



YOUR LONDON AIRPORT
Gatwick

*Our northern runway:
making best use of Gatwick*

Preliminary Environmental Information Report Chapter 19: Cumulative Effects and Inter-relationships

September 2021

Table of Contents

19 Cumulative Effects and Inter-relationships	19-1
19.1. Introduction	19-1
19.2. Legislation and Policy	19-1
19.3. Consultation and Engagement	19-4
19.4. Assessment Methodology	19-6
19.5. Assumptions and Limitations of the Assessment	19-19
19.6. Key Project Parameters	19-19
19.7. Mitigation and Enhancement Measures Adopted as Part of the Project	19-20
19.8. Cumulative Effects Assessment	19-20
19.9. Inter-relationships	19-28
19.10. Summary	19-48
19.11. References	19-49
19.12. Glossary	19-50

19 Cumulative Effects and Inter-relationships

19.1. Introduction

19.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the findings of the Environmental Impact Assessment (EIA) work undertaken to date concerning the potential effects of the proposal to make best use of Gatwick's existing runways (referred to within this report as 'the Project') on cumulative effects and inter-relationships.

19.1.2 This chapter considers the effects arising from the Project that may occur at the same time as effects from other developments on environmental receptors (cumulative effects), as well as the combined effects of the environmental topics covered in Chapters 7 to 18 of this PEIR on single receptors or receptor groups (inter-relationships).

19.1.3 The Cumulative Effects Assessment (CEA) element of this chapter considers effects on environmental receptors from two or more developments which could occur at the same time and which could result in greater effects than if the Project occurred on its own. The inter-related effects assessment considers effects on receptors or receptor groups, such as local residents, users of local rights of way or services, which may be affected by different environmental effects generated by the Project only. These effects could occur simultaneously or concurrently and may result in a greater effect than when considered on a topic by topic basis. This assessment therefore includes consideration of particular locations where several effects, for example noise, air quality and visual change, may all occur at the same time or one after another. Further information on the methodology can be found at Section 19.4 of this Chapter.

19.1.4 In particular, this PEIR chapter considers:

- the effects of one or more other developments alongside the effects from the Project on a single receptor;
- the effects of environmental topics over the lifetime of the Project including the construction and operation phases; and
- the receptor-led effects which result as a combination of multiple environmental effects on a single receptor or receptor groups.

19.1.5 This chapter is accompanied by Appendix 19.4.1 and Figures 19.4.1, 19.4.2, 19.4.3, 19.4.4, 19.9.1 and 19.9.2.

19.1.6 The PEIR will inform pre-application consultation. Following consultation, comments on the PEIR will be reviewed and taken into account in preparation of the Environmental Statement (ES) that will accompany the application to the Planning Inspectorate for development consent.

19.2. Legislation and Policy

Legislation

19.2.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (hereafter referred to as 'the EIA Regulations') require the EIA process 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 effects can also result from:

'Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project.' (European Commission, 1999).

19.2.2 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.

19.2.3 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.'

19.2.4 The EIA Regulations (Regulation 5(2)(e)) also 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.]'

Planning Policy Context

National Policy Statements

19.2.5 As set out in Chapter 2: Planning Policy Context, the Airports National Policy Statement (NPS) (Department for Transport, 2018), although primarily provided in relation to a new runway at Heathrow Airport, remains a relevant consideration for other applications for airport infrastructure in London and the south east of England.

19.2.6 The NPS for National Networks (Department for Transport (DfT), 2015¹) 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. This has been taken into account in relation to the highways improvements proposed as part of the Project.

¹ It is noted that the Transport Decarbonisation Plan published by DfT on 14 July 2021 announced DfT's intention to review the NPS for National Networks in due course once demand patterns post-pandemic become clearer. It is understood DfT intend to commence the review by the end of 2021 and complete it by Spring 2023. In the interim and whilst the review is undertaken, DfT have confirmed the NPS for National Networks remains relevant government policy and has full force and effect for the purposes of the Planning Act 2008.

19.2.7 Table 19.2.1 provides a summary of the relevant requirements of these NPSs in relation to the assessment of cumulative effects and inter-relationships and how these are addressed within the PEIR.

Table 19.2.1: Summary of NPS Information Relevant to this Chapter

Summary of NPS Requirement	How and Where Considered in the PEIR
Airports NPS and NPS for National Networks	
<p>In considering any proposed development the examining authority will take into account its potential adverse impacts including any longer term and cumulative adverse impacts as well as measures to avoid, reduce or compensate for any adverse impacts (paragraphs 4.4 in Airports NPS and 4.3 in NPS for National Networks).</p> <p>Any environmental statement should describe any cumulative effects (paragraphs 5.176 in Airports NPS and 5.223 in NPS for National Networks).</p>	<p>The cumulative effects of the Project with other developments are considered in Chapters 7 – 18 of this PEIR and summarised in this chapter.</p>
<p>When considering significant cumulative effects, any environmental statement should provide information on how the effects of an applicant’s proposal would combine and interact with the effects of other development (including projects for which consent has been granted, as well as those already in existence if they are not part of the baseline) (paragraphs 4.13 in Airports NPS and 4.16 in NPS for National Networks).</p>	<p>The cumulative effects of the Project with other developments are considered in Chapters 7 – 18 of this PEIR and summarised in this chapter. Other developments, including those applications which have been granted but not yet implemented and those recently constructed and not forming part of the baseline, have been considered in the cumulative ‘long list’ (Appendix 19.4.1).</p>
<p>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 (paragraphs 4.15 in Airports NPS and 4.17 in NPS for National Networks).</p>	<p>The cumulative and inter-related effects are considered and presented within this chapter of the PEIR.</p>

National Planning Policy Framework

19.2.8 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021) sets out the planning policies for England. In relation to various specific environmental topics, the NPPF states that the consenting authority should take cumulative effects into account when making a decision.

19.2.9 The National Planning Practice Guidance (NPPG) (Ministry of Housing, Communities and Local Government, 2019) supports the NPPF and provides guidance across a range of topic areas. The NPPG states that:

'Each application (or request for a screening opinion) should be considered on its own merits. There are occasions, however, when other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a proposed development. The local planning authorities should always have regard to the possible cumulative effects arising from any existing or approved development.'
(Paragraph 024, updated May 2020).

19.2.10 For individual environmental topics the NPPF reiterates the need to consider cumulative and inter-related effects.

19.3. Consultation and Engagement

19.3.1 In September 2019, Gatwick Airport Limited (GAL) submitted a Scoping Report to the Planning Inspectorate, which described the scope and methodology for 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 described those topics or sub-topics which are proposed to be scoped out of the EIA process and provided justification as to why the Project would not have the potential to give rise to significant environmental effects in these areas.

19.3.2 Following consultation with the statutory bodies, the Planning Inspectorate (on behalf of the Secretary of State) provided a Scoping Opinion on the 11 October 2019.

19.3.3 Key issues raised during the scoping process specific to cumulative effects and inter-relationships are listed in Table 19.3.1, together with details of how these issues have been addressed within the PEIR.

Table 19.3.1: Summary of Scoping Responses

Details	How/where addressed in PEIR
The Inspectorate recognises that a number of the ES aspect chapter study areas are yet to be fully defined for the purposes of the assessment (and by extension, the cumulative assessment). The ES should specifically justify the definition of each of these Zols (Zone of Influence), particularly where subjective judgements are made based on local knowledge (which should be fully explained in each case). For example, the Zol for European designations will need to be established in light of transport and air quality modelling work which may require it to be extended beyond the 20 km currently stated.	The Zols used in the CEA are based on the study areas presented within each topic chapter. The justification for the selection of each study area is outlined in Chapters 7 to 18 of this PEIR.
The implications of Heathrow's expansion should be fully identified and explored in terms of potential for significant cumulative effects across relevant aspect chapters for both construction and operation. Although the project at Heathrow is outside of the 15 km Zol, the Inspectorate considers that an increase in night flights associated with the Proposed Development (combined with Heathrow expansion and any airspace change) could impact residential amenity (and other aspects) of communities and other receptors adjacent to Gatwick Airport. The	The expansion of Heathrow has been included in the short list of other developments as a Tier 2 development. The cumulative effects with Heathrow have been assessed (where relevant) as part of the cumulative assessments in the PEIR

Details	How/where addressed in PEIR
<p>Inspectorate also expects there will be a degree of overlap in the strategic level transport modelling for both projects which will also need to be addressed within the ES (including construction Heavy Goods Vehicles (HGVs)).</p>	<p>based on the information available to date.</p>
<p>Where new ‘other development’ comes forward following the Applicant’s stated assessment cut-off date (3 months prior to submission), the Examining Authority may request additional information during the Examination in relation to effects arising from such development. The Applicant should be aware of the potential need to conduct further assessments and provide more information.</p>	<p>The long list of other developments will be reviewed up until three months prior to submission of the application for development consent. Any applications for other developments submitted after this cut off will be considered as required by the Planning Inspectorate post submission.</p>
<p>Crawley Borough Council and West Sussex County Council have highlighted the need for the Homes England “West of Ifield” development (10,000 homes) to be considered as part of the cumulative assessment, as a receptor of and a contributor towards potential cumulative effects of the Proposed Development.</p>	<p>The ‘West of Ifield’ development is included in the short list of other developments considered in this assessment (Appendix 19.4.1).</p>
<p>Surrey County Council highlight a number of recently permitted minerals developments and allocated minerals sites (which would qualify as ‘major development’ against the Applicant’s criteria). The Applicant should consider inclusion of these developments in the ‘long list’ of cumulative schemes or otherwise justify their exclusion.</p>	<p>Allocated mineral sites and permitted mineral developments for both Surrey and Sussex have been included in the long list.</p>
<p>The ES should consider the potential for cumulative effects of the Horley Employment Park as well as any influence of the Employment Park scheme on the design of the Proposed Development, with particular regard to assessment assumptions around:</p> <ul style="list-style-type: none"> ▪ proposed end uses of the site (in the absence of a masterplan for the Employment Park); and ▪ construction phasing (given that construction is estimated to take place over a twenty-year period). 	<p>The Horley Employment Park is included in the long list of other developments considered in this assessment (Appendix 19.4.1).</p>

19.3.4 Key issues raised during consultation and engagement with interested parties specific to the CEA and assessment of inter-relationships are listed in Table 19.3.2, together with details of how these issues have been addressed within the PEIR.

Table 19.3.2: Summary of Consultation

Consultee	Date	Details	How/where addressed in PEIR
Local Authority Working Groups	August 2019	Overview of approach set out. Authorities identified some potential considerations for cumulative effects, but no detailed comments made.	Long list of cumulative developments issued with scoping report – local authorities to respond through consultation responses.

19.4. Assessment Methodology

Relevant Guidance

19.4.1 A range of guidance is available on CEA and the assessment of inter-relationships but at present there is no single, agreed industry standard method. The following guidance documents have been taken into consideration for the assessment presented in this chapter.

Design Manual for Roads and Bridges

19.4.2 The Design Manual for Roads and Bridges (DMRB) provides guidance on cumulative effects and inter-relationships. 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 projects. The DMRB (LA 104) (Highways England *et al.*, 2020) 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 1 effects: A single project (eg numerous different effects impacting a single receptor) and
- Type 2 effects: Different projects (together with the project being assessed).

19.4.3 The guidance sets out the following factors to be considered in the assessment of such effects.

- Which receptors/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?

Planning Inspectorate Advice Notes

19.4.4 Planning Inspectorate Advice Note Seventeen (Planning Inspectorate, 2019) provides a clear and systematic approach to CEA which forms the basis of the CEA for the Project. The approach consists of a four stage process which is further described below.

19.4.5 In relation to the assessment of inter-relationships, the Planning Inspectorate Rochdale Envelope Advice Note Nine (Planning Inspectorate, 2018), 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).'

European Commission

- 19.4.6 The Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions published by the European Commission (1999) provide a useful explanation of the types of cumulative and inter-related effects that can occur as a result of development. The report emphasises the need for a thorough scoping process so that the CEA and inter-relationships assessment focuses on specific effects which have not already been assessed in other areas. It notes the need to identify the temporal and geographical overlap of effects as well as future and historical effects.

Study Area

- 19.4.7 The study area, or Zone of Influence (Zol), for the CEA and assessment of inter-relationships is based primarily on the study areas for each topic area for the Project as well as the study areas for each of the other developments. Further information on the Zols used in this assessment is presented below.

Methodology

Cumulative Effects Assessment

- 19.4.8 As mentioned above, the CEA methodology is primarily based on the process set out in the Planning Inspectorate Advice Note Seventeen (Planning Inspectorate, 2019) which consists of a four stage process. The four stage process and how this has been progressed is outlined in Table 19.4.1.

Table 19.4.1: 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 has been identified which forms the basis of the search area. The developments included in the long list have been included along with important information and the assigned tier.
Stage 2	From the long-list, develop a short list of 'other developments' which are considered within the CEA. Inclusion/exclusion criteria outlined below used to define the short list. The short list has been consulted upon with statutory and non-statutory consultees during the EIA process.
Stage 3	A desk study has been undertaken to gather the appropriate environmental information (if available) for the identified 'other developments' in the short list.
Stage 4	An assessment of the likely cumulative effects. Mitigation measures are identified (where appropriate) where an adverse cumulative effect is identified. The apportionment of effect between the Project and the 'other developments' is considered, eg whether the contribution to the effect is demonstrably related to one development or whether there is an equal contribution from either development.

Stage 1

19.4.9 The Zol for each topic area has been identified primarily based on the extent of likely effects. Each topic area has used topic-specific guidance along with professional judgement and knowledge of the local area to define the geographical Zol. The identified Zols are presented in Table 19.4.2 below and shown on Figure 19.4.1.

Table 19.4.2: Zone of Influence for Cumulative Effects Assessment

Topic	Zone of Influence
Historic Environment	Built heritage: 3 km. Buried archaeology: 1 km. Setting of heritage assets: overflying aircraft below 7,000 feet within noise preferential route (NPR).
Landscape, Townscape and Visual Resources	Landscape, townscape and visual receptors: 5 km and within ZTV (zone of theoretical visibility). Landscape tranquillity, visual receptors (overhead aircraft): overflying aircraft below 7,000 feet within the NPR.
Ecology and Nature Conservation	Nationally and locally designated sites: 5 km. European designated sites: 20 km (may be extended for Special Areas of Conservation (SAC) designated for bats should relevant species be identified on the Project site). Additional internationally, nationally and locally designated sites within 200 metres of significant surface access routes. Protected species records: 2 km (and 10 km for bats). General surveys: within the Project site boundary. Bats surveys: woodland in the surrounding landscape if they support bat roosts/ would help in the understanding of bat use of the Project site. Otter surveys: 500 metres up and down stream of major water resources entering the Project site.
Hydrogeology, Geology and Ground Conditions	500 metres.
Water Environment	General: 2 km (may be extended if a hydrological pathway is identified). Geomorphology: the catchments and channels of the receptors that could be directly impacted by the Project (River Mole upstream of Horley, River Mole (Horley to Hersham), Tilgate Brook and Gatwick Stream at Crawley, and Burstow Stream). Flood risk: areas within hydraulic and morphological connectivity of receptors. Wastewater: Gatwick's supporting infrastructure.
Traffic and Transport	Road network: affected road network modelled to result in a greater than 30% increase of vehicles (or the number of heavy good vehicles (HGVs) to increase by 30%) or greater than 10% in a sensitive area (or HGVs increase by 10% in a sensitive area). Rail network: affected rail network and PLANET South (railway) model.
Air Quality	Construction dust emissions: 350 metres from construction activities or 50 metres for ecological effects.

Topic	Zone of Influence
	Trackout: 500 metres along construction traffic routes from site entrance(s). Construction road traffic emissions: the extent of the road traffic model. Operation Emissions: ADMS- Airport Dispersion modelling software (11 km by 10 km centred on the airport).
Noise and Vibration	Zol includes all receptors that may experience potential adverse impacts. For example, for some air noise metrics, this area extends more than 20 km from the airport and overflights are considered beyond this, whereas for ground noise, the nearest receptors around the airport have been assessed, as at greater distances, the impacts will be lower.
Climate Change and Carbon	In-combination Climate Change Impact: dependent on related topic, eg flood risk. Climate Change Resilience: the Project itself. Greenhouse Gases (GHG): GHG emissions from the Project to the global climate in context of UK national GHG targets.
Socio-Economic Effects	Local study area includes 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 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 has focused on the local authority districts of Crawley, Reigate and Banstead, Tandridge, Mid Sussex, Horsham and Mole Valley, 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.

19.4.10 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.

19.4.11 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 which are not likely to result in significant cumulative effects. Nevertheless, minor applications have been 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 have been included in the assessment.

- 19.4.12 Applications that introduce new receptors have been identified and considered within each topic chapter, where appropriate.
- 19.4.13 Table 19.4.3 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 19.4.3: Search Criteria for Developments to be Included in the Long List

Development/plan	Search timescale	Search radius	Screening criteria				
			Housing unit (no)	Housing land (ha)	Non-residential (m ²)	Non-residential (ha)	
Nationally Significant Infrastructure Projects	5 years previous from March 2021	15 km	Screened in				
Transport and Works Act Orders (TWAO)			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.				

- 19.4.14 The types of ‘other development’ considered in the CEA are set out in Table 19.4.4 (adapted from Table 2 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 have been employed to consider the receptors or resources that may be affected by the Project and the ‘other developments’ in question.

Table 19.4.4: 'Other Developments' for Inclusion in the CEA (Adapted from Planning Inspectorate, 2019)

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 as you move down the tiers.
	Permitted application(s) but not yet implemented.	
	Submitted application(s) but not yet determined.	
Tier 2	Planning application(s) 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.	
	Other plans and programmes (as appropriate) which set the framework for future development consent/approval, where such development is reasonably likely to come forward.	

19.4.15 The long list identified using the above method is presented in Appendix 19.4.1. Each development on the long list has been assigned a tier based on Table 19.4.4.

19.4.16 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 application for development consent.

Stage 2

19.4.17 The following criteria have been used in screening developments for inclusion in the short list. These criteria, however, are not exhaustive or wholly prescriptive: expert judgement by the EIA team has also been applied throughout the CEA process. The following developments have been included in the short list.

- 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 on the planning register, or which have the potential to result in cumulative effects (based on professional judgement).
- Developments whose scale, nature or location suggests potential for particular cumulative effects - 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 a 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 Nationally Significant Infrastructure Projects, Transport and Works Act project and Hybrid Bill schemes.

19.4.18 The short listed developments are highlighted in green in Appendix 19.4.1 and summarised in Table 19.4.5. The locations of these developments are shown in Figures 19.4.2, 19.4.3 and 19.4.4. Developments not meeting these inclusion criteria and/or not considered to have potential for cumulative effects have been screened out of the short list.

Table 19.4.5: Summary of Short List of 'Other Developments' Identified for CEA

Reference Number	Application Number	Description	Distance from Project (km)
Tier 1			
2	CR/2016/0858/ARM	Forge Wood. Application for approval for reserved matters for Phase 3 Employment Building, car parking, internal access roads, footpaths, parking and circulation areas, hard and soft landscaping and other associated infrastructure and engineering works.	1.6
3	CR/2016/0083/ARM	Forge Wood. Application for approval of reserved matters for Phase 2c for the erection of 249 dwellings, car parking including garages, internal access roads, footpaths, parking and circulation area, hard and soft landscaping and other associated infrastructure and engineering works.	2.1
9	CR/2016/0962/ARM	Forge Wood. Application for approval of reserved matters for Phase 3b for 151 dwellings and associated works.	2.2
15	CR/2016/0114/ARM	Forge Wood. Approval of reserved matters for Phase 2d for the erection of 75 dwellings, car parking including garages, internal access roads, footpaths, parking and circulation area, hard and soft landscaping and other associated infrastructure and engineering works and noise.	2.1
17	CR/2016/0780/ARM	Forge Wood. Application for approval of reserved matters for Phase 3a for 225 dwellings and associated works.	2.2
46	CR/2018/0544/OUT	Application for up to 150 residential units; new site access from Birch Lea with enhanced access from Kenmara Court, demolition of the existing Oakwood Football Club.	2.1
48	CR/2017/0810/FUL	Application for the temporary use (for a period of 5 years) of the site as a Park and Ride car park, comprising 892 car parking spaces (814 long stay) and associated infrastructure.	1.2
155	CR/2018/0894/OUT	Outline application for up to 185 residential dwellings with associated vehicle and pedestrian access via steers lane, car parking, cycle storage and landscaping.	1.3

Reference Number	Application Number	Description	Distance from Project (km)
158	CR/2016/0997/FUL	Demolition of 3 existing office buildings and erection of a new b1(a) office building.	2.0
159	CR/2012/0134/OUT	Outline application for erection of a mixed use employment park to include use classes b1c, b2, b8 and a business hub accommodating a mix of uses, including b1a, b1c, b8, c1, a1, a3, a5 and car dealerships.	2.4
162	CR/2017/0997/OUT	Hybrid application for construction of a new town hall and offices, associated car parking, 182 residential units and commercial space.	3.3
52	04/02120/OUT	Comprehensive mixed use development to comprise housing (approx. 1510 dwellings), neighbourhood centre, primary school, recreation and open space uses, plus associated infrastructure and access roads linking the development to A23 and A217.	5.0
64	2019/548/EIA	Request for screening opinion for the proposed development of circa 360 residential units and a small amount of commercial development.	1.5
73	DC/17/2481	Outline planning application for the development of approximately 227 dwellings with the construction of a new access from Calvert Link, a pumping station and associated amenity space.	6.3
81	13/04127/OUTES	Outline planning application for up to 500 homes, a primary school and doctors surgery, up to 15,500 sqm employment floorspace, public open space, allotments, associated landscaping, infrastructure and pedestrian and cycle access.	2.7
102	CR/2014/0760/FUL	Crawley Local Plan 2030 (Adopted). Part of the Manor Royal Main Employment Area Site Allocation. Planning permission, subject to legal agreement, for erection of two office buildings, a four and a half storey decked car park, a single storey decked car park and surface car parking with landscaping and new access from private roads linking to Fleming Way and London Road.	1.5
103	CR/2015/0552/NCC (and subsequent reserved matters and non-material amendment applications)	Allocated in Crawley Local Plan 2030 (Adopted) known as Forge Wood. Erection of up to 1900 dwellings, 5000sq.m. of use class b1,b2 & b8 employment floorspace, 2500sq.m. of retail floorspace, a local centre/community centre (including a community hall), a new primary school, recreational open space, landscaping, the relocation of the 132kv overhead power line adjacent to the M23, infrastructure and means of access. CR/1998/0039/OUT	1.6

Reference Number	Application Number	Description	Distance from Project (km)
		permitted through appeal on 16/02/2011. A variation of condition application, CR/2015/0552/NCC, was approved in 2016 and did not change the quantum of development, the proposed land uses or for the most part the general disposition of those land uses within the site. There have since been a number of reserved matters applications for the phased stages of development (1A,1C,2A,3A) and non-material amendments made.	
281	CR/2019/0542/FUL	Demolition of existing nightclub and redevelopment of site providing 152 apartments, ground floor commercial/retail space (class A1, A3, A4, B1 and/or D2 uses) split between 2 to 4 units, new publicly accessible public realm (including pocket park), new publicly accessible electric vehicle charging hub, car club and associated works	4
283	CR/2015/0718/ARM	Allocation within Crawley Local Plan 2021-2037 (Regulation 19). Approval of Reserved Matters for Phase 2B for 169 dwellings and associated works pursuant to outline permission CR/2015/0552/NCC for a new mixed use neighbourhood	1.6
289	20/02515/SCREEN	Screening opinion for erection of a crematorium together with associated access, parking and landscaping. Screened as not EIA.	7.2
292	20/02017/S73	Part demolition of existing building, conversion of upper floors of existing building to residential with additional floor, connected 5 storey new build residential building. To provide total 43 apartments.	1.5
149	DC/10/1612	Housing/Mixed Development site allocated in the Horsham DC Planning Framework (Adopted 2015). Outline approval for the development of approximately 2500 dwellings, new access from A264 and a secondary access from A264, neighbourhood centre, comprising retail, community building with library facility, public house, primary care centre and care home, main pumping station, land for primary school and nursery, land for employment uses, new rail station, energy centre and associated amenity space. To be constructed in phases of which most are built out.	6.7
328	EIA/20/0004	EIA Scoping for West of Ifield - allocated site. The proposed development is on a site of 194 hectares in size with a minimum of 3,250 homes and up to 4,000 homes	1.5

Reference Number	Application Number	Description	Distance from Project (km)
		along with social infrastructure, green infrastructure and highway links.	
334	13/04127/OUTES	Outline planning application for up to 500 homes, a primary school and doctors surgery, up to 15,500sqm employment floorspace (B1c light industry/B8 storage and distribution), public open space, allotments, associated landscaping, infrastructure (including sub stations and pumping station) and pedestrian and cycle access	2.7
341	DM/20/4127	Outline application for an expansion of the existing commercial estate with up to 7,310 sq m of new commercial space. There is currently 3,243 sq m of existing commercial space, of which 2,530 sq m will be retained and 713 sq m of lower-quality, temporary buildings and portacabins removed.	7.3
387	CR/2018/0273/FUL	Gatwick Station. Proposed construction of new station concourse/airport entrance area, link bridges, platform canopies, back of house staff accommodation and associated improvement works.	0
Tier 2			
328	EIA/20/0004	EIA Scoping for West of Ifield - allocated site. EIA Scoping for West of Ifield - allocated site. The proposed development is on a site of 194 hectares in size with a minimum of 3,250 homes and up to 4,000 homes along with social infrastructure, green infrastructure and highway links.	1.5
385	TR020003 (PINS Reference)	Expansion of Heathrow Airport to enable at least 740,000 air traffic movements per annum and including a new runway to the north-west of the existing airport; supporting airfield, terminal and transport infrastructure; works to the M25, local roads and rivers; temporary construction works, mitigation works and other associated development.	40
Tier 3			
112	Tinsley Lane	Key Housing Site Allocation for 120 dwellings and community uses under Local Plan. Outline application CR/2018/0544/OUT for 150 units and community uses submitted in July 2018 appears to have been undetermined or withdrawn.	2.2

Reference Number	Application Number	Description	Distance from Project (km)
133	Land west of Balcombe Road, Horley Strategic Business Park	Horley Employment Park - Strategic Employment Site - 83ha with 200,000 sqm office space.	0
134	Land off the Close and Haroldslea Drive	Residential allocation, up to 40 new homes, 2.4 hectare site.	1.2
152	Land north of Rosemary Lane	Identified for a potential ca. 150 housing units, 5.12 hectare site.	1.4
153	Land east of Ifield Road	Identified for a potential ca. 150 housing units, 9 hectare site with 5 hectares developable.	1.4
356	Land adjacent to Desmond Anderson	Housing allocation for 150 dwellings	6.6
357	Land to the southeast of Heathy Farm, Balcombe Road	Housing allocation for 150 dwellings	4.1
359	Telford Place/ Haslett Avenue	Town Centre Key Opportunity Site - Housing allocation for 300 dwellings	5
361	Crawley College	Town Centre Key Opportunity Site - Housing allocation for 400 dwellings	4.7
368	Land east of Balcombe Road and South of the M23 Spur - 'Gatwick Green'	Allocated for an industrial-led Strategic Employment Location that will provide as a minimum 24.1ha new industrial land, predominantly for B8 storage and distribution use	2.5
145	Land at Plough Road and Redehall Road, Smallfield	160 residential units, 5 hectare site under Proposed Plan	3.6
146	Land North of Plough Road, Smallfield	120 residential units, 9.2 hectare site under Proposed Plan	4.0
264	Land West of Reigate Road, Hookwood Site Allocation Policy SA42	Site identified in the Reg 18 consultation draft local plan (Feb 2020 to March 2020) for 450 dwellings and two gypsy and travellers pitches	0.3
386	Gatwick Airport Sewage Treatment Works	Land within the airport available for extension to the Crawley Sewage Treatment Works if required.	0

Stage 3

- 19.4.19 A desk study search of the environmental information available for each of the ‘other developments’ listed in the short list has been undertaken. This included searching on Local Planning Authorities and the Planning Inspectorate websites. The information gathered has been used to identify the likely significant cumulative effects.

Stage 4

- 19.4.20 The CEA does not aim to assign significance levels (such as negligible, minor, moderate or major) for the identified effects. Instead the assessment is 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 or not. A statement is 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.
- 19.4.21 Each topic assessed as part of the EIA process has considered the ‘other developments’ from the short list which could result in significant effects. Each topic has based this selection on the location, nature and status of each development and provided a table justifying the inclusion of each development in their assessment. Chapters 7 to 18 provide an assessment on the likely significant cumulative effects. This chapter provides a summary of these assessments.

Inter-relationships

- 19.4.22 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 19.4.2.
- 19.4.23 The approach to assessing inter-related effects will also follow a four stage process, albeit different stages to the CEA, as summarised in Table 19.4.6 and discussed in the following paragraphs.

Table 19.4.6: 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 combined 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

- 19.4.24 The first stage of the assessment of inter-related effects has been presented in each of the individual topic chapters (Chapters 7 to 18 of this PEIR) and comprises the individual assessments of effects on receptors across the construction and operational phases of the Project.

Stage 2: Identification of Receptor Groups

19.4.25 Stage 2 involves 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 process, 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 recreational facilities (eg Public Rights of Way (PRoW));
- 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 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

19.4.26 Consideration has been 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 and operation and maintenance) 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, could include construction dust and noise, increased traffic and visual change which 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

19.4.27 Individual effects on each of the receptor groups identified above have been considered. A descriptive assessment of the scope for these individual effects to interact to create a different or greater effect has then been undertaken. The assessment has been undertaken qualitatively

based on the information available at this stage of the Project. Professional judgement has been used to identify the likely inter-related effects that could occur at these receptor locations. The assessment does not assign significance levels but instead a statement has been 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.

- 19.4.28 Due to the preliminary nature of the assessment presented within this PEIR, a detailed assessment of the significance of the likely inter-related effects has not been undertaken. Instead, a discussion on the effects likely to arise within these receptor groups has been presented and consideration of whether the inter-related effects would be any greater than those considered in the PEIR. When an updated assessment is undertaken at the ES stage, a more descriptive assessment of inter-related effects will be undertaken.

19.5. Assumptions and Limitations of the Assessment

Cumulative Effects Assessment

- 19.5.1 The assessment of cumulative effects is based on the short listed developments and publicly available information. The short list of developments will regularly be updated. However, an appropriate cut off has been applied prior to publication of the PEIR to allow the assessment to be finalised. Therefore, new applications which come forward after the cut -off have not been included in the PEIR but will be brought forward to the ES. Where further information becomes available on developments already considered, this will be taken into account before the ES is finalised. However, it is noted that new developments coming forward after the cut-off date for the ES could be considered during the examination period if considered necessary and appropriate by the Examining Authority.
- 19.5.2 As with any assessment of cumulative effects, the outcome is based on the amount of information available for each other developments on the short list. The level of information available depends on which stage in the planning process the development is at: ie those for which an application has been submitted will have more information available compared to allocations in a local development plan. Similarly, the likelihood of a development coming forward is also highly dependent on the corresponding stage in the planning process. To overcome this, greater weight is given to those developments for which more information is available and is more likely to come forward. Any mitigation measures presented in planning applications or other planning documents for the 'other developments' are assumed to be brought forward in an application (if the application hasn't yet been submitted) and implemented by the applicant (should planning permission be granted).

Inter-related Effects

- 19.5.3 The assessment of inter-related effects presented in this PEIR is based on information known about the Project at this stage. The assessment will be further refined at the ES stage to produce a conclusion on whether likely significant inter-related effects would arise.

19.6. Key Project Parameters

- 19.6.1 The key Project parameters used for the CEA and inter-relationships assessment are based on those presented in each of the topic chapters (Chapters 7 to 18 of the PEIR).

19.7. Mitigation and Enhancement Measures Adopted as Part of the Project

19.7.1 The assessment of cumulative and inter-related effects is based on the mitigation measures presented in chapters 7 to 18 of the PEIR. 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.

19.8. Cumulative Effects Assessment

19.8.1 As stated in Section 19.4, an assessment of cumulative effects has been undertaken in each of the topic chapters of this PEIR (Chapters 7 to 18). A summary of these effects is presented in Table 19.8.1.

Table 19.8.1: Summary of Cumulative Effects Assessment

Assessment Year	Summary	Potential for Significant Effects?
Historic Environment		
Initial Construction Phase: 2024-2029	The Horley Business Park coincides with the location of the proposed surface access satellite contractor compound for the South Terminal roundabout. The development would need to have regard to conserving the setting of listed buildings and retention of hedgerows and a buffer to the green corridor along Balcombe Road. An archaeological assessment (including field evaluation where appropriate) would be undertaken for the Horley Business Park development.	No significant effects considered likely.
2030-2032	No further cumulative effects have been identified.	
2033-2038		
Design year: 2038		
Landscape, Townscape and Visual Resources		
Initial Construction Phase: 2024-2029	<p>Landscape and Townscape Character – The other developments alongside the Project would form a more developed landscape. The urban fringe characteristics of the surrounding landscape character areas would be considerably intensified as a result of the construction phase or completed relevant cumulative developments. The Project would make a negligible contribution to the overall cumulative effect.</p> <p>Visual Receptors – There could be visual overlap between the Project and Horley Business Park on receptors at PRoW 362a Horley, Meadowcroft House and occupiers of vehicles using the A23/M23 spur and trains on the railway. These effects are not likely to be significant.</p>	Yes, for landscape and townscape effects on the High Woodland Fringes and Low Weald Character Areas. The Project would make a medium to negligible contribution to the significant cumulative effect. Visual effects would not be significant.
2030-2032	<p>Landscape and Townscape Character – Following completion of the relevant developments, the urban fringe characteristics of the surrounding character areas would be considerably intensified. In the long term the character of the area would be changed to residential development within a framework of woodland and hedgerows or urban fringes would be intensified. The Project would make a negligible contribution to the overall cumulative effect.</p>	

Assessment Year	Summary	Potential for Significant Effects?
	Visual Receptors – Receptors at Meadowcroft House would gain filtered views of Horley Business Park in combination with the South Terminal contractors compound. Receptors on the A23/M23 spur and train users would gain views of the Horley Business Park and the South Terminal contractors compound. These effects are not likely to be significant.	
2033-2038	Landscape and Townscape Character – The cumulative effect would remain as per the 2030-2032 assessment with the exception of the Mole Valley Open Weald Character Area which would not experience any long-term cumulative effects. Visual Receptors – The introduction of the South Terminal roundabout improvements including the flyover would be viewed alongside the development at Horley Business Park from receptors at Meadowcroft House, the occupiers of vehicles on the A23/M23 spur and railway passengers.	
Design year: 2038 and beyond	Landscape and Townscape Character – Contractor compounds would be removed and some land would be restored to its former use. This would reduce the Project’s contribution to landscape effects in the Low Weald Character Area. Visual Receptors – The cumulative effect would remain as per the 2033-2038 assessment.	
Ecology and Nature Conservation		
Initial Construction Phase: 2024-2029	Developments would result in the permanent loss of existing habitats and would have effects on protected and notable species, although losses would be compensated for. Construction of these developments could give rise to disturbance impacts, which have potential to result in greater disturbance to species if construction overlaps with the construction of the Project. The other developments have recorded the presence of grass snake, great crested newt, common toad, badger, harvest mouse and hedgehog and the loss of habitat across the developments could impact these species.	No significant effects would be likely as each development would mitigate their impacts.
2030-2032	Two developments within 2 km of the Project would be potentially under construction during the first full year of operation when parts of the Project would still be under construction. A number of developments would be operational and any habitat creation would be complete thereby compensating for any construction phase cumulative effects and potentially offering additional habitats to more mobile species. No detailed ecology	A detailed assessment cannot be undertaken due to the lack of ecological
2033-2038		

Assessment Year	Summary	Potential for Significant Effects?
	assessments have been undertaken for these other developments, without which it is not possible to determine cumulative effects at this stage.	information for the other developments.
Design year: 2038	It is not possible to determine cumulative effects at this stage.	
Geology and Ground Conditions		
Initial Construction Phase: 2024-2029	The only developments which could result in cumulative effects are the Horley Business Park and Hookwood site. Both developments would result in the permanent sealing of the soil resource, however any cumulative effect with the Project is considered to be not significant. No surface or groundwater bodies link any of the other developments with the Project. Any contamination found on the site of the other development would be mitigated. Horley Business Park is not in an area designated for mineral safeguarding; therefore, no effects are considered likely in relation to mineral resources.	No significant effects considered likely.
2030-2032	No further cumulative effects have been identified.	
2033-2038		
Design year: 2038		
Water Environment		
Initial Construction Phase: 2024-2029	It is assumed that the other developments would include appropriate drainage and flood risk measures to prevent the increase in flood risk off site. Measures embedded in the design of other developments would also ensure no effects on water quality are seen. The combination of the Project and other developments could result in increased pressure on the foul water network and the potable water supply. All development would be taken into account by Thames Water and Sutton and East Surrey Water during their respective assessments for foul water capacity.	No significant effects considered likely.
2030-2032		
2033-2038		
Design year: 2038		
Traffic and Transport		
Initial Construction Phase: 2024-2029	Cumulative traffic and transport effects are inherently included in the future baseline scenarios. Highways modelling reported in Chapter 12: Traffic and Transport includes background traffic growth from TEMPRO through to 2051 based on published Local Plan data. The estimates of rail and station crowding for the PEIR	No significant effects considered likely.
2030-2032		

Assessment Year	Summary	Potential for Significant Effects?
2033-2038	also allow for background traffic growth in line with Network Rail projections. No additional cumulative assessment is considered to be required. With mitigation in place no significant effects have been identified for any of the assessment years in terms of traffic and transport.	
Design year: 2038	The Heathrow expansion project has not been included in the traffic modelling as the opening of a third runway at Heathrow would initially result in lower passengers using Gatwick. Therefore the most conservative assessment scenario has been undertaken.	
Air Quality		
Initial Construction Phase: 2024-2029	Traffic data used in the assessment include known future developments and the assessment therefore incorporates cumulative impacts. As with traffic the effects of Heathrow expansion is not included as initially the Heathrow expansion would result in a lower number of passengers using Gatwick. The ADMS model takes into account all sources of pollution either as modelled sources or included in the background concentrations.	No significant effects considered likely.
First Full Year of Opening: 2029	Measures to reduce the effects of dust during construction would be implemented at the Project and it is assumed that the other developments would also implement suitable measures.	
Interim Assessment Year: 2032	No significant effects have been identified for any of the assessment years in terms of air quality.	
Design year: 2038	No detailed assessment of road traffic emissions has been undertaken for the design year 2038 and 2047 as road traffic emissions are anticipated to improve in future years due to changes in fleet composition, the introduction of cleaner vehicles in the fleet and increased uptake of electric vehicles. It is not anticipated that there would be any significant air quality effects from road traffic emissions in this scenario and therefore, no further cumulative effects are considered likely.	
Noise		
Initial Construction Phase: 2024-2029	The majority of other development sites are to the South of the airport. In most cases, they fall within the lower air noise contours bands, and in areas where the Project will slightly reduce air noise levels.	No significant effects considered likely.
First Full Year of Opening: 2029	There is potential for noise impacts on the future residents of these developments as a result of Gatwick's operations which in some cases will increase or decrease due to the Project. In seeking permission to develop	

Assessment Year	Summary	Potential for Significant Effects?
Interim Assessment Year: 2032	sites for residential use in noisy areas developers are required to consider the potential for noise impacts on future residents and to design the developments with suitable mitigation accordingly. Proposals for a third runway at Heathrow would increase aircraft noise over a wide area including in the area between the two airports. Although it seems unlikely that that LOAEL noise contours from the two projects would overlap, the design of the airspace required to facilitate a third runway at Heathrow is not developed sufficiently that allows cumulative assessment at this stage. This PEIR provides forecasts of air noise, ground noise and road traffic noise that will assist in designing for future conditions to ensure adverse effects are minimised and significant effects are avoided.	
Design year: 2038		
2047		
Climate Change and Carbon		
Initial Construction Phase: 2024-2029	The Climate Change Resilience assessment presented in Chapter 15: Climate Change and Carbon requires consideration of the resilience of the design of an individual project to climate change. Therefore, an assessment of cumulative effects is not relevant. The in-combination Climate Change impacts assessment considers the exacerbation of climate change on existing effects. As the climate change projections have been included within each aspect's primary assessment and are therefore carried through to the aspect-specific CEA, a separate climate change CEA is not required. Greenhouse gas emissions are inherently cumulative and therefore a cumulative assessment is not considered to be required for this Project. Further justification is provided in Chapter 15: Climate Change and Carbon.	No cumulative assessment required.
First Full Year of Opening: 2029		
Interim Assessment Year: 2032		
Design year: 2038		
2047		
Socio-economics		
Initial Construction Phase: 2024-2029	It is expected that all the permitted schemes in Tier 1 would be under construction within the Project's initial construction phase to 2029. Whilst there is insufficient data availability to assess impacts it is considered that the construction activity generated by these cumulative schemes is likely to overlap with the initial construction period and to eventually increase the construction activity of the local study area and the labour market impact areas. Nevertheless, the cumulative effect on construction employment is not anticipated to change and no further cumulative effects are considered likely.	No significant effects considered likely.

Assessment Year	Summary	Potential for Significant Effects?
First Full Year of Opening: 2029	For the reasons set out in Chapter 16 the operational conclusions associated with the Project in 2029 are not expected to change due to the cumulative developments.	
Interim Assessment Year: 2032	No further cumulative effects have been identified.	
Design year: 2038		
Health and Wellbeing		
Initial Construction Phase: 2024-2029	Based on the inherent cumulative nature of the traffic and transport and air quality assessments, no further assessment in terms of human health is required. (The Heathrow expansion project would increase aircraft noise over a wide area including in the area between the two airports. At PEIR stage, the design of the airspace required to facilitate a third runway at Heathrow is not sufficiently developed allow for a cumulative noise assessment and as such, no health and wellbeing assessment is possible). The Horley Business Park development could result in impacts to users of local PRowWs. Measures to mitigate these impacts such as re-provision of any loss of resource are assumed to be implemented by the applicant for this development. No cumulative impacts in terms of light exposure have been identified in Chapter 8: Landscape, Townscape and Visual Resources. Measures to reduce impacts of a development on the ground conditions and water environment are assumed to be implemented by the applicant of the other developments reducing any impact.	No significant effects considered likely.
2030-2032		
2033-2038		
Design year: 2038		
Agricultural Land Use and Recreation		
Initial Construction Phase: 2024-2029	Agricultural Land Use – The quality of the land affected by the Project comprises lower quality Subgrade 3b land and therefore would not contribute to any cumulative loss of the best and most versatile Grades 1, 2 or Subgrade 3a land. It is not considered that losses of agricultural land resulting from the other developments together with those limited areas of grassland affected by the Project would affect agricultural productivity in the local area.	No significant effects considered likely.

Assessment Year	Summary	Potential for Significant Effects?
	Recreation – The development of the Horley Business Park could result in impacts to public footpath 362a (Sussex Border Path). Measures expected to be implemented as part of the development would reduce the effects on the users of this path.	
2030-2032	No further cumulative effects have been identified.	
2033-2038		
Design year: 2038		

19.9. Inter-relationships

Scoping of Receptors/Receptor Groups

- 19.9.1 This assessment considers receptors or receptor groups, such as local residents, users of local rights of way or services, that may be affected by different environmental effects generated from the Project simultaneously or concurrently. This may include, for example, particular locations where noise, air quality and visual change may all occur at the same time. All of these effects would be derived from the Project alone (ie not in combination with any other development).
- 19.9.2 The majority of the PEIR topic assessments consider the effects of the Project on receptors or receptor groups and, as such, many of the inter-related impacts on those receptors are considered within the topic chapters. For example, effects on ecological receptors arising from noise, visual disturbance, air quality impacts and water quality impacts are assessed within Chapter 9: Ecology and Nature Conservation. As such, the potential for inter-related effects is inherent within some topic assessments and these effects are not repeated in this chapter. A summary of the inter-relationships that exist between topics is presented in Table 19.9.1. Cells coloured blue represent an inter-relationship.
- 19.9.3 A scoping exercise to identify which topic areas could result in inter-related effects which have not already been considered in the topic chapter has been undertaken. Table 19.9.2 presents a summary of the scoping process and identifies the inter-related effects which are scoped out of this chapter as the effects have already been assessed in the topic chapters. All other topics are considered within this chapter.

Table 19.9.1: Summary of Relationship Between Topics and Reference to the Location of Relevant Assessment Sections of the PEIR

Topic	Historic Environment	Landscape, Townscape and Visual	Ecology and Nature Conservation	Geology and Ground Conditions	Water Environment	Traffic and Transport	Air Quality	Noise and Vibration	Climate Change and Carbon	Socio-economics	Health and Wellbeing	Agriculture and Recreation
Historic Environment		Section 7.9 and 8.9				Section 7.9		Section 7.9	Section 7.10			Section 7.9
Landscape, Townscape and Visual			Section 8.9 and 9.9			Section 8.9		Section 8.9	Section 8.10		Section 17.9	Section 9.9 and 18.9
Ecology and Nature Conservation					Section 9.9	Section 13.9	Section 11.9 and 13.9	Section 9.9	Section 9.10			
Geology and Ground Conditions					Section 10.9 and 11.9				Section 10.10		Section 17.9	
Water Environment						Section 11.8 and 11.9			Section 11.10		Section 17.9	Section 11.9
Traffic and Transport							Section 13.9		Section 12.10	Section 16.9	Section 17.9	
Air Quality									Section 13.10	Section 16.9	Section 17.9	
Noise and Vibration									Section 14.10	Section 16.9	Section 17.9	

Topic	Historic Environment	Landscape, Townscape and Visual	Ecology and Nature Conservation	Geology and Ground Conditions	Water Environment	Traffic and Transport	Air Quality	Noise and Vibration	Climate Change and Carbon	Socio-economics	Health and Wellbeing	Agriculture and Recreation
Climate Change and Carbon										Section 16.9	Section 17.9	Section 18.10
Socio-economics											Section 17.9	Section 17.9
Health and Wellbeing												Section 17.9
Agriculture and Recreation												

Table 19.9.2: PEIR Topics Scoping Summary for Inter-related Effects Assessment

Topic receptor / resource	Scoped in to the Project lifetime assessment?	Scoped in to the receptor led assessment?	Justification for exclusion/inclusion within Inter-related Effects Assessment
Historic Environment	No	No	The assessment of effects on historic environment is provided in Chapter 7: Historic Environment. This assessment considers all potential effects on the relevant receptors, namely heritage assets. This topic has drawn from other topics such as landscape and visual and noise assessment for consideration of potential impacts on heritage asset setting. No receptor led or Project lifetime effects are considered likely for buried archaeology.
Landscape, Townscape and Visual	Landscape: No Visual: Yes	Landscape: No Visual: Yes	The landscape resource is assessed in Chapter 8: Landscape, Townscape and Visual Resource. This assessment includes the consideration of all potential impacts on landscape character and landscape quality, therefore no additional inter-related effects are considered likely to occur beyond those identified within the chapter. Visual resource effects will be considered in the inter-related effects assessment.
Ecology and Nature Conservation	Yes	No	The assessment of inter-related effects is central to the assessment of potential impacts on ecological receptors and the integrity of designated sites and, as such, has already been assessed within Chapter 9: Ecology and Nature Conservation. No additional effects are therefore, considered likely to occur beyond those identified in the assessment in Chapter 9. This topic has drawn from other topics to understand the variety of impacts on ecological receptors.
Geology and Ground Conditions	No	No	All the potential impacts on geological receptors and soils have been assessed within Chapter 10: Geology and Ground Conditions, no further inter-related effects are considered likely.
Water Environment	No	No	All the potential impacts on the water environment are assessed in Chapter 11: Water Environment, no further inter-related effects are considered likely.
Traffic and Transport	Yes	Yes	The effects presented in Chapter 12: Traffic and Transport take into account all likely contributions to traffic on the surrounding road network as a result of the Project, therefore no additional traffic is considered likely. However,

Topic receptor / resource	Scoped in to the Project lifetime assessment?	Scoped in to the receptor led assessment?	Justification for exclusion/inclusion within Inter-related Effects Assessment
			the effect of driver delay prolonged over the construction period could be greater than those assessed in the assessment year. Therefore, traffic is scoped in to the Project lifetime assessment. The effect of traffic in combination with other topics could result in inter-related effects on receptor groups, therefore traffic and transport is scoped in to the receptor led assessment.
Air Quality	Yes	Yes	Human receptors could be exposed to air quality effects at the same time as effects from other topics or effects across the Project lifetime, which could result in inter-related effects. Therefore, air quality is scoped in to the Project lifetime and receptor led assessments.
Noise and Vibration	Yes	Yes	Human receptors could be exposed to noise effects at the same time as effects from other topics or effects across the Project lifetime, which could result in inter-related effects. Therefore, noise and vibration is scoped in to the Project lifetime and receptor led assessments.
Climate Change and Carbon	No	No	The effects in relation to GHGs are assessed in Chapter 15: Climate Change and Carbon and includes the effect of the entire Project on the global receptor. This assessment inherently includes Project lifetime and receptor led effects and therefore no further assessment is required. The resilience of the project in relation to the climate change has been assessed across the Project lifetime and a further assessment is not required.
Socio-economics	Yes	Yes	Human receptors include residents and businesses which could be exposed to effects from a number of different topics or effects across the Project lifetime, including socio-economics. Therefore, this topic is scoped in to the inter-relationships assessment for both the Project lifetime and receptor led effects. The Project lifetime assessment considers only effects in the Project site boundary and local study area. This is due to the wider effects being so widespread over a large area that it is not likely that effects would be greater than those considered in the chapter.
Health and Wellbeing	Yes	No	The nature of the health and wellbeing assessment presented in Chapter 17: Health and Wellbeing draws from all environmental and socio-economic topics that have the potential to affect determinants of health and wellbeing.

Topic receptor / resource	Scoped in to the Project lifetime assessment?	Scoped in to the receptor led assessment?	Justification for exclusion/inclusion within Inter-related Effects Assessment
			Therefore, all potential inter-related effects in relation to health and wellbeing are considered within Chapter 17. The change in health of human receptors across the lifetime of the Project is considered in this assessment.
Agricultural Land Use and Recreation	No	Yes	The effects on land use and agriculture are considered in Chapter 18: Agricultural Land Use and Recreation. The effects on agricultural land and farm holdings are likely to be permanent and occur during the construction phase. Therefore, further inter-related effects from other topic areas are unlikely to result in any greater effect than those assessed within Chapter 18. Effects on recreational resources have been assessed taking into account other topic areas such as visual and tranquillity (Chapter 8) and increased pressure on resources (Chapter 18). However, inter-related effects on recreational receptors are presented in this chapter.

Identification of Receptors/Receptor Groups

- 19.9.4 The potential for inter-related effects (other than those already inherently forming part of the topic-specific assessments where specified in Table 19.9.2 is limited to the ZOI presented in Table 19.4.2. Inter-related effects have been considered where the study areas of the respective assessments are shared.

Project Lifetime Effects

- 19.9.5 Table 19.9.3 lists the lifetime inter-related effects that are predicted to arise during construction and operation of the Project. A discussion on how the identified effects could change over the lifetime of the Project is also presented in Table 19.9.3

Table 19.9.3: Assessment of Project Lifetime Effects

Topic Area	Rector or Receptor Group	Significance of Individual PEIR Effect with Mitigation	Project Lifetime Inter-related Effects
Visual Resources	Receptors using public rights of way and pavements	2024-2029: Major to Negligible adverse 2030-2032: Major to Negligible adverse 2033-2038: Moderate to Minor beneficial 2038 and beyond: Moderate adverse to Minor beneficial	The visual effects considered in Chapter 8: Landscape, Townscape and Visual Resources relate to a number of different receptors and the effects vary widely depending on the distance from the development and the sensitivity of the receptor. The greatest effects are likely to be realised by the users of the PRow network, especially around the Pentagon Field area, which would see a change in view from open fields to a decked car park. The largest effects are likely to be felt during the construction phase (which spans over the first three assessment years) and other visual effects would be experienced in the context of the existing airport. Overall, is it not likely that the Project lifetime effects would be greater than those assessed for each of the assessment years.
	Occupiers of airport hotels and restaurants (outside of terminals)	2024-2029: Moderate to Minor adverse 2030-2032: Moderate to Minor adverse 2033-2038: Major to Negligible adverse 2038: Moderate to Negligible	
	Employees (on and off airport) and visitors	2024-2029: Minor to Negligible adverse 2030-2032: Minor to Negligible adverse 2033-2038: Moderate to Negligible adverse 2038: Negligible to Moderate adverse	
	Vehicle occupiers	2024-2029: Minor to Negligible adverse 2030-2032: Moderate to Negligible adverse 2033-2038: Moderate to Negligible adverse 2038: Moderate to Negligible adverse	
	Residents	2029: Moderate to Minor adverse 2038: Moderate to Minor adverse	

Topic Area	Rector or Receptor Group	Significance of Individual PEIR Effect with Mitigation	Project Lifetime Inter-related Effects
Ecology and Nature Conservation	Statutory designated Sites	All assessment years: No Change	No effects are considered likely to statutory designated sites; therefore, no inter-related effects are considered likely.
	Non-statutory Designated Sites and ancient woodland	All assessment years: No Change	The effects assessed in Chapter 9: Ecology and Nature Conservation consider the combined effects during construction and operation of the Project. The effects are not likely to be greater when considered over the lifetime of the Project.
	Habitats and flora	2024-2029: No Change to Moderate adverse 2030-2032: No Change to Moderate adverse 2033-2038: Negligible to Moderate adverse	An assessment of the overall net gain or loss of habitats as a result of the Project has been undertaken. This identifies there will be no net habitat loss overall and some habitats would experience a betterment. Some habitats, such as woodland, would take longer to establish, however habitat creation would be implemented early in the construction programme. The long term effect on designated sites has been considered through the appropriate assessment process. Therefore, no further Project lifetime effects are considered likely.
	Breeding birds and wintering birds	2024-2029: Minor beneficial to Moderate adverse 2030-2032: Minor beneficial to Moderate adverse 2033-2038: Negligible to Minor adverse	The assessment on breeding birds presented in Chapter 9: Ecology and Nature Conservation has taken into account the overall loss and creation of habitat as a result of the Project. During construction, loss of habitat would occur in different places at different times. Birds using these areas could experience, over time, prolonged loss and disruption. The reduction in habitat could reduce the overall size of the breeding bird population due to increased competition for territory. The creation of habitat in the west of the site would mitigate this effect, however this would take time to mature in order to be attractive for breeding. Collision risk could increase over the lifetime of the Project, however this is considered in the assessment in Chapter 9: Ecology and Nature Conservation. Therefore, no further Project lifetime effects are considered likely.
	Grass snake, great crested newt, common	2024-2029: No Change to Minor adverse	Effects on these species are only likely to occur during the construction phases of the Project when habitat losses would occur. The habitat creation would

Topic Area	Rector or Receptor Group	Significance of Individual PEIR Effect with Mitigation	Project Lifetime Inter-related Effects
	toad, otter, harvest mouse and hedgehog	2030-2032: Minor beneficial to Minor adverse 2033-2038: Negligible to Minor adverse 2038: Negligible (otter)	mitigate effects on these species. Therefore, no further Project lifetime inter-related effects are considered likely.
	Bats and badgers	2024-2029: Minor adverse to Negligible (for badgers). Minor adverse (for bats) 2030-2032: Negligible (for badgers) Minor beneficial to Moderate adverse (for bats) 2032-2038: Negligible (for badgers) Negligible to Moderate adverse (for bats) 2038: Negligible (for badgers) and No change (for bats).	Effects on bats and badgers are related to habitat loss and collision risk. Habitat loss effects would only occur during the construction phase and would be mitigated by habitat creation. Collision risk could increase over the lifetime of the Project, however this is considered in the assessment in Chapter 9: Ecology and Nature Conservation. The overall Project lifetime effects on these species are not likely to be greater than those considered in Chapter 9.
Traffic and Transport	Pedestrians and cyclists	2024-2029: Negligible to Minor adverse 2030: Negligible 2032: Minor adverse to Minor beneficial 2038: Minor adverse to Minor beneficial	The effects on pedestrians, cyclists and public transport users include severance, delay, amenity and safety. These types of effects would only be experienced at the time the effect occurring and would not increase due to the duration of the impact. The receptors are likely to be felt in a transient nature only as pedestrians or cyclists move through the area.
	Public transport users	2024-2029: Negligible to Minor adverse 2029: Negligible 2032: Negligible 2038: Negligible	
	Car drivers and passengers	2024-2029: No Change to Moderate adverse 2029: No Change to Minor adverse 2032: Minor adverse to Minor beneficial 2038: Minor adverse to Minor beneficial	

Topic Area	Rector or Receptor Group	Significance of Individual PEIR Effect with Mitigation	Project Lifetime Inter-related Effects
			through the area and the limited extent of the effects. All other types of effects are not likely to change over the lifetime of the Project.
Air Quality	Human receptors and property (construction dust)	2024-2032: Not Significant	The air quality assessment is based on the difference between background concentrations and the increase in emissions as a result of the Project. Based on this concept, the Project lifetime effects are inherently included in the changes to background concentration levels across the assessment years. The assessment also takes into consideration the duration of exposure for each receptor. Therefore, the Project lifetime effects are not likely to be greater than those assessed within the chapter.
	Human receptors	2024-2032: Not Significant 2038: Not assessed in detail for the PEIR	
	Ecological receptors	2024-2032: Not Significant 2038: Not assessed in detail for the PEIR	
Noise and Vibration	Residential	Construction noise 2024-2029: Moderate (after mitigation) subject to further assessment	The assessment of noise across all assessment years covers the likely sources of noise occurring at each particular time. The only Project lifetime effects related to noise would be the effect continued noise exposure has on the health of residents. The Project lifetime health effects are considered under the health and wellbeing heading.
		Air noise 2029: Lower than 2032 2032: Minor beneficial to Moderate adverse 2038: Lower than 2032	
		Ground noise 2029: Lower than 2032 2032: Negligible to Moderate adverse 2038: Lower than 2032	

Topic Area	Rector or Receptor Group	Significance of Individual PEIR Effect with Mitigation	Project Lifetime Inter-related Effects
		<p>Traffic noise</p> <p>2032: Not Significant to Significant beneficial</p>	
Socio-economics (Project site and local study area only)	Employment	<p>2024-2029: Minor to Major beneficial</p> <p>2029-2032 (Construction): Minor to Moderate beneficial</p> <p>2029 (Operational): Negligible to Minor beneficial</p> <p>2032-2037 (Construction): Negligible to Minor beneficial</p> <p>2032 (Operational): Negligible to Moderate beneficial</p> <p>2038: Negligible to Moderate beneficial</p>	<p>The socio-economic effects are likely to be experienced across the local study as defined in Chapter 16: Socio-economics. Over the lifetime of the project similar effects associated with construction and operation are likely to be felt across all assessment years. Construction and operational effects on the labour market and supply chain are mutually exclusive from each other as they will attract different skills and have a different supply chain. Therefore, the same receptors would not be impacted during both the construction and the operation.</p> <p>Business and local population (including cohesion and community facilities) could experience disruption as a result of construction and operation, however this combination has already been taken into consideration in the traffic modelling undertaken for the Project.</p> <p>The effects on the economy have been assessed to be beneficial across all assessment years. The combined effect over the lifetime of the Project is not likely to be higher than those assessed within the chapter.</p>
	Supply chain	<p>2024-2029: Minor beneficial</p> <p>2029-2032 (Construction): Negligible to Minor beneficial</p> <p>2029 (Operational): Minor to Moderate beneficial</p> <p>2032-2037 (Construction): Negligible to Minor beneficial</p> <p>2032 (Operational): Minor to Major beneficial</p> <p>2038: Minor to Major beneficial</p>	
	Labour market	<p>2024-2029: Negligible to Minor beneficial</p>	

Topic Area	Rector or Receptor Group	Significance of Individual PEIR Effect with Mitigation	Project Lifetime Inter-related Effects
		2029-2032 (Construction): Negligible to Minor Beneficial 2029 (Operational): Negligible 2032-2037 (Construction): Negligible to Minor beneficial 2032 (Operational): Negligible to Moderate to Minor adverse 2038: Minor to Moderate adverse	
	Businesses (disruption / displacement)	2024-2029: Minor adverse to Negligible 2029-2032 (Construction): Minor adverse to Negligible 2029 (Operational): Negligible 2032-2037 (Construction): Moderate adverse to Negligible 2032 (Operational): Moderate adverse to No Change 2038: No Change	
	Existing residents	2024-2029: Minor adverse to Negligible 2029-2032 (Construction): Minor adverse to Negligible 2029 (Operational): Minor adverse to Negligible 2032-2037 (Construction): Minor adverse to Negligible 2032: Minor adverse to Negligible 2038: Negligible to Minor adverse	
	Population	2024-2029: Negligible	

Topic Area	Rector or Receptor Group	Significance of Individual PEIR Effect with Mitigation	Project Lifetime Inter-related Effects
		2029-2032 (Construction): Negligible 2029 (Operational): Negligible 2032-2037 (Construction): Negligible 2032 (Operational): Negligible 2038: Negligible	
	Housing	2024-2029: Negligible 2029-2032 (Construction): Negligible 2029 (Operational): Negligible 2032-2037 (Construction): Negligible 2032 (Operational): Negligible 2038: Negligible	
	Community facilities and services	2024-2029: Minor adverse 2029-2032 (Construction): Minor adverse 2029 (Operational): Minor adverse 2032-2037 (Construction): Minor adverse 2032 (Operational): Minor adverse to Negligible 2038: Minor adverse to Negligible	
	Community cohesion	2024-2029: Minor adverse 2029-2032 (Construction): Minor adverse 2029 (Operational): Minor adverse to Negligible 2032-2037 (Construction): Minor adverse	

Topic Area	Rector or Receptor Group	Significance of Individual PEIR Effect with Mitigation	Project Lifetime Inter-related Effects
		2032 (Operational): Minor adverse to Negligible 2038: Minor adverse to Negligible	
	Open Space – Riverside Garden Park	2029-2032 (Construction): Moderate to minor adverse	
Health and Wellbeing	Health and wellbeing effects from changes in air quality	2024-2029: Minor adverse 2030-2032: Minor adverse 2033-2038: Minor adverse 2038: Minor adverse	The main health and wellbeing assessment analyses changes in annual average concentrations and how this affects annual average background concentrations. While there would be chronic exposure to the changes predicted, background concentrations remain relatively constant and do not accumulate. Taking into consideration the predicted changes, the predicted annual average background concentrations remain within air quality objective thresholds set to be protective of the environment and health in all circumstances and therefore the conclusions of the main health and wellbeing would not be greater when considered across the lifetime of the Project.
	Health and wellbeing effects from changes in noise exposure	2024-2029: To be assessed at ES stage 2030-2032: Minor adverse 2033-2038: Minor adverse 2038: Minor adverse	Predicted health and wellbeing effects relating to the incidence of health outcomes are generally measured as an annual rate. While changes in noise exposure for any given year are predicted to have a measurable increase in risk factors, there is no measurable increase in actual health outcomes. If the time period for incidence rate were to increase from an annual rate between the years of 2029 (first full year of operation) to 2040 (two years after the design year), there would still not be a measurable change in health outcomes. Impacts on the prevalence of health outcomes cannot be added in the same way, as this measure looks at the total proportion of a population who have a condition; as a result, the worst-case impact would be the impact which is recorded for 2032. Therefore, the conclusions of the main health and wellbeing chapter would not be greater when considered across the lifetime of the Project.

Topic Area	Rector or Receptor Group	Significance of Individual PEIR Effect with Mitigation	Project Lifetime Inter-related Effects
	Health and wellbeing effects from changes in transport nature and flow rate	2024-2029: Minor adverse 2030-2032: Minor adverse 2032: Minor adverse 2038: Minor adverse	As stated within Chapter 17: Health and Wellbeing, there is limited exposure to changes in traffic volume and composition is low as there are limited pedestrian and cyclist movements expected along affected routes. In addition, health and wellbeing effects on pedestrians and cyclists would only be experienced at the time the effect occurring and would not increase due to the duration of the impact due to the transient nature of these receptors. In addition, health and wellbeing effects associated with accidents and safety is not likely to change over the lifetime of the Project as risk of accidents is primarily dependent on constant factors such as traffic volumes and road capacity.
	Health and wellbeing effects from changes in lifestyle factors	2024-2029: Minor beneficial 2030-2032: Minor beneficial 2033-2038: Minor beneficial	As stated within Chapter 17: Health and Wellbeing, permanent impacts carry more weight in the potential to impact on barriers to recreation/physical activity and the associated health and wellbeing effects. It is the case that any adverse permanent impacts reported do not completely remove the opportunity for access to recreation or physical activity. Therefore, the impacts would not accumulate over the lifetime of the project.
	Health and wellbeing effects from changes in socio-economic factors	2024-2029: Minor beneficial 20230-2032: Minor beneficial 2033-2038: Moderate beneficial 2038: Moderate beneficial	Within Chapter 17: Health and Wellbeing, it is stated that “Having a consistent income and being in long-term employment are two of the most important wider determinants of health”. As such, the length of employment for individuals is a key consideration when assessing magnitude/significance of effect for this health determinant, whereby only a significant generation of long-term employment would have beneficial health and wellbeing effects at the population level. Is it considered that the significance of effects undertaken for 2038 would be representative of the Project lifetime effects and no greater effect would occur.
	Health and wellbeing effects from changes in exposure to light	2024-2029: Minor adverse 2030-2032: Minor adverse 2033-2038: Minor adverse	The existing baseline includes sky glow which is visible during the night time period at residences that surround the site. The main assessment reports an increase in exposure to light at approximately 99 residences at Horley

Topic Area	Rector or Receptor Group	Significance of Individual PEIR Effect with Mitigation	Project Lifetime Inter-related Effects
		2038: Minor adverse	Residential Edge during winter only as vegetation in leaf during the summer period would provide screening effects. Considering that this impact would firstly be seasonal, and on the basis that new tree/shrub planting, which would develop over time to reduce the level of effects, there would be no consistent accumulation of effects. Conversely, this seasonal impact would lessen over time.
	Health and wellbeing effects from changes to water quality and flood risk	2024-2029: Minor adverse 2030-2032: Minor adverse 2033-2038: Minor adverse 2038: Minor beneficial	All potential impacts on water quality and flood risk are expected to be mitigated to a level which is not considered significant. All mitigation measures offer long-term approaches to the management of water quality and flood risk. Therefore, there is no risk of an additive impact over the lifetime of the project and consequent health and wellbeing effects.
	Health and wellbeing effects from ground conditions	2024-2029: Minor adverse 2030-2032: Minor adverse 2033-2038: Minor adverse 2038: Minor adverse	All complex remediation activities are expected to occur during the initial construction phase which is already assessed in the chapter and any exposure would be temporary. Exposure to contamination would generally need to be consistent in order to manifest any health or wellbeing outcome. As a result, no additive impacts on health and wellbeing over the lifetime of the Project are anticipated.
	Health and wellbeing effects from changes in healthcare capacity	2024-2029: To be assessed at the ES stage 2030-2032: Minor adverse 2033-2038: Minor adverse 2038: Minor adverse	As stated in the main assessment, if the peak number of construction workers were to move temporarily to the local study area from outside, it would equate to a worst-case increase in the local population of approximately 1% which would persist for the peak year of construction only (2026). The construction workforce in all other years would be less than this and there would be no accumulation of effects over the lifetime of the Project (construction-phase, specifically). It should also be noted that an on-site health service provision has been recommended in order to internalise any increase in demand on local healthcare capacity so even if there was an increase of 1%, it is anticipated that

Topic Area	Rector or Receptor Group	Significance of Individual PEIR Effect with Mitigation	Project Lifetime Inter-related Effects
			this would not have an external impact. Therefore, the impacts would not accumulate over the lifetime of the Project.

Receptor-led Inter-related Effects

- 19.9.6 Table 19.9.4 identifies those receptor groups which are unlikely to experience receptor led inter-related effects or where such inter-related effects have already inherently been assessed through the methodology of the respective topic chapter. The remaining topics which could result in additional inter-related effects are:
- visual resources;
 - traffic and transport;
 - air quality;
 - noise and vibration;
 - socio-economics; and
 - recreation
- 19.9.7 The effects identified for these topics have the potential, when occurring at the same time, to affect the same receptors, which could result in a greater effect than if they occurred on their own. An inter-related effect is likely to occur when the effects of two or more topics overlap either spatially or temporally. Due to the long term duration of the construction phase, it is likely that both construction and operational effects from different topics would overlap temporally. Therefore, for the preliminary commentary presented in this PEIR it is assumed there all potential inter-related effects could occur at the same time.
- 19.9.8 The receptor groups that are likely to experience multiple effects are limited to the receptors located in the Zols identified in Table 19.4.2. Based on the assessments included in Chapters 7 to 18, the following receptor groups have been identified which could experience effects from multiple environmental topic areas.
- Long term receptors (residents, users of schools and community facilities, places of work). These are likely to be long term receptors in that they are likely to experience the effects over a longer period of time.
 - Short term receptors (traveller, pedestrians/cyclists and users of PRowWs). These are likely to be short term or intermittent receptors as they are only likely to experience effects for a short period of time while passing through.
- 19.9.9 For each receptor group, Table 19.9.4 lists the potential effects on these receptors.

Table 19.9.4: Receptor Groups and Potential Impacts

Receptor Group	Potential Impact
Long term receptors: people living at dwellings and users of schools and work places	Potential impacts include changes in the level of traffic (including HGVs and air traffic) which would lead to an increase in noise and emissions. The combination of an increase in noise from surface and air sources, and the perception of more traffic could result in a greater impact than when assessed alone. Receptors could also experience a change in views with more built infrastructure in certain areas and additional aircraft.

Receptor Group	Potential Impact
Short term or intermittent receptors: people using PRowS and local road network	Users of PRowS in proximity to the airport could experience a combination of increase noise, emissions and frequency of aircraft taking off. Views on some routes would change from agricultural fields to built development (eg Pentagon Field).

Long Term Receptors

19.9.10 A number of communities representing long term receptors have been identified in the Zol for the Project. These are presented in the list below and on Figure 19.9.1. The identified communities are based on the parish boundaries within 5 km of the Project site boundary. The communities include all residential receptors, users of schools and places of work. Communities based outside of the 5 km are not likely to experience effects from more than one topic based on the Zols identified for the topics scoped in to the assessment.

- Crawley.
- Rusper.
- Charlwood.
- Newdigate.
- Salfords and Sidlow.
- Horley.
- Outwood.
- Burstow.
- Horne.
- Felbridge.
- Worth.

19.9.11 Work undertaken to date indicates that the majority of traffic (80%) currently access the airport via the M23 spur road while all remaining traffic is spread over the local road network. The highways model used for the PEIR has been developed to focus on the roads surrounding the airport which are likely to be impacted by the Project. The air quality effects likely to contribute to long term receptor led inter-related effects are likely to be constrained to emissions from road traffic. Therefore, air quality effects are also only likely to be felt locally to the airport. The receptors within these areas are mainly those using the PRow network, the road and rail network or are passengers at the airport. These are short-term receptors and are considered below. The main long term receptors within the extent of the traffic model (indicating receptors that could be impacted by different topic areas) would be members of staff working at the airport or in proximity to it. These include hotel and restaurant staff, and workers at Lowfield House, Manor Royal, Schlumberger, Meadowcroft House and Amadeus. Residential receptors in closer proximity to the eastern part of the airport could also be considered as long term receptors. These receptors are likely to experience an increase in traffic close to their place of work/home, a potential increase in vehicle emissions as well as an increase in noise and visual disturbances.

19.9.12 More distant from the airport, receptors are only likely to experience a combination of noise and visual effects. The socio-economic effect of the Project is likely to be felt across all community groups and it is not possible to assign a particular parish which is likely to experience greater or lesser effects than others. Chapter 8: Landscape, Townscape and Visual Resources uses representative viewpoints to assess the visual effects of the Project on receptors. These are

based on the areas which are likely to result in visual effects. Only three of the identified parishes have representative viewpoints (Crawley, Charlwood and Horley). Visual effects on other parishes are likely to be negligible or no greater than those assessed for the representative viewpoints and therefore are not considered further. Due to the lack of spatial overlap between topic areas, the remaining parishes are not likely to result in inter-related effects.

- 19.9.13 Based on the community representative locations modelled to inform Chapter 14: Noise and Vibration, long term receptors in the three parishes (Crawley, Charlwood and Horley) could experience a noise increase from air noise sources. The visual effects for these areas have been assessed, across all assessment years, as Negligible to Moderate (not significant).
- 19.9.14 Inter-related effects on long term receptors in Crawley, Charlwood and Horley could therefore be felt as a combination of an increase in traffic, emissions, noise and visual disturbances. The combination of some of these effects are taken into account in the assessment outlined in Chapter 17: Health and Wellbeing. These include effects from traffic, air quality, light exposure, flood risk, ground conditions and socio-economic factors. Significant effects are not likely to occur with the exception of long term significant beneficial effects in relation to socio-economic factors. Due to the nature of the inter-related effects, many of which would be intermittent and would occur at a distance from the receptors, further significant effects are not considered likely.
- 19.9.15 The assessment of inter-related effects on long term receptor groups will be further updated in the ES.

Short Term Receptors

- 19.9.16 A number of short term receptors have been identified in the Zol for the Project. These are presented in the list below and on Figure 19.9.2.
- Users of PRoW and other recreational routes in the immediate vicinity of the Project site boundary or directly linking to it.
 - Users of the local road and rail network.
 - Passengers of the airport.
- 19.9.17 The recreational resources most likely to experience inter-related effects are Riverside Garden Park, National Cycle Route 21, the Sussex Border Path (PRoW 346Sy, 346-2Sy, 347Sy and 355-1Sy) and the PRoW at Pentagon Field. Due to their proximity to the airport these receptors would experience a change in visual amenity, noise, traffic and vehicle emissions. The extent to which these effects would be felt would vary between each individual human receptor. It would depend on their reason for using the recreational facility, how often they use it and the extent of the change.
- 19.9.18 Those receptors using these resources for recreational purposes are deemed to be more sensitive to changes compared with those using them for commuting or access. The assessment undertaken in Chapter 18: Agriculture and Recreation determines that there would be no significant effects on users of PRoW in the long term with a significant long term moderate adverse effect on Riverside Park. These conclusions would not likely change when taking into account additional factors such as noise, visual amenity and emissions.
- 19.9.19 Other short term receptors include users of the road and rail network around the airport and passengers using the airport itself. These users would experience a change in traffic flows, visual amenity and noise. As with users of recreational facilities, the extent of the effect would depend

on their purpose for using the road/rail network, however most receptors are likely to be passing through for travel purposes, rather than recreation. Therefore the changes in traffic flows, visual amenity and noise would result in a lower effect. Effects greater than those presented in the PEIR are not considered likely due to the low sensitivity of these receptors.

- 19.9.20 As with the assessment for long term receptors above, the assessment of inter-related effects on short term receptor groups will be further updated in the ES.

19.10. Summary

- 19.10.1 This chapter considers the cumulative and inter-related effects arising from the Project during the construction and operational phases. The cumulative assessment uses a short list of 'other developments' which could result in cumulative effects on the same receptors as the Project. The assessment of inter-relationships uses the assessments in each of the topic chapters of the PEIR and considers whether additional effects over the lifetime of the Project or from multiple topics on the same receptor could occur.

- 19.10.2 The CEA concludes that significant effects are not likely in relation to many of the topic areas. Significant effects could occur in relation to the High Woodland Fringes Character Area and Low Weald Character Area when considered with other developments. However, the contribution of the Project to this significant effect is considered to be medium to negligible. No further significant effects are considered likely.

- 19.10.3 Inter-related effects could occur in two ways; a single impact extended over the lifetime of the Project (Project lifetime effects), and a combination of effects from a number of different topic areas (receptor led effects). Project lifetime effects could occur in relation to visual effects, ecology, air quality, noise and health and wellbeing. None of the Project lifetime effects considered at this stage in the EIA process are likely to be significant.

- 19.10.4 Receptor led effects are likely to be felt in two main receptor groups; long term and short term receptors. These relate to communities (identified using parish boundaries) and users of the local PRoW and road/rail network. The inter-related effects on these receptors are likely to be limited to noise, air quality, visual, traffic and transport and socio-economic effects. Due to the preliminary nature of the PEIR a more detailed assessment of the likely significance of inter-related effects will be undertaken in the ES.

Next Steps

- 19.10.5 The long list and short list of other developments to inform the CEAs will continually be updated throughout the EIA process. Any additional developments that have been identified through the consultation process and during the drafting of the ES will be added to the long list and reviewed for inclusion in the short list. A cut-off date of three months before submission of the application will be implemented to allow for the final preparation of the ES.
- 19.10.6 The assessment of inter-relationships will also be further updated for the ES. Following finalisation of the design parameters and the full assessment of effects in the topic chapters, an updated assessment of the likely inter-relationships will be carried out. The chapter will come to a conclusion as to whether the inter-relationships will result in a larger effect than considered within the topic chapters.

19.11. References

Legislation

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19.12. Glossary

Table 19.12.1: Glossary of Terms

Term	Description
CEA	Cumulative Effects Assessment
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
ES	Environmental Statement
GAL	Gatwick Airport Limited
GHG	Greenhouse gas
HGV	Heavy Goods Vehicle
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPR	Noise Preferential Route
NPS	National Policy Statement
PEIR	Preliminary Environmental Information Report
PRoW	Public Right of Way
SAC	Special Area of Conservation
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility