14.20 The assessment will consider major accident and disaster events/scenarios in two main categories:
- Vulnerability of the Project to external natural and manmade hazards; and
 - Major accidents and disasters events and risks which could be generated or exacerbated by the Project.
- 7.14.21 The assessment will consider potential events during both construction (including demolition) and operational phases of the Project.
- 7.14.22 Major accidents and disasters by their nature are 'unplanned' (ie with the potential for effects that are not part of the intended design, construction or operation) and will be infrequent. The assessment of possible major accident and disaster events/scenarios therefore focusses on the

determination of the potential risk and the 'tolerability' of that risk.

Approach to Assessment of Effects

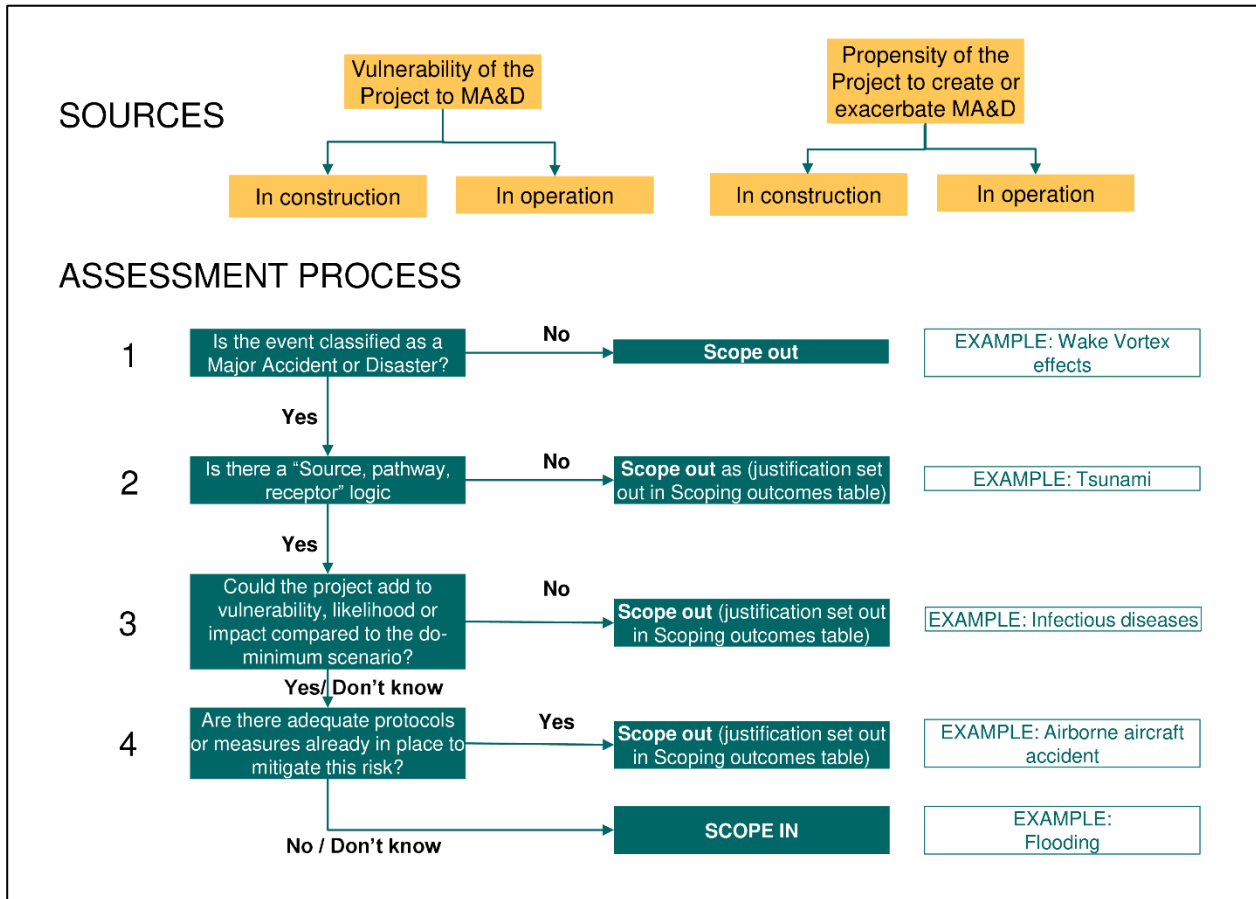
Overview

- 7.14.23 The first stage in this approach is to identify a comprehensive list of possible major accident and disaster events/scenarios. As set out above, the assessment will consider those events that could arise externally and those that could occur as a result of the Project during both construction and operational phases.
- 7.14.24 Once the events/scenarios have been identified, two risk assessments will then be undertaken: a safety risk assessment to determine the risk to human health; and an environmental risk assessment to evaluate the risks to environmental receptors. Risk will be determined through consideration of the combination of the potential for harm/damage to a receptor and the likelihood of the event.
- 7.14.25 Further details of the identification of major accident and disaster events/scenarios and the safety and environmental risk assessment methodologies are provided in the subsequent sections.

Event/Scenario Identification

- 7.14.26 A comprehensive long-list of major accident and disaster events/scenarios with the potential to impact human and environmental receptors has been generated. The list was initially developed from the events included in the National Risk Register of Civil Emergencies (Cabinet Office, 2017). This list was then expanded by considering events included in the Major Accident Reporting System (eMARS) and CAP 1036: Global Fatal Accident Review 2002 to 2011 (EC, 2018; CAA, 2013) guidance documents. In addition, information on potential major accidents and disasters events/scenario were also collated from key Gatwick Airport safety staff.
- 7.14.27 The list of potential major accident and disaster events/scenarios was preliminary screened to determine whether there was potential for a risk to occur in the study area. Four 'scoping tests' were applied to determine whether a particular event should be scoped in or out of the EIA process. This process is set out in Diagram 7.14.1. Major accident and disaster events/scenarios were scoped in only if they met all four scoping tests.
- 7.14.28 The scoping outcomes table in Appendix 7.14.1 and summarised in paragraph 7.14.47, explain the scoping decision for each of the potential events/scenarios in the long list and provides a justification for scoping in or out the event from the EIA process. As set out in Diagram 7.14.1, events which are not classified as 'major' (ie no risk of 'serious' danger or damage) and events/scenarios where there is no source, pathway, receptor route are proposed to be scoped out of the assessment. Events where the Project would not potentially increase the risk compared to the do-minimum scenario, or where strong measures and protocols are already in place to manage the risk, are also proposed to be scoped out, with a full justification provided in the scoping outcomes table including evidence of existing measures. Any remaining events on the long-list are proposed to be scoped into the EIA process and will be subject to further assessment.

Diagram 7.14.1: Decision Making Process for Scoping Major Accidents and Disaster Events/Scenarios



7.14.29 All aircraft within the air space and on the ground at Gatwick Airport are included in the scope of the major accidents and disasters assessment.

7.14.30 The list of major accident and disaster events/scenarios will be subject to continuous review and other potential events/scenarios may also be identified during design development.

Overarching Approach to Risk Assessment

7.14.31 The major accident and disaster events/scenarios have been identified as scoped in will be assessed for their potential risks to human and environmental receptors.

7.14.32 The methodology developed for assessing the risk of major accidents and disasters to human and environmental receptors will involve the following steps:

- Evaluation of the severity/consequences of the events/scenarios;
- Determination of the likelihood of occurrence; and
- Assessment of the risk posed by each event/scenario and the tolerability of the risk(s).

7.14.33 The risk assessment will consider the Project design and embedded mitigation. This assessment will apply expert judgement to identify material adverse events and determine any intolerable risks. Assessment of risk tolerability for major accidents and disasters in the UK generally incorporates consideration of the 'as low as reasonably practicable' (ALARP) principle, which

means that intolerable risk should be eliminated and that any residual risk should be reduced where practicable. This is a requirement of the COMAH Regulations to demonstrate that relevant legislation, good practice and ‘all necessary measures’ have been adopted, and that the risks have been reduced to a level which is ALARP.

7.14.34 Where appropriate, amendments will be made to the design or further mitigation requirements will be incorporated into the Project based on the findings of the assessment process.

Safety Risk Assessment

7.14.35 The safety risk assessment approach for effects on human receptors is set out in Table 7.14.2. The evaluation also leads to a conclusion regarding the tolerability of the risk. The likelihood and severity definitions are consistent with the HSE’s general guidance on the principle of risk being ALARP (see HSE SPC 37 and 39, 2012) and the acceptability of societal risk. The risk assessment matrix below therefore provides a suitable basis for ALARP judgement.

Table 7.14.2: Major Accidents and Disasters Safety Risk Assessment Matrix

Severity	Likelihood of event to occur				
	Extremely unlikely	Very unlikely	Unlikely	Reasonably likely	Likely
None	Green	Green	Green	Green	Green
Minor	Green	Green	Green	Green	Green
Significant	Green	Green	Green	Yellow	Yellow
Severe	Green	Green	Yellow	Yellow	Red
Major	Green	Yellow	Yellow	Red	Red
Catastrophic	Yellow	Yellow	Red	Red	Red
Risk Categories					
Manage for continuous improvement		Tolerable if ALARP (incorporate risk reduction measures)		Intolerable	

7.14.36 The terms used above for severity and likelihood are defined in Table 7.14.3 and Table 7.14.4.

Table 7.14.3: Safety Risk Ranking Matrix Definition- Likelihood

Likelihood term	Likelihood range
Extremely unlikely	<10 ⁻⁵ /year, less than once per 100,000 years
Very unlikely	10 ⁻⁵ to 10 ⁻³ /year, between once per 100,000 and once per 1000 years
Unlikely	10 ⁻³ to 10 ⁻¹ /year, between once per 1000 and once per 10 years
Reasonably likely	10 ⁻¹ to 1/year, between once per 10 years and once per year
Likely	>1 per year, greater than once per year

Table 7.14.4: Safety Risk Ranking Matrix Definition- Severity

Severity	Definition	
None	Personnel	No injury or damage to health
	Public	No injury or damage to health
Minor	Personnel	Minor injury
	Public	Nuisance offsite
Significant	Personnel	Lost time accident
	Public	Short term, minor effects
Severe	Personnel	Single or few serious injuries.
	Public	Few people require hospital treatment. Emergency plan in operation.
Major	Personnel	Single or few fatalities (<5). Many serious injuries.
	Public	Serious injuries. Tens in hospital.
Catastrophic	Personnel	Many fatalities (5 or more). Numerous serious injuries.
	Public	One or more fatalities. Several serious injuries

7.14.37 With regard to risk, it is noted that Table 7.14.2 indicates, for example, that:

- A 'Major' event (single or few fatalities) becomes 'intolerable' at the 'reasonably likely' likelihood of >10⁻¹/year;
- A 'Catastrophic' event (many fatalities) becomes 'intolerable' at the 'unlikely' likelihood of >10⁻³/year; and
- A 'Major' event (single or few fatalities) becomes 'manage for continuous improvement' only at the 'extremely unlikely' likelihood of <10⁻⁵ /year.

7.14.38 These results from the risk matrix are broadly consistent with the HSE's general guidance on ALARP (see HSE SPC 37 and 39, 2012) and the acceptability of societal risk, and the risk matrix above therefore provides a suitable basis for ALARP judgements.

Environmental Risk Assessment

- 7.14.39 A common methodology has been published by the CDOIF for the purpose of determining the tolerability of environmental risks for COMAH establishments. Once a set of accident scenarios has been identified, the methodology typically involves the following stages:
- Assess potential impacts of events/scenarios to determine the level of severity/harm and the duration/recovery;
 - Combine the level of severity/harm and the duration/recovery to determine the 'consequence level'; and
 - Use of a risk matrix, combining the consequence level and likelihood of major accident and disaster events/scenarios to determine the overall risk and the tolerability of that risk.
- 7.14.40 The assessment of potential impacts will be undertaken based on the source-pathway-receptor approach. This approach typically involves an estimate of the quantity and composition of material which could escape (the source), the routes by which it could travel off-site (pathways) and the environmental sensitivity of the receiving environment (receptors):
- Source - refers to the hazardous materials (pollutants) and physical effects (eg thermal radiation and blast overpressure) that may be released in the event of a major accident;
 - Pathway - the means by which any pollutant can escape to the environment. Pathways may be internal (within the boundaries of the site) or external; in the latter case pathways can extend for several kilometres or more; and
 - Receptor - the features of the environment which could be affected (directly or indirectly) by the escape of pollutants to the receiving environment.
- 7.14.41 For there to be environmental harm with the potential to result in a major accident to the environment (MATTE), all three components of the source-pathway-receptor process must be present and linked together. Where it is established that a complete linkage exists, an environmental consequence assessment will be undertaken. Typically, the assessment is a qualitative or semi-quantitative process. The potential environmental effects will then be compared to the criteria provided in the CDOIF Guideline document to determine the level of severity/harm and the duration/recovery rate for effects on a particular type of receptor. The CDOIF severity/harm and duration/recovery criteria take into account the sensitivity of each type of receptor considered.
- 7.14.42 Severity is described as significant, severe, major or catastrophic. In the context of the CDOIF Guideline, a 'significant' level of harm is the lowest level of harm and would not result in a MATTE (ie it would be 'sub-MATTE'). Therefore, for the purposes of this assessment 'significant' has a different meaning to that set out within the EIA Regulations and does not equate to a significant overall effect. 'Severe' is the lowest level of harm that may be considered to be a MATTE. The MATTE definitions, in relation to the severity of effects, are described in Appendix 4, Table 4.1 of the CDOIF.
- 7.14.43 Duration / recovery criteria are based on unmitigated consequences and are different for different types of receptors. Harm/recovery durations are judged to be 'short-term', 'medium-term', 'long-term' or 'very long-term'. 'Short-term' harm is not considered to be a MATTE (sub-MATTE).
- 7.14.44 If either the severity of impact or the duration of an event are identified as being sub-MATTE, the

event will not be not considered further in the risk tolerability assessment in the CDOIF guidance; implying that such outcomes are of low risk, and at the very least could be considered 'broadly acceptable'.

- 7.14.45 Where both the level of severity/harm or the duration/recovery category of an event are assessed to be of MATTE potential, the consequence level will be determined. The environmental risk, and the associated tolerability, will be determined using the CDOIF Guideline Tolerability Assessment Matrix, which combines the consequence level with the likelihood of the major accident and disaster events/scenarios occurring.

Approach to Mitigation, Enhancement and Monitoring

- 7.14.46 The approach to mitigation envisaged to prevent or mitigate potential adverse effects of major accidents and disasters on the environment will be set out within the PEIR/ES. Mitigation for major accidents and disasters will include measures to minimise the risk of the occurrence of an event and to mitigate the effects of an event, if it was to occur, including measures to increase the resilience of the Project to such events. This will also include details of preparedness for and proposed response to such emergencies.

Issues Proposed to be Scoped Out

- 7.14.47 Table 7.14.5 presents the potential events/scenarios proposed to be scoped in and out of the assessment. The detail behind each scoping decision is based on the analysis in Appendix 17.14.1.

Table 7.14.5: Potential Major Accidents and Disasters Events/Scenarios Proposed to be Scoped In and Out of the Assessment

Events/Scenarios	Construction	Operation
Flooding (coastal and tidal)	×	×
Flooding (rainfall)	✓	✓
Flooding (riparian)	✓	✓
Earthquake	✓	✓
Subsidence	✓	✓
Landslide	✓	✓
Extreme heat/cold (runway degradation)	✓	✓
Extreme heat/cold (air operations)	×	×
Snow (including ice and hail) (building snow loading)	✓	✓
Snow (including ice and hail) (air operations)	×	×
Tsunami	×	×
Storm surge	×	×
Extreme storm (building damage)	✓	✓
Extreme storm (aircraft)	×	×

Events/Scenarios	Construction	Operation
Lightning	×	✓
Wild fire	✓	✓
Volcanic Eruption	×	×
Ash Cloud	×	×
Infectious diseases (epidemics and pandemics)	×	×
Infectious animal diseases (epidemics, pandemics, animal plagues and pests)	×	×
Climate change	✓	✓
Drought	×	×
Famine and food security	×	×
Severe space weather	×	×
Dam failure	×	×
Contamination (drinking water)	✓	✓
Large and small attacks (biological and chemical)	×	×
Malicious attack	×	×
Terrorism	×	×
Sabotage, vandalism, trespass and theft	×	×
Drones and lasers	×	×
Industrial action	×	×
Widespread public disorder	×	×
Cyber-attacks and digital/data security	×	×
Displaced population	×	×
External objects (for example Bird strike/fireworks/ sky lanterns/wind turbine)	×	×
Fire/explosion at neighbouring site	×	×
Structural collapse at neighbouring site	×	×
Excavation failure at neighbouring site	×	×
Transport accident (runway taxiway and apron)	×	×
Transport accident (airborne)	×	×
Aircraft wake vortex	×	×
Transport accident – other vehicles (airside and landside)	✓	✓
Transport accident – Rail	✓	×
Accidental release of hazardous chemical	✓	✓
Fire	✓	✓

Events/Scenarios	Construction	Operation
Explosion	✓	✓
Structural collapse	✓	✓
Collapse of excavation	✓	✗
Legacy issues (unexploded ordnance)	✓	✗
Occupational hazards	✓	✗
Damage to important artefacts	✗	✗
Deficient safety/environmental management systems	✗	✗
Deficient emergency planning, preparedness or provision	✗	✗
Loss of utilities	✓	✗
Loss of essential air safety or airside systems	✗	✗
Deficient security provisions	✗	✗

7.15 Cumulative Effects and Inter-relationships

Relevant Policy, Legislation and Guidance

7.15.1 The following key legislation, policy and guidance documents relevant to the cumulative assessment will be considered:

- The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended);
- Airports NPS (Department for Transport, 2018a);
- NPS for National Networks (Department for Transport, 2014);
- Planning Inspectorate Advice Note Nine: Rochdale Envelope (Planning Inspectorate, 2018a)
- Planning Inspectorate Advice Note Seventeen: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects (Planning Inspectorate, 2015a); and
- Design Manual for Roads and Bridges (DMRB) HA205/08 (Highways Agency *et. al.*, 2008)

7.15.2 The EIA Regulations require an ES to consider cumulative and inter-related effects. Cumulative effects result from multiple actions on receptors and resources over time and are generally additive or interactive (synergistic) in nature. Cumulative impacts can also be considered as:

'Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project.' (European Commission, 1999).

7.15.3 It is good practice to consider the inter-relationships between topics that may lead to environmental effects. For example, the separate impacts of noise and habitat loss may have an effect upon a single ecological receptor.

Cumulative Effects Assessment

- 7.15.4 The EIA Regulations state in Schedule 4(5) that an assessment should provide a description of the likely significant effects, including cumulative effects, that could occur as a result of the Project in combination with other developments:

‘(e) the cumulation of effects with other existing and/or approved projects, taking account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;

...

The description of the likely significant effects on the factors specified in regulation 5(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary...effects of the development.’

- 7.15.5 The need for a cumulative assessment is also described in the Airports NPS which states that:

‘When considering significant cumulative effects, any environmental statement should provide information on how the effects of an applicant’s proposal would combine and interact with the effects of another development (including projects for which consent has been granted, as well as those already in existence if they are not part of the baseline)’ (Paragraph 4.14).

Assessment of Inter-related Effects

- 7.15.6 The EIA Regulations (Regulation 5(2)(e)) require that the EIA process should identify, describe and assess the significant effects in relation to:

‘(e) the interaction between the factors referred to in sub-paragraphs (a) to (d) [population and human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage and the landscape.]’

- 7.15.7 In addition, the Airports NPS also states that:

‘The Examining Authority should consider how significant cumulative effects, and the interrelationship between effects, might as a whole affect the environment, even though they may be acceptable when considered on an individual basis or with mitigation measures in place’ (Paragraph 4.15).’

- 7.15.8 The Planning Inspectorate Rochdale Envelope Advice Note (Planning Inspectorate, 2018a), states that the assessment should:

‘...ensure that the assessment of the worst case scenario(s) addresses impacts which may not be significant on their own but could become significant when they inter-relate with other impacts alone or cumulatively with impacts from other development (including those identified in other aspect assessments).’

DMRB Guidance

- 7.15.9 The DMRB also provides guidance on this topic. Although directly relevant to the assessment of road schemes/new highways infrastructure, it is widely recognised as useful in the context of other types of major infrastructure project. Although not the main guidance consideration for this type of project, the DMRB (Volume 11, Section 2, Part 5) (Highways Agency *et al.*, 2008)

provides useful definitions and assessment methodologies for inter-related effects, and therefore this document has been taken into consideration in this assessment. The DMRB defines the following two types of effects:

- Type (i) effects are those that arise from the combined action of a number of different environmental topic-specific impacts from a single scheme upon a single receptor / resource. The guidance states that, when considered in isolation, the environmental effects upon any single receptor/resources may not be significant. However, when all effects from a single scheme are considered together, the resulting combined effect may be significant.
- Type (ii) effects are those that arise cumulatively from different projects (in combination with the project being assessed).

7.15.10 The guidance sets out factors to be considered in the assessment of such effects:

- Which receptor/resources are affected?
- How will the activity or activities affect the condition of the receptor/resource?
- What are the probabilities of such effects occurring?
- What ability does the receptor / resource have to absorb further effects before changes become irreversible?

Proposed Approach and Scope of Assessment

Approach to Cumulative Effects Assessment

7.15.11 A range of guidance is available on cumulative effects assessment (CEA) but at present there is no single, agreed industry standard method. Planning Inspectorate Advice Note Seventeen (Planning Inspectorate, 2015a) provides a clear and systematic approach to cumulative effects assessment which forms the basis of the CEA for the Project. That approach consists of a four-stage process, as outlined in Table 7.15.1.

Table 7.15.1: Summary of the Four Stage Approach to CEA

CEA Stage	Activity
Stage 1	Identify a long list of 'other developments' using the tiered approach (see below). In order to do this the Zone of Influence (Zol) for each topic area will be identified which will form the basis of the search area. The developments included in the long list will be included along with important information and the assigned tier.
Stage 2	Develop a shortlist of 'other developments' which will be considered within the CEA. Inclusion/exclusion criteria outlined below will be used to define the shortlist. The shortlist will be consulted upon with statutory and non-statutory consultees during the EIA process.
Stage 3	A desk study will be undertaken to gather the appropriate environmental information (if available) for the identified 'other developments' in the shortlist.
Stage 4	An assessment of the likely cumulative effects. Mitigation measures will be identified (where appropriate) where an adverse cumulative effect is identified. The apportionment of effect between the Project and the 'other developments' will be considered, eg the contribution to the effect demonstrably related to one development or is there an equal contribution from either development.

Stage 1

7.15.12 The Zol for each topic area has been identified primarily based on the extent of likely effects. Each topic area has used industry specific guidance along with professional judgement and knowledge of the local area to define the geographical Zol. The identified Zols are presented in Table 7.15.2 below.

Table 7.15.2: Zone of Influence for Cumulative Effects Assessment

Topic	Zone of Influence
Historic Environment	Built Heritage: 3 km Archaeology: 1 km
Landscape, Townscape and Visual Resources	Landscape, townscape and visual receptors: 5 km Landscape tranquillity, visual receptors (overhead aircraft): overflying aircraft below 7,000 feet within NPR.
Ecology and Nature Conservation	Nationally and locally designated sites: 5 km European designated sites: 20 km (may be extended for SACs designated for bats should relevant species be identified on the Project site) Additional internationally, nationally and locally designated sites within 200 m of significant surface access routes. Protected species records: 2 km (and 10 km for bats). General surveys: within the Project boundary. Bats surveys: woodland in the surrounding landscape if they support bat roosts/ would help understanding of bat use. Otter surveys: 500 m up and down stream of major water resources entering the Project site.
Water Environment	General: 2 km (may be extended if a hydrological pathway is identified) Geomorphology: the catchments of the receptors that could be directly impacted by the Project plus at least 2 km upstream and downstream of the impacted areas.
Hydrogeology, Geology and Ground Conditions	500 m
Traffic and Transport	Affected road network calculated using SERTM (highway) model. Affected rail network and PLANET South (railway) model.
Air Quality	Construction dust emissions: 350 m from construction activities. Trackout: 500 m along construction traffic routes from site entrance(s). Construction road traffic emissions: ADMS-Roads dispersion modelling software Operation Emissions: ADMS- Airport Dispersion modelling software (11 km by 10 km centred on the airport)
Noise and Vibration	Zol will be determined based on the results of noise modelling. The extent to include all receptors likely to experience adverse effects.
Climate Change and Carbon	Adaptation & Resilience In-combination Climate Change Impact: dependent on related topic, eg flood risk.

Topic	Zone of Influence
	Climate Change Resilience: the Project itself. Greenhouse Gases GHG emissions from the Project to the global climate in context of UK nation GHG targets.
Socio-Economic Effects	Local study area to include the surrounding six local authorities (Crawley, Horsham, Mid Sussex, Mole Valley, Reigate and Banstead and Tandridge). Labour market area extends wider to also include Croydon, Wealden, Lewes, Brighton and Hove, Mid Sussex, Eastbourne, Adur and Worthing, and Arun, as well as those indicated above. 'Five authorities' area will be used as the widest extent to include the County areas of East Sussex, West Sussex, Kent and Surrey, plus the unitary authority of Brighton and Hove.
Health and Wellbeing	For initial analysis, data collection will focus on the local authority districts of Crawley and Reigate and Banstead, with data for areas within the surrounding counties of West Sussex and Surrey (where appropriate), using regional (South East) and national (England) averages as comparators. Health-specific data will be tailored in geographic scope to the varying health determinants being assessed, and the requirement of the individual health assessment protocols being applied.
Agricultural Land Use and Recreation	Agriculture: Agricultural land within the Project site and the wider land holdings. Recreation: The Project site, any resources that lie immediately adjacent to the Project site and any links to it.

7.15.13 The overarching criteria used in the desk study for long-listing potentially-relevant 'other developments' are:

- Other developments with the potential for overlap with the Project in terms of impacts on sensitive receptors; or
- Other developments that introduce new sensitive receptors that could be impacted by the Project, where existing receptors assessed are not adequately representative of effects.

7.15.14 These overarching criteria generally exclude minor household applications and business applications (such as extensions or changes of use), of which there are very large numbers at any given time and are not likely to result in significant cumulative effects. Nevertheless, minor applications will be reviewed within 1 km of the Project site and a judgement taken as to whether they could result in any significant cumulative effects. Any minor applications that could result in significant cumulative effects would be included in the assessment.

7.15.15 Applications that introduce new receptors will be identified and considered within each topic chapter, where appropriate.

7.15.16 Table 7.15.3 provides a summary of the search criteria used to identify 'other developments' for the long list. Known 'other developments' located outside of the search radius have been considered on a case by case basis as to whether they are likely to result in cumulative effects. These have been included in the long list as appropriate.

Table 7.15.3: Search Criteria for Long List Developments

Development/plan	Search timescale	Search radius	Screening criteria				
			Housing unit (no)	Housing land (ha)	Non-residential (m2)	Non-residential (ha)	
Nationally Significant Infrastructure Projects	5 years previous from 01 April 2019	15 km	Screened in				
Transport and Works Act Orders (TWAOs)			Screened in				
Hybrid Bills			Screened in				
“Major applications” to LPA		Large Scale	8 km	200+	4+	10,000+	2+
		Small Scale		10-199	0.5 – 4	1,000 – 10,000	1-2
Other applications to LPA		1 km	Considered on a case by case basis				
Local Development Plan allocations	8 km	Screened in with less weight given to emerging plans.					

7.15.17 The types of ‘other development’ considered in the CEA are set out below (adapted from Table 3 of Planning Inspectorate Advice Note Seventeen). The key difficulties in any CEA relate to the level of detail available in relation to ‘other developments’ and the reliance that needs to be made on environmental assessment carried out by others. For those applications at earlier stages of development or those for which EIA has not been undertaken, professional judgement and knowledge of the study area will be employed to consider the receptors or resources that may be affected by the Project and the ‘other developments’ in question.

Table 7.15.4: ‘Other Developments’ for inclusion in the CEA (Adapted from Planning Inspectorate, 2015a)

Tier	Description	
Tier 1	Under construction (however, where projects are expected to be completed before construction of the Project and the effects of those projects are fully determined, effects arising from them should be considered as part of the baseline).	Decreasing level of detail likely to be available.
	Permitted application(s) but not yet implemented.	
	Submitted application but not yet determined	
Tier 2	Planning applications where a scoping report has been submitted.	
Tier 3	Projects on the planning register where a scoping report has not yet been submitted.	
	Sites identified in the relevant Local Development Plans (and emerging Local Development Plans – with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposal will be limited.	

Tier	Description
	Other plans and programmes (as appropriate) which set the framework for future development consent/approval, where such development is reasonably likely to come forward.

7.15.18 The long list identified using the above method is presented in Appendix 7.15.1 along with figures showing the location of each development. Each development on the long list has been assigned a tier based on Table 7.15.4. This list will be updated periodically during the EIA process, informed by consultation and modelling confirming the extent of study areas, and will be finalised approximately three months prior to the submission of the ES.

Stage 2

7.15.19 The following criteria will be used in screening developments for inclusion in the shortlist. These criteria however are not exhaustive or wholly prescriptive: expert judgement by the EIA team will also be applied throughout. The following developments will be included in the shortlist:

- EIA developments or those where an un-determined EIA screening or scoping request indicated the possibility of significant environmental effects was foreseen.
- 'Major developments' where identified as such in planning application or decision.
- Developments whose scale, nature or location suggests potential for particular cumulative impacts - eg an industrial or combustion process as a source of air or water pollutant or noise emissions, a potential large traffic generator such as distribution warehouse or retail park, or a development in proximity to designated site or other asset.
- Completed developments that may not be captured in baseline studies (eg due to very recent start of operation).
- Developments that introduce sensitive receptors for which the assessment of effects on existing sensitive receptors identified through baseline study and included in the assessment of a particular environmental impact would not be representative.
- All long-listed NSIPs.

7.15.20 Developments not meeting these inclusion criteria and/or not considered to have potential for cumulative effects will be screened out of the shortlist.

Stage 3

7.15.21 A desk study search of the available environmental information available for each of the 'other developments' listed in the shortlist will be undertaken. This will include searching on Local Planning Authorities and the Planning Inspectorate' websites.

Stage 4

7.15.22 The CEA will not aim to assign significance levels for the identified effects. Instead the assessment is to be used to identify where there is the potential for cumulative effects to occur and to provide details of whether cumulative effects are likely to be significant. A statement will be made as to whether the cumulative effect would be worse or better than the effects predicted for the Project alone, whether the cumulative effects have the potential to be more significant than the effects of the Project alone and, if so, whether this would be adverse or beneficial.

Approach to Assessment of Inter-related Effects

- 7.15.23 The study areas or Zol for the assessment of inter-related effects have been informed by the study areas used in the topic specific assessments. The Zol used in the assessment of inter-related effects is the same as those used in the CEA, outlined in Table 7.15.2.
- 7.15.24 The approach to assessing inter-related effects will follow a four stage process as summarised in Table 7.15.5 and discussed in the following paragraphs.

Table 7.15.5: Summary of the approach for assessment of inter-related effects

Stage	Description
1	Assessments undertaken for individual EIA topic areas within the ES.
2	Review of the likely receptor(s)/resource(s) affected by more than one impact through analysis of the assessment of effect sections undertaken for individual EIA topic areas.
3	Identification of potential combination effects on these receptor groups through review of the topic specific assessments in the ES chapters.
4	Assessment undertaken on how individual effects may combine to create inter-related effects on each receptor group for 'Project lifetime effects' and 'receptor led effects'.

Stage 1: Topic-specific Assessments

- 7.15.25 The first stage of the assessment of inter-related effects will be presented in each of the individual topic chapters and will comprise the individual assessments of effects on receptors across the construction and operational phases of the Project. The findings of these assessments will be presented within the topic chapters of the ES.

Stage 2: Identification of Receptor Groups

- 7.15.26 Stage 2 will involve a review of the assessments undertaken in the topic-specific chapters to identify 'receptor groups' requiring assessment within the inter-related effects assessment. The term 'receptor group' is used to highlight that the approach taken for the inter-related effects assessment does not assess every individual receptor assessed during the EIA, but rather potentially sensitive groups of receptors. The receptor groups assessed can be broadly categorised as follows:

- Landscape and visual resources: designated sites; landscape character; visual receptors (residents; users of public rights of way; other visual receptors);
- Historic environment: buried archaeology; designated heritage assets; settings of heritage assets;
- Land use and recreation: agricultural land; farm businesses; users of and common land;
- Socio-economics: employment levels, housing and other local services; tourism;
- Ecology and nature conservation: ecologically designated sites; important habitat features; protected species;
- Traffic and transport: road users, residents; pedestrians/cyclists; sensitive local uses (eg schools, hospitals, local facilities);
- Noise and vibration: residents, users of; users of other land uses (eg places of work);

- Air quality: residents; places of public amenity/public attractions; places of work; schools/hospitals; species/habitats;
- Health: residents in the local area;
- Climate change: global climate;
- Water environment: surface water bodies; flood risk (residents; other land uses); and
- Geology and ground conditions: geologically designated sites; land/soils; groundwater (including aquifers and Source Protection Zones).

Stage 3: Identification of Potential Inter-related Effects on Receptor Groups

7.15.27 Consideration will be given to the potential for inter-related effects to arise for each of the identified receptor groups across the project phases (ie project lifetime effects) as well as the interaction of multiple effects on a receptor (ie receptor-led effects), as defined below:

- Project Lifetime Effects - Assessment of the scope for effects that occur throughout more than one phase of the project (construction, operation and maintenance, and decommissioning) to interact to potentially create a more significant effect on a receptor than if assessed in isolation.
- Receptor-led Effects - Assessment of the scope for multiple effects to interact, spatially and temporally, to create inter-related effects on a receptor or receptor group. As an example, multiple effects on a given receptor such as local residents – construction dust and noise, increased traffic and visual change may interact to produce a greater effect on this receptor than when the effects are considered in isolation. Receptor-led effects might be short term, temporary, or incorporate longer term effects.

Stage 4: Assessment of the Inter-related effects on Each Receptor

7.15.28 Individual effects on each of the receptor groups identified above will be considered. A descriptive assessment of the scope for these individual effects to interact to create a different or greater effect will then be undertaken. The assessment will be undertaken qualitatively, and professional judgement will be used to identify whether significant inter-related effects are considered likely.

7.15.29 The assessment will not assign significance levels. Instead the assessment is to be used to identify where there is the potential for inter-related effects. A statement is made as to whether the inter-related effects would be worse or better than the effects considered alone, and if so, whether this would be adverse or beneficial.

Mitigation

7.15.30 The assessments of cumulative and inter-related effects will be undertaken assuming the mitigation measures presented within the ES are enforced and put in place. If potential significant cumulative or inter-related effects are considered likely further mitigation measures which are applicable and feasible for implementation by GAL, will be presented and assessed.

7.16 Transboundary Effects

7.16.1 Transboundary effects arise when impacts from a development within one European Economic Area (EEA) state affect the environment of another EEA state(s). The need to consider such

transboundary effects has been embodied by the United Nations Economic Commission for Europe Convention on EIA in a Transboundary Context (commonly referred to as the 'Espoo Convention'). The Convention requires that assessments are extended across borders between Parties of the Convention when a planned activity may cause significant adverse transboundary impacts.

- 7.16.2 Schedule 3 of the EIA Regulations requires that *'the likely significant effects of the development on the environment must be considered... taking into account - ... (c) the transboundary nature of the impact'*. Further, at Schedule 4, the EIA Regulations state that the ES must include *'The description of the likely significant effects on the factors specified in regulation 5(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary... effects of the development'*. Regulation 32 also obligates the Planning Inspectorate to form a view on the potential for transboundary impact and consult with relevant EEA states.
- 7.16.3 The Planning Inspectorate Advice Note Twelve (Planning Inspectorate, 2018b) outlines the legal context and the process to undertake a transboundary assessment. The advice note states that the Inspectorate should determine whether or not the development is likely to have significant effects on the environment within another EEA State. A transboundary screening exercise has been undertaken to aid the Inspectorate and details are provided in Appendix 7.16.1. The information presented in this appendix identifies that significant effects on other EEA States are not likely, therefore a transboundary assessment has been scoped out of the EIA process.

8 Topics Proposed to be Scoped out of the EIA Process

8.1 Introduction

8.1.1 Section 7 sets out those elements of the topic assessments that are proposed to be scoped out. In addition, the following topics are proposed to be scoped out of the EIA process.

8.2 Planning Policy Context

8.2.1 The ES will provide an overview of relevant legislative and planning policy context within each topic chapter. Each assessment will have regard to national and local policy documents.

8.2.2 In addition, details of the Planning Act and consenting regime will be provided within the introductory chapters of the ES.

8.2.3 It is not proposed to include a separate chapter on Planning Policy Context in the ES. A Planning Statement will be submitted with the application for development consent.

8.3 Material Assets

8.3.1 The EIA Regulations refer to 'material assets', including architectural and archaeological heritage. The phrase 'material assets' has a broad scope, which may include assets of human or natural origin, valued for socio-economic or heritage reasons. Material assets are in practice considered across a range of topic areas within an ES, in particular the socio-economic and historic environment chapters. These topics are proposed to be included within the ES (see Chapter 10). Therefore, no separate consideration of material assets is considered necessary.

8.4 Radiation and Heat

8.4.1 Radiation is used within airports as part of the security screening process, including metal detectors, baggage screening and staff and passenger body screening. Each of these processes is well regulated in order to ensure that receptors are not exposed to any health or environmental risk. The Project would require internal reconfiguration of airport processes but would not introduce any new sources of radiation or include any sources of radiation other than those in use at airports throughout the UK.

8.4.2 The Project would include some changes to the provision of power within the site (eg the potential use of additional biomass boilers). These would be operated in line with existing regulatory and permitting procedures and no sources of significant heat emissions to the atmosphere are anticipated.

8.4.3 Overall, the Project does not propose any new or unusual sources of heat or radiation that could lead to significant effects on the environment. The Project would operate in line with normal good practice, regulatory and permitting requirements as is the case for all other UK airports. It is therefore proposed to scope radiation and heat emissions out of the EIA process.

8.4.4 The effects of heatwaves/weather and of external hazards on the Project will be considered within the Major Accidents and Disasters technical appendix.

8.5 Daylight, Sunlight and Microclimate

8.5.1 All the proposed works for the Project would be undertaken within the boundaries of the airport. Due to the location of the proposed works and the nature of the surrounding infrastructure and land use it is not considered likely that the Project would have significant effects in relation to daylight and sunlight. In addition, the nature of the Project is not likely to result in microclimate changes and therefore this topic is also scoped out of the assessment. The effects of the Project on climate change would be considered separately in a Climate Change and Carbon chapter of the ES, as described in Section 7.9.

8.6 Decommissioning Effects

8.6.1 The Project is proposed to form a long-term part of Gatwick Airport, providing an integral part of the improved airport in order to allow an increase in flight and passenger numbers through making best use of Gatwick's existing runways. Although some elements of the Project would have a defined design life, it is proposed that all elements would be subject to continued maintenance/replacement in line with the management of the airport as a whole. Therefore, the Project, once operational, would form part of a permanent airport and no activities are proposed that would require decommissioning or associated decommissioning plans.

8.7 Airspace Change Process

8.7.1 Work is being undertaken to review the airspace over London and the south east of England, with an aim to address existing constraints and allow for future growth in air transport. This work is being undertaken by the National Air Traffic Services (NATS), in partnership with the Department for Transport and the CAA and is known as the Future Airspace Strategy Implementation (FASI) South.

8.7.2 FASI South will be developed through an airspace consultation in line with the CAA's airspace change process document (CAP1616). The timing of the process is such that any updated flightpaths would not be available within the timeframe of the EIA process for the Project. The EIA process will therefore be undertaken based on current flightpath information and information available from GAL.

8.7.3 The proposed FASI South airspace changes lie outside of the scope of this Project. However, should information become available during the course of the EIA process (at a time when the information can be taken into account prior to submission), this would be reviewed and consideration given to how the proposed changes could affect the conclusions of the EIA process.

8.7.4 Whilst it is considered that an airspace change to enable dual runway operations is unlikely to be required, GAL will submit a Statement of Need within the scope of the CAP1616 process at the appropriate time to the CAA.

9 Summary of Matters to be Scoped In/Out

9.1 Summary

9.1.1 Table 9.1.1 below summarises the scope of assessment proposed in Chapters 7 and 8 of this report. Appendix 9.1.1 provides further details of topics scoped out of the assessment.

Table 9.1.1: Summary of Proposed Scope of EIA Process

Topic	Effect	Scoped into Assessment?	
		Construction	Operation
Historic environment	Effects on buried archaeology within the Gatwick airfield and existing hardstanding areas.	✓	✗
	Effects arising from changes within settings of designated and non-designated heritage assets (within study area, except assets where settings is predominantly urban – see below).	✓	✓
	Effects on the wider historic landscape as a result of construction activity, including construction of upgraded highway junctions, use of construction compounds and creation of mitigation/enhancement areas.	✓	✓
	Effects arising from changes within settings of designated and non-designated heritage assets in urbanised areas of Horley and Crawley.	✗	✗
	Effects on the wider historic landscape.	✓	✓
Landscape, townscape and visual resources	Change in landscape/townscape character	✓	✓
	Effects on views (including effects arising from lighting) within 5 km of Project site boundary and within the ZTV.	✓	✓
	Effects on landscape landscape/townscape character and views, as a result of proposed development at Gatwick Airport, beyond 5 km of Project site boundary and areas within 5 km but outside of the ZTV.	✗	✗
	Effects on landscape tranquillity and visual receptors coinciding with overflying aircraft using NPRs and arrival flight paths at height profiles up to 7,000 feet.	✗	✓
	Effects on seascapes	✗	✗
Ecology and nature conservation	Effects on designated sites arising from disturbance and effects arising from traffic emissions to air (both surface access and airport operations)	✓	✓
	Effects on designated sites arising from direct habitat loss.	✗	✗
	Effects on nationally, or locally, designated sites due to loss of habitat used by interest feature species, habitat severance and loss of ecological connectivity, habitat disturbance, changes to air and water quality.	✓	✓

Topic	Effect	Scoped into Assessment?	
		Construction	Operation
	Effects on habitats of principal importance (Ancient woodland (both on site and in the surrounding landscape), other areas of mature broadleaved woodland, species-rich grasslands, River Mole; Gatwick Stream; Crawter's Brook; ponds; and hedgerows).	✓	✓
	Effects on species where there is a potential for significant effects to arise (likely to include great crested newt, bats, terrestrial and aquatic invertebrates, dormice, grass snakes and breeding birds).	✓	✓
	Effects on species absent from the study area or where there is no potential for significant effects to arise.	✗	✗
Geology and ground conditions	Contamination risk to public and workers on site	✓	✓
	Pollution effects arising from site runoff to soils and subsequent leaching into groundwater	✓	✓
	Effects on designated geological sites	✗	✗
	Effects on mineral extraction	✓	✓
Water Environment	Effects on flooding from fluvial and surface water sources (to on site and off site receptors)	✓	✓
	Effects on flooding from tidal/coastal sources	✗	✗
	Effects on surface water quality	✓	✓
	Effects on groundwater quality	✓	✓
	Effects on surface water features and surface water flow	✓	✓
	Effects on groundwater features and groundwater flow	✓	✓
	Effects on Water Framework Directive bodies	✓	✓
	Effects on water supply (increased demand affecting supply from local water resources zone)	✓	✓
	Effects on public water supplies from groundwater (other than one licensed supply from Upper Tunbridge Wells Sand 2 km away)	✗	✗
	Effects on licensed supply from groundwater within Upper Tunbridge Wells Sand 2 km away and any as yet unidentified private supplies which may experience significant effects.	✓	✓
Effects on the wastewater network	✓	✓	
Traffic and transport	Traffic generation and changes in flow on local highway network	✓	✓
	Severance– local highway network	✓	✓
	Driver delay – local highway network, including during construction of highway junctions	✓	✓
	Driver stress, in relation to proposed highway mitigation	✓	✓

Topic	Effect	Scoped into Assessment?	
		Construction	Operation
	Pedestrian and cyclist delay – local highway network, including during construction of highway junctions	✓	✓
	Pedestrian and cyclist amenity – local highway network, including during construction of highway junctions	✓	✓
	Accidents and safety	✓	✓
	Hazardous loads	✓	✓
	Effects on rail network and rail users, such as amenity and crowding	✓	✓
	Effects on other public transport services and users (eg bus and coach, such as amenity)	✓	✓
Air quality	Generation of dust and particulate matter – effects on human and ecological receptors	✓	✗
	NO _x , PM ₁₀ and PM _{2.5} emissions from non-road mobile machinery – effects on human and ecological receptors	✓	✗
	NO _x , PM ₁₀ and PM _{2.5} emissions from road vehicles/car parks – effects on human and ecological receptors	✓	✓
	NO _x , PM ₁₀ and PM _{2.5} emissions from aircraft emissions - effects on human and ecological receptors	✗	✓
	NO _x , PM ₁₀ and PM _{2.5} emissions from airport operations/combustion plant - effects on human and ecological receptors	✗	✓
	Emissions of odours from operations (eg aircraft fuel, wastewater facility, other airport operations/plant) causing annoyance	✗	✓
	Emissions of odours from construction	✗	✗
	Emissions of other pollutants from aircraft emissions, airport operations/combustion plant and road vehicles	✗	✗
Noise and vibration	Jettisoning of fuel from aircraft	✗	✗
	Construction noise	✓	✗
	Traffic noise	✓	✓
	Changes in aircraft noise (air noise) during operation	✗	✓
	Changes in ground noise (airside and fixed sources) during operation	✗	✓
	Effects on designated 'quiet areas'	✗	✗
	Ground noise effects from APUs	✗	✗
	Vibration from road traffic	✓	✗
	Vibration from construction activities	✗	✗
Vibration from operational activities	✗	✗	
Climate	Climate change resilience	✓	✓

Topic	Effect	Scoped into Assessment?	
		Construction	Operation
change and carbon - Adaptation & Resilience	In-combination Climate Change Impact	✓	✓
	Vulnerability to sea level rise	✗	✗
Climate change and carbon - Effects of Greenhouse Gases	GHGs arising from the extraction, processing and manufacturing of construction materials	✓	✗
	GHGs arising from transportation of materials from factory to site	✓	✗
	GHGs arising from energy use in construction activities (ie operation of plant etc)	✓	✗
	GHGs arising from transport and disposal of construction and demolition waste	✓	✗
	GHGs arising from surface access for construction staff arising from the Project	✓	✗
	Loss of carbon sink from soil organic carbon and changes arising from removal/addition of ground vegetation	✓	✗
	GHGs from aircraft in the LTO phases for flights departing Gatwick (take-off) and arriving to Gatwick (landing)	✗	✓
	GHGs from aircraft in the LTO phases for flights departing other airports (take-off) and arriving to other airports (landing)	✗	✗
	GHGs from departing flights in CCD phase	✗	✓
	GHGs from arriving flights in CCD phase	✗	✗
	GHGs from energy (fuel, electricity) use for GSE, APUs, GPU, and FEGP during operation	✗	✓
	GHGs from firefighting activities during operation	✗	✓
	GHGs from engine testing during operation	✗	✓
	GHGs from potable water supply during operation	✗	✓
	GHGs from pumping and treatment of wastewater during operation	✗	✓
	GHGs from waste treatment and disposal during operation	✗	✓
	GHGs arising from other use of aviation fuels within the airport boundary not listed above (eg training, aero clubs, helicopter usage).	✗	✓
	GHGs arising from surface access journeys from employees, passengers, and freight (rail, road)	✗	✓
	Economic effects, including effects on employment and supply chain (direct and indirect)	✓	✓

Topic	Effect	Scoped into Assessment?	
		Construction	Operation
Socio-economic effects	Effects on supply chain, labour market, disruption to businesses and residents and displacement of businesses.	✓	✓
	Effects on community facilities and services	✓	✓
	Effects on community cohesion	✓	✓
	Housing compensation	✓	✓
	Effects on property value	✗	✗
	Effects on Foreign Direct Investment (FDI) and trade	✗	✗
	Effects on Population	✗	✗
Health and wellbeing	Effects on health and wellbeing from changes in air quality and noise exposure (including effects from traffic)	✓	✓
	Effects on health and wellbeing from changes to transport nature and flow rate (safety, community connectivity)	✓	✓
	Effects on lifestyle (access to open space, barriers to physical activity)	✓	✓
	Effects on health and wellbeing arising from socio-economic factors	✓	✓
	Effects on local health care capacity	✓	✗
	Effects on health and wellbeing arising from changes in electromagnetic interference	✗	✗
	Effects on health and wellbeing arising from major accidents, fuel storage, changes to Public Safety Zones, and international communicable diseases	✗	✗
	Health risks from pests	✗	✗
	Health effects from light	✗	✗
Health and wellbeing of the workforce	✗	✗	
Agricultural land use and recreation	Permanent loss of topsoil/best and most versatile land	✓	✓
	Loss and severance of farm holdings	✓	✓
	Effects on rural designations	✓	✓
	Effects on public open space	✓	✓
	Effects on public rights of way and cycle routes	✓	✓
	Effects on common land and allotments	✗	✗
Waste	Waste arising during demolition and construction (including waste types)	✓	✗
	Waste generated during operation (including types)	✗	✓
	Waste arising from extraction and manufacture of construction materials and components.	✗	✗

Topic	Effect	Scoped into Assessment?	
		Construction	Operation
Major accidents and disasters	External natural disasters, including tsunamis, wild fire, volcanic eruption, ash cloud, infectious diseases, drought, extreme storm, famine and food security, severe space weather, and dam failure.	×	×
	External natural disasters, including flooding (including extreme rainfall events and river), earthquake, subsidence, landslide, extreme weather (heat, cold, snow, lightning), and climate change.	✓	✓
	External manmade accidents – contamination.	✓	✓
	External manmade accidents, including large and small attacks (biological and chemical), malicious attack, terrorism, sabotage/vandalism/theft, drones and lasers, industrial action, widespread public disorder, cyber-attack and digital/data security, displaced population, external objects (eg bird strike), fire/explosion at neighbouring site, structural collapse at neighbouring site, and excavation failure at neighbouring site.	×	×
	Construction and operational phase MA&D events/scenarios, including transport accident (airside ground vehicles), transport accident (landside road or construction site), and damage to important artefacts.	✓	✓
	Construction and operational phase MA&D including, transport accident (rail), accidental release of hazardous chemical, fire, explosion, structural collapse, collapse of excavation, legacy issues (unexploded ordnance), occupational hazards, and loss of utilities.	✓	×
	Construction and operational phase MA&D events/scenarios, including transport accident (aircraft incident on runways, taxiways and apron), and aircraft wake vortex.	×	✓
	Construction and operational phase MA&D events/scenarios including transport accident (airborne); deficient safety/environmental management systems; deficient emergency planning, preparedness or provision; loss of essential air safety or airside systems; and deficient security provision.	×	×

10 Structure of the ES

10.1 Proposed ES Structure

10.1.1 The EIA process will be managed by RPS, accredited members of the IEMA Quality Mark. Information about the Project will be provided by GAL. Each topic assessment will be undertaken by competent experts in that subject, as indicated below.

10.1.2 Table 10.1.1 sets out the proposed structure of the ES, together with the main author responsible for the assessment.

Table 10.1.1: Proposed ES Structure

Volume/Chapter	Topic	Author
Non-Technical Summary: Summary of the ES using non-technical terminology		
Volume 1: Text		
1	Introduction	RPS
2	Consenting Process	RPS/WSP
3	Need and Alternatives Considered	RPS/GAL
4	Existing Site and Operation	RPS/GAL
5	Project Description	RPS/GAL
6	Approach to Environmental Assessment	RPS
7	Historic Environment	RPS
8	Landscape, Townscape and Visual Resources	RPS
9	Ecology and Nature Conservation	RPS
11	Geology and Ground Conditions	RPS
10	Water Environment	Jacobs
12	Traffic and Transport	Arup
13	Air Quality	Arup (supported by Ricardo)
14	Noise and Vibration	ERM (supported by Hayes McKenzie)
15	Climate Change and Carbon	Arup
16	Socio-economic Effects	Lichfields (supported by Oxera)
17	Health and Wellbeing	RPS
18	Agricultural Land Use and Recreation	RPS
19	Cumulative Effects and Inter-relationships	Assessment team
20	Summary of Effects	RPS
21	Glossary	RPS/GAL
Volume 2: Figures		
Volume 3: Appendices		

- 10.1.3 Technical appendices will be identified throughout the EIA process but will include the following:
- Outline Code of Construction Practice;
 - Accidents and Disasters Technical Appendix;
 - Waste Strategy;
 - Historic Environment Desk-based Assessment
 - No Significant Effects Report or (if Appropriate Assessment is required following screening) as a Habitats Regulations Assessment Report;
 - Flood Risk Assessment;
 - Water Framework Compliance Assessment;
 - Transport Assessment;
 - Equality Impact Assessment;
 - Lighting Strategy; and
 - Survey reports (all topics).

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12 Glossary/Abbreviations

Term	Description
AEP	Annual Exceedance Probability
AFS	Airport Fire Service
ALARP	As Low As Reasonably Practicable
ALC	Agricultural Land Classification
Altered Northern Runway	The existing northern runway with alterations made to enable its use at the same time as the main runway
ANPR	Automatic Number Plate Recognition
AoDM	Area of Detailed Modelling
AONB	Area of Outstanding Natural Beauty
APF	Aviation Policy Framework
APCAG	Association of Parish Councils Action Group
APIS	Air Pollution Information System
APU	Auxillary Power Unit
AQMA	Air Quality Management Area
ARM	Automatic Read Meters
ASAS	Airport Surface Access Strategy
ATM	Air Transport Movement
BAP	Biodiversity Action Plan
BGS	British Geological Survey
C&I	Commercial and Industrial
CAA	Civil Aviation Authority
CAMS	Catchment Abstraction Management Strategy

Term	Description
CARE	Central Area Recycling Enclosure
CBC	Crawley Borough Council
CCAR	Climate Change Adaption and Resilience
CCC	Committee on Climate Change
CCD	Climb, Cruise, Descent
CCG	Clinical Commissioning Group
CCR	Climate Change Resilience
CDE	Construction, Demolition and Excavation
CEA	Cumulative Effects Assessment
CEH	Centre for Ecology and Hydrology
CIBSE	Chartered Institution of Building Services Engineers
CIEEM	Chartered Institute of Ecology and Environmental Management
CIF	Common Interface File
CIfA	Chartered Institute for Archaeologists
CoCP	Code of Construction Practice
COMAH	Control of Major Accident Hazard
COPD	Chronic Obtrusive Pulmonary Disease
CORSIA	Carbon Offsetting Reduction Scheme for International Aviation
CPRE	Campaign to Protect Rural England
CTMS	Construction Traffic Management Strategy
DAAD	Deviation Acceptance and Action Document
DCLG	Department for Communities and Local Government

Term	Description
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
EASA	European Union Aviation Safety Agency
EEA	European Economic Area
EIA	Environmental Impact Assessment
eMARS	Major Accident Reporting System
EMF	Electric and Magnetic Fields
ES	Environmental Statement
ETS	Emission Trading Scheme
Existing Northern Runway	Existing northern runway in its current configuration for use as an emergency/standby runway (unable to be used as a runway at the same time as the main runway)
FEGP	Fixed Electrical Ground Power
FRA	Flood Risk Assessment
GAL	Gatwick Airport Limited
GATCOM	Gatwick Airport Consultative Committee
GHG	Greenhouse Gas
GIP	Global Infrastructure Partners
GOG	Gatwick Officers Group
GPU	Ground Power Units
GSE	Ground Support Equipment
GTR	Govia Thames Link
HER	Historic Environment Record
HGV	Heavy Goods Vehicle

Term	Description
ICAO	International Civil Aviation Organization
ICCAN	Independent Commission on Civil Aviation Noise
ICCI	In-combination Climate Change Impact
IDL	International Departure Lounge
IEF	Important Ecological Feature
IEMA	Institute of Environmental Management and Assessment
IFRC	International Federation of Red Cross
ILS	Instrument Landing System
IPCC	Intergovernmental Panel on Climate Change
ITTS	Inter-Terminal Transit System
JLAG	Joint Local Authorities Members Group
LGS	Local Geological Sites
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
LOAEL	Lowest Observed Adverse Effect Level
LTO	Landing and Take Off
MA&D	Major Accidents and Disasters
Main Runway	Gatwick's existing main runway routinely used for departures and arrivals
MATTE	Major Accident To The Environment
MCC	Manual Classified Counts
MHCLG	Ministry for Housing, Communities and Local Government
MMP	Materials Management Plan

Term	Description
mppa	million passengers per annum
MRF	Materials Recycling Facility
MT	Motor Transport
mtpa	million tonnes per annum
NaTMAG	Noise and Track Monitoring Advisory Group
NCR	National Cycle Route
NMB	Noise Management Board
NNR	National Nature Reserve
NOEL	No Observed Effect Level
NPPF	National Planning Policy Framework
NPR	Noise Preferential Route
NPS	National Policy Statement
NPSE	Noise Policy Statement for England
NSIP	Nationally Significant Infrastructure Project
NTK	Noise and Track Keeping
NVZ	Nitrate Vulnerable Zone
ONS	Office for National Statistics
PATM	Passenger Air Transport Movements
PEA	Preliminary Ecological Appraisal
PEIR	Preliminary Environmental Impact Assessment
PHE	Public Health England
PINS	Planning Inspectorate

Term	Description
PPG	Pollution Prevention Guidelines
RBMP	River Basin Management Plan
RIGS	Regionally Important Geological Sites
R-NAV	Area Navigation. A method of space based navigation which permits aircraft operations on a desired flight path.
RoFSW	Risk of Flooding from Surface Water
SAC	Special Area of Conservation
SERTM	South East Regional Traffic Model
SESW	Sutton and East Surrey Water
SFRA	Strategic Flood Risk Assessment
SgZ	Safeguard Zone
SOAEL	Significant Observed Adverse Effect Level
SoCC	Statement of Community Consultation
SOLHAM	South London Highway Assessment Model
SONA	Survey of Noise Attitudes
SPA	Special Protection Area
SRN	Strategic Road Network
SSSI	Site of Special Scientific Interest
ST	Surface Transport
Standby Runway	
SuDS	Sustainable Drainage Systems
TA	Transport Assessment
TfL	Transport for London

Term	Description
The Project	Project to Make Best Use of Gatwick's Existing Runways
UKCP18	UK Climate Projections 18
UNDRR	United Nations Office of Disaster Risk Management
UNFCCC	United Nation Framework Convention on Climate Change
UXO	Unexploded Ordnance
WFD	Water Framework Directive
WSI	Written Scheme of Investigation
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility