CITY AIRPORT DEVELOPMENT PROGRAMME
(CADP1) S73 APPLICATION

ENVIRONMENTAL STATEMENT

VOLUME 1: MAIN ES

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Pell Frischmann

City Airport Development Programme (CADP1) S73 Application

Volume 1: Environmental Statement
Chapter 8: Noise and Vibration

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8 Noise

8.1 Introduction

8.1.1 This chapter of the Environmental Statement (ES) has been prepared by Bickerdike Allen Partners LLP and assesses the likely significant effects of the proposed development with reference to noise. It should be read in conjunction with Chapter 2: Site Description & Development Proposals. The chapter considers the noise associated with the following activities at the airport:

- Flights into and out of the airport (air noise);
- Aircraft operations at the airport (ground noise);
- Road traffic movements related to the airport (road traffic noise); and
- Construction of the of the remaining elements from the CADP1 permission that have not as yet been built (construction noise).

8.1.2 The operational noise is assessed for both the baseline year of 2019, and for future years for both the Do Minimum (DM) and Development Case (DC) Scenarios. Sensitivity tests are also included which consider how sensitive the DC Scenario is to changes.

8.1.3 This chapter commences by describing the noise related planning context against which the proposed development will be considered. It goes on to present the assessment criteria and methodology. The baseline noise environment at the airport is presented and then consideration of the potential impacts of changes to air, ground, road traffic and construction noise comparing the DM and DC Scenarios. Within these sections, the baseline noise conditions are discussed where relevant, and assessments are made of any significant effects (beneficial and adverse) associated with the proposed development. Mitigation measures are also described, where appropriate, as are cumulative and residual effects.

8.1.4 The assessment of noise involves a significant amount of technical detailed work and to seek to maintain this chapter as concise and informative as possible, this chapter is supplemented by a series of appendices which provide further detail on each of the specific topics. These are referenced throughout this chapter to aid an understanding of the topic being described. This chapter should be read in conjunction with the following appendices:

Appendix 8.1 – Relevant legislation, policy, technical guidelines and assessment criteria;

Appendix 8.2 – Baseline Noise;

Appendix 8.3 – Air Noise;

Appendix 8.4 – Ground Noise;

Appendix 8.5 – Road Traffic Noise; and

Appendix 8.6 – Construction Noise.

8.2 Legislative and Policy Context

8.2.1 A summary of the key national, regional, local, and other legislation, policy and guidance that is relevant to the assessment of the effects on noise receptors is given below. Further details of how this legislation and policy relates to noise is given in Appendix 8.1.

Legislation

8.2.2 EU Regulation 598-2014[1] is retained EU legislation under the European Union (Withdrawal) Act 2018 and sets out for airports where a noise problem has been identified, the process to be followed for the introduction of noise-related operating restrictions in a consistent manner on an airport-by-airport basis, so as to help improve the noise climate and to limit or reduce the number of people significantly affected by potentially harmful effects of aircraft noise, in accordance with the Balanced Approach[2].

8.2.3 The *Environmental Noise Directive (END)*[3] concerning the assessment and management of environmental noise from transport, came into effect in June 2002. Its aim was to define a common approach across the European Union with the intention of avoiding, preventing or reducing on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise.

8.2.4 The *Civil Aviation Act 2006*[4] includes measures aimed at strengthening the powers available to control noise. The Act gave airport operators statutory powers to introduce noise control schemes for the purpose of avoiding, limiting, or mitigating the effect of noise connected with the taking off or landing of aircraft.

8.2.5 The *Civil Aviation Act 2012*[5] placed a new duty on the Civil Aviation Authority (CAA) to make information about the environmental performance of the aviation sector available to the general public and measures taken to limit adverse environmental effects.

8.2.6 *Environmental Noise (England) Regulations 2006 (*as amended) transpose the *European Environmental Noise Directive (Directive 2002/49/EC)* into English law. They require operators of non-designated major civil airports, such as London City Airport, to make and submit strategic noise maps to the Secretary of State every five years, which reflect the noise situation in the preceding calendar year, and to draw up a Noise Action Plan for places near the airport and submit this to the Secretary of State.

8.2.7 The A*irports (Noise-related operating restrictions) (England and Wales) Regs 2018*[6] implement, in relation to England and Wales, the requirement to designate competent authorities for the purposes of Regulation (EU) No 598/2014 of the European Parliament and of the Council of 16th April 2014 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Union airports within a Balanced Approach.

8.2.8 *The Aeroplane Noise Regulations 1999*[7] require that all civil propeller and jet aeroplanes registered in the UK shall have a noise certificate.

8.2.9 The *Control of Pollution Act 1974*[8] provides a means for regulating construction noise and vibration.

National Policy

8.2.10 The *National Planning Policy Framework*[9] *(NPPF)* sets out the UK Government's planning policies for England and how these are expected to be applied. It is designed to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth.

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[1] European Commission. (2014) *Regulation (EU) No 598/2014 of the European Parliament and of the Council of 16 April 2014 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Union airports within a Balanced Approach and repealing Directive 2002/30/EC*

[2] Balanced Approach' as defined in EU Regulation 598-2014 is the process developed by the International Civil Aviation Organization under which the range of available measures, namely the reduction of aircraft noise at source, land-use planning and management, noise abatement operational procedures and operating restrictions, is considered in a consistent way with a view to addressing the noise problem in the most cost-effective way on an airport-by-airport basis.

[3] European Commission. (2002) *Directive 2002/49/EC Directive of the European Parliament and of the Council of 25th June 2002 relating to the assessment and management of environmental noise*

[4] UK Government. (2006) *Civil Aviation Act*

[5] UK Government. (2012) *Civil Aviation Act*

[6] UK Government. (2018) *Airports (Noise-related Operating Restrictions) (England and Wales) Regulations 2018*

[7] UK Government. (1999) *The Aeroplane Noise Regulations 1999*

[8] UK Government, (1974) *Control of Pollution Act 1974*

[9] Ministry of Housing, Communities & Local Government. (2021) *National Planning Policy Framework*

8.2.11 *The Noise Policy Statement for England (NPSE) 2010*[10] provides the framework for noise management decisions to be made that ensure noise levels do not place an unacceptable burden on society.

8.2.12 The NPSE introduces the concepts of NOEL (No Observed Effect Level), LOAEL (Lowest Observed Adverse Effect Level) and SOAEL (Significant Observed Adverse Effect Level).

8.2.13 The NPSE states that where any adverse noise effects are predicted, these are to be identified and, if these cannot be avoided, mitigation measures are recommended to ensure no significant residual effects on health and quality of life arise. This approach is considered consistent with the principal aims of the NPSE. It is important to note that findings against the LOAEL and SOAEL are measures of the effect of noise on health and quality of life, and not environmental impact assessment findings.

8.2.14 Further guidance on how planning authorities should take account of the acoustic environment and the mitigation strategies which should be applied in relation to the above terms is provided in the *National Planning Practice Guidance* in the section on *Noise*[11] (PPGN).

8.2.15 Paragraph 5 of the PPGN provides guidance on how to establish when noise is likely to be a concern. It advises that as noise increases above the LOAEL it:

"starts to cause small changes in behaviour and attitude, for example, having to turn up the volume on the television or needing to speak more loudly to be heard. The noise therefore starts to have an adverse effect and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise)."

8.2.16 The guidance is that where the predicted noise level is above the SOAEL, the planning process should be used to avoid a material change in behaviour that would otherwise occur, for example by use of appropriate mitigation. Furthermore, while such decisions must be made taking account of the economic and social benefit of the activity causing or affected by the noise, it is undesirable for such exposure to be caused.

8.2.17 In this chapter the highest noise exposure level is referred to as the Unacceptable Adverse Effect Level (UAEL). This approach has become a commonly accepted method of identifying the noise exposure level representing this important threshold to safeguard health and quality of life.

8.2.18 The *Aviation Policy Framework*[12] (APF) was published in March 2013 by the Department for Transport (DfT). The APF defines the Government's objectives and policies on the impacts of aviation in the UK.

8.2.19 On managing aviation's environmental impacts, and specifically noise, it states in paragraph 3.12 that:

"The Government's overall policy on aviation noise is to limit and where possible reduce the number of people in the UK significantly affected by aircraft noise, as part of a policy of sharing benefits of noise reduction with industry".

8.2.20 As detailed later, this assessment finds that the area of the 57 dB daytime contour is forecast to reduce compared to 2019 and be around 20% less than the current contour area limit by 2031 with the proposed amendments. So, while there is growth in the number of passengers, the overall amount of noise produced reduces due to the forecast aircraft types.

8.2.21 The APF also provides guidance on the noise metric used to rate air noise, it's meaning, and the expectations for noise insulation and compensation.

[10] Department for Environment, Food and Rural Affairs. (2010) *Noise Policy Statement for England (NPSE)*
[11] Department for Levelling Up, Housing and Communities and Ministry of Housing. (2019) *Planning practice guidance, Noise*. [Online]. Available at: https://www.gov.uk/guidance/noise--2
[12] Department for Transport. (2013) *Aviation policy framework*

8.2.22 The CAA *Survey of Noise Attitudes 2014: Aircraft*[13] (SoNA) includes the results of a survey to noise attitudes to civil aircraft. SoNA largely replaces *Attitudes to noise from aviation sources in England* (ANASE), the last large scale survey on attitudes to aircraft noise published in 2007.

8.2.23 SoNA compared reported mean annoyance scores against average summer-day noise exposure defined using $L_{Aeq,16h}$, L_{den}, N70 and N65. Mean annoyance score correlated well with average summer day noise exposure, $L_{Aeq,16h}$. No evidence was found to suggest any of the other indicators correlated better with annoyance than $L_{Aeq,16h}$. 'Summer' in this context refers to the 92 day period from 16th June to 15th September. This differs from the summer season used for aircraft scheduling.

8.2.24 The survey resulted in the 54 dB $L_{Aeq,16h}$ becoming the threshold of significant community annoyance rather than 57 dB $L_{Aeq,16h}$ which was based on the *UK Aircraft Noise Index Study (or ANIS)* from 1985.

8.2.25 In 2017 the DfT reported on the outcome of a consultation regarding changes to UK airspace[14] which included a review of criteria and metrics for assessing aircraft noise. This states in paragraph 9:

"The Government's current aviation policy is set out in the Aviation Policy Framework (APF). The policies set out within this document provide an update to some of the policies on aviation noise contained within the APF, and should be viewed as the current Government policy. The Government also intends to develop aviation noise policy further through the Aviation Strategy consultation process. As part of the Aviation Strategy consultation on sustainable growth planned for 2018 the Government intends to consider the roles, structures and powers that currently exist and what, if any, new ones will be necessary to bring about the network wide, co-ordinated and complex changes needed for airspace modernisation".

8.2.26 Based on this report, the Government proposed to implement a range of proposals of which the key points are given below. Their implementation, as discussed in the remainder of this section, was affected by the unprecedented challenges that the aviation sector faced as a result of the coronavirus (Covid-19) pandemic.

- The creation of an Independent Commission on Civil Aviation Noise (ICCAN) as an advisory non-departmental public body; (ICCAN was created but was wound down in September 2021 with some of the functions now taken on by the UK CAA);
- The removal of the 3 dB minimum change requirement for financial assistance towards acoustic insulation to residential properties in the 63 dB $L_{Aeq,16h}$ level or above, A level of 54 dB $L_{Aeq,16h}$ is now acknowledged to correspond to the onset of significant community annoyance and replaces the 57 dB $L_{Aeq,16h}$ level in the APF; and
- Some adverse effects of annoyance can now be seen to occur down to 51 dB $L_{Aeq,16h}$. LOAEL of 51 dB $L_{Aeq,16h}$ and 45 dB L_{night}, for daytime and night-time noise respectively, are to be used in assessing and comparing noise impacts of airspace changes (N.B. Following consultation with the CAA, the Government consider it appropriate to use 45 dB $L_{Aeq,8h}$ as the LOAEL for air space change assessment, for consistency with daytime noise).

8.2.27 As part of this consultation, the DfT published their updated air navigation guidance[15] on airspace and noise management and environmental objectives. This proposes that rather than limiting the number of people exposed to any level of aircraft noise, the number of people experiencing significant adverse effects should be limited. For the purposes of assessing and comparing the noise impacts of airspace changes, a LOAEL of 51dB L_{Aeq} for daytime noise and 45dB L_{night} for night-time noise is proposed.

8.2.28 In December 2018, the Government published *Aviation 2050: The Future of UK Aviation*[16] (Aviation 2050) which outlines proposals for a new aviation strategy and addresses a wide range of associated issues. The Strategy sets out that the Government intends to put in place a stronger and clearer framework in order to

[13] Department for Transport and Civil Aviation Authority. (2017) *Survey of attitudes to aviation noise*

[14] Department for Transport. (2017) *UK airspace policy: a framework for the design and use of airspace*
[15] Department for Transport and Civil Aviation Authority. (2017) *Air navigation guidance 2017*
[16] Department for Transport. (2022) *Aviation 2050 – the future of UK aviation*

ensure the sector is sufficiently incentivised to reduce noise, or to put mitigation measures in place where reductions are not possible.

8.2.29 Aviation 2050 also set out in paragraph 3.122 that the Government proposes noise insulation measures including:

- *"To extend the noise insulation policy threshold beyond the current 63 dB $L_{Aeq,16h}$ contour to 60 dB $L_{Aeq,16h}$".*
- *"To require all airports to review the effectiveness of existing schemes. This should include how effective the insulation is and whether other factors (such as ventilation) need to be considered, and also whether levels of contributions are affecting take-up"; and*
- *"The Government or the Independent Commission on Civil Aviation Noise (ICCAN) to issue new guidance to airports on best practice for noise insulation schemes, to improve consistency".*

8.2.30 Regarding the first measure, LCY already operate a scheme that goes beyond this, with a threshold of 57 dB $L_{Aeq,16h}$. The airport has re-considered the effectiveness of the existing schemes as part of this application (see later in this Chapter).

8.2.31 The ICCAN review of airport noise insulation schemes was published in March 2021 and focussed on the products used, with no consideration of eligibility.

8.2.32 In October 2019, the government published a consultation response on legislation for enforcing the development of airspace change proposals (ACPs)[17] alongside an impact assessment. This response concerned Annex A of the *'Aviation 2050 – the future of UK aviation'* consultation document.

8.2.33 The consultation response concluded when the Government released *Flightpath to the Future*[18] (FttF) and advised that:

"given the unprecedented challenges that the aviation sector has faced as a result of the coronavirus (COVID-19) pandemic, we have decided we will not publish a further formal response to the remaining parts of this consultation.

Instead, in May 2022, the government published Flightpath to the future, a strategic framework that builds upon the consultation responses received. It establishes our ambitions and commitments for aviation over the next 10 years."

8.2.34 FttF contains a ten point plan for the future of UK aviation. Point 4 includes that the Government will *"continue to work with the sector to reduce the localised impacts of aviation from noise and air pollution".* FttF also details how the CAA has assumed most of the functions previously performed by ICCAN and that the Government will work closely with the CAA on these issues. *"This will include collaboration on the CAA's plans to create a new Sustainability Panel, designed to provide independent expert advice on a range of environmental issues including carbon, noise and air quality."*

8.2.35 It is also stated that:

"the Government set out new policy proposals to tackle these localised impacts through the Aviation 2050 consultation (2018). These included a clearer noise policy framework alongside measures to incentivise best operational practice to reduce noise and measures to improve airport noise insulation schemes. As the sector recovers, and air travel volumes increase again, these aims remain very relevant and we will set out next steps in 2022/23".

[17] Department for Transport. (2019) *Consultation Response on Legislation for Enforcing the Development of Airspace Change Proposals*

[18] Department for Transport. (2022) *Flightpath to the future: a strategic framework for the aviation sector*

Regional Policy

8.2.36 The Mayor of London's policy on noise, D14, is given in The London Plan 2021[19]. This sets out how residential and other non-aviation development proposals should manage noise in order to reduce, manage and mitigate noise to improve health and quality of life. While strictly not in relation to airport developments, it is noted that these include *"promoting new technologies and improved practices to reduce noise at source".*

8.2.37 Policy T8 Aviation sets out the Mayor's approach to aviation related development. The policy contains nine parts, which include:

"A - The Mayor supports the role of the airports serving London in enhancing the city's spatial growth, particularly within Opportunity Areas well connected to the airports by public transport and which can accommodate significant numbers of new homes and jobs. This should be reflected in relevant Development Plans and other area-based strategies;

B - The environmental and health impacts of aviation must be fully acknowledged and aviation-related development proposals should include mitigation measures that fully meet their external and environmental costs, particularly in respect of noise, air quality and climate change. Any airport expansion scheme must be appropriately assessed and if required demonstrate that there is an overriding public interest or no suitable alternative solution with fewer environmental impacts;

E - Development proposals that would lead to changes in airport operations or air traffic movements must take full account of their environmental impacts and the views of affected communities. Any changes to London's airspace must treat London's major airports equitably when airspace is allocated; and

F - Development proposals should make better use of existing airport capacity, underpinned by upgraded passenger and freight facilities and improved surface access links, in particular rail."

Local Policy

8.2.38 The *Newham Local Plan 2018*[20] sets out a vision and framework for development in the borough. It is the starting point for considering whether planning applications can be approved. Along with the London Plan, the Local Plan forms the Development Plan against which individual proposals are assessed.

8.2.39 Noise is referred to in policy SP2 Healthy Neighbourhoods. This advises that development proposals which address the strategic principles and spatial strategy, and technical criteria will be supported. These include:

"The need to improve employment levels and reduce poverty, whilst attending to the environmental impacts of economic development including community/ public safety, noise, vibrations and odour and the legacy of contaminated land as per SP8 and SC1."

8.2.40 Policy SP8 Ensuring Neighbourly Development advises that proposals which address the strategic principles, spatial strategy and design, management and technical criteria will be supported. These include the need to:

"Avoid unacceptable exposure to light (including light spillage), odour, dust, noise, disturbance, vibration, radiation and other amenity or health impacting pollutants in accordance with policy SP2".

Other Guidance

8.2.41 The following additional guidance has been considered when undertaking the assessment:

[19] Mayor of London. (2021) *The London Plan*

[20] London Borough of Newham (2018) *Newham Local Plan 2018*

8.2.42 WHO Guidelines for Community Noise[21] - sets out noise targets which represent goals for minimising the adverse effects of noise on health.

8.2.43 WHO Night Noise Guidelines[22] - provide guidance on effects on health and sleep from transportation sources.

8.2.44 WHO Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Effects on Sleep[23] - reports the latest findings from the WHO concerning night noise from transportation sources and its effects on health and sleep.

8.2.45 BS8233:2014 Sound insulation and noise reduction for buildings – Code of practice[24] - provides guidance on the control of external noise. The standard presents a number of design ranges for indoor noise levels for different types of space.

8.2.46 Department of Education BB93[25] - gives upper limits for indoor ambient noise level for new and refurbished schools, and schools formed by a material change of use.

8.2.47 Department of Health HTM 08-1[26] - provides guidance on recommended internal noise levels for healthcare facilities.

8.2.48 IEMA Guidelines on Environmental Noise Impact Assessment[27] - provides guidance on significance rating for a change in air noise level.

8.2.49 Report of a Field Study of Aircraft Noise and Sleep Disturbance[28] - provides guidance on eligibility threshold for a sound insulation scheme due to night-time aircraft noise.

8.2.50 Environmental Noise: Valuing impacts on sleep disturbance, annoyance, hypertension, productivity and quiet[29] - provides a percentage of those people likely to be highly sleep disturbed.

8.2.51 Design Manual for Roads and Bridges (DMRB)[30] - provides road traffic noise assessment criteria.

8.2.52 BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Noise[31] - provides methods to predict, measure and assess the impact of construction and demolition noise.

8.2.53 The UK Aeronautical Information products are provided by authority of the CAA. The products include the Aeronautical Information Publication (AIP)[32] for the airport, which details restrictions on aircraft operators and aircraft movements to control noise.

[21] Berglund, B. et al. (1999) *Guidelines for community noise*
[22] World Health Organisation Europe. (2009) *Night Noise Guidelines for Europe*
[23] Basner, M. et al. (2018) *WHO Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Effects on Sleep*
[24] British Standards Institution. (2014). *BS 8233:2014 Sound insulation and noise reduction for buildings – Code of practice*
[25] Education Funding Agency. (2014). *BB93: acoustic design of schools - performance standards*
[26] Department of Health. (2013) *Specialist Services, Health Technical Memorandum 08-01: Acoustics*
[27] Institute of Environmental Management and Assessment. (2014) *Guidelines on Environmental Noise Impact Assessment*
[28] Ollerhead, J.B. et al. (1992) *Report of a Field Study of Aircraft Noise and Sleep Disturbance: A Study Commissioned by the Civil Aviation Policy Directorate of the Department of Transport*
[29] Department for Environment Food and Rural Affairs. (2014) *Environmental Noise: Valuing impacts on: sleep disturbance, annoyance, hypertension, productivity and quiet.*
[30] Highways England. (2020) *Design Manual for Roads and Bridges, LA 111 Noise and Vibration*
[31] British Standards Institution. (2009) *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Noise*
[32] *NATS (2022). Aeronautical Information Publication – Current AIP – Part 3*

8.3 Assessment Methodology

Consultation

8.3.1 In addition to consultation with the local planning authority and other statutory consultees, the airport held a ten-week, non-statutory, public consultation. The latter included both public exhibitions, pop-up events and a dedicated website and virtual exhibition. Information was provided through exhibition boards and an Initial Environmental Report (IER), as described in Chapter 3: EIA Methodology.

8.3.2 The feedback was mixed with positive comments received from industry stakeholders, passengers, and local businesses. Neutral or mixed feedback came from some members of the public, with concerns voiced by some members of the public, elected representatives and political stakeholders on issues such as Saturday hours and noise. Further details of the public consultation and the responses are contained in the Statement of Community Involvement (SCI) which accompanies this application.

8.3.3 The feedback received from all stakeholders has been taken into account in preparing this application. The key themes and issues raised have informed the proposals which have been revised from those which were consulted on. As described earlier in this ES, these changes comprise a reduction in the extended hours sought on a Saturday, a reduction in the number of additional movements sought in the early morning period, and no longer seeking to change the cap on the number of aircraft movements which experience unavoidable operational delays and so can operate in an extended 30 minute period (up to 22.30).

8.3.4 An EIA Scoping Report was also prepared which detailed the approach to the noise assessment including the use of the $L_{Aeq,16h}$ index as the standard noise indicator, how the noise contours would be prepared and at what values. This included the use of dedicated contours for the weekend period and contours for the night-time period. In addition, details were given on how significance was to be determined using both absolute noise levels and any changes in noise level.

8.3.5 The proposed approach to the noise assessment was accepted by the London Borough of Newham, with one recommendation which is detailed in Table 8-1 along with how it has been addressed. Responses were also received from the Greater London Authority and the Mayor of London. These are summarised in the table along with how they have been addressed.

Table 8-1 Consultation responses relevant to this chapter

Consultee	Issues Raised	How/ Where Addressed
London Borough of Newham – Scoping Opinion of 24 November 2022	Where individual aircraft movements in the <0700 period are considered this should include discussion on the average (L_{Aeq}), and short duration (L_{Amax}) noise levels in the context of the existing ambient acoustic environment at sensitive receptors (NV1).	This chapter and associated appendices detail the results of noise surveys of the existing acoustic environment in the surrounding area, including short duration (L_{Amax}) noise levels. Information is also provided on the area exposed to the highest maximum noise levels from aircraft, both in the baseline and under each future scenario.
Greater London Authority – 15 July 2022	The noise assessment should include those communities overflown beyond the immediate vicinity of the airport and factoring in the cumulative impacts, including from other London airports. The applicant must ensure that the proposed modifications do not exacerbate impacts on health and quality of life and that any noise reduction resulting from new technologies benefits residents, rather than being banked to enable more flights.	While the assessment, in accordance with policy, focusses on those exposed to the highest noise levels, information is also provided, for example through 'number above' contours on the anticipated changes for more distant locations. Cumulative impacts including those from other airports are considered in Section 8.9. While a key part of the application is the greater use of new technologies, no increase in the permitted number of flights is sought.

Consultee	Issues Raised	How/ Where Addressed
Mayor of London – September 2022	The assessment needs to include a suite of noise metrics, not just an L_{Aeq} noise contour. Those metrics which capture a single event level and/or the number of noise events above a certain level would paint a clearer picture of the impacts of the relaxation of restrictions proposed. The assessment would also benefit from more comprehensive baseline data, both pre- and post-pandemic. No baseline data has been provided for weekend noise and no assessment is provided whatsoever with regard to early morning or late evening flights. The assessment is, again, underpinned by the assumption of accelerated re-fleeting as a result of the proposals and this is liable to mislead, particularly relative to the impacts of the future 'do minimum' scenarios. This leads to a conclusion that "noise is forecast to decrease compared to what is currently permitted" – even though any such decrease is down to factors unrelated to this application. The previous flightpath changes implemented by London City Airport, which disproportionately concentrated flightpaths – and therefore noise – on a relatively limited number of residents remains unaddressed and are a source of continued anguish for many. The Airport's inaction on this issue continues to undermine trust in its approach to aircraft noise. This assessment does little to allay the fears of local communities about the fundamental increase in noise expected to result from the scheme. London City Airport needs to undertake and set out a more rigorous assessment of the noise impacts of the scheme, for all the relevant periods and using a range of metrics,	The assessment discussed is understood to be the Initial Environmental Report. This chapter and the associated appendices detail a suite of noise metrics, including a metric which captures the number of noise events above a certain noise level. Baseline data is provided for both 2019 and 2022, with the latter relating to the weekend. An assessment is also included regarding early morning flights. Although it did feature in the consultation, no change is sought to late evening flights. A key part of the application is to encourage re-fleeting by restricting operations, such as those during any extended hours on a Saturday, to new generation types. The forecast effect of this can be seen by comparing the future scenarios with and without the proposed amendments. No change is sought to flight paths under this application. They are considered through a separate process which is currently looking at the airspace over London with the involvement of the relevant airports. This chapter and the associated appendices include a more detailed assessment of the noise impacts than was included in the Initial Environmental Report.

Scope of the Assessment

Technical Scope

8.3.6 This noise chapter considers the potential impacts and likely significant effects associated with the following types of noise: construction noise; construction and operational road traffic noise; operational air noise; and operational ground noise.

8.3.7 An assessment of operational vibration is scoped out of the assessment on the basis that there are not considered to be any likely significant effects.

8.3.8 An assessment of vibration from construction works is also scoped out of the assessment on the basis that there are not considered to be any likely significant effects. The 2015 UES considered vibration from construction and found no significant effects. In addition, the construction element of CADP1 most likely to result in vibration effects was piling in the dock, which is now complete.

8.3.9 Air noise is that produced by aircraft during departure and arrival at the airport. It includes the noise generated:

On departure:

- From the point at which an aircraft commences its take-off roll ('start of roll' noise);
- Proceeds along the runway to the point of leaving the ground; and
- Climbs into the air and departs the vicinity of the airport.

On arrival:

- From the point at which an aircraft approaches the vicinity of the airport;
- Descends to the runway;
- Touches down;
- Slows down along the runway to the point of exiting onto a taxiway; and
- Includes reverse thrust if that is required to slow the aircraft down on the runway.

8.3.10 Air noise does not include the aircraft taxiing between the aircraft stands and the runway, which is captured under ground noise.

8.3.11 Ground noise encompasses that produced by aircraft activities on the ground, such as during taxiing, manoeuvring, holding on the runway prior to departure, running engines on the stand and operation of auxiliary power units (APUs) while on stands. Noise from engine running for test and maintenance purposes is also considered as ground noise.

8.3.12 Road traffic noise includes noise from road vehicles accessing the airport, including vehicles related to the construction activity, as well as that from other road vehicles, not related to the airport, using the surrounding roads. Due to the overlap between the construction and operation phases, construction and operational traffic is considered together and the noise impact of total traffic flows is considered.

8.3.13 An assessment of noise from construction of the remaining elements of CADP1 that have not been built, taking into account the revised construction programmes has been undertaken.

Study Area

8.3.14 The study area is based on the largest extent of likely effects due to noise. This area is different for the separate noise sources considered.

8.3.15 The largest Zone of Influence (ZoI) considered for the assessment is for air noise. This is based on the extent of the noise contours prepared corresponding to the LOAEL. The methodology used for the preparation of these noise contours is detailed in Section 8.4. The ZoI consists of an area that extends up to 7.5 km to the east, 7.5 km to the west, 5.5 km to the north and 2.5 km to the south of the airport runway and is shown in Figure 8.3.1 in Appendix 8.3.

8.3.16 For ground noise, road traffic noise and construction noise the ZoI considered consists of a rectangle that extends 1.5 km to the east, 1.5 km to the west, 0.5 km to the north and 0.5 km to the south of the airport runway. This covers the roads closest to the airport where airport related road traffic will be greatest. Further from this, the airport traffic will split amongst multiple roads and so the volume on any will be lower.

Noise Sensitive Receptors

Air Noise

8.3.17 Population and dwelling data for the air noise assessment has been provided by CACI Ltd in the form of a 2022 postcode database.

8.3.18 In addition, the air noise assessment has considered permitted developments with the ZoI. These are residential developments with planning permission which have not yet been built or are only partially built at the time of this assessment. These 'cumulative development' are set out in Appendix 14.1 of the ES. The permitted development locations are shown in Figure 8.3.2 in Appendix 8.3.

8.3.19 The air noise assessment has also considered the effects on non-residential noise sensitive receptors within the ZoI. Data has been provided by Quod for the existing receptors. Three types of receptors have been considered:

- Schools including formal nurseries but excluding informal settings such as day care;
- Long term healthcare facilities, such as hospitals and nursing homes, but excluding pharmacies, GP surgeries, etc.; and
- Outdoor amenity areas, such as official parks and playgrounds, but excluding areas not open to the public and areas of a minimal extent such as road side verges.

8.3.20 There are currently 129 schools, 4 residential healthcare buildings and 287 outdoor amenity areas within the air noise ZoI. A full list of these receptors is given in Appendix 8.3 and their locations are shown in Figure 8.3.3. No permitted, but not yet built, non-residential noise sensitive receptors within the ZoI have been identified.

8.3.21 Noise levels are also presented for 12 locations representative of the areas around the airport. The locations are not themselves noise sensitive, as the assessment is based on the population data, but are presented to allow individuals to understand the noise levels in their area and how it is forecast to change. Noise levels were also presented for these same 12 locations in the 2015 UES. These representative locations are listed in Table 8-2 and are shown in Figure 8.3.1.

Table 8-2: Air Noise Representative Locations

Location Reference	Location
1	Blackwall / A1261
2	Britannia Village
3	Silvertown / A1020
4	Custom House
5	Camel Road
6	Royal Albert Dock (north)
7	North Woolwich (north)
8	Thamesmead
9	Eastern Quay Apts, Britannia Village
10	Coral Apts, Western Gateway
11	Silvertown Quays
12	Ramada Hotel

Ground Noise

8.3.22 The ground noise assessment considers 10 representative locations, these are the same 10 locations assessed in the 2015 UES. These representative locations are listed in Table 8-3 and are shown in Figure 8.4.1 in Appendix 8.4.

Table 8-3 Ground Noise Representative Locations

Location Reference	Location
A	Drew Road
B	North Side of Royal Albert Dock
C	Camel Road Flats
D	Parker Street
E	Newland Street
F	Storey Road School
G	Great Eastern Quays / “Norton Pharmaceutical”
H	University of East London
I	Royal Docks Business
J	Brixham Street

8.3.23 In addition, a set of 3,673 receptor locations representative of the current dwellings around the airport have been assessed.

Road Traffic Noise

8.3.24 For each road assessed, the noise level has been calculated at the worst affected property or properties. Details of the roads assessed and the distance of the location to the nearside kerb are shown below in Table 8-4. Figure 8.5.1 in Appendix 8.5 indicates the locations of the road traffic noise assessment locations.

Table 8-4: Road Traffic Noise Assessment Locations

Road Name	Assessment location	Distance of location to nearside kerb (m)
Connaught Bridge	Connaught Bridge PH (A)	34
Hartman Road (West)	2 Camel Road (B)	14
Connaught Road	Connaught Road (C)	4
Royal Albert Way (East)	Royal Albert Way East (D1)	28
	Royal Albert Way East (D2)	33
Royal Albert Way (West)	Royal Albert Way West (E)	40
Woolwich Manor Way	Woolwich Manor Way (F1)	11
	Woolwich Manor Way (F2)	15
Hartman Road (East)	29 Woodman St (G)	26

Construction Noise

8.3.25 The construction noise assessment focusses on representative locations which have the potential to be significantly affected by noise. These are the same locations assessed in the 2015 UES and are shown below in Table 8-5. The locations of these receptors are shown in Figure 8.6.1 in Appendix 8.6.

Table 8-5: Construction Noise Assessment Locations

Location Reference	Location	Notes
A	19 Camel Road	Residential area. Low level housing benefiting from substantial road traffic noise barrier and barrier provided by Pier. Nearby high level flats have limited screening.
B	Drew Road Primary School	Primary school – constructed relatively recently with mitigation measures to control airborne aircraft noise.
C	40 Newland Street	Residential area. Housing benefits from noise screening due to DLR noise barrier, Eastern Apron noise barrier and topography.
D	86 Winifred Street Flats	Residential area. Housing benefits from noise screening due to DLR noise barrier.
E	38 Campion Close	Residential area. Housing benefits from limited noise screening due to topography of Royal Albert Way.
F	32 Brixham Street	Residential area. Housing benefits from noise screening due to DLR noise barrier.
G	30 Renfrew Close	Residential area. Housing benefits from limited noise screening due to topography of Royal Albert Way.
H	Storey Street School	Residential area including Storey Street School, Woodman Street Community Hall both already treated under the Sound Insulation Scheme. High level flats on Woodman Street overlook docks.
I	UEL halls of residence	Recently constructed university constructed to mitigate airborne aircraft noise.
J	3 Weaver Close	Residential area. Housing benefits from limited noise screening due to topography of Royal Albert Way.
K	43 Felixstowe Court	Residential area constructed to mitigate airborne aircraft noise.

8.3.26 In addition, a set of 3,673 receptor locations representative of the current dwellings around the airport have been assessed. These are the same set of receptors used for the ground noise assessment.

Assessment Scenarios

8.3.27 Air traffic at the airport was severely impacted by the Covid-19 pandemic throughout 2020 and 2021. Noise data for 2019 has therefore been used to represent the baseline for the noise assessment.

8.3.28 For air noise, ground noise and road traffic noise the following assessment years and scenarios have been considered in this chapter:

- 2019 Baseline;
- 2025, for both the DM and DC Scenarios;
- 2027, for both the DM and DC Scenarios; and
- 2031, for both the DC and DM Scenarios.

8.3.29 Daytime construction noise has been assessed on the basis of all of the activities associated with the build out of the remaining elements of CADP1 being considered in one of six categories. The Out-of-Operational Hours (OOOH) construction noise has been assessed in detail for each 3 month time slice from 2025 Q1 to 2030 Q4.

8.3.30 In addition to these core assessment scenarios, a sensitivity test based on reaching the proposed passenger cap of 9 mppa slightly earlier in 2029 or later in 2033 have been quantitively assessed for air noise. These ‘Faster Growth’ and ‘Slower Growth’ Scenarios are described in detail in Chapters 2 and 3 of the ES and result in slight differences in the forecast mix of aircraft and the proportion of quieter new generation aircraft. As the eventual number of aircraft movements and passenger numbers are the same in these sensitivity tests as the core DC Scenario (111,000 ATMs and 9 mppa respectively), it is not considered necessary to consider ground noise or road traffic noise for these scenarios.

8.3.31 The construction works for the Faster Growth and Slower Growth Scenarios would essentially be the same as those for the DC forecast, with them being delayed by two years in the Slower Growth Scenario.

Therefore, it is not considered necessary to separately consider the construction noise impacts of the Faster Growth and Slower Growth Scenarios.

8.3.32 Further sensitivity tests, in addition to those considered in other technical chapters, consider the number of early movements being at the proposed limit every day, and an alternative fleet mix of future aircraft types.

8.3.33 The core DM and DC assessments are based on the expected number of flights in the early morning period (06:30-06:59) over the 92-day summer period based on the permitted limit of up to 6 and proposed limit of up to 9 flights per day respectively, excluding Sunday morning when the airport is closed. Although the airport is allowed to operate a maximum of 6 flights per day, over the summer period the average per day is historically less than this limit, for example in 2019 there were 361 flights in the early morning period although the current limit equated to 468 over the summer period.

8.3.34 The Proposed Early Morning Limit sensitivity assesses the noise effects in the event that the airport was to operate the maximum of 9 movements every early morning throughout the 92-day summer period (excluding Sundays).

8.3.35 The core assessment scenarios consider the most likely future aircraft fleet. The airport has committed to only allowing quieter new generation aircraft to operate in the extended weekend operating hours. There are a number of quieter new generation aircraft currently available that could operate at the airport but are not currently forecast to do so. One of these, the Airbus A220-300, is quieter than existing types but is noisier than other new generation aircraft. To consider whether the use of this aircraft would materially affect the weekend noise assessment, the Alternative Fleet Mix Scenario has been quantitatively assessed for air noise.

Baseline Characterisation

8.3.36 The noise climate around the airport includes noise from aircraft activity, as well as other sources such as road traffic and industry. The baseline at any given location will depend on its proximity to the airport and aircraft flight paths as well as to major or minor roads and any other local noise sources, such as the Tate & Lyle factory in Silvertown.

Noise Monitoring

8.3.37 Noise monitoring was undertaken for the CADP1 application in 2011, 2012 and 2015. Further noise monitoring was undertaken in 2019 at similar locations to obtain more up to date ambient and background noise levels for locations representative of the areas around the airport. Supplementary surveys were undertaken in 2022 to specifically measure weekend noise levels. Details of the noise survey work is provided in Appendix 8.2 and a summary is presented below.

8.3.38 In 2019, daytime and night-time noise surveys were undertaken at fifteen locations around the airport in North Woolwich and Beckton to measure the baseline noise environment and make observations of the noise climate prevailing at the time. The locations are representative of the communities in closest proximity to the airport, which therefore are likely to experience the greatest noise impacts from airport operations. A follow up survey of daytime weekend noise levels was undertaken in 2022.

8.3.39 The noise survey work comprised attended noise monitoring undertaken during periods in November and December 2019 and weekends in March and April 2022. These attended measurements include the noise contribution of non-aircraft related activities but exclude aircraft noise. This is to provide information on the situation without the aircraft. Information on the baseline aircraft noise is given by the air and ground noise modelling for 2019.

8.3.40 Noise levels have been measured in terms of $L_{Aeq,T}$, which represents the ambient noise level, and L_{AF90}, which represents the background noise level. A list of the noise monitoring locations is given in Table 8-6 and are shown in Figure 8.2.1. Location A5 was not accessible at night.

Table 8-6: Baseline Survey Locations

e	Location
A1	Grassy patch between Albert Road and Wythes Road
A2	Centre of green pedestrian area between Muir Street and Lord Street
A3	Corner of Kennard Street/Newland Street
A4	Corner of Woodman Street/Robert Street
A5	Middle of Royal Victoria Gardens
A6	End of Claremont Close
A7	Corner of Brixham Street and Dockland Street
A8	At the corner of Manwood Street and Fernhill Street
A9	Drew Road – between Wythes Road and Saville Road
A10	Outside Royal Victoria Gardens, south-east corner
B2	At the corner of Cyprus Place and Ferndale Street
B3	The end of Agnes Close
B4	On pavement of Strait Road on residential side
B5	On grass triangle in the centre of houses near Campion Close
B6	Beckton Park

8.3.41 In addition, long term noise monitoring data is available from the airport's six fixed noise monitoring terminals (NMTs). These NMTs are part of the Noise and Flight Track Monitoring System (NFTMS) at the airport and continuously record the noise. They are primarily used to identifying aircraft events which are correlated with radar information. $L_{Aeq,T}$ and L_{AF90} noise levels at these six locations are presented for 2019 for the daytime, night-time and weekend daytime periods.

Method of Assessment

General Approach

8.3.42 The generic project-wide approach to the assessment methodology is set out in Chapter 3: EIA Methodology. However, whilst this has informed the approach that has been used in this noise assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this assessment.

8.3.43 The general assessment methodology involves the following:

- Derivation of assessment criteria for each type of noise source;
- Computation of existing and future noise levels under the various scenarios;
- Determination of the change in noise levels between the DM and DC Scenarios, and associated impacts (relative) as a result of the introduction of the proposed development;
- Assessment of magnitude of impacts (absolute) on residential and non-residential receptors, for each scenario;
- Assessment of the likely significant effects (beneficial and adverse) of changes in noise levels by comparing the impacts of the DM and DC Scenarios;
- Consideration of the findings of the 2015 UES and comparison of the likely significant effects observed; and
- Description of any mitigation measures, where appropriate, in relation to the proposed development and description of any residual effects.

8.3.44 While the technical assessment methodology adopted for a given source of noise is generally unique (each of which is described in the relevant section later in this chapter), there are some common concepts that apply across all noise topics based on Government guidance through the NPSE.

8.3.45 The Government, through the NPSE, and the introduction of the Significant Observed Adverse Effect Level (SOAEL), has introduced the concept of significance thresholds related to health effects and quality of life. It is generally accepted that "significance" in this context differs from that used in an ES. This is because it refers to the significance of the absolute noise level, whereas an ES assesses the significance of changes brought about by any proposed development. For example, a receptor may be exposed to significant levels of noise regardless of any development, but if the noise level remains the same then the receptor would not be said to be significantly impacted by the proposed development.

8.3.46 The thresholds for assessing health effects and quality of life are important, particularly when considering and comparing different scenarios as well as establishing the need for and extent of noise mitigation. The NPSE introduces the concept of the NOEL, LOAEL and SOAEL as discussed in Section 8.2 above. PPGN also introduces the concept of the UAEL.

8.3.47 The NOEL, LOAEL, SOAEL and UAEL can vary depending on the source, receptor, and time period (e.g. day or night), and in this way the sensitivity of the receptor is embedded into the criteria. For example, the SOAEL for a dwelling at night will be lower than during the day, to reflect the fact that residents are more sensitive to noise at night.

8.3.48 The technical guidance, summarised in Section 8.2 and described in detail in Appendix 8.1, has been used to develop noise assessment criteria and also used to derive values of LOAEL, SOAEL and UAEL as given in NPSE and PPGN where appropriate. The definition of these is as follows:

- LOAEL – Lowest observed adverse effect level. This is the level above which adverse effects on health and quality of life can be detected;
- SOAEL – Significant observed adverse effect level. This is the level above which significant adverse effects on health and quality of life occur; and
- UAEL – Unacceptable adverse effect level. Noise above this level should be prevented.

8.3.49 The assessment criteria for different noise sources is provided in the subsequent section.

8.3.50 Where any adverse noise effects are predicted, these are identified and if these cannot be avoided, mitigation measures are recommended to ensure no significant residual effects on health and quality of life arise. This approach is considered consistent with the principal aims of the NPSE. It is important to note that findings against the LOAEL and SOAEL are measures of the effect of noise on health and quality of life, and not environmental impact assessment findings.

8.3.51 The World Health Organization (WHO) published their updated Environmental Noise Guidelines which summarise international research on the effects of noise. This can therefore be useful for quantifying noise effects. The WHO review of the research assessed the quality of the evidence it provided and proposed guidelines in certain circumstances. They consider this public health advice essential to drive policy action. The guidelines are not policies themselves, although they can be of assistance in areas where policy is limited.

8.3.52 With regard to aircraft noise the guidelines strongly recommend that noise does not exceed 45 dB L_{den} or 40 dB L_{night} outside a dwelling. These are very low recommended levels and are aspirational targets which have not been adopted as policy in the UK. As a result, this assessment still relies on previous advice from the World Health Organisation as relevant to this assessment, as this has informed Government policy that applies today.

8.3.53 For context the guidelines also give recommendations for other noise sources including road traffic. The 2017 reporting for the Greater London Urban Area agglomeration shows almost 2,650,000 people in the urban area are exposed to average day-evening-night noise levels (L_{den}) of at least 55 dB from road traffic, which is above the WHO recommended level.

Noise Indices

8.3.54 The noise assessment utilises a range of primary and supplementary indices to predict future noise levels and the associated effects.

8.3.55 The $L_{Aeq,T}$ index is the equivalent noise exposure level that occurs over a time period T. In the case of aircraft noise, it accounts for the sound energy produced both by the number of aircraft events and the noisiness of each aircraft event, over a defined time period. It is the primary metric for quantifying community effects of aircraft noise in the UK, specifically:

- $L_{Aeq,16h}$ – covers noise exposure over the daytime period from 07:00 to 23:00; and
- $L_{Aeq,8h}$ - covers noise exposure over the night-time period from 23:00 to 07:00.

8.3.56 The convention for the aforementioned units is to assess aircraft movements over three summer months, specifically a 92 day period from 16th June to 15th September inclusive. Summer in this chapter refers to this 92 day period unless stated otherwise.

8.3.57 The Government, as set out in the APF and supported by SoNA, confirms that daytime aircraft noise should be assessed using daytime $L_{Aeq,16h}$ noise contours determined from an average summer day of aircraft movements. As a result, emphasis on the assessment of daytime noise in this chapter is placed on the UK methodology and $L_{Aeq,16h}$ unit. This unit has been used historically within the UK over the past 30 years to assess the effects of aircraft noise and there is a body of research considering the response of and effects on people from aircraft L_{Aeq} noise levels.

8.3.58 For night-time, the publication of the Government's response to the airspace change consultation[33] confirms the use of $L_{Aeq,8h}$ noise exposure contours determined from an average summer night of aircraft movements for assessing aircraft noise effects at night. These contours are also now prepared and published annually for the designated airports such as Heathrow, Stansted, and Gatwick, along with daytime $L_{Aeq,16h}$ contours.

8.3.59 L_{Aeq} contours are typically produced based on the average modal split, meaning they allow for the overall split of aircraft movements in terms of whether the airport is operating in a westerly or easterly direction. Single mode contours can be produced assuming either 100% westerly operations or 100% easterly operations. There are no specific criteria available to rate noise levels associated with single mode contours. However, such contours show the noise exposure levels expected for a given day when operations occur from a single runway direction.

- While average exposure noise contours of this type are well established and important at demonstrating trends in total noise around an airport, it is recognised in the APF that the L_{Aeq} indicator does not necessarily reflect all aspects of the perception of aircraft noise. Supplementary indices are therefore considered as part of this air noise assessment which may help to explain how aircraft noise is experienced in different localities. The purpose of this is to ensure a better understanding of noise effects and to inform the development of targeted noise mitigation measures.

8.3.60 The following additional metrics have been considered:

- L_{ASmax} - reflects what a person hears as the maximum noise level during an aircraft movement and is an index that is most understandable to people without the need for technical understanding. It can be used to consider the typical noise levels of individual aircraft and rate the noise of an individual event, particularly at night. Although they can be easier for people to understand, as they relate to individual events, they are not the best measurement to consider the overall situation and therefore they cannot be used as a primary assessment metric;

[33] Department for Transport. (2017) *Policy Paper UK airspace policy: a framework for the government's approach to support modernisation of the UK airspace is managed.*

- L_{den} - considers an average annual day of aircraft traffic (although it can be applied equally to either rail or road traffic) over a 24-hour period. It provides greater emphasis, by way of adding noise penalties of 5 dB and 10 dB to the noise levels for the evening (19:00 to 23:00) and night (23:00 to 07:0059) periods respectively;
- L_{night} - equates approximately to the $L_{Aeq,8h}$ index however it is based on an average annual night of aircraft movements rather than an average summer night;
- L_{A90} - the noise level that is exceeded for 90% of the time. It is often used to describe the background noise level at a location; and
- L_{A10} - the noise level that is exceeded for 10% of the time. In the UK, the convention for assessing road traffic noise is in terms of $L_{A10,18h}$, specifically the L_{A10} for the 18-hour period between 06:00 and midnight.

8.3.61 In Europe, noise indicators L_{den} and L_{night} are used to assess environmental noise effects and are used in the UK to prepare Strategic Noise Maps and Noise Action Plans. Noise contours, in terms of L_{den} and L_{night}, are produced on a five-yearly basis for all major airports, including LCY. The development of criteria by which to judge this European index is in its relative infancy compared to the body of knowledge built around the $L_{Aeq,16h}$ unit, although guidance is continuing to emerge, particularly regarding noise exposure and potential health effects.

8.3.62 People experience aircraft noise as a series of individual events over a day. The number above (N) index considers the number of events and is becoming more commonly used to assist in describing aircraft noise to aid public understanding:

- N65 - number of times during the daytime that a receptor will experience a noise level of 65 dB L_{ASmax} as a result of an aircraft movement; and
- N60 - number of times during the night-time that a receptor will experience a noise level of 60 dB L_{ASmax} as a result of an aircraft movement.

8.3.63 These metrics allow an understanding of how, for a given noise level and above, the number of flights during the daytime or night-time might alter when comparing two scenarios, such as with or without an airport development. There are no specific criteria for rating the acceptability of N65 or N60 contours although they further assist a comparison of two different operational scenarios.

8.3.64 Further information on how these supplementary indicators can be interpreted is given in Appendix 8.1.

8.3.65 With regard to maximum noise levels, the number of people exposed to individual events of at least 80 dB L_{ASmax} (approximately equivalent to 90 dB(A) SEL) at least once per night has also been determined. This threshold is commonly used and was developed based on the *Report of a Field Study of Aircraft Noise and Sleep Disturbance.* An interpretation of that research study's results is that there is no significant risk of sleep disturbance for locations outside the 90 dB(A) SEL footprint area. For locations within 90 dB(A) SEL footprint, a very slight risk of sleep disturbance will be present.

8.3.66 Noise annoyance ratings are also a useful way of explaining how a given noise environment is likely to affect the local community, by identifying those likely to be 'highly annoyed' by aircraft noise. The measure considers the general population, and it is accepted that some people would be more annoyed or less annoyed for a given daytime noise exposure level. This method of assessment offers some advantages over simply banding a population into "low", "moderate" and "high" annoyance categories since it recognises that even at relatively low levels of aircraft noise, some people can by highly annoyed. It can therefore be usefully used as a means of evaluating differences between scenarios. Similar ratings for sleep disturbance also exist for night-time activities.

8.3.67 The number of people likely to be highly annoyed has been calculated based on the dose response provided in SoNA 2014. The number of people likely to be highly sleep disturbed has been calculated based on the dose response equation in the 2018 WHO Environmental Noise Guidelines for the European Region. Further details are included in Appendix 8.3. In both calculations no account is taken of any improved insulation for dwellings which have benefitted from LCY's sound insulation scheme (SIS).

8.3.68 While noise exposure contours take account of both the noisiness of aircraft events and the number of operations that occur during a day or night, they only provide an overall value. While this is required by Government for planning purposes, it does not reflect the change that occurs over a day. Supplementary information can therefore be beneficial on how the noise level might vary at a given receptor across a given day, for example, on an hourly basis.

Air Noise

8.3.69 Air noise contours have been prepared in terms of the usual UK noise indicator for daytime airborne noise, the $L_{Aeq,16h}$ index, and for night-time airborne noise, the $L_{Aeq,8h}$ index, using the Federal Aviation Administration (FAA) Aviation Environmental Design Tool (AEDT).

8.3.70 For daytime air noise, the standard 16 hour period assessed in the UK is 07:00-23:00. At LCY daytime noise contours have generally been produced based on the airport's operational hours 06:30-22:30, thus including all flights that occur at the airport. This approach has therefore also been used for this assessment. The 8 hour night period contours have been based on the standard UK night period 23:00-07:00, and thus include some movements that are also modelled in the daytime contours (i.e. those between 06:30-07:00).

8.3.71 The following supplementary indicators have also been provided for information, although they do not form the primary basis of the assessment of significance for air noise. They do however provide context to the significance, helping to show how the noise environment will change between one scenario and another.

- Single mode contours (L_{Aeq}), westerly and easterly;
- Number of people likely to be highly annoyed;
- Number of people likely to be highly sleep disturbed;
- Day, evening, night contours (L_{den});
- Night noise contours (L_{night}); and
- Nx and L_{Amax} noise contours.

8.3.72 In addition to the aircraft types currently operating at the airport, such as the Embraer E190-E2, the forecasts include movements by new aircraft types. Consideration has therefore been given to other sources of aircraft performance data, such as those available from the CAA on the performance of future aircraft types, in particular the Embraer E195-E2. As mentioned previously, consideration has also been given to the Airbus A220-300, which could operate at the airport in future. As this type is expected to be the noisiest of the new generation aircraft, a sensitivity test considering operations by it has been undertaken.

8.3.73 Table 8-7 shows the noise level differences between the most common current aircraft type, the Embraer E190 and the quieter new generation aircraft. For the Airbus A220-100 and Embraer E190-E2 these differences are based on average measured noise levels from the airport's NMTs (2019-2021). The Embraer E195--E2 and Airbus A220-300 have not yet operated regularly at the airport and therefore measured noise levels from the airport's NMTs are not available. The noise levels for these types of aircraft have therefore been based on noise certification levels.

Table 8-7: New Generation Aircraft Noise Levels Compared to Embraer E190

Aircraft Type	Change in Noise Level Compared to Embraer E190, SEL dB(A)	
	Arrival	Departure
Airbus A220-100	-2.8	-5.1
Airbus A220-300	-2.0	-4.0
Embraer E190-E2	-3.2	-5.4
Embraer E195-E2	-2.9	-4.6

8.3.74 In addition to these primary metrics, due to the proposed changes in Saturday operational hours, a specific assessment of weekend noise has been undertaken. Air noise predictions have been undertaken in

terms of the standard daytime $L_{Aeq,16h}$ metric, but the predictions are based on only the aircraft movements at the weekend. This is not a standard assessment metric but is intended to show how noise at the weekend could change over time with the proposals.

8.3.75 Further details of the assessment methodology for the calculation of air noise are set out in in Appendix 8.3.

Ground Noise

8.3.76 A ground noise assessment has been undertaken for the area around the airport where ground noise is expected to give rise to the greatest potential noise effects. Further details of the assessment methodology for ground noise are given in Appendix 8.4.

8.3.77 Ground noise contours have been prepared in terms of the daytime $L_{Aeq,16h}$ index and the night-time $L_{Aeq,8h}$ index using Datakustik CadnaA noise modelling software. For the daytime ground noise assessment this has considered the period (07:00-23:00), which is the standard approach for assessing daytime noise in the UK and matches the approach used in the 2015 UES.

8.3.78 Consideration has been given to survey work of aircraft ground operations, both at the airport and at other UK airports.

8.3.79 As with air noise, a specific weekend assessment of ground noise has been undertaken, with ground noise predictions produced in terms of the $L_{Aeq,16h}$ metric, but the predictions are based on only the aircraft movements at the weekend.

Road Traffic Noise

8.3.80 Road traffic noise, from construction and operational traffic combined, has been assessed as set out in the DMRB document LA 111. This requires the use of the $L_{A10,18h}$ metric, which is the A-weighted sound level exceeded for 10% of the time between 06:00 and midnight. The assessment therefore covers the operating hours of the airport. In addition, a weekend specific assessment of road traffic noise has been undertaken covering the same period, but based only on traffic at the weekend.

8.3.81 Road traffic noise predictions have been produced using the CadnaA software package, following the methodology set out in the Department of Transport document Calculation of Road Traffic Noise (CRTN) as recommended by LA 111.

8.3.82 The assessment methodology for road traffic noise is set out in further detail in Appendix 8.6

Construction Noise

8.3.83 The construction noise assessment follows the same methodology as was used for the CADP1 2015 UES. This comprises an overall assessment of daytime construction activities for each phase of the proposed construction programme, with a more detailed assessment of Out of Operational Hours (OOOH) works, of the remaining elements of CADP1.

8.3.84 The construction plant noise emission details as set out in tables within BS 5228-1 along with the associated described methodologies have been used to assess and predict construction noise for different phases of the proposed development at key noise sensitive receptors.

Significance Criteria

Air Noise

Residential Receptors

Absolute Levels

8.3.85 Based on Government guidance as described in Section 8.2, the following contour values are relevant in terms of assessing daytime airborne aircraft noise:

- 51 dB $L_{Aeq,16h}$ which provides a threshold below which there are no observed adverse effects from air noise. This represents the LOAEL; with the exposure above it attributed a subjective description of impact of 'low';
- 54 dB $L_{Aeq,16h}$ which currently provides an indication of the onset of significant community annoyance;
- 63 dB $L_{Aeq,16h}$ which denotes moderate levels of community annoyance, commonly used at airports and recommended by the Government as an eligibility criterion for sound insulation schemes. This value is commonly considered to represent the SOAEL; with the exposure above it attributed a subjective description of impact of 'medium'; and
- 69 dB $L_{Aeq,16h}$ which denotes high levels of community annoyance where UK Government guidance is for consideration to be given by airports to assist in the costs of re-locating people from exposed dwellings, or, under certain circumstances, to offer to purchase such dwellings. This represents the UAEL; with the exposure above it attributed a subjective description of impact of 'high'.

8.3.86 The SOAEL and UAEL noise levels used for this assessment are the same as those used in the 2015 UES. In the 2015 UES the LOAEL was set at 54 dB $L_{Aeq,16h}$.

8.3.87 Night-time aircraft noise can be evaluated in a number of different ways. The common method is to rate night noise in terms of noise exposure, using the $L_{Aeq,8h}$ index (for the period 23:00 to 07:00). The $L_{Aeq,16h}$ and $L_{Aeq,8h}$ indices are the primary indicators used in this assessment, in line with those recommended by UK Government in the APF and the recent response to the air space change consultation.

8.3.88 As stated previously, the UK Government has recognised 45 dB L_{night} as representing the LOAEL while adopting the 45 dB $L_{Aeq,8h}$ index for this purpose for consistency with the $L_{Aeq,16h}$ daytime noise index.

8.3.89 The $L_{Aeq,8h}$ index differs only slightly from the L_{night} index in that it relates to an average summer day of aircraft activity, as opposed to an average annual day. As summer activity is generally higher than at other times of the year, the adoption of the $L_{Aeq,8h}$ unit, in place of the L_{night} unit represents a conservative approach. Similarly, on this basis, 55 dB $L_{Aeq,8h}$ is adopted as the SOAEL in this assessment.

8.3.90 At the airport, night-time aircraft activity is limited to only 30 minutes between 06:30 and 07:00. While using the $L_{Aeq,8h}$ metric has the effect of considering the noise across the whole night, it is common for night-time aircraft activity to be concentrated at certain times. For example, at London Heathrow around 80% of the night flights from 23:30 to 06:00 are between 04:30 - 06:00[34]. Despite this, the Government has used the standard metric to express their view of the LOAEL.

8.3.91 In addition, there is no policy, guidance, or research regarding the effects of $L_{Aeq,30m}$ noise contours. Using the same criteria as is used to assess changes in $L_{Aeq,8h}$ contours would substantially overstate the effects, as it would suggest there was no benefit to surrounding residents of the airport being closed for 7.5 hours of the night-time assessment period. Supplementary metrics such as L_{ASmax} have been produced for information, these provide noise information for single aircraft operations, the key results are presented in Section 8.6, with full results given in Appendix 8.3.

[34] Heathrow Airport. (2022) *Night Flights* https://www.heathrow.com/company/local-community/noise/operations/night-flights#:~:text=Heathrow%20also%20has%20a%20voluntary,to%20arrive%20after%2005%3A00

8.3.92 The magnitude of impact with regard to exposure to absolute noise levels at residential receptors has been categorised on a scale of Negligible, Low, Medium and High. On the basis of the above, the absolute noise values assigned to each category are given in Table 8-8.

Table 8-8: Magnitude of Impact (Absolute) – Residential, Outdoors

Subjective description of Impact	Daytime Criteria, dB $L_{Aeq,16h}$	Night-Time Criteria, dB $L_{Aeq,8h}$
Negligible	<51	<45
Low	51 (LOAEL) – 62.9	45 (LOAEL) – 54.9
Medium	63 (SOAEL) – 68.9	55 (SOAEL) – 62.9
High	≥69 (UAEL)	≥63 (UAEL)

Relative Levels

8.3.93 In addition to the absolute noise level, the relative change in noise level between the DM and DC Scenarios for future assessment years is used to assess the potential impacts from air noise. The proposed magnitude of impact ratings in relation to changes in noise level is set out in Table 8-9. A semantic scale of this type, based on the IEMA noise impact guidelines, has been widely accepted in the assessment of other UK airport development projects such as the recent Bristol Airport application and the Luton Airport Development Consent Order (DCO) application.

8.3.94 The impact ratings are also consistent with those presented in the EIA Scoping Report.

Table 8-9: Air Noise Impact Ratings - Change in Noise Level, Outdoors

Subjective description of Impact	Change in Daytime Noise Level, dB $L_{Aeq,16h}$	Change in Night-Time Noise Level, dB $L_{Aeq,8h}$
Negligible	0 – 1.9	0 – 1.9
Low	2 – 2.9	2 – 2.9
Medium	3 – 5.9	3 – 5.9
High	≥6	≥6

Scale of Effect and Significance

8.3.95 The scale of an effect is established from consideration of both the absolute noise level along with the magnitude of the change in noise level that occurs at a receptor.

8.3.96 The effect of a change in noise level tends to increase with the absolute level of noise experienced at a receptor. If, for example, the daytime noise level at a dwelling were to change from 45 dB to 50 dB $L_{Aeq,16h}$, (below the LOAEL) the overall effect for the occupants would be less than if the daytime noise level were to increase by the same amount from 63 dB to 68 dB $L_{Aeq,16h}$ (above the SOAEL).

8.3.97 There is no clearly accepted method of how to rate the scale of the effect and accordingly this has been determined based on professional judgement. Some guidance has however been provided in the PPGN which states among *"What factors influence whether noise could be a concern?"* the following:

"In cases where existing noise sensitive locations already experience high noise levels, a development that is expected to cause even a small increase in the overall noise level may result in a significant adverse effect occurring even though little or no change in behaviour would be likely to occur."

8.3.98 Table 8-10 illustrates how the scale of effect from air noise on both residential and non-residential receptors has been determined in this noise chapter based on the absolute air noise levels and associated change in noise level.

Table 8-10: Scale of Effect Matrix– Air Noise

Absolute Impact	Relative Impact			
	Negligible	Low	Medium	High
Negligible	Negligible	Negligible	Negligible	Minor
Low	Negligible	Minor	Moderate	Moderate
Medium	Negligible	Moderate	Moderate	Moderate
High	Minor	Moderate	Moderate	Major

8.3.99 Effects that are rated as moderate or major are deemed to be significant in EIA terms. Generally, a significant effect (adverse or beneficial) is considered to arise if the relative impact is rated as medium or high or if the relative impact is rated as low and the absolute impact is rated as medium or high.

8.3.100 Given the specific nature of the proposed development in respect to extended operational hours at the weekend, a reduction in the weekend respite period and changes to the weekend movement limits, an assessment based on noise over the whole 92 day period is not considered to fully encapsulate the impacts. Therefore, an assessment of noise just at the weekend in the summer period has been undertaken to specifically demonstrate the air noise impacts of the changes at the weekend.

8.3.101 Weekend noise predictions are not a standard metric and, as such, there is no specific policy or guidance on how changes in weekend noise should be interpreted. For this assessment, the same criteria regarding absolute noise levels and relative changes in noise levels have been used to rate the impacts of weekend air noise, as have been used to rate the impacts of daytime air noise. This is considered to be a conservative approach, as any noise level or change in noise level experienced for only two days a week must inherently have a lesser impact than the same noise level or change in noise experienced seven days a week.

Non-Residential Receptors

8.3.102 For receptors other than residential dwellings, absolute levels rated as 'medium' have been derived from the relevant guidance documents, as described in Appendix 8.1. These are given in Table 8-11. The significance of an effect depends on both the absolute impact and the relative impact. The effect on each non-residential receptor has been rated as significant if the absolute noise level is above the threshold given in Table 8-11 and the relative impact is rated as a medium or higher, i.e. a change in noise level of at least 3 dB(A).

8.3.103 For the non-residential receptors the approach to weekend criteria is the same as that for the residential receptors, with the same criteria used for daytime and weekend. The exception is schools, which have not been assessed for the weekend or night-time as they would not generally be expected to be open. Similarly outdoor amenity areas have not been assessed for night-time as many will be closed and even if not closed, the use of such areas at night is limited.

Table 8-11: Air Noise Impact Thresholds (Absolute) – Non-Residential, Outdoors

Receptor	Daytime Noise Level Threshold	Night-Time Noise Level Threshold
Schools (08:00-16:00)	55 dB $L_{Aeq,30m}$	n/a
Residential Healthcare Buildings	55 dB $L_{Aeq,1h}$	50 dB $L_{Aeq,1h}$
Outdoor Amenity Areas	55 dB $L_{Aeq,16h}$	n/a

8.3.104 The criteria relating to schools is required to be met over a 30-minute period, not over 16 hours. From Table 8-40 it can be deduced that during the school hours, L_{Aeq} noise levels could be around 3 dB higher than the 16-hour average. Based on this, a criterion of 52 dB $L_{Aeq,16h}$ has been used to represent 55 dB $L_{Aeq,30m}$.

8.3.105 The criteria relating to residential healthcare buildings is based on a 1 hour period, not 16 hours for daytime or 8 hours for night-time. As with schools, for the daytime assessment an allowance of 3 dB has been made based on Table 8-40, resulting in a criterion of 52 dB $L_{Aeq,16h}$, which has been used to represent 55 dB $L_{Aeq,1h}$.

Ground Noise

8.3.106 There is no definitive agreement on the method of assessment of aircraft ground noise. Various methods have been adopted in the past, and these have led to the assessment of ground noise in terms of the equivalent continuous sound level, $L_{Aeq,T}$, for various time periods. The daytime period has been assessed using the $L_{Aeq,16h}$ metric (07:00 to 23:00) and the night-time period has been assessed using the $L_{Aeq,8h}$ metric (23:00 to 07:00).

8.3.107 The ground noise level assessed at various receptors can be compared to the existing ambient environmental noise and published guidelines for the assessment of environmental noise. The WHO have previously recommended a guideline value of 50 dB $L_{Aeq,16h}$ to prevent 'moderate' community annoyance and 55 dB $L_{Aeq,16h}$ for 'serious' community annoyance.

8.3.108 To put these guidance criteria into context, over half of the population UK population was estimated to be exposed to levels which exceed the 55 dB L_{Aeq} guideline for 'serious' community annoyance from the results of the Defra funded 2000/2001 National Noise Incidence Study[35].

8.3.109 The ambient noise levels in the area around the airport have been measured at the baseline survey locations in Table 8-6 and found to lie in the range 52 dB to 64 dB $L_{Aeq,T}$ during the daytime with an underlying background noise level in the range 45 dB to 59 dB L_{AF90}. During the night-time, ambient noise levels have been measured to lie in the range 47 dB to 60 dB $L_{Aeq,T}$ with underlying background noise levels in the range 42 dB to 58 dB L_{AF90}. The background noise levels better reflect the noise environment in the absence of aircraft noise and other intermittent environmental noise sources.

8.3.110 Based on the standards in BS 8233 for dwellings, the WHO previously recommended guideline values would ensure that the recommended indoor noise levels of 35 dB $L_{Aeq,16h}$ within living rooms and 30 dB $L_{Aeq,8h}$ within bedrooms, would be achieved with windows partly open.

8.3.111 If windows are closed, an additional protection of around 10 dB can be expected. If ground noise were to rise above these levels, some form of additional mitigation, such as sound insulation treatment to the dwelling, would be required to protect people inside dwellings from the effects of ground noise.

8.3.112 Sound insulation can only provide so much protection to a dwelling, typically around 35 dB, and once the noise level outside a dwelling rises beyond a certain value, mitigation in itself will not provide sufficient protection.

Absolute Levels

8.3.113 The absolute noise values used to assess ground noise at the modelled receptors are given in Table 8-12. These LAeq,T levels are based on the BS8233 and WHO guidance and professional judgement. The daytime values for LOAEL, SOAEL and UAEL match those in the 2015 UES. The 2015 UES did not separately consider ground noise at night.

[35] C.J. Skinner and C.J. Grimwood, BRE. (2002) *The UK National Noise Incidence Study 2000/2001*

Table 8-12: Ground Noise Impact Ratings (Absolute) – Outdoors

Subjective description of Impact	Daytime Criteria, dB $L_{Aeq,16h}$	Night-Time Criteria, dB $L_{Aeq,8h}$
Negligible	<50	<45
Low	50 (LOAEL) – 59.9	45 (LOAEL) – 49.9
Medium	60 (SOAEL) – 69.9	55 (SOAEL) – 64.9
High	≥70 (UAEL)	≥65 (UAEL)

Relative Levels

8.3.114 In addition to the absolute noise level, the relative change in noise level between the DM and DC Scenarios for future assessment years is used to assess ground noise. A potential impact rating for a change in level is given in Table 8-13. A semantic scale of this type, based on the IEMA noise impact guidelines, has been accepted in various airport Public Inquiries.

Table 8-13: Ground Noise Impact Ratings (Relative) – Outdoors

Subjective description of Impact	Change in Daytime Noise Level, dB $L_{Aeq,16h}$	Change in Night-Time Noise Level, dB $L_{Aeq,8h}$
Negligible	0 – 1.9	0 – 1.9
Low	2 – 2.9	2 – 2.9
Medium	3 – 5.9	3 – 5.9
High	≥6	≥6

Scale of Effect and Significance

8.3.115 The approach to assessing the scale of effect and significance associated with ground noise is the same as set out previously for air noise and shown in Table 8-10.

8.3.116 As for air noise, a specific weekend assessment of ground noise has been undertaken. Weekend noise predictions are not a standard metric and, as such, there is no specific policy or guidance on how changes in weekend noise should be interpreted. For this assessment, the same criteria regarding absolute noise levels and relative changes in noise levels have been used to rate the impacts of weekend ground noise, as have been used to rate the impacts of daytime ground noise. This is considered to be a conservative approach, as any noise level or change in noise level experienced for only two days a week must inherently have a lesser impact that the same noise level or change in noise experienced seven days a week.

Road Traffic Noise

Absolute Levels

8.3.117 LOAEL, SOAEL and change thresholds for the day (06:00-24:00) are defined in LA 111:

- LOAEL - 55 dB LA10,18hr at the façade location; and
- SOAEL - 68 dB LA10,18hr at a facade location. This SOAEL level is broadly equivalent to 63 dB $L_{Aeq,16h}$ at a location away from a façade, which was the value used in the 2015 UES.

8.3.118 In the 2015 UES the UAEL was set as 72 dB $L_{Aeq,16h}$ at a location away from a façade, which is broadly equivalent to 77 dB $L_{A10,18h}$ at a façade. The same UAEL value has been used for this assessment.

8.3.119 As for air noise, a specific weekend assessment of road traffic noise has been undertaken and the same principles apply to this non-standard assessment which is again considered to be a conservative approach, as any noise level or change in noise level experienced for only two days a week must inherently have a lesser effect than the same noise level or change in noise experienced seven days a week.

8.3.120 The 18 hour (06:00-24:00) road traffic flows upon which the road traffic noise assessment are based cover the entire operational period of the airport (06:30-22:30). Therefore, it is not considered necessary to separately consider night-time road traffic noise, as any changes will be allowed for in the in daytime assessment.

8.3.121 The absolute noise values used to assess the impacts of road traffic at all receptors are given in Table 8-14.

Table 8-14: Road Traffic Noise Magnitude of Impact Ratings (Absolute) – Outdoors

Subjective description of Impact	Daytime Criteria, dB $L_{A10,18h}$	Weekend Criteria, dB $L_{A10,18h}$
Negligible	<55	<55
Low	55 (LOAEL) – 67.9	55 (LOAEL) – 67.9
Medium	68 (SOAEL) – 76.9	68 (SOAEL) – 76.9
High	≥77 (UAEL)	≥77 (UAEL)

Relative Levels

8.3.122 In addition to the absolute noise level, the relative change in noise level between the DM and DC Scenarios for future assessment years scenarios is used to assess road traffic noise. Evidence suggests that residents are much more likely to perceive very small changes in daytime noise level (1 to 3 dB(A)) following the opening of a major road infrastructure project. Over time, people become accustomed to the change and respond to any changes in traffic flow and associated change in noise conditions with reduced sensitivity. DMRB therefore provides objective assessment criteria in terms of changes in noise for both the 'short term' and the 'long term'.

8.3.123 No new roads or infrastructure are being built as part of the proposed development. Therefore, long-term changes in noise level are the only changes relevant to this assessment and the magnitude of impact ratings correspond to those for long term changes in DMRB which are set out in Table 8-15.

Table 8-15: Road Traffic Noise Impact Ratings (Relative) – Outdoors, Long Term

Subjective description of Impact	Change in Daytime Noise Level, dB $L_{A10,18h}$	Change in Weekend Noise Level, dB $L_{A10,18h}$
Negligible	0 – 2.9	0 – 2.9
Minor/Low[1]	3 – 4-9	3 – 4-9
Moderate	5 – 9.9	5 – 9.9
Major/High[1]	≥10	≥10

[1] DMRB uses the terms Minor and Major, for consistency with other assessment topics these are treated as equivalent to Low and High relative impact ratings respectively.

Scale of Effect and Significance

8.3.124 As with air noise and ground noise, the significance of the resulting effect is a function of both the absolute road traffic noise level and the relative change in noise level. The matrix used to determine the scale of effect is the same as that used for the assessment of air noise and ground noise, as presented in Table 8-10.

Construction Noise

8.3.125 Construction noise relates to that produced by demolition, piling and construction plant operating at the construction sites during each phase of the construction project, as well as that produced by construction traffic operating on the construction sites. Noise from construction traffic travelling to and from the construction sites is assessed as part of the road traffic noise assessment.

8.3.126 The effects of construction noise have been assessed taking account of their magnitude and also the likely sequence, period and daily duration over which they will occur for the affected receptors. Further details of the assessment methodology for construction noise are given in Appendix 8.6.

8.3.127 In the UK, BS 5228-1 is the current guidance and approved code of practice document for the control of construction noise. This provides guidance on methods of controlling noise and provides methods to predict, measure and assess the impact of construction and demolition noise. The guidance in the document can be considered to present recommendations for best practical means to control noise on site.

8.3.128 An informative Annex is included in BS 5228-1 that provides guidance on objectively assessing the significance of construction noise. It advises that a pragmatic approach needs to be taken when assessing the noise effects of any construction project and suggests the guidance provided in the annex would generally only apply to projects of significant size, and lesser projects might not need to be assessed or might only require general consideration of noise effects and mitigation. For large infrastructure projects for example, it highlights the procedure that has historically been developed in the UK based on the use of fixed noise limits and also additionally introduces alternative methods used to rate the potential significance of construction noise, based on prevailing ambient noise conditions.

8.3.129 There are no universally recognised or mandatory UK standards or guidelines that set out limits for construction noise. The historical use of fixed noise limits for projects of significant size is described in BS 5228-1 which sets out a subjective principle as follows:

"Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut."

8.3.130 It also goes on to describe external noise limits as:

"Noise levels, between say 07:00 and 19:00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed:

- *70 decibels (dBA) in rural, suburban and urban areas away from main road traffic and industrial noise; and*
- *75 decibels (dBA) in urban areas near main roads in heavy industrial areas."*

8.3.131 Previously, construction noise limits were agreed with LBN and set out in the 2009 Section 106 Agreement. The criteria used for this assessment are set out in Table 8-16 below and are based on the more stringent of these, which related to properties not treated under the airport's Sound Insulation Scheme (SIS).

Table 8-16: Indicative Scale of Effect – Construction Noise

Indicative Scale of Effect	Daytime, dB $L_{Aeq,12h}$	Night-Time, dB $L_{Aeq,15min}$
Negligible	<65	<50
Minor	65 (LOAEL) – 74.9	50 (LOAEL) – 54.9
Moderate	75 (SOAEL) – 84.9	55 (SOAEL) – 59.9
Major	≥85 (UAEL)	≥65 (UAEL)

8.3.132 The above effects are for properties not treated by the airport's SIS. Where a property has been treated this will reduce the residual effect. As for air noise, ground noise and road traffic noise, residual effects that are rated as moderate or major once mitigation has been allowed for are deemed to be significant in EIA terms.

Assumptions and Limitations

8.3.133 Air noise and ground noise assessments in the future have been based on forecast aircraft movement data, while assessments for 2019 have been based on actual data. The forecasts used in this assessment

have been prepared by York Aviation Ltd (YAL) and are set out in Chapter 4 of the ES and in the Need Case (ES Volume 3).

8.3.134 The assessments have all been carried out on the basis of external noise levels, as this is what the main criteria relate to. Therefore, mitigation in the form of improved sound insulation is not accounted for. This will reduce the internal noise levels for dwellings where works have been carried out, and therefore the absolute effects will be lower than predicted for those properties. Whether or not a property has already been treated by the airport's various sound insulation schemes has been accounted for in concluding whether a significant effect is likely to occur.

8.3.135 The assessment of construction noise is based on detailed construction plant schedules prepared for the CADP1 application. These have been updated to reflect the revised construction phasing plan, as described in ES Chapter 6.

8.3.136 For the air noise assessment, the estimates of population and dwellings have been based on a postcode level database for 2022 provided by CACI Ltd. In addition, residential developments that are under construction or have planning permission but have not yet been built have been allowed for.

8.3.137 For the ground noise and construction noise assessments, the receptors have been based on dwelling data for 2022 provided by Ordnance Survey in their AddressBase Plus product.

8.4 Baseline Conditions

Existing Baseline

8.4.1 This section describes the environmental conditions in the 2019 and 2022 Baseline Years. It is an important precursor to the remainder of the chapter, which considers the noise effects arising from the proposed development, as it provides context on the degree and type of change that might be expected.

8.4.2 Modelled baseline noise levels for 2019 have been produced and are presented in Section 8.6 where they are compared with the future DM and DC Scenario results. Further detailed results are provided in Appendix 8.3 for air noise.

8.4.3 A summary of the results of the noise monitoring surveys from 2019 and 2022 are presented in Table 8-17 below. The measured noise levels are presented in terms of the $L_{Aeq,T}$ and L_{AF90} metrics for the daytime (07:00-23:00), night-time (23:00-07:00) and weekend daytime periods. These results are intended to show the background noise environment, without the effect of the airport, they therefore exclude noise from airborne aircraft. Detailed results are presented in Appendix 8.2 along with a figure showing the monitoring locations.

Table 8-17: Baseline Noise Monitoring Results

Location Reference	Daytime Noise Level		Night-time Noise Level		Weekend Daytime Noise Level	
	dB $L_{Aeq,T}$	dB L_{AF90}	dB $L_{Aeq,T}$	dB L_{AF90}	dB $L_{Aeq,T}$	dB L_{AF90}
A1	61	59	60	58	59	57
A2	52	50	54	52	51	49
A3	54	49	49	46	48	42
A4	56	48	50	45	53	45
A5	60	53	n/a[1]	n/a[1]	56	49
A6	53	45	47	44	50	43
A7	58	51	50	44	53	40
A8	55	50	50	47	49	41
A9	59	54	52	50	61	53
A10	57	53	52	46	56	50
B2	61	52	59	47	60	47
B3	63	50	59	42	62	46
B4	64	56	54	45	59	49
B5	53	48	49	45	50	44
B6	52	49	49	45	50	44

[1] Location A5 was not accessible at night.

8.4.4 The airport's six fixed NMTs provide long term monitoring of noise levels. A summary of the results from 2019 are presented in Table 8-18 below. The measured noise levels are presented in terms of the $L_{Aeq,T}$ and L_{AF90} metrics for the daytime (07:00-23:00), night-time (23:00-07:00) and weekend daytime periods. These results exclude noise from airborne aircraft.

Table 8-18: 2019 Baseline Noise Levels – Fixed NMTs

NMT	Daytime Noise Level		Night-time Noise Level		Weekend Daytime Noise Level	
	dB $L_{Aeq,T}$	dB L_{AF90}	dB $L_{Aeq,T}$	dB L_{AF90}	dB $L_{Aeq,T}$	dB L_{AF90}
1	61	54	55	45	60	52
2	58	50	52	43	57	49
3	59	48	52	43	56	47
4	57	45	50	40	54	44
5	58	53	55	48	57	53
6	56	48	51	40	58	48

8.4.5 Overall, it can be seen that the long-term background L_{AF90} noise levels at the weekend are broadly similar to those during the week at the fixed NMTs. At the short-term monitoring locations, weekend background noise levels are generally slightly lower than during the week, although at some locations the difference is greater. The weekend short term surveys were carried out in 2022, whereas the other noise levels relate to 2019. The short-term weekend could therefore potentially be lower due to the ongoing recovery from the pandemic at the time of the survey.

Future Baseline (DM Scenario)

8.4.6 Air noise, ground noise and road traffic noise predictions for the future baseline (DM Scenario) have been produced. Results are presented in Section 8.6 where they are compared with the noise predictions for the DC Scenario. Further detailed results are provided in Appendix 8.3 for air noise.

8.5 Embedded Mitigation and Existing Controls

8.5.1 The airport operates a range of mitigation and control measures in relation to noise. As part of the 2016 CADP1 permission, new schemes designed to mitigate the noise impact of aircraft operations have been introduced or are in the process of being introduced at the time of writing. These, together with the short runway length and steep approach angle, limit the types of aircraft which can operate from the airport.

8.5.2 The airport is committed to minimising, where possible, the noise impact of its operations on the local area. Most of the airport's noise mitigation measures benefit everyone who experiences noise from the airport, both those within and those outside of the air noise contours. The various ground noise monitoring and mitigation measures primarily benefit those closest to the airport; particularly in the Camel Road area, as this is the area most exposed to ground noise from the airport. The airport's sound insulation scheme benefits those within the relevant noise contours.

Aircraft Movement Limits

8.5.3 There are strict limits on the number of hourly, daily and annual aircraft movements. The proposed amendments to the existing CADP1 consent include changes to some of these limits, as described in detail in Chapter 2 of the ES. It is proposed to retain most of the limits, and these are set out below:

- 200 per day on Sundays; and
- 592 per weekday, except for Public or Bank Holidays, specifically:
    - 132 on 1st January
    - 164 on Good Friday
    - 198 on Easter Monday
    - 248 on May Day
    - 230 on late May Bank Holiday
    - 230 on late August Bank Holiday
    - 100 on 26th December
    - 400 movements annually in the last 30 minutes of operations for aircraft which were scheduled earlier but have suffered unavoidable operational delays.

8.5.4 As part of the CADP1 permission, a new limit of 45 scheduled movements per hour was introduced and the annual movement limit of 120,000 movements per year was reduced to 111,000 per year.

Airport Operating Hours

8.5.5 The proposed amendments to the existing CADP1 consent include changes to the airport's operating hours on Saturday, as detailed in Chapter 2 of the ES. The restrictions on the operating hours on other days will remain. The airport is permitted to operate flights (including unavoidable operational delays) between the following hours:

- 06.30 and 22.30 on weekdays;
- 12.30 and 22.30 on Sundays; and
- 09.00 and 22.30 on Public or Bank Holidays.

8.5.6 There is full closure on 25th December. In addition, the final 30 minutes of operation on every day of the week is solely for flights scheduled earlier which have been unavoidably delayed.

Departure and Arrival Procedures

8.5.7 The routes flown to and from any major UK airport are prescribed by Standard Instrument Departures (SIDs) and Standard Terminal Arrival Routes (STARs). These departure and arrival routes are established by the CAA. The UK AIP entry for the airport outlines the restrictions on aircraft operators and aircraft movements to control noise. These include:

- Standard noise abatement procedures for aircraft departing the airport following the Standard Instrument Departure (SID) instructions;
- Minimum requirements for aircraft departing the airport to climb straight to a minimum of 1000 feet above airport level (aal) before turning on track unless otherwise instructed by Air Traffic Control (ATC);
- Aircraft approaching the airport to follow a descent path which will result in the aircraft not being lower at any point than the altitude prescribed by the Instrument Landing System (ILS);
- A minimum altitude of 1,500 feet for aircraft carrying out visual approaches (where the airport is clearly in the pilot's sight) until established on the final approach (within approximately four miles of the airport); and
- Instructions for following holding patterns over the airfield.

8.5.8 In addition to the above, aircraft approaching the airport follow a steep approach angle of 5.5 degrees on final approach (compared to 3 degrees in place at other airports) which helps keep aircraft higher for longer, reducing the noise impact on local communities.

Noise Management and Mitigation Scheme (NOMMS)

8.5.9 As required by the existing Condition 31 of the CADP1 planning permission, LCY have produced the NOMMS which is a framework to provide a robust system of noise monitoring and mitigation. This includes the measurement and monitoring of a range of different airport operations that generate noise, such as aircraft arriving and departing and Auxiliary Power Unit (APU) usage.

8.5.10 The most recent version of the NOMMS was submitted to and approved by LBN in 2022 (ref 22/02035/AOD) and covers a wide range of measures and procedures to monitor and manage the noise impact of LCY operations. These include:

- Combined Noise and Track Monitoring System;
- Quiet Operating Procedures;
- Incentives and Penalties Scheme;
- Control of Ground Noise;
- Production of Annual Noise Contours;
- Minimise use of Reverse Thrust; and
- Sound Insulation Scheme.

8.5.11 Further information on the various components of the NOMMS is set out in the following paragraphs.

Combined Noise and Track Monitoring

8.5.12 For many years the airport operated a system of four noise monitors (NMTs 1-4) which are positioned close to the airport as part of the Noise and Flight Track Monitoring System (NFTMS). The NFTMS was enhanced in 2016 and 2017 with the acquisition of two new fixed noise monitors (NMTs 5&6) which are located under the arrival and departure paths from each runway end and a seventh mobile noise monitor (NMT7), which is used to monitor aircraft related ground noise and reverse thrust usage.

8.5.13 The noise data from the NFTMS is used to validate the noise contours produced for the Sound Insulation Scheme and to monitor compliance with the contour area limit introduced as part of the CADP1 permission (discussed further below).

8.5.14 The flight track monitoring component of the system is permanently linked to the airport's radar feed, which is provided by the Air Traffic Control centre. Aircraft flight tracks are correlated with flight information and

noise events. Based around this information, the airport have introduced a web-based system (known as TraVis2) to share data from the flight track monitoring system with the public.

Quiet Operating Procedures

8.5.15 The airport requires that every operator of aircraft adopt procedures which will produce the least noise disturbance. Where aircraft manufacturers have established special procedures for the purposes of reducing noise, these are required to be applied to operations at the airport, subject to the safe operation of aircraft.

8.5.16 Quiet operating procedures at the airport also include the following:

- Minimum use of reverse thrust;
- Use of fixed electrical ground power or mobile electrical ground power units where possible and minimum use of auxiliary power units;
- Operation of a steep glide slope (5.5 degrees); and
- An Electronic Flight Progress Strips System (EFPS), which provides the ability to monitor the time that aircraft operate engines on the ground.

Incentives and Penalties Scheme

8.5.17 The airport operates a scheme of incentives and penalties based on departure noise levels as measured by the NFTMS. The penalty limits are the most stringent of any UK airport for daytime operations.

8.5.18 The scheme encourages airlines to operate aircraft more quietly, rewarding those airlines with credits. The airline with the most credits each year co-partners with the airport to deliver the Community Projects Fund in the following year.

8.5.19 Under the penalties part of the scheme, a fixed penalty for exceeding upper noise limits is charged at a rate of £600 per dB of exceedance. The money from any penalties accrued is added to the Community Projects Fund.

8.5.20 The credit award thresholds and upper noise limits are reviewed annually with LBN to ensure they remain at appropriate levels.

Control of Ground Noise

8.5.21 In accordance with Condition 8 of the CADP1 planning permission, aircraft maintenance and repair work and ground running of aeroplane engines is restricted to specific hours and the time of any engine ground running on the apron for maintenance is monitored.

8.5.22 There is a ground running noise limit of 60 dB $L_{Aeq,12h}$ which is calculated based on the average daily noise level during the worst (noisiest) month of the year. If the ground running noise level approaches within 1 dB of the limit, the airport takes action as necessary to ensure the limit is not exceeded. Any excessive or unnecessary operation of aircraft engines is investigated by the airport.

8.5.23 An Electronic Flight Progress Strip system has been installed at the airport which provides the ability to monitor the time that aircraft operate engines on the ground, from engine start-up until the time of departure from stand and following the time of landing until engine shutdown. Where engine running time from start-up to departure is found to regularly exceed 7.5 minutes, this is investigated by the airport and measures are identified to reduce the engine running time as far as possible.

8.5.24 The use of APUs at the airport is limited to a maximum of 10 minutes before departure from the stand and 10 minutes after arrival except under exceptional circumstances.

Ground Noise Studies

8.5.25 The airport has been required to conduct a Ground Noise Study at least every three years since 2010, with the most recent one submitted to LBN in 2021 based on measurements taken in 2019. Noise measurements at locations where ground noise is the dominant noise source were broadly in line with those predicted in the 2015 UES.

8.5.26 The studies have all been reviewed by LBN with no additional noise mitigation measures required.

Annual Noise Contours

8.5.27 Air noise contours are produced annually, based on the actual summer (16th June – 15th September inclusive) movements in the previous year and the forecast summer movements in the following year. The noise contours are regularly validated using results from the NFTMS.

8.5.28 Condition 33 of the CADP1 planning permission sets a limit on the area of the 57 dB $L_{Aeq,16h}$ contour of 9.1 km^2 and LCY is required to produce a Noise Contour Strategy that seeks to reduce the area of the noise contour by 2030 and every 5 years thereafter.

8.5.29 The noise contours are also used for determining eligibility under the Sound Insulation Scheme.

Reverse Thrust

8.5.30 The use of reverse thrust is required to be kept to the minimum required for the necessary deceleration of the aircraft and within the limits of the airline's standard operating procedures. Any instance of unusual or excessive use of thrust reversers is investigated and reported by way of reference to noise data collected at NMT7.

Sound Insulation Schemes

8.5.31 As part of the existing CADP1 Section 106 (S106) Agreement, LCY operates a three tier sound insulation scheme (SIS) for residential properties which offers sound insulation treatment to eligible properties within the 57 dB $L_{Aeq,16h}$ (Low Tier/Tier 1), 63 dB $L_{Aeq,16h}$ (Middle Tier/Intermediate Tier) and 66 dB $L_{Aeq,16h}$ (High Tier/Tier 2) noise contours. The sound insulation works involve the treatment of habitable rooms (defined as bedrooms, dining rooms, living rooms and kitchen diners within eligible dwellings) to upgrade eligible external windows and doors. The SIS also provides the option of acoustic ventilation in accordance with the sound insulation standards given in the Noise Insulation Regulations. Previously treated properties are inspected every 10 years.

8.5.32 Eligible community buildings such as schools and community centres are also offered improvement works under the scheme on a similar basis to the residential SIS. Sound insulation works are assessed on a case-by-case basis and agreed with the relevant local authority.

8.5.33 LCY have also provided advanced sound insulation for properties close to the airport to mitigate the noise impacts from construction activities under its construction sound insulation scheme (CSIS), in accordance with Condition 89 (Construction Sound Insulation for Sensitive Receptors) and Condition 90 (Night time Construction Sound Insulation) of the CADP1 planning permission.

Aircraft Noise Categorisation Scheme (ANCS)

8.5.34 The Aircraft Noise Categorisation Scheme (ANCS) comprises two main aspects; firstly it determines which aircraft are permitted to use the airport and secondly it defines a Quota Count (QC) classification system.

8.5.35 Aircraft must carry a noise certificate. This provides their certification noise levels for three reference locations, denoted as flyover, sideline and approach. To be permitted to operate at LCA, an aircraft must:

- Have a flyover level not exceeding 88.0 EPNdB,
- Have a sideline level not exceeding 93.5 EPNdB,
- Have an approach level not exceeding 98.0 EPNdB, and
- Have a sum of its three certificated noise levels not exceeding 271.0 EPNdB.

8.5.36 Only quieter new generation aircraft will be allowed to operate in the newly extended period on a Saturday and undertake flights above the currently permitted number in the early morning period. To qualify as 'new generation' an aircraft must meet the following more stringent noise criteria, which are based on the range of certification noise levels for the new generation aircraft types used in this assessment:

- Have a flyover level not exceeding 85.0 EPNdB,
- Have a sideline level not exceeding 89.0 EPNdB,
- Have an approach level not exceeding 93.0 EPNdB, and
- Have a sum of its three certificated noise levels not exceeding 263.0 EPNdB.

8.5.37 LCY also operates a noise QC system, in accordance with Condition 18 (Aircraft Noise Categorisation Scheme) of the CADP1 planning permission. Under the ANCS, each aircraft type is assigned a separate quota count (QC) for arrivals and for departures, based on their certification noise levels and categorised into 1 dB bands. The QC system is similar to that operated at many UK airports at night.

8.5.38 The ANCS QC system has an annual limit of 22,000 per calendar year, with a maximum of 742.5 in any single week. These limits are reviewed regularly. The ANCS also sets out noise level limits based on an aircraft's noise certificate.

Permanent and Temporary Noise Barriers

8.5.39 As part of the CADP1 permission, a new 5 m high temporary noise barrier is required to be installed prior to the use of the new aircraft stands on the eastern apron. Part of this barrier, covering stands 25-28, has been installed. The remainder will be installed prior to the use of stands 29-32. Upon completion of the new eastern pier an 8 m permanent noise barrier will be installed, replacing the remaining easternmost section of temporary noise barrier.

8.5.40 Also, as part of the CADP1 permission, a temporary 3 m construction noise barrier was been installed along Hartmann Road. While most of the noisiest works have now been undertaken, it has been assumed that this will be in place where necessary when construction works re-start to manage noise impacts. This is in addition to 3 m site hoardings being used as standard at all work sites. For works taking place around the proposed Western Energy Centre (WEC) and Western Terminal Extension (WTE), it has been assumed that site hoardings of sufficient height will be used to fill the space below the elevated DLR track which will in combination provide a larger effective barrier.

8.6 Assessment of Effects: Construction

Introduction

8.6.1 Appendix 8.6 provides full details of the construction noise assessment. The key construction noise effects are presented in this section. Any effects from off-site construction traffic are included under operational phase effects, as the road traffic flows used for the road traffic noise assessment include forecast construction traffic in addition to forecast operational traffic.

8.6.2 The construction noise effects associated with the proposed development have been assessed and compared with the construction noise effects forecast in the 2015 UES.

8.6.3 Under the DM Scenario no significant construction activity is expected to occur prior to 2031, with construction of the remaining elements of CADP1 expected to be built out in the mid to late 2030s as discussed in Chapter 6 of the ES.

8.6.4 It is considered unlikely, but it is possible that the remaining elements of CADP1 would never be built out for the DM Scenario. If this were the case, there would inherently be no construction noise effects associated with the DM Scenario. As no meaningful construction activity is expected to occur by 2031 for the DM Scenario, whether or not CADP1 is eventually built will not affect the other noise assessment topics, namely air noise, ground noise and road traffic noise, which have been assessed in 2025, 2027 and 2031.

Daytime

8.6.5 Construction effects associated with the remaining elements of CADP1 were assessed in the 2015 UES with activities separated into the following categories:

- Site preparation and compound
- Buildings – site preparation, excavation
- Buildings – piling
- Buildings – substructure and superstructure
- Buildings – envelope and fit out
- Landside infrastructure - concrete and general works

8.6.6 The daytime construction noise assessment has been undertaken based on a worst case assumption that all of the activities associated with each category are occurring simultaneously for a particular element. The current assessment differs from that in the 2015 UES as it excludes the elements of CADP1 that have already been built; namely, the piling and deck works within KGV Dock.

8.6.7 Daytime noise levels have been predicted at the location of the facades of eleven representative locations around the application site, as shown in Figure 8.6.1 in Appendix 8.6. For each of the construction activities listed above, the assumptions concerning the plant, the duration of the activity and associated noise level are given in Appendix 8.6. Predicted daytime construction noise levels are provided in Table 8-18. This assessment of noise against criteria relates to construction works undertaken during the current operational day (08.00 to 18.00 hours weekdays and 08.00-13.00 Saturdays).

Table 8-19: Daytime Construction Noise Levels, $L_{Aeq,T}$

Location Reference	Location	Construction Activity					
		Site prep and compound	Buildings – site prep, excavation	Buildings – piling	Buildings – sub and super structure	Buildings – envelope and fit out	Landside infrastructure concrete and general works
A	19 Camel Road	35	46	49	48	47	59
B	Drew Road Primary School	36	48	52	51	50	61
C	40 Newland Street	38	56	60	59	58	69
D	86 Winifred Street Flats	41	54	58	57	56	67
E	38 Campion Close	39	42	45	44	43	55
F	32 Brixham Street	43	53	56	55	54	66
G	30 Renfrew Close	41	41	44	43	42	54
H	Storey Street School	63	48	51	50	49	61
I	UEL halls of residence	50	45	48	47	46	58
J	3 Weaver Close	42	37	40	39	38	50
K	43 Felixstowe Court	57	41	45	44	43	55

8.6.8 On the basis of the noise levels shown in Table 8-19, no significant daytime construction noise effects are predicted from the build out of the remaining elements of CADP1 based on the daytime construction noise criteria set out in Section 8.3. The above noise levels are the same as those forecast for Year 6 of the CADP1 construction programme in the 2015 UES. Therefore, the daytime construction noise effects forecast for the DC Scenario are the same as those forecast for the later years of CADP1 in the 2015 UES.

Out of Operational Hours (OOOH) (night-time and weekend) Works

8.6.9 This OOOH construction noise assessment is based on the updated core DC construction programme for the build out of the remaining elements of CADP1 between 2025 and 2031, as presented in Chapter 6 of the ES. The proposed sequence of works and related assumptions are shown in Appendix 8.6. Due to safety and operational constraints, some construction activity needs to take place whilst the airport is not operational. This assessment has been carried out on a worst-case basis, assuming all OOOH works will occur at night.

8.6.10 Once a contractor is appointed, the expected noise levels will be re-assessed applying best practical means (BPM) to identify improvements available, including a review of what construction activities must occur at night. This will include more details of the proposed construction plant and methodology, in addition to identifying any further appropriate noise reduction measures that may be available.

8.6.11 Construction noise maps are provided in Figures 8.6.2 to 8.6.18 in Appendix 8.6. These maps indicate, in 3-month slices of time throughout the construction programme, the noise levels expected at a typical 1st floor bedroom receptor height for the OOOH periods. They are based on a 15-minute assessment period and include noise effects from the haul road that extends along Hartmann Road East. Additional physical mitigation measures including a temporary noise barrier along the southern edge of the airport long term car park and local site hoardings, have been assumed in the assessment.

8.6.12 The assessment considers both receptors at the conventional assessment height of 4 metres (first floor level), which is appropriate for most of those receptors closest to the works (i.e. within North Woolwich to the south of the airport) but also for all other receptors such as those in blocks of flats with more than two storeys. The results of this assessment, accounting for all receptors, are shown in Table 8-20 below.

8.6.13 The table below identifies, for each 3-month slice of time within the construction programme and based on the activities described in Appendix 8.6, the number of receptors that may be exposed to 55 dB and above, between 50 dB and 55 dB, between 45 dB and 50 dB and those exposed to less than 45 dB $L_{Aeq,15min}$.

8.6.14 As discussed above, the assessment has been carried out on a worst case basis, assuming all OOOH works occur at night. In addition, the assessment is based on a 15-minute averaging time, therefore the receptors identified as experiencing a given noise level will only experience this at times during a night when the specified activity or works are taking place and not necessarily for extended periods of time.

Table 8-20: Number of Receptors Exposed to Construction Noise

Contour and 3 Monthly Construction Time Slice	Description	<45	≥45 - <50	≥50 - <55	Location of dwellings/ receptors	≥55	Location of dwellings/ receptors
Year 1 – 2025 Q1	No OOOH	0	0	0	N/A	0	N/A
Year 1 – 2025 Q2	No OOOH	0	0	0	N/A	0	N/A
Year 1 – 2025 Q3	East Pier Part 1	3407	229	36	Holt Road, Kennard Street, Lord Street, Newland Street, Rawsthorne Close, Sheldrake Close, Winifred Street	1	Newland Street
Year 1 – 2025 Q4	East Pier Part 1	3470	184	19	Holt Road, Lord Street, Newland	0	N/A

Contour and 3 Monthly Construction Time Slice	Description	<45	≥45 - <50	≥50 - <55	Location of dwellings/ receptors	≥55	Location of dwellings/ receptors
					Street, Rawsthorne Close, Winifred Street		
Year 2 – 2026 Q1	East Pier Part 1 Eastern Terminal Extension	3289	291	85	Dunedin House, Holt Road, Keiller House, Kennard Street, Leonard Street, Lord Street, Muir Street, Newland Street, Rawsthorne Close, Saville Road, Sheldrake Close, Tate Road, Winifred Street	8	Holt Road, Lord Street, Newland Street.
Year 2 – 2026 Q2	East Pier Part 1 Eastern Terminal Extension	3326	280	63	Holt Road, Kennard Street, Leonard Street, Lord Street, Muir Street, Newland Street, Rawsthorne Close, Sheldrake Close, Winifred Street	4	Lord Street, Newland Street.
Year 2 – 2026 Q3	East Pier Part 1 Eastern Terminal Extension	3323	271	72	Dunedin House, Holt Road, Keiller House, Kennard Street, Leonard Street, Lord Street, Muir Street, Newland Street, Rawsthorne Close, Saville Road, Sheldrake Close, Winifred Street	7	Holt Road, Lord Street, Newland Street.
Year 2 – 2026 Q4	Western Energy Centre Eastern Terminal Extension	3445	195	33	Holt Road, Leonard Street, Lord Street, Muir Street, Newland Street, Winifred Street	0	N/A
Year 3 – 2027 Q1	Western Energy Centre Eastern Terminal Extension	3442	184	47	Holt Road, Leonard Street, Lord Street, Muir Street, Newland Street, Tate Road, Winifred Street	0	N/A
Year 3 – 2027 Q2	No OOOH	0	0	0	N/A	0	N/A
Year 3 – 2027 Q3	No OOOH	0	0	0	N/A	0	N/A
Year 3 - 2027 Q4	Forecourt / Hartmann Road Utilities	3562	108	3	Lord Street, Winifred Street	0	N/A
Year 4 – 2028 Q1	Forecourt / Hartmann Road Utilities	3562	108	3	Lord Street, Winifred Street	0	N/A
Year 4 – 2028 Q2	Forecourt / Hartmann Road Utilities	3562	108	3	Lord Street, Winifred Street	0	N/A
Year 4 – 2028 Q3	No OOOH	0	0	0	N/A	0	N/A
Year 4 – 2028 Q4	No OOOH	0	0	0	N/A	0	N/A
Year 5 – 2029 Q1	Airfield Services	3606	66	1	Winifred Street	0	N/A

Contour and 3 Monthly Construction Time Slice	Description	<45	≥45 - <50	≥50 - <55	Location of dwellings/ receptors	≥55	Location of dwellings/ receptors
	Western Terminal Extension						
Year 5 – 2029 Q2	Airfield Services East Pier Part 2 Western Terminal Extension	3370	240	62	Dunedin House, Fernhill Street, Newland Street, Sheldrake Close, Silverland Street, Westland House, Winifred Street	1	Winifred Street
Year 5 – 2029 Q3	Airfield Services East Pier Part 2 Eastern Terminal Extension Western Terminal Extension Dockside Upgrade + Surface Car Parks	3265	317	87	Dunedin House, Fernhill Street, Keiller House, Kennard Street, Newland Street, Rawsthorne Close, Sheldrake Close, Silverland Street, Tate Road, Westland House, Winifred Street	4	Newland Street, Winifred Street.
Year 5 – 2029 Q4	Eastern Terminal Extension Dockside Upgrade + Surface Car Parks	3470	167	34	Keiller House, Kennard Street, Newland Street, Rawsthorne Close, Sheldrake Close, Winifred Street	2	Newland Street
Year 6 – 2030 Q1	Forecourt / Hartmann Road Utilities Dockside Upgrade + Surface Car Parks	3433	195	42	Keiller House, Kennard Street, Lord Street, Newland Street, Rawsthorne Close, Sheldrake Close, Winifred Street	3	Newland Street
Year 6 – 2030 Q2	Airfield Services Forecourt / Hartmann Road Utilities	3552	115	6	Lord Street, Newland Street, Winifred Street	0	N/A
Year 6 – 2030 Q3	Airfield Services	3608	64	1	Winifred Street	0	N/A
Year 6 – 2030 Q4	No OOOH	0	0	0	N/A	0	N/A

8.6.15 The above predictions provide an objective snapshot as to the predicted noise levels for various representative OOOH periods during the construction of the remaining elements of CADP1. In some of the 3 monthly periods, a very small number of receptors, up to 8 of over 3,600 considered, are forecast to experience construction noise levels in excess of 55 dB $L_{Aeq,15min.}$ All of these receptors have already been treated or offered treatment by the airport's construction SIS (CSIS) associated with the existing CADP1 planning permission. This CSIS has also already treated some of the receptors now forecast to be exposed to lower noise levels.

8.6.16 The 2015 UES found that in the worst 3-month period, 24 receptors would be exposed to noise levels above 55 dB $L_{Aeq,15min}$ and over 200 receptors would be exposed to noise levels between 50 and 55 dB $L_{Aeq,15min}$. This assessment finds that in the worst 3-month period, only 8 receptors would be exposed to noise levels above 55 dB $L_{Aeq,15min}$ and fewer than 100 receptors would be exposed to noise levels between 50 and 55 dB $L_{Aeq,15min}$.

8.6.17 This suggests that overall, the OOOH construction noise effects of the build out of the remaining elements of CADP1 under the updated construction programme will be less than the construction noise effects

presented in the 2015 UES. This is to be expected, as many of the noisiest OOOH elements of CADP1, such as piling in KGV Dock, have already been completed.

Cumulative effects

8.6.18 There are a number of major developments surrounding airport which have the potential to increase the cumulative impact of temporary construction noise on nearby noise sensitive receptors. These are identified in Chapter 14 of the ES and the potential for cumulative construction effects is described below.

8.6.19 Major developments are proposed around the Albert Basin. These include Gallions Reach (Phase 3B), Silvertown Quays and the Albert Island redevelopment. It is not known when these developments will be constructed. However, it is possible that the construction of some of these sites could take place at the same time as some of the remaining elements of CADP1. For Gallions Reach, this could increase temporary construction noise levels for the closest receptors in Gallions Point in North Woolwich (Location K). This could also increase construction noise levels for the receptors in UEL and Beckton (Locations I and J). For Silvertown Quays, this could increase temporary construction noise levels for the closest receptors around the Camel Road area (Location A).

8.6.20 All of the cumulative developments considered are expected to be constructed in the daytime. The daytime construction noise levels predicted from the remaining CADP1 works at these receptors are low, generally less than 55 dB L_{Aeq}. The CADP1 construction noise levels will therefore not significantly contribute to any noise impact from these major developments. The impact of construction noise from these developments can also be expected to be mitigated to meet local requirements, by for example the adoption of project-specific CEMPs..

8.6.21 A similar conclusion can be drawn with regard to the remaining elements of the major development on the ABP Royal Albert Docks Scheme site. This development site is close to UEL and Beckton (Locations I and J). The construction noise levels predicted from the remaining CADP1 works at these receptors are low and the CADP1 construction noise levels will therefore not significantly contribute to any cumulative construction noise impact arising from the development of this site.

8.6.22 The remaining elements of the ABP Royal Albert Docks Scheme development could result in a beneficial impact in terms of noise. If this site is completed prior to the remaining construction of CADP1, the additional buildings are likely to act as local noise barriers. This could reduce construction noise and will reduce operational ground noise from the airport for those residential buildings in Beckton that become consequently shielded as a result of the completion of the ABP development.

Summary

8.6.23 No significant daytime construction noise effects are predicted from the construction of the remaining elements of CADP1.

8.6.24 There will be a relatively small number of properties exposed to potentially significant levels of construction noise during OOOH works. All of these properties have already been treated or offered treatment by the airport's existing CSIS.

8.6.25 On the basis of the number of properties affected and the mitigation measures already provided, the residual construction noise effects are considered to be **Negligible** during daytime operational hours and a **Negligible to Minor Adverse** effect during OOOH periods. Overall, the construction noise effects associated with the construction of the remaining elements of CADP1 are similar to, or less than, those forecast in the 2015 UES.

8.6.26 The assessment has been carried out on a worst case basis, assuming all OOOH works will take place at night. Once a contractor is appointed, the expected noise levels will be re-assessed to identify improvements available, including a review of what construction activities must occur at night. This will include more details of the proposed construction plant and methodology, in addition to identifying any further appropriate noise reduction measures that may be available.

Assessment of Effects: Operation

Air Noise

8.6.27 The key results of the air noise assessment are presented in this section, with further detailed results provided in Appendix 8.3. Air noise results are presented for the primary and supplementary indicators, including contour areas, dwelling and population counts within each contour band for residential receptors. For non-residential receptors, noise exposure values are presented and changes in noise level discussed.

8.6.28 For all tables in this section, dwelling and population counts are rounded to the nearest 50 above 500 and to the nearest 10 below 500. Population counts between 1 and 10 are shown as "<10". The counts include all those dwellings or people within a specified contour band as well as any higher value bands so, for example, any dwellings within a 63 dB contour would also be counted as being within a 60 dB contour.

8.6.29 When comparing the DM and DC Scenarios, population and dwelling counts allow for the permitted developments within the ZoI. Where 2019 is also being compared for context, the permitted developments have been excluded to allow for a like for like comparison. Each table notes whether permitted developments are included or not. All population and dwelling counts including and excluding the permitted developments are presented in Appendix 8.3.

8.6.30 This section commences with a summary of the forecast changes in air noise over time based on each of the Primary and Supplementary Indicators. This is followed by a detailed discussion of the Predicted Air Noise Effects and their Significance, comparing the DM and DC Scenarios for each assessment year.

Primary Indicators

Daytime

8.6.31 To explore by how much noise exposure levels in the daytime are expected to change between different scenarios, noise predictions have been undertaken comparing the various scenarios and the change expected at a series of representative locations around the airport. The receptors assessed are shown in Figure 8.3.1.

8.6.32 Table 8-21 shows the daytime air noise exposure levels for 2019 and the DM Scenario (in brackets) and the relative change in noise level for the DC Scenario compared to the DM Scenario for each of the three assessment years.

Table 8-21: Air Noise Exposure Levels And Relative Change, $L_{Aeq,16h}$ Average Mode Summer Day

Locations	Absolute level ($L_{Aeq,16h}$) dB or change DC-DM						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
(1) Blackwall / A1261	(59)	(59)	-0.1	(59)	-1.9	(57)	+0.1
(2) Britannia Village	(64)	(64)	-0.1	(64)	-1.7	(62)	+0.2
(3) Silvertown / A1020	(61)	(61)	-0.1	(61)	-1.3	(60)	+0.4
(4) Custom House	(59)	(59)	0	(59)	-0.8	(58)	+0.6
(5) Camel Road	(66)	(66)	0	(66)	-0.8	(65)	+0.5
(6) Royal Albert Dock (north)	(63)	(63)	0	(63)	-1.0	(63)	+0.4
(7) North Woolwich (north)	(59)	(59)	0	(59)	-0.9	(59)	+0.5
(8) Thamesmead	(60)	(60)	-0.1	(60)	-1.5	(59)	+0.3
(9) Eastern Quay Apts, Britannia Village	(65)	(65)	-0.1	(65)	-1.8	(63)	+0.2
(10) Coral Apts, Western Gateway	(63)	(63)	-0.1	(63)	-1.9	(61)	+0.1
(11) Silvertown Quays	(68)	(68)	-0.1	(68)	-1.9	(66)	+0.1
(12) Ramada Hotel	(66)	(65)	-0.1	(65)	-1.5	(64)	+0.3

8.6.33 For all 12 locations, the daytime noise levels in the DC Scenario in 2025 and 2027 are lower than those for the corresponding DM Scenario years. This is due to the greater forecast use of quieter new generation aircraft in the DC Scenario, which offsets the impact of additional aircraft.

8.6.34 By 2031, marginally higher noise levels are predicted in the DC Scenario than the 2031 DM Scenario due to the greater difference in forecast ATMs between the two scenarios in 2031, which is not fully offset by the impact of quieter new generation aircraft.

8.6.35 All the changes in noise level (adverse and beneficial) between the DM and DC Scenarios are less than 2 dB. Based on the criteria set out in Table 8-9, changes of this magnitude would be rated as a **Negligible** impact.

8.6.36 The areas of the key daytime air noise contours are presented in Table 8-22 for all assessment years and scenarios. These contours are presented in Figure 8.3.4 to Figure 8.3.10 in Appendix 8.3. The population counts within these contours are presented in Table 8-23. Table 8-24 presents the number of non-residential noise sensitive receptors exposed to noise levels above the relevant noise level criteria thresholds set out in Table 8-11.

Table 8-22: Air Noise Contour Areas, $L_{Aeq,16h}$ Average Mode Summer Day

Contour, dB $L_{Aeq,16h}$	Contour Area, km^2						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
51 (LOAEL)	26.7	26.7	26.3	27.0	20.9	21.4	22.7
57 (Contour Area Limit)	8.7	8.6	8.5	8.8	6.5	6.7	7.2
63 (SOAEL)	2.3	2.3	2.2	2.3	1.7	1.8	1.9
69 (UAEL)	0.6	0.6	0.6	0.7	0.5	0.5	0.6

Table 8-23: Air Noise Population Counts, $L_{Aeq,16h}$ Average Mode Summer Day

Contour, dB $L_{Aeq,16h}$	Number of People excluding Permitted Developments						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
51 (LOAEL)	205,300	202,950	200,450	204,400	147,150	154,900	160,000
57 (Contour Area Limit)	51,500	50,450	49,050	51,000	33,150	34,950	37,550
63 (SOAEL)	5,750	5,250	5,050	5,750	2,100	2,300	2,550
69 (UAEL)	0	0	0	0	0	0	0

Table 8-24: Air Noise Non Residential Counts, $L_{Aeq,16h}$ Average Mode Summer Day

Receptor	Number of Non Residential Receptors						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
Schools ≥ 52 dB $L_{Aeq,16h}$	87	86	83	86	60	62	64
Healthcare≥ 52 dB $L_{Aeq,16h}$	1	1	1	1	1	1	1
Amenity Areas ≥ 55 dB $L_{Aeq,16h}$	103	102	101	106	58	60	66

8.6.37 The areas of the 57 dB daytime contours for 2019 and all of the forecast scenarios remain below the contour area limit of 9.1 km^2 and are forecast to reduce by 2031 compared to 2019. This shows the proposals are consistent with the APF[12] policy of “sharing the benefits” of the quieter new generation aircraft. The number of people within the 57 dB contours is also forecast to reduce by 2031 broadly in line with the reductions in contour area, as would be expected.

8.6.38 The 2025 DM daytime contours are similar in area to the 2019 contours and contain a similar number of people (excluding Permitted Developments). The 2025 DC contours are also similar to 2019 and those for the 2025 DM Scenario. The number of schools, residential healthcare buildings and outdoor amenity areas above the noise level thresholds also remains similar.

8.6.39 Under the DM Scenario the 2027 daytime contours increase slightly in area due to an increase in the number of ATMs, with a fleet mix that is broadly similar to that in 2019. The number of people within the contours also increases slightly. Under the DC Scenario the contours reduce in area and contain correspondingly fewer people and fewer schools and outdoor amenity areas are exposed to noise levels above the corresponding thresholds. This is due to a forecast increase in the use of quieter new generation aircraft in the DC Scenario, which more than offsets the increase in ATMs.

8.6.40 Under the DM Scenario, the 2031 daytime contours reduce in area due to an increasing use of quieter new generation aircraft, and the number of people within the contours reduces correspondingly. Under the DC Scenario the contours increase slightly in area and contain correspondingly more people and more schools and outdoor amenity areas are exposed to noise levels above the corresponding thresholds. This is due to the greater difference in ATMs between the DC and DM Scenarios, which is mostly offset by the shift to quieter, new generation aircraft. The 2031 DC contour areas and population counts, however, generally remain well below 2019 levels.

8.6.41 Nobody is forecast to be exposed to noise levels above the UAEL in any of the scenarios. The number of schools forecast to be exposed to noise levels above the 52 dB $L_{Aeq,16h}$ threshold reduces over time and is broadly similar for the 2031 DM and DC Scenarios. There is 1 residential healthcare receptor exposed to noise levels above the 52 dB $L_{Aeq,16h}$ threshold for all scenarios.

8.6.42 The number of amenity areas forecast to be exposed to noise levels above the 55 dB $L_{Aeq,16h}$ threshold reduces over time. There are slightly more amenity areas forecast to be exposed to noise above this level under the 2031 DC Scenario compared to the 2031 DM Scenario, however it is around a third fewer than in 2019.

Night-Time

8.6.43 The night-time noise assessment is based on the aircraft movements between 06:30 and 06:59. The airport is closed and will remain so for the rest of the night-time period (23:00-06:29). Table 8-25 shows the night-time air noise exposure levels for 2019 and the DM Scenario (in brackets) and the relative change in noise level for the DC Scenario compared to the DM Scenario for each of the three assessment years.

Table 8-25: Air Noise Exposure Levels And Relative Change, $L_{Aeq,8h}$ Average Mode Summer Night

Locations	Absolute level ($L_{Aeq,8h}$) dB or change DC-DM						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
(1) Blackwall / A1261	(44)	(44)	+1.6	(44)	-0.5	(44)	-0.8
(2) Britannia Village	(49)	(49)	+1.9	(49)	+0.3	(49)	+0.1
(3) Silvertown / A1020	(46)	(46)	+2.2	(46)	+1.3	(47)	+1.1
(4) Custom House	(44)	(43)	+2.5	(43)	+2.2	(45)	+2
(5) Camel Road	(50)	(50)	+2.5	(50)	+2.2	(51)	+2
(6) Royal Albert Dock (north)	(48)	(48)	+2.3	(48)	+1.7	(49)	+1.5
(7) North Woolwich (north)	(44)	(44)	+2.3	(44)	+1.8	(45)	+1.6
(8) Thamesmead	(46)	(47)	+0.8	(47)	-1.9	(47)	-2.1
(9) Eastern Quay Apts, Britannia Village	(50)	(50)	+1.6	(50)	-0.4	(51)	-0.5
(10) Coral Apts, Western Gateway	(48)	(48)	+1.6	(48)	-0.3	(48)	-0.5
(11) Silvertown Quays	(53)	(53)	+1.8	(53)	-0.2	(53)	-0.4
(12) Ramada Hotel	(50)	(50)	+2.1	(50)	+0.9	(51)	+0.8

8.6.44 For all 12 locations, the night-time noise levels are forecast to stay the same or increase slightly from 2019 levels by 2031 for the DM Scenario, due to a slight increase in forecast night-time movements. In 2025 the DC Scenario results in higher noise levels than the 2025 DM Scenario at all locations, due to the expected increase in the number of night-time movements, which is mostly offset by the additional use of quieter new generation aircraft in the DC Scenario.

8.6.45 In 2027 and 2031, noise levels are forecast to decrease at some locations and increase at other locations in the DC Scenario compared to the DM Scenario. This is due to much greater use of the quieter new generation aircraft, the noise benefit of which is not evenly distributed, with departure noise levels improving by more than arrival noise levels (albeit both improve). Therefore, at some locations, primarily those to the east and west of the airport, this improvement in large enough to outweigh the greater number of night time movements forecast for the DC Scenario, resulting in overall noise reductions. However, at some locations, primarily those to the north and south of the airport, the quieter noise levels from the new generation aircraft does not offset the increase in night-time aircraft movements, resulting in increases in the overall night-time noise level.

8.6.46 The absolute levels of noise at all locations are forecast to remain below the SOAEL for both the DM and DC Scenarios. Almost all the changes in noise levels (adverse and beneficial) between the 2031 DM and DC Scenarios are less than 2 dB. Based on the criteria set out in Table 8-9, changes of this magnitude would be rated as a **Negligible** impact. Thamesmead (Location 8) is forecast to experience a 2.1 dB reduction in

night-time noise in the DC Scenario compared to the DM Scenario, which would be rated as a **Minor Beneficial** impact.

8.6.47 The areas of the key night-time air noise contours are presented in Table 8-26 for all assessment years and scenarios. These contours are presented in Figure 8.3.11 to Figure 8.3.17 in Appendix 8.3. The population counts within these contours are presented in Table 8-27. Table 8-28 presents the number of non-residential noise sensitive receptors exposed to noise levels above the relevant noise level criteria thresholds set out in Table 8-11.

Table 8-26: Air Noise Contour Areas, $L_{Aeq,8h}$ Average Mode Summer Night

Contour, dB $L_{Aeq,8h}$	Contour Area, km^2						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
45 (LOAEL)	4.5	7.8	10.6	7.8	7.1	7.1	7.3
55 (SOAEL)	0.5	0.9	1.2	0.9	0.8	0.8	0.9
63 (UAEL)	0.1	0.2	0.3	0.2	0.2	0.2	0.3

Table 8-27: Air Noise Population Counts, $L_{Aeq,8h}$ Average Mode Summer Night

Contour, dB $L_{Aeq,8h}$	Number of People excluding Permitted Developments						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
45 (LOAEL)	19,300	21,150	36,400	21,150	24,700	25,750	26,500
55 (SOAEL)	0	0	0	0	0	0	70
63 (UAEL)	0	0	0	0	0	0	0

Table 8-28: Air Noise Non Residential Counts, Average Mode Summer Night

Receptor	Number of Non Residential Receptors						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
Healthcare≥ 50 dB $L_{Aeq,1h}$	1	1	1	1	1	1	1

8.6.48 The 2025 DM night-time contours are larger than those for 2019 and contain more people, due to a greater number of night-time departure movements in the DM Scenario. Nobody is forecast to experience night-time noise above the SOAEL. The 2025 DC contours are larger than those for the 2025 DM Scenario and contain more people but, again, none above the SOAEL.

8.6.49 Under the DM Scenario, the 2027 night-time contours remain the same size as those in the 2025 DM. The number of people within the contours also remains the same. In 2027 under the DC Scenario, the contours reduce in area and contain correspondingly fewer people This is due to a forecast substantial increase in the use of quieter new generation aircraft in the DC Scenario, which more than offsets the increase in aircraft movements.

8.6.50 Under the DM Scenario, the 2031 night-time contours reduce in area due to an increasing use of quieter new generation aircraft; however, the number of people within the contours is forecast to increase. This is due to a change in the shape of the noise contours, due to an increase in forecast night-time departure movements. Under the DC Scenario the contours increase slightly in area and contain correspondingly more people. This is due to the forecast increase in movements, which is mostly offset by the continuing shift to quieter new generation aircraft.

8.6.51 The 2031 DC contours and population counts are larger than those for 2019 due to the increase in night-time movements, which is mostly offset by the increased use of quieter new generation aircraft. By 2031

under the DC Scenario there are 70 people forecast to be exposed to night-time noise levels above the SOAEL. These people are all located in the Camel Road area and have already been treated under the highest tier of the SIS, as they are also within the existing 66 dB $L_{Aeq,16h}$ daytime eligibility contour.

8.6.52 Nobody is forecast to be exposed to noise levels above the UAEL in any of the scenarios. There is 1 residential healthcare receptor exposed to noise levels above the 50 dB $L_{Aeq,1h}$ threshold for all scenarios, which is Richard House Children's Hospice. Comparing the 2031 DM and DC Scenarios, the change in night-time noise level at this receptor is less than 3 dB and is therefore not significant. In addition, Richard House Children's Hospice has already received works as part of the airport's sound insulation scheme.

Weekend Daytime

8.6.53 Table 8-29 shows the weekend air noise exposure levels for 2019 and the DM Scenario (in brackets) and the relative change in noise level for the DC Scenario compared to the DM Scenario for each of the three assessment years.

Table 8-29: Air Noise Exposure Levels And Relative Change, $L_{Aeq,16h}$ Average Mode Summer Weekend Day

Locations	Absolute level ($L_{Aeq,16h}$) dB or change DC-DM						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
(1) Blackwall / A1261	(56)	(56)	0	(56)	-1.2	(54)	+1.0
(2) Britannia Village	(60)	(61)	0	(61)	-1.0	(59)	+1.1
(3) Silvertown / A1020	(58)	(58)	+0.1	(58)	-0.5	(57)	+1.4
(4) Custom House	(56)	(56)	+0.2	(56)	+0.1	(55)	+1.6
(5) Camel Road	(63)	(62)	+0.2	(63)	0	(62)	+1.5
(6) Royal Albert Dock (north)	(60)	(60)	+0.1	(60)	-0.2	(59)	+1.4
(7) North Woolwich (north)	(56)	(56)	+0.1	(56)	-0.1	(55)	+1.5
(8) Thamesmead	(57)	(57)	0	(57)	-0.8	(56)	+1.2
(9) Eastern Quay Apts, Britannia Village	(62)	(62)	0	(62)	-1.0	(60)	+1.1
(10) Coral Apts, Western Gateway	(59)	(59)	0	(59)	-1.3	(58)	+1.0
(11) Silvertown Quays	(65)	(65)	0	(65)	-1.2	(63)	+1.0
(12) Ramada Hotel	(62)	(62)	0	(62)	-0.7	(61)	+1.3

8.6.54 For all 12 locations, the weekend noise levels for the 2025 and 2027 are forecast to remain similar to 2019 for both the DM and DC Scenarios. The DM Scenario has a similar number of ATMs. The DC Scenario has more ATMs, particularly in 2027, but this is offset by increased use of quieter new generation aircraft.

8.6.55 In 2031, the DC Scenario results in higher noise levels than the 2031 DM Scenario, due to the material difference in forecast ATMs between the two scenarios in 2031. This increase in ATMs by 2031 is not fully offset by the slightly greater use of quieter new generation aircraft in the DC Scenario.

8.6.56 The 2031 DC noise levels are similar to those in 2019, as the increase in ATMs is largely offset by much greater use of quieter new generation aircraft.

8.6.57 All of the changes in noise level (adverse and beneficial) between the DM and DC Scenarios are less than 2 dB. Based on the daytime criteria set out in Table 8-9, changes of this magnitude would be rated as a **Negligible** impact.

8.6.58 All the weekend daytime noise levels are lower than the equivalent daytime levels over the whole week, reflecting the continuation of the current reduced level of activity at the weekends compared to a typical weekday. The weekend is therefore forecast to remain quieter than a typical weekday, with fewer movements per day.

8.6.59 The areas of the key weekend daytime air noise contours are presented in Table 8-30 for all assessment years and scenarios. These contours are presented in Figure 8.3.18 to Figure 8.3.24 in Appendix 8.3. The population counts within these contours are presented in Table 8-31. Table 8-32 presents the number of non-residential noise sensitive receptors exposed to noise levels above the relevant noise level criteria thresholds set out in Table 8-11.

Table 8-30: Air Noise Contour Areas, $L_{Aeq,16h}$ Average Mode Summer Weekend Day

Contour, dB $L_{Aeq,16h}$	Contour Area, km^2						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
51 (LOAEL)	15.2	15.0	15.1	15.2	13.5	11.9	15.1
63 (SOAEL)	1.1	1.1	1.1	1.1	1.0	0.9	1.2
69 (UAEL)	0.4	0.4	0.4	0.4	0.4	0.3	0.4

Table 8-31: Air Noise Population Counts, $L_{Aeq,16h}$ Average Mode Summer Weekend Day

Contour, dB $L_{Aeq,16h}$	Number of People excluding Permitted Developments						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
51 (LOAEL)	108,600	110,050	110,000	111,250	88,000	78,750	99,850
63 (SOAEL)	750	750	750	750	750	750	1,150
69 (UAEL)	0	0	0	0	0	0	0

Table 8-32: Air Noise Non Residential Counts, $L_{Aeq,16h}$ Average Mode Summer Weekend Day

Receptor	Number of Non Residential Receptors						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
Healthcare≥ 52 dB $L_{Aeq,16h}$	1	1	1	1	1	1	1
Amenity Areas ≥ 55 dB $L_{Aeq,16h}$	31	31	31	31	28	18	30

8.6.60 The 2025 DM weekend contours are similar in area to the 2019 contours and contain a similar number of people. The 2025 DC contours are also similar to 2019 and those for the 2025 DM Scenario. The number outdoor amenity areas above the noise level threshold remains the same.

8.6.61 Under the DM Scenario, the 2027 weekend contours remain similar to 2019 and 2025. The number of people within the contours also remains similar. Under the DC Scenario the contours reduce in area and contain correspondingly fewer people and fewer outdoor amenity areas are exposed to noise levels above the corresponding threshold. This is due to a forecast substantial increase in the use of quieter new generation aircraft in the DC Scenario, this more than offsets the increase in ATMs.

8.6.62 Under the DM Scenario, the 2031 weekend contours reduce in area due to an increasing use of quieter new generation aircraft and the number of people within the contours correspondingly decreases. Under the DC Scenario, the contours increase in area and contain correspondingly more people and more outdoor

amenity areas are exposed to noise levels above the corresponding thresholds. This is due to the forecast increase in ATMs, which is mostly offset by the continuing shift to quieter new generation aircraft.

8.6.63 The 2031 DC contours remain similar in size to those for 2019, however the number of people exposed to noise levels above the LOAEL decreases, whereas the number of people exposed to noise levels above the SOAEL increases. These changes are due to slight changes in the shape of the noise contours, due to the forecast changes in the number of ATMs and the fleet mix.

8.6.64 Nobody is forecast to be exposed to noise levels above the UAEL in any of the scenarios. There is 1 residential healthcare receptor exposed to noise levels above the 52 dB $L_{Aeq,16h}$ threshold for all scenarios.

Supplementary Indicators

L_{den} and L_{night}

8.6.65 Analysis of these parameters show broadly similar results to the $L_{Aeq,16h}$ and $L_{Aeq,8h}$ metrics. The results are given in detail in Appendix 8.3. The contours are presented in Figures 8.3.25 to 8.3.38 in Appendix 8.3.

Annoyance

8.6.66 Table 8-33 shows the number of people likely to be highly annoyed by air noise around the airport. This does not take account of any improved insulation for dwellings which have benefitted from the noise insulation scheme.

Table 8-33: Highly Annoyed Population Count, $L_{Aeq,16h}$ Average Mode Summer Day

	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
Population Highly Annoyed excluding Permitted Developments	23,500	23,100	22,700	23,300	16,350	17,150	17,900

8.6.67 This shows that in the future, the number of people highly annoyed in 2025 will remain similar to 2019 for the DM and DC Scenarios. In 2027 under the DM Scenario the number of people highly annoyed is forecast to remain similar but forecast to reduce by around 30% under the DC Scenario, due to forecast reductions in daytime noise due to increasing use of the quieter new generation aircraft.

8.6.68 In 2031 the number of people highly annoyed is forecast to reduce under the DM Scenario, due to increasing use of quieter new generation aircraft. Annoyance is forecast to increase slightly for the DC Scenario, as the increase in ATMs compared to the DM Scenario is not fully offset by the continuing increased used of quieter new generation aircraft.

8.6.69 The number of people highly annoyed for the 2031 DC Scenario remains below that for 2019. This is in line with the changes in the daytime noise contours and the number of people they contain and is due to the increases in ATMs being offset by the increasing use of quieter new generation aircraft.

Sleep Disturbance

8.6.70 Table 8-34 shows the number of people likely to be highly sleep disturbed by air noise around the airport. This does not take account of any improved insulation for dwellings which have benefitted from the noise insulation scheme.

Table 8-34: Highly Sleep Disturbed Population Count, L_{night} Average Mode Annual Night

	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
Population Highly Sleep Disturbed excluding Permitted Developments	12,400	12,100	18,600	12,100	12,700	13,450	13,250

8.6.71 This shows that the number of people highly sleep disturbed will initially increase in 2025 under the DC Scenario. However, by 2031 the number of people highly sleep disturbed under the DC Scenario is expected to

decrease so that is it only slightly higher than in 2019 and slightly lower than is predicted for 2031 under the DM Scenario. This is due to the more rapid transition to quieter new generation aircraft in the DC Scenario. In 2031 there are forecast to be no current generation E190s in the early morning period under the DC Scenario; however, there are still expected to be some in the DM Scenario.

N65 Daytime

8.6.72 The summer N65 daytime contours have been prepared at values of 10, 25, 50, 100 and 200 events. The areas of the N65 daytime air noise contours are presented in Table 8-35 for all assessment years and scenarios. These contours are presented in Figures 8.3.39 to 8.3.45. Further explanation of these contours is given in paragraph 8.3.65. The population counts within these contours are presented in Table 8-36. The N65 results are presented in detail in Appendix 8.3.

Table 8-35: Air Noise Contour Areas, N65 Average Mode Summer Day

N65 Contour, Events	Contour Area, km^2						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
10	106.7	106.8	105.7	106.5	71.4	83.3	69.3
25	66.4	69.9	62.6	67.0	44.0	46.4	45.3
50	64.6	31.9	30.9	31.8	21.8	22.0	22.5
100	12.4	11.6	12.4	12.8	12.9	12.3	16.7
200	1.1	0.9	1.0	1.2	1.5	1.4	1.8

Table 8-36: Air Noise Population Counts, N65 Average Mode Summer Day

N65 Contour, Events	Number of People excluding Permitted Developments						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
10	802,800	803,250	796,800	799,250	577,600	660,200	557,100
25	552,450	573,550	515,200	558,650	334,000	362,300	344,600
50	276,200	266,050	254,900	265,150	171,300	172,950	177,450
100	78,050	73,600	79,000	80,300	81,250	77,700	120,100
200	1,700	600	1,700	3,450	7,100	5,700	8,150

8.6.73 The populations within the N65 contours broadly vary in line with the change in the areas of the contours, as would be expected. The daytime N65 contours do not generally vary in as consistent a manner between the DM and DC Scenarios as other metrics, however some general comparisons are given below. The N65 25 and 50 event contours do not vary consistently between the scenarios or between the assessment years, therefore the analysis below focusses on the 10, 100 and 200 event contours. The 2025 DM and 2025 DC N65 contours are generally very similar for all of the contour levels:

- The N65 10 event contours cover all the arrival and departure routes. For the departure routes, the contours end around where the altitude holds typically end and the aircraft resume climbing. For the arrival routes the contours end around the start of the altitude holds where aircraft temporarily stop descending. These points are different for each route and are controlled by air traffic control.
- The N65 100 event contours cover the area overflown by both arrivals and departures.
- The N65 200 event contours are relatively small, only extending up to the dock edge in some areas.

8.6.74 With regards to specific assessment years, the following interpretation is given:

- The 2027 DC N65 10 contour is smaller than that for the 2027 DM Scenario, due to the increased use of quieter new generation aircraft in the DC Scenario. Whereas the N65 100 event and N65 200 event contours for the 2027 DC Scenario are larger than those for the 2027 DM Scenario, due to the greater number of aircraft movements in the DC Scenario;
- The 2031 DC N65 10 event contour is slightly smaller than that for the 2031 DM Scenario, due to the increased use of quieter new generation aircraft in the DC Scenario. Whereas the N65 100 event contour for the 2031 DC Scenario is larger than that for the 2031 DM Scenario, due to the greater number of aircraft movements in the DC Scenario. The N65 200 event contours are similar for both scenarios;
- For the DM Scenario, 2025 and 2027 are very similar for all contour levels. The N65 10 event contours get smaller by 2031, due to the increased use of quieter new generation aircraft. The N65 100 event and 200 event contours remain broadly similar in each of the assessment years; and
- For the DC Scenario, the N65 10 event contours get smaller in 2027 and 2031 due to more rapid transition to quieter new generation aircraft. The N65 100 event and 200 event contours get slightly larger over time, due to the increase in aircraft movements.

N60 Night-time

8.6.75 N60 contours are generally prepared at a minimum contour level of 10 events. There are not currently more than 10 events (flights) per summer night on average nor are there forecast to be under the DM or DC future scenarios. Therefore, N60 noise contours have not been presented. This is also the case for the Proposed Early Morning Limit Scenario. Noise from individual events at night are considered in the L_{ASmax} assessment below.

N65 Weekend Daytime

8.6.76 There were not as many as 200 events (flights) per summer weekend day in any of the assessed weekend scenarios. Therefore, N65 weekend contours have been prepared at values of 10, 25, 50 and 100 events. The areas of the N65 weekend air noise contours are presented in Table 8-37 for all assessment years and scenarios. These contours are presented in Figures 8.3.46 to 8.3.52. Further explanation of these contours is given in paragraph 8.3.65. The population counts within these contours are presented in Table 8-38. The weekend N65 results are presented in detail in Appendix 8.3.

Table 8-37: Air Noise Contour Areas, N65 Average Mode Summer Weekend Day

N65 Contour, Events	Contour Area, km²						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
10	87.3	84.9	81.4	84.6	48.6	52.5	50.0
25	28.6	31.5	30.2	31.3	22.7	21.8	33.2
50	12.1	9.5	12.6	12.0	17.1	11.7	18.7
100	1.1	0.6	1.2	1.0	2.3	1.3	2.7
200	87.3	84.9	81.4	84.6	48.6	52.5	50.0

Table 8-38: Air Noise Population Counts, N65 Average Mode Summer Weekend Day

N65 Contour, Events	Number of People excluding Permitted Developments						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
10	685,150	675,900	639,250	670,050	377,650	420,850	383,150
25	227,550	264,000	246,050	262,050	179,700	171,100	264,700
50	73,900	59,400	79,750	75,700	125,800	72,950	144,750
100	1,550	120	3,450	1,200	9,350	4,100	10,900

8.6.77 The populations within the N65 weekend contours broadly vary in line with the change in the areas of the contours, as would be expected. The weekend N65 contours do not generally vary in as consistent a manner between the DM and DC Scenarios as other metrics, however some general comparisons are given below.

- The 2031 DC weekend N65 10 event contour is slightly smaller than that for the 2031 DM Scenario and much smaller than that for 2019. This is due to the reduced use of the noisier current generation Embraer E190 in the 2031 DC Scenario. The new generation aircraft that replace it are quieter and therefore expose a smaller area to at least 65 dB L_{ASmax}.
- The 2031 DC weekend N65 25 event contour is generally similar to that for the 2031 DM Scenario except to the west and south of the airport. In this area there are sufficient easterly arrivals in the DC Scenario to generate a 25 event contour for the level section of the easterly arrival track, but for the 2031 DM Scenario there are only sufficient arrivals to generate a 10 event contour.
    - Compared to 2019, the 2031 DC weekend N65 25 event contour is smaller to the north of the airport due to fewer departures by the current generation Embraer 190. To the west and south of the airport the 2031 DC contour is larger, as there were insufficient easterly arrivals in 2019 to generate a 25 event contour for the level section of the easterly arrival track.
- The 2031 DC weekend N65 50 event contour is larger than that for the 2031 DM Scenario and that for 2019. This is due to greater number of weekend movements in the DC Scenario, which results in there being sufficient westerly arrivals and westerly departures to generate a 50 event contour. For the 2031 DM Scenario and 2019, the 50 event contour is formed by the overlap of westerly departures and easterly arrivals to the west of the airport, and the overlap of easterly departures and westerly arrivals to the east of the airport. As these contours are formed by the overlap of multiple operations, they are smaller only covering the areas exposed to 65 dB L_{ASmax} by both pairs of operations.
- Similarly, the 2031 DC weekend N65 100 event contour is slightly larger than that for the 2031 DM Scenario and that for 2019. This is due to greater number of weekend movements in the DC Scenario, which results in there being sufficient westerly departures and easterly departures to generate a 100 event contour in the areas they overlap. For the 2031 DM Scenario, the 100 event contour is formed by the overlap of westerly departures and easterly departures and westerly arrivals. As these contours are formed by the overlap of three sets of operations, rather than just two in the DC Scenario, they are smaller only covering the areas exposed to 65 dB L_{ASmax} by all three sets of operations.

L_{ASmax}

8.6.78 The number of people exposed to individual events of at least 80 dB L_{ASmax} at least once per night is given in Table 8-39 for each scenario. The results are presented in detail in Appendix 8.3. The contours are shown in Figures 8.3.53 to 8.3.59 in Appendix 8.3.

Table 8-39: Air Noise Population Counts, L_{ASmax} Average Mode Summer Night

Contour, dB L_{ASmax}	Number of People excluding Permitted Developments						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
80	5,113	6,233	14,046	6,233	2,401	6,374	4,363

8.6.79 Table 8-39 demonstrates that the number of people exposed to 80 dB L_{ASmax} at least once per night in 2025 is forecast to be greater in the DC Scenario than the DM Scenario. However, by 2031 the number of people under the DC Scenario is round 30% fewer than that expected under the DM Scenario and lower than in 2019. This is due to the greater use of quieter new generation aircraft under the DC Scenario.

Single Mode

8.6.80 Single mode L_{Aeq} noise contours have been produced which show how, under westerly and easterly conditions, noise exposure levels will vary between scenarios for the daytime, night-time and weekend.

8.6.81 The number of people exposed between scenarios generally varies in a similar manner to the average mode L_{Aeq} contours. A feature is under easterly operations the 51 dB $L_{Aeq,16h}$ daytime contour extends further from the airport, as the contour includes the area where aircraft are held at 2,000 ft on approach. This is the same for 2019 and all future scenarios. Small parts of the 54 dB $L_{Aeq,16h}$ contour are also affected for 2019 and some of the future scenarios. The 57 dB $L_{Aeq,16h}$ and higher noise level contours are not affected.

8.6.82 The night-time contours are not affected due to the lower noise levels in this period. The weekend contours are generally not affected either, with the exception of the 51 dB $L_{Aeq,16h}$ contour for the 2031 DC Scenario. The change between the 2031 DM and DC Scenarios for the 51 dB contour appears visually large, but changes in noise levels in this area are less than 2 dB (negligible relative impact), with noise just below 51 dB for the DM Scenario and just above for the DC Scenario.

8.6.83 The westerly mode contours are also not affected, as the altitude hold for westerly approaches is 3,000ft. The quieter noise levels resulting from this greater altitude means that the contour does not extend over the area under the level section of the westerly approach.

8.6.84 The results are presented in detail in Appendix 8.3 and the contours are shown in Figures 8.3.60 to 8.3.101 in Appendix 8.3.

Variation in Noise Level Over The Day

8.6.85 The noise level at a receptor will vary by the hour because of variations in the hourly timetabling of aircraft over a 24-hour period. Table 8-40 shows how the noise levels at a given receptor could vary over a typical day for the 2031 DC Scenario.

Table 8-40: Hourly Air Noise Exposure Levels, 2031 DC Average Mode Summer Day

Locations	Hourly Noise Levels, dB $L_{Aeq,1h}$																
	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	16h Avg.
(1) Blackwall / A1261	53	59	60	59	57	57	55	55	57	57	56	59	60	59	56	53	57
(2) Britannia Village	58	64	65	64	62	62	60	60	62	62	61	64	65	64	61	58	63
(3) Silvertown / A1020	56	62	63	62	60	60	58	58	60	60	59	62	63	62	59	56	60
(4) Custom House	54	60	61	60	58	58	57	56	58	58	57	60	61	61	58	55	59
(5) Camel Road	60	67	68	67	65	65	63	63	65	65	64	67	68	67	64	61	65
(6) Royal Albert Dock (north)	58	65	65	64	62	62	61	60	62	63	61	64	65	65	62	59	63
(7) North Woolwich (north)	54	61	62	60	58	58	57	56	58	59	57	60	62	61	58	55	59
(8) Thamesmead	56	61	62	60	58	58	57	56	58	59	57	60	62	61	58	55	59
(9) Eastern Quay Apts, Britannia Village	60	65	66	65	63	63	61	61	63	63	62	65	66	65	62	59	64
(10) Coral Apts, Western Gateway	57	63	64	62	60	60	59	58	60	61	60	63	64	63	60	57	61
(11) Silvertown Quays	62	68	69	67	66	65	64	63	65	66	65	68	69	68	65	62	66
(12) Ramada Hotel	60	66	67	66	64	64	62	62	64	64	63	66	67	66	63	60	64

8.6.86 Typical hourly levels are generally within 3 dB of the 16 hour daytime average for most of the day. The first hour is quieter as the airport is only operational for half of the hour and the number of aircraft movements in this half hour are lower than average. 9pm-10pm is also forecast to be quieter, as typically fewer flights are scheduled late in the evening.

8.6.87 There are no scheduled flights after 10pm, although flights that were scheduled earlier and have been delayed can operate up to 10:30pm. It is difficult to forecast how many flights could operate in this period and

therefore what typical noise levels might be. The number of flights in 2019 was low compared to the other daytime hours, and this is expected to remain the case in the future.

Respite

8.6.88 In 2019 and under the DM Scenario there are 72 predictable respite hours per week when the airport is closed. Under the DC Scenario this would reduce to 65 hours per week in the winter season and 64 hours per week in the summer season, due to the proposed extended operational hours on a Saturday. This is a reduction of around 10%.

8.6.89 There are no recognised criteria for the assessment of respite or a change in the amount of respite. It is important to recognise that the amount of respite for residents around the airport is very unusual, even with the proposed reduction, with no other major UK airport having such restrictive operation hours and London's other four passenger airports permitted to open 24 hours a day, seven days a week.

8.6.90 In addition to the predictable periods of respite when the airport is closed, many of the people affected by aircraft noise from the airport are only overflown by either westerly or easterly operations, not both. For those who are only overflown by westerly operations, this occurs around 70% of the time on average, which equates to around 30 additional hours of respite per week. For those who are only overflown by easterly operations, this only occurs around 30% of the time on average, which equates to around an additional 70 hours of respite per week.

Predicted Air Noise Effects and Their Significance

8.6.91 This section sets out the air noise effects arising from the proposed development by comparing the results of the DM Scenario to those of the DC Scenario. A subjective account of how noise conditions will change between 2019 (the baseline year) and the 2031 DM and DC Scenarios has also been included to provide context. To summarise, the assessment of effects is based on a comparison of the following key scenarios:

- 2019 vs 2031 DM and 2031 DC;
- 2025 DM vs 2025 DC;
- 2027 DM vs 2027 DC; and
- 2031 DM vs 2031 DC.

2019 (Baseline Year) vs 2031 DM and DC Scenarios

8.6.92 The airport is forecast to grow to its current passenger limit of 6.5 mppa by 2031 under the DM Scenario. Annual aircraft movements are forecast to increase from 83,963 in 2019 to 94,000 in 2031. This increase will be accompanied by the replacement of many of the most common aircraft at the airport with cleaner, quieter new generation equivalents.

8.6.93 The greater use of quieter new generation aircraft more than offsets the forecast increases in forecast daytime and weekend movements, resulting in reductions in overall daytime and weekend noise under the DM Scenario. The decreases in daytime and weekend noise are forecast to be negligible at all twelve representative locations. The decreases in noise result in fewer people (excluding permitted developments) being exposed to daytime and weekend noise levels above the LOAEL for the 2031 DM Scenario than occurred in 2019. The number of people exposed to daytime noise levels above the SOAEL is also forecast to reduce. The number of people exposed to weekend noise levels above the SOAEL is forecast to remain the same.

8.6.94 The increase in forecast night-time movements is mostly offset by the greater use of quieter new generation aircraft, resulting in some increases in overall night-time noise in the DM Scenario. The increases in night-time noise are however forecast to be negligible at all twelve representative locations. The increases in noise result in more people being exposed to night-time noise levels above the LOAEL for the 2031 DM Scenario than occurred in 2019. Nobody is forecast to be exposed to night-time noise levels above the SOAEL for the 2031 DM Scenario, as occurred in 2019.

8.6.95 The airport is forecast to grow to its proposed passenger limit of 9 mppa by 2031 under the DC Scenario. Annual aircraft movements are forecast to increase from 83,963 in 2019 to 111,000 in 2031. This increase will be accompanied by the replacement of the most common aircraft at the airport with cleaner, quieter new generation equivalents.

8.6.96 In the 2031 DC Scenario the airport is forecast to have reached 9 mppa, while aircraft movements will increase, noise exposure levels during the day are predicted to reduce due to the modernisation of the aircraft fleet, leading to a reduction in the number of people adversely affected by air noise. The number of people (excluding permitted developments) exposed to noise levels at or above the LOAEL reduces from 205,300 to 160,000. The 57 dB contour for 2031 is forecast to reduce in area compared to 2019 and be around 20% less than the current contour area limit. In 2019 there were 51,500 people within this contour, this is forecast to reduce to 37,550 by 2031. In 2019 there were 5,750 people exposed to noise levels at or above the SOAEL. This is forecast to reduce to around 2,550 people in 2031. Most people within the noise contours will experience a decrease in noise, generally of less than 2 dB which is rated as a negligible magnitude of impact. A small number of people are forecast to experience a larger decrease in noise of between 2 and 3 dB. As these people are exposed to a low absolute level of noise between the LOAEL and the SOAEL, this effect would be rated as minor beneficial. A small number of people are also forecast to experience a negligible increase in noise of less than 2 dB.

8.6.97 The proposed amendments to the CADP1 planning permission include an increase in the cap on flights in the night-time period (6.30 to 6.59). This results in an increase in the number of people that are exposed to night-time noise levels at or above the LOAEL, from 19,300 in 2019 to 26,500 in 2031. Whilst in 2019 nobody was exposed to night-time noise levels at or above the SOAEL, there are forecast to be 70 people exposed to noise levels at or above the SOAEL in 2031. These people are all located in the Camel Road area and have already been treated under the highest tier of the SIS, as they are also within existing the 66 dB $L_{Aeq,16h}$ daytime contour. The high tier of the SIS is designed to achieve a reduction of at least 35 dB in internal noise levels compared to external noise levels, meaning good internal night-time noise levels based on the standard set out in BS 8233[24] should be achieved.

8.6.98 In the event of any proerty, not already treated, being exposed to night-time noise levels above the SOAEL, they would be eligible for the high tier of the sound insulation scheme under the proposed new night-time eligibility criteria based on the 55 dB $L_{Aeq,8h}$ contour.

8.6.99 The proposed amendments to the CADP1 planning permission include an extension of operational hours on Saturdays into the early evening and an increase in the weekend and Saturday movement limits. Despite this, due to the increased use of quieter new generation aircraft in the future, the number of people that are exposed to weekend noise levels at or above the LOAEL is forecast to decrease, from 108,600 in 2019 to 99,850 in 2031. In 2019, 750 people were exposed to weekend noise levels at or above the SOAEL. There are forecast to be 1,150 people exposed to noise levels at or above the SOAEL in 2031. Most people within the noise contours are forecast to experience a decrease in weekend noise, however around a third of people are forecast to experience an increase in weekend noise. All the forecast changes in weekend noise are less than 2 dB and therefore would be rated as **Negligible**.

8.6.100 In summary, due to the greater use of quieter new generation aircraft by 2031, the number of people adversely affected by daytime noise is expected to reduce compared to 2019. Due to the proposed increase in early morning movements, which is not fully offset by the improvement in noise levels from the quieter new generation aircraft, night-time noise levels are forecast to increase by 2031 for the DC Scenario. There are 70 people forecast to become exposed to night-time noise levels above the SOAEL. These people's dwellings have all already been treated by the high tier of the SIS and so, allowing for this sound insulation, good internal night-time noise levels should still arise.

8.6.101 Due to the greater use of quieter new generation aircraft by 2031, weekend noise levels are expected to remain broadly similar to 2019 despite the extended operating hours. More people are forecast to experience a decrease in weekend noise levels than are forecast to experience an increase, with all of the changes in weekend noise forecast to be negligible.

2025 DM vs 2025 DC

8.6.102 This section summarises the noise effects forecast for 2025. Annual aircraft movements are forecast to be 78,500 in the 2025 DM Scenario compared to 83,000 in the 2025 DC Scenario. The fleet mix for the two scenarios are broadly similar, but there are forecast to be a greater proportion of movements by the quieter new generation aircraft in the DC Scenario.

8.6.103 The absolute and relative impact ratings in the tables below and the resulting scale of effects are based on the criteria set out in Section 8.3.

8.6.104 The following Tables summarise how the proposed development will affect average summer daytime, night-time and weekend noise levels based on the absolute levels arising under the 2025 DC Scenario and the change in noise level compared to the 2025 DM Scenario that is experienced:

- Table 8-41 and Table 8-42 – Daytime Noise (dB $L_{Aeq,16h}$)
- Table 8-43 and Table 8-44 – Night-time Noise (dB $L_{Aeq,8h}$)
- Table 8-45 and Table 8-46 – Weekend Daytime Noise (dB $L_{Aeq,16h}$)

Table 8-41: Air Noise Receptor Counts, $L_{Aeq,16h}$ Average Mode Summer Day

Receptor	Number of Receptors (including permitted developments)	
	2025 DM	2025 DC
Population ≥ 51 dB $L_{Aeq,16h}$ (LOAEL)	361,400	355,150
Population ≥ 57 dB $L_{Aeq,16h}$ (Contour Area Limit)	108,950	106,550
Population ≥ 63 dB $L_{Aeq,16h}$ (SOAEL)	13,600	12,650
Population ≥ 69 dB $L_{Aeq,16h}$ (UAEL)	0	0
Schools ≥ 52 dB $L_{Aeq,16h}$	86	83
Healthcare≥ 52 dB $L_{Aeq,16h}$	1	1
Amenity Areas ≥ 55 dB $L_{Aeq,16h}$	102	101

Table 8-42: Population Exposed to Absolute and Relative Air Noise Impacts, 2025 DC Vs 2025 DM, Daytime

2025 DC Noise Level, dB $L_{Aeq,16h}$	Absolute Impact	Population including Permitted Developments								
		Change in Noise Level DC vs DM, dB $L_{Aeq,16h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible		Low	Medium	High	
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
51 (LOAEL) to 62.9	Low	0	0	0	317,850	4,700	19,950	0	0	0
63 (SOAEL) to 68.9	Medium	0	0	0	12,000	140	490	0	0	0
≥69 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

8.6.105 Overall, it can be seen that daytime noise exposure levels are predicted to remain broadly the same between the DM and DC Scenario, leading to no material change in the number of those people adversely affected by air noise. This is because, while aircraft movements are higher under the 2025 DC Scenario, this is largely offset by the predicted additional modernisation of the aircraft fleet.

8.6.106 The number of people (including permitted developments) exposed to daytime noise levels at or above the LOAEL (low absolute impact) reduces slightly from 361,400 under the DM Scenario to 355,150 under the

DC Scenario. Most receptors experience a decrease of less than 2 dB, with some experiencing an increase of less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect.

8.6.107 The number of people exposed to daytime noise levels at or above 57 dB (within low absolute impact) reduces slightly from 108,950 under the DM Scenario to 106,550 under the DC Scenario. Most receptors experience a decrease of less than 2 dB, with some experiencing an increase of less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect.

8.6.108 The number of people exposed to daytime noise levels at or above the SOAEL (medium absolute impact) reduces slightly from 13,600 under the DM Scenario to 12,650 under the DC Scenario. Most receptors experience a decrease of less than 2 dB, with some experiencing an increase of less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect.

8.6.109 Nobody is exposed to noise levels with an absolute impact rated as high (above the UAEL).

8.6.110 Compared to the DM Scenario, for the DC Scenario there are 3 fewer schools exposed to noise levels equal to or above the threshold level of 52 dB $L_{Aeq,16h}$. There are the same number of residential healthcare buildings exposed to noise levels equal to or above the threshold level of 52 dB $L_{Aeq,16h}$. There is 1 fewer outdoor amenity area exposed to noise levels equal to or above the threshold level of 55 dB $L_{Aeq,16h}$. All of the changes in noise at these receptors are less than 3 dB, therefore the effects are rated as **Not Significant**.

Table 8-43: Air Noise Receptor Counts, Average Mode Summer Night-time

Receptor	Number of Receptors (including permitted developments)	
	2025 DM	2025 DC
Population ≥ 45 dB $L_{Aeq,8h}$ (LOAEL)	46,250	78,600
Population ≥ 55 dB $L_{Aeq,8h}$ (SOAEL)	0	0
Population ≥ 63 dB $L_{Aeq,8h}$ (UAEL)	0	0
Healthcare ≥ 50 dB $L_{Aeq,1h}$	1	1

Table 8-44: Population Exposed to Absolute and Relative Air Noise Impacts, 2025 DC Vs 2025 DM, Night-time

2025 DC Noise Level, dB $L_{Aeq,8h}$	Absolute Impact	Population including Permitted Developments								
		Change in Noise Level DC vs DM, dB $L_{Aeq,8h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible		Low	Medium	High	
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
45 (LOAEL) to 54.9	Low	0	0	0	0	0	53,200	25,400	0	0
55 (SOAEL) to 62.9	Medium	0	0	0	0	0	0	0	0	0
≥63 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

8.6.111 Due to the small proposed increase in the cap on early morning movements (from 6 to 9), noise exposure levels are predicted to be higher under the DC Scenario than the DM Scenario, leading to a higher number of people adversely affected by air noise at night.

8.6.112 The number of people exposed to night-time noise levels at or above the LOAEL (low absolute impact) increases from 46,250 under the DM Scenario to 78,600 under the DC Scenario. Most people are forecast to experience an increase of less than 2 dB – a negligible magnitude of change which constitutes a negligible

effect. Around a third of people are forecast to experience an increase of between 2 and 3 dB (low magnitude of change) this constitutes a **Minor Adverse** effect, which is **not significant.**

8.6.113 Nobody is exposed to noise levels with an absolute impact rated as medium (above the SOAEL) or high (above the UAEL).

8.6.114 Compared to the DM Scenario, for the DC Scenario the number of residential healthcare buildings exposed to noise levels equal to or above the threshold level of 50 dB $L_{Aeq,1h}$ remains the same. All of the changes in noise at these receptors are less than 3 dB, therefore the effects are rated as **not significant.**

Table 8-45: Air Noise Receptor Counts, $L_{Aeq,16h}$ Average Mode Summer Weekend Day

Receptor	Number of Receptors (including permitted developments)	
	2025 DM	2025 DC
Population ≥ 51 dB $L_{Aeq,16h}$ (LOAEL)	223,200	222,350
Population ≥ 63 dB $L_{Aeq,16h}$ (SOAEL)	3,000	3,000
Population ≥ 69 dB $L_{Aeq,16h}$ (UAEL)	0	0
Healthcare≥ 52 dB $L_{Aeq,16h}$	1	1
Amenity Areas ≥ 55 dB $L_{Aeq,16h}$	31	31

Table 8-46: Population Exposed to Absolute and Relative Air Noise Impacts, 2025 DC Vs 2025 DM, Weekend

2025 DC Noise Level, dB $L_{Aeq,16h}$	Absolute Impact	Population including Permitted Developments								
		Change in Noise Level DC vs DM, dB $L_{Aeq,16h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible			Low	Medium	High
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
51 (LOAEL) to 62.9	Low	0	0	0	104,300	7,350	107,700	0	0	0
63 (SOAEL) to 68.9	Medium	0	0	0	2,250	0	750	0	0	0
≥69 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

8.6.115 Overall, it can be seen that weekend noise exposure levels are predicted to remain broadly the same between the DM and DC Scenario, leading to no material change in the number of those people adversely affected by air noise. This is because, while aircraft movements are higher under the 2025 DC Scenario, this is largely offset by the predicted additional modernisation of the aircraft fleet.

8.6.116 The number of people exposed to weekend noise levels at or above the LOAEL (low absolute impact) reduces slightly from 223,200 under the DM Scenario to 222,350 under the DC Scenario. Around half of the receptors experience a decrease of less than 2 dB and half experiencing an increase of less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect.

8.6.117 The number of people exposed to weekend noise levels at or above the SOAEL (medium absolute impact) remains the same at around 3,000. Most receptors experience a decrease in noise of less than 2 dB and some experience an increase in noise less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect.

8.6.118 Nobody is exposed to noise levels with an absolute impact rated as high (above the UAEL).

8.6.119 For both the DM and DC Scenarios, there are the same number of residential healthcare buildings exposed to noise levels equal to or above the threshold level of 52 dB $L_{Aeq,16h}$ and the same number of outdoor amenity area exposed to noise levels equal to or above the threshold level of 55 dB $L_{Aeq,16h}$. All of the changes in noise at these receptors are less than 3 dB, therefore the effects are rated as **not significant**.

8.6.120 In summary, the air noise effects are not materially different between the DM and DC Scenario. The number of people adversely affected by daytime and weekend noise is broadly similar between the two scenarios. All changes in daytime and weekend noise levels are rated as negligible and would therefore result in a **Negligible** effect. There is an increase in the number of people adversely affected by night-time noise, with most people forecast to experience a negligible effect and around a third of people forecast to experience a **Minor Adverse** effect.

8.6.121 As all of those forecast to be affected by daytime or weekend aircraft noise in 2025 are forecast to experience a negligible effect and nobody is forecast to experience a significant effect, the overall effect rating for each period is **Negligible**. Around two thirds of those forecast to be affected by night-time aircraft noise in 2025 are forecast to experience a negligible effect, with the remainder forecast to experience a minor adverse effect, nobody is forecast to experience a significant effect. Therefore, the overall effect rating for night-time is **Negligible to Minor Adverse.**

2027 DM vs 2027 DC

8.6.122 This section summarises the noise effects forecast for 2027. Annual aircraft movements are forecast to be 84,500 in the 2027 DM Scenario compared to 97,000 in the 2027 DC Scenario. There are forecast to be a much greater proportion of movements by the quieter new generation aircraft in the DC Scenario.

8.6.123 The following Tables summarise how the proposed development will affect average summer daytime, night-time and weekend noise levels based on the absolute levels arising under the 2027 DC Scenario and the change in noise level compared to the 2027 DM Scenario that is experienced:

- Table 8-47 and Table 8-48 – Daytime Noise (dB $L_{Aeq,16h}$);
- Table 8-49 and Table 8-50 – Night-time Noise (dB $L_{Aeq,8h}$); and
- Table 8-51 and Table 8-52 – Weekend Daytime Noise (dB $L_{Aeq,16h}$).

Table 8-47: Air Noise Receptor Counts, $L_{Aeq,16h}$ Average Mode Summer Day

Receptor	Number of Receptors (including permitted developments)	
	2027 DM	2027 DC
Population ≥ 51 dB $L_{Aeq,16h}$ (LOAEL)	362,850	284,750
Population ≥ 57 dB $L_{Aeq,16h}$ (Contour Area Limit)	111,100	71,800
Population ≥ 63 dB $L_{Aeq,16h}$ (SOAEL)	14,150	7,350
Population ≥ 69 dB $L_{Aeq,16h}$ (UAEL)	0	0
Schools ≥ 52 dB $L_{Aeq,16h}$	86	60
Healthcare≥ 52 dB $L_{Aeq,16h}$	1	1
Amenity Areas ≥ 55 dB $L_{Aeq,16h}$	106	58

Table 8-48: Population Exposed to Absolute and Relative Air Noise Impacts, 2027 DC Vs 2027 DM, Daytime

2027 DC Noise Level, dB $L_{Aeq,16h}$	Absolute Impact	Population including Permitted Developments						
		Change in Noise Level DC vs DM, dB $L_{Aeq,16h}$						
		Beneficial				Adverse		
		High	Medium	Low	Negligible	Low	Medium	High

		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
51 (LOAEL) to 62.9	**Low**	0	0	39,050	237,100	180	1,150	0	0	0
63 (SOAEL) to 68.9	**Medium**	0	0	0	7,350	0	0	0	0	0
≥69 dB (UAEL)	**High**	0	0	0	0	0	0	0	0	0

8.6.124 Overall, it can be seen that daytime noise exposure levels are predicted to decrease between the DM and DC Scenarios, leading to a decrease in the number of those people adversely affected by air noise. This is because while aircraft movements are higher under the 2027 DC Scenario, this is more than offset by the predicted additional modernisation of the aircraft fleet.

8.6.125 The number of people exposed to daytime noise levels at or above the LOAEL (low absolute impact) reduces from 362,850 under the DM Scenario to 284,750 under the DC Scenario. Over 80% of receptors experience a decrease of less than 2 dB and a small number experience an increase of less than 2 dB (negligible magnitude of change). This constitutes a negligible effect. Around 39,000 people are forecast to experience a reduction in noise of between 2 and 3 dB (low magnitude of change). This constitutes a **Minor Beneficial** effect.

8.6.126 The number of people exposed to daytime noise levels at or above 57 dB (within low absolute impact) reduces from 111,100 under the DM Scenario to 71,800 under the DC Scenario. Over 90% of receptors experience a decrease of less than 2 dB and a small number experience an increase of less than 2 dB (negligible magnitude of change). This constitutes a negligible effect. Around 5,600 people are forecast to experience a reduction in noise of between 2 and 3 dB (low magnitude of change). This constitutes a **Minor Beneficial** effect.

8.6.127 The number of people exposed to daytime noise levels at or above the SOAEL (medium absolute impact) reduces from 14,150 under the DM Scenario to 7,350 under the DC Scenario. All receptors experience a decrease of less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect.

8.6.128 Nobody is exposed to noise levels with an absolute impact rated as high (above the UAEL).

8.6.129 Compared to the DM Scenario, for the DC Scenario there are 26 fewer schools exposed to noise levels equal to or above the threshold level of 52 dB $L_{Aeq,16h}$. There are the same number of residential healthcare buildings exposed to noise levels equal to or above the threshold level of 52 dB $L_{Aeq,16h}$. There are 48 fewer outdoor amenity areas exposed to noise levels equal to or above the threshold level of 55 dB $L_{Aeq,16h}$. All of the changes in noise at these receptors are less than 3 dB, therefore the effects are rated as **not significant.**

Table 8-49: Air Noise Receptor Counts, Average Mode Summer Night-time

Receptor	**Number of Receptors (including permitted developments)**	
	2027 DM	**2027 DC**
Population ≥ 45 dB $L_{Aeq,8h}$ (LOAEL)	46,250	50,300
Population ≥ 55 dB $L_{Aeq,8h}$ (SOAEL)	0	0
Population ≥ 63 dB $L_{Aeq,8h}$ (UAEL)	0	0
Healthcare ≥ 50 dB $L_{Aeq,1h}$	1	1

Table 8-50: Population Exposed to Absolute and Relative Air Noise Impacts, 2027 DC Vs 2027 DM, Night-time

2027 DC Noise Level, dB $L_{Aeq,8h}$	Absolute Impact	Population including Permitted Developments								
		Change in Noise Level DC vs DM, dB $L_{Aeq,8h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible		Low	Medium	High	
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
45 (LOAEL) to 54.9	Low	0	0	2,750	16,000	100	22,900	8,550	0	0
55 (SOAEL) to 62.9	Medium	0	0	0	0	0	0	0	0	0
≥63 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

8.6.130 Overall, it can be seen that night-time noise exposure levels are predicted to remain similar between the DM and DC Scenarios, with a small increase in the number of those people adversely affected by air noise. This is because while aircraft movements are higher under the 2027 DC Scenario, this is largely offset by the predicted additional modernisation of the aircraft fleet.

8.6.131 The number of people exposed to night-time noise levels at or above the LOAEL (low absolute impact) increases from 46,250 under the DM Scenario to 50,300 under the DC Scenario. Around 80% of receptors experience a change in noise of less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect. 2,750 people are forecast to experience a decrease in noise of between 2.1 and 3 dB (low magnitude of change). This constitutes a minor beneficial effect. 8,550 people are forecast to experience an increase in noise of between 2.1 and 3 dB (low magnitude of change). This constitutes a **Minor Adverse** effect.

8.6.132 Nobody is exposed to noise levels with an absolute impact rated as medium (above the SOAEL) or high (above the UAEL).

8.6.133 Compared to the DM Scenario, for the DC Scenario there are the same number of residential healthcare buildings exposed to noise levels equal to or above the threshold level of 50 dB $L_{Aeq,1h}$. All of the changes in noise at these receptors are less than 3 dB, therefore the effects are rated as **not significant.**

Table 8-51: Air Noise Receptor Counts, $L_{Aeq,16h}$ Average Mode Summer Weekend Day

Receptor	Number of Receptors (including permitted developments)	
	2027 DM	2027 DC
Population ≥ 51 dB $L_{Aeq,16h}$ (LOAEL)	224,850	178,500
Population ≥ 63 dB $L_{Aeq,16h}$ (SOAEL)	3,000	1,500
Population ≥ 69 dB $L_{Aeq,16h}$ (UAEL)	0	0
Healthcare≥ 52 dB $L_{Aeq,16h}$	1	1
Amenity Areas ≥ 55 dB $L_{Aeq,16h}$	31	28

Table 8-52: Population Exposed to Absolute and Relative Air Noise Impacts, 2027 DC Vs 2027 DM, Weekend

2027 DC Noise Level, dB $L_{Aeq,16h}$	Absolute Impact	Population including Permitted Developments								
		Change in Noise Level DC vs DM, dB $L_{Aeq,16h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible		Low		Medium	High
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
51 (LOAEL) to 62.9	Low	0	0	0	161,900	250	14,800	0	0	0
63 (SOAEL) to 68.9	Medium	0	0	0	1,500	0	0	0	0	0
≥69 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

8.6.134 Overall, it can be seen that weekend noise exposure levels are predicted to decrease between the DM and DC Scenarios, leading to a decrease in the number of those people adversely affected by air noise. This is because while aircraft movements are higher under the 2027 DC Scenario, this is more than offset by the predicted additional modernisation of the aircraft fleet.

8.6.135 The number of people exposed to weekend noise levels at or above the LOAEL (low absolute impact) reduces from 224,850 under the DM Scenario to 178,500 under the DC Scenario. Most receptors experience a decrease of less than 2 dB with a small number experiencing an increase of less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect.

8.6.136 The number of people exposed to weekend noise levels at or above the SOAEL (medium absolute impact) decreases from 3,000 under the DM Scenario to 1,500 under the DC Scenario. All receptors experience a decrease in noise of less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect.

8.6.137 Nobody is exposed to noise levels with an absolute impact rated as high (above the UAEL).

8.6.138 Compared to the DM Scenario, for the DC Scenario there are the same number of residential healthcare buildings exposed to noise levels equal to or above the threshold level of 52 dB $L_{Aeq,16h}$. There are 3 fewer outdoor amenity areas exposed to noise levels equal to or above the threshold level of 55 dB $L_{Aeq,16h}$. All of the changes in noise at these receptors are less than 3 dB, therefore the effects are rated as **not significant.**

8.6.139 In summary, the air noise effects under the DC Scenario are generally lower than under the DM Scenario. The number of people adversely affected by daytime, and weekend noise is lower under the DC Scenario and the number of people adversely affected by night-time noise is similar between the two scenarios. All changes in weekend noise levels are rated as negligible and would therefore result in a **Negligible** effect. In the daytime there are a small number of people forecast to experience a minor beneficial effect under the DC Scenario. The majority of those within the LOAEL and all those within the SOAEL are forecast to experience a negligible effect. In the night-time there are a small number of people forecast to experience minor beneficial or minor adverse effects. All of these are forecast to be exposed to noise below the SOAEL. Around 80% of people are forecast to experience a negligible change in night-noise.

8.6.140 As over 80% of those forecast to be affected by daytime aircraft noise in 2027 are forecast to experience a negligible effect, with the remainder forecast to experience a minor beneficial effect, the overall effect rating for daytime is negligible to minor beneficial. Over 80% of those forecast to be affected by night-time aircraft noise in 2027 are forecast to experience a negligible effect, of the remainder more people are forecast to experience a minor adverse effect than a minor beneficial effect, nobody is forecast to experience a significant effect. Therefore, the overall effect rating for night-time is negligible to minor adverse. All of those

forecast to be affected by weekend aircraft noise in 2027 are forecast to experience a negligible effect, therefore the overall effect rating for the weekend is **Negligible.**

2031 DM vs 2031 DC

8.6.141 This section summarises the noise effects forecast for 2031. Annual aircraft movements are forecast to be 94,000 in the 2031 DM Scenario compared to 111,000 in the 2031 DC Scenario. There are forecast to be a greater proportion of movements by the quieter new generation aircraft in the DC Scenario.

8.6.142 The following Tables summarise how the proposed development will affect average summer daytime, night-time and weekend noise levels based on the absolute levels arising under the 2031 DC Scenario and the change in noise level compared to the 2031 DM Scenario that is experienced:

- Table 8-53 and Table 8-54 – Daytime Noise (dB $L_{Aeq,16h}$);
- Table 8-55 and Table 8-56 – Night-time Noise (dB $L_{Aeq,8h}$); and
- Table 8-57 and Table 8-58 – Weekend Daytime Noise (dB $L_{Aeq,16h}$).

Table 8-53: Air Noise Receptor Counts, $L_{Aeq,16h}$ Average Mode Summer Day

Receptor	Number of Receptors (including permitted developments)	
	2031 DM	2031 DC
Population ≥ 51 dB $L_{Aeq,16h}$ (LOAEL)	295,300	302,250
Population ≥ 57 dB $L_{Aeq,16h}$ (Contour Area Limit)	75,450	81,050
Population ≥ 63 dB $L_{Aeq,16h}$ (SOAEL)	7,600	8,600
Population ≥ 69 dB $L_{Aeq,16h}$ (UAEL)	0	0
Schools ≥ 52 dB $L_{Aeq,16h}$	62	64
Healthcare≥ 52 dB $L_{Aeq,16h}$	1	1
Amenity Areas ≥ 55 dB $L_{Aeq,16h}$	60	66

Table 8-54: Population Exposed to Absolute and Relative Air Noise Impacts, 2031 DC Vs 2031 DM, Daytime

2031 DC Noise Level, dB $L_{Aeq,16h}$	Absolute Impact	Population including Permitted Developments								
		Change in Noise Level DC vs DM, dB $L_{Aeq,16h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible		Low	Medium	High	
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
51 (LOAEL) to 62.9	Low	0	0	0	5,900	480	287,250	0	0	0
63 (SOAEL) to 68.9	Medium	0	0	0	0	0	8,600	0	0	0
≥69 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

8.6.143 Overall, it can be seen that due to the greater number of aircraft movements in the 2031 DC Scenario, daytime noise exposure levels are predicted to increase, leading to an increase in the number of those people adversely affected by air noise. This is however largely offset by the predicted additional modernisation of the aircraft fleet.

8.6.144 The number of people exposed to daytime noise levels at or above the LOAEL (low absolute impact) increases from 295,300 under the DM Scenario to 302,250 under the DC Scenario. The majority of receptors

experience an increase of less than 2 dB, with a relatively small number experiencing a decrease of less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect.

8.6.145 The number of people exposed to daytime noise levels at or above 57 dB (within low absolute impact) increases from 75,450 under the DM Scenario to 81,050 under the DC Scenario. All receptors experience an increase of less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect.

8.6.146 The number of people exposed to daytime noise levels at or above the SOAEL (medium absolute impact) increases from 7,600 under the DM Scenario to 8,600 under the DC Scenario. All receptors experience an increase of less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect.

8.6.147 Nobody is exposed to noise levels with an absolute impact rated as high (above the UAEL).

8.6.148 Compared to the DM Scenario, for the DC Scenario there are 2 more schools exposed to noise levels equal to or above the threshold level of 52 dB $L_{Aeq,16h}$. There are the same number of residential healthcare buildings exposed to noise levels equal to or above the threshold level of 52 dB $L_{Aeq,16h}$. There are 6 more outdoor amenity areas exposed to noise levels equal to or above the threshold level of 55 dB $L_{Aeq,16h}$. All of the changes in noise at these receptors are less than 3 dB, therefore the effects are rated as **not significant.**

Table 8-55: Air Noise Receptor Counts, Average Mode Summer Night-time

Receptor	Number of Receptors (including permitted developments)	
	2031 DM	2031 DC
Population ≥ 45 dB $L_{Aeq,8h}$ (LOAEL)	56,200	55,200
Population ≥ 55 dB $L_{Aeq,8h}$ (SOAEL)	0	70
Population ≥ 63 dB $L_{Aeq,8h}$ (UAEL)	0	0
Healthcare ≥ 50 dB $L_{Aeq,1h}$	1	1

Table 8-56: Population Exposed to Absolute and Relative Air Noise Impacts, 2031 DC Vs 2031 DM, Night-time

2031 DC Noise Level, dB $L_{Aeq,8h}$	Absolute Impact	Population including Permitted Developments								
		Change in Noise Level DC vs DM, dB $L_{Aeq,8h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible		Low	Medium	High	
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
45 (LOAEL) to 54.9	Low	0	0	2,750	16,700	90	26,800	8,850	0	0
55 (SOAEL) to 62.9	Medium	0	0	0	0	0	70	0	0	0
≥63 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

8.6.149 Overall, it can be seen that night-time noise exposure levels are predicted to remain similar between the DM and DC Scenarios, with a slight decrease in the total number of those people adversely affected by air noise. This is because while aircraft movements are higher under the 2031 DC Scenario, this is offset by the predicted additional modernisation of the aircraft fleet.

8.6.150 The number of people exposed to night-time noise levels at or above the LOAEL (low absolute impact) decreases from 56,200 under the DM Scenario to 55,200 under the DC Scenario. Around 80% of receptors a forecast to experience a change in noise of less than 2 dB (negligible magnitude of change). This constitutes a negligible effect. 2,750 people are forecast to experience a decrease in noise of between 2 and 3 dB (low

magnitude of change). This constitutes a minor beneficial effect. 8,850 people are forecast to experience an increase in noise of between 2 and 3 dB (low magnitude of change). This constitutes a **Minor Adverse** effect.

8.6.151 The number of people exposed to night-time noise levels at or above the SOAEL (medium absolute impact) increases from 0 under the DM Scenario to 70 under the DC Scenario. All receptors experience an increase of less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect. In addition, all of these receptors have already been offered treatment under the high tier of the SIS as they are all within the existing 66 dB $L_{Aeq,16h}$ daytime contour. The high tier of the SIS is designed to achieve a reduction in internal noise levels of at least 35 dB compared to external noise levels, meaning good internal night-time noise levels based on the standard set out in BS 8233[24] should be achieved.

8.6.152 Nobody is exposed to noise levels with an absolute impact rated as high (above the UAEL).

8.6.153 Compared to the DM Scenario, for the DC Scenario there are the same number of residential healthcare buildings exposed to noise levels equal to or above the threshold level of 50 dB $L_{Aeq,1h}$. All of the changes in noise at these receptors are less than 3 dB, therefore the effects are rated as **not significant.**

Table 8-57: Air Noise Receptor Counts, $L_{Aeq,16h}$ Average Mode Summer Weekend Day

Receptor	Number of Receptors (including permitted developments)	
	2031 DM	2031 DC
Population ≥ 51 dB $L_{Aeq,16h}$ (LOAEL)	156,750	199,950
Population ≥ 63 dB $L_{Aeq,16h}$ (SOAEL)	750	3,400
Population ≥ 69 dB $L_{Aeq,16h}$ (UAEL)	0	0
Healthcare≥ 52 dB $L_{Aeq,16h}$	1	1
Amenity Areas ≥ 55 dB $L_{Aeq,16h}$	18	30

Table 8-58: Population Exposed to Absolute and Relative Air Noise Impacts, 2031 DC Vs 2031 DM, Weekend

2031 DC Noise Level, dB $L_{Aeq,16h}$	Absolute Impact	Population including Permitted Developments								
		Change in Noise Level DC vs DM, dB $L_{Aeq,16h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible		Low		Medium	High
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
51 (LOAEL) to 62.9	Low	0	0	0	0	0	196,550	0	0	0
63 (SOAEL) to 68.9	Medium	0	0	0	0	0	3,400	0	0	0
≥69 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

8.6.154 Overall, it can be seen that weekend noise exposure levels are predicted to increase between the DM and DC Scenario, leading to an increase in the number of those people adversely affected by air noise. This is because aircraft movements are higher under the 2031 DC Scenario and this is not fully offset by the predicted additional modernisation of the aircraft fleet.

8.6.155 The number of people exposed to weekend noise levels at or above the LOAEL (low absolute impact) increases from 156,750 under the DM Scenario to 199,950 under the DC Scenario. All receptors experience an increase of less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect.

8.6.156 The number of people exposed to weekend noise levels at or above the SOAEL (medium absolute impact) increases from 750 under the DM Scenario to 3,400 under the DC Scenario. All receptors experience an increase in noise of less than 2 dB (negligible magnitude of change). This constitutes a **Negligible** effect.

8.6.157 Nobody is exposed to noise levels with an absolute impact rated as high (above the UAEL).

8.6.158 Compared to the DM Scenario, for the DC Scenario there are the same number of residential healthcare buildings exposed to noise levels equal to or above the threshold level of 52 dB $L_{Aeq,16h}$. There are 18 more outdoor amenity areas exposed to noise levels equal to or above the threshold level of 55 dB $L_{Aeq,16h}$. All of the changes in noise at these receptors are less than 3 dB, therefore the effects are rated as **not significant.**

8.6.159 In summary, the air noise effects under the DC Scenario are generally greater than under the DM Scenario. The number of people adversely affected by daytime and weekend noise is higher under the DC Scenario. The number of people adversely affected by night-time noise is broadly similar between the DM and DC Scenarios. All changes in daytime and weekend noise levels are rated as negligible and would therefore result in a negligible effect. In the night-time some people forecast to experience a minor beneficial or minor adverse effect under the DC Scenario. Around 80% of those within the LOAEL and all those within the SOAEL are forecast to experience a **Negligible** effect.

8.6.160 As all of those forecast to be affected by daytime or weekend aircraft noise are forecast to experience a negligible effect and nobody is forecast to experience a significant effect the overall effect rating for each period is negligible. Around 80% of those forecast to be affected by night-time aircraft noise in 2031 are forecast to experience a negligible effect and nobody is forecast to experience a significant effect, more people are forecast to experience a minor adverse effect than a minor beneficial effect, therefore the overall effect rating for night-time is **Negligible to Minor Adverse**.

Comparison with Findings of the 2015 UES

8.6.161 The above assessment primarily considers the effects of the proposed development. This section discusses whether the proposed development would have altered the conclusions of the 2015 UES, by comparing, where possible, the effects of proposed development with those of the approved CADP1 scheme as set out in the 2015 UES.

8.6.162 The daytime air noise LOAEL for this assessment is 51 dB $L_{Aeq,16h}$. 51 dB contours were not prepared as part of the 2015 UES. The comparisons below therefore focus on the 57 dB contour and the 63 dB (SOAEL) contour. Table 8-59 shows the areas of the 2025 contours from the 2015 UES and the 2025 DC and 2031 DC contours from this assessment.

Table 8-59: Summer Daytime Noise Contour Area

Noise Contour, dB $L_{Aeq,16h}$	Noise Contour Area, km2			
	2015 UES 2025 Without Dev.	2015 UES 2025 With Dev.	2025 DC	2031 DC
57	8.4	9.0	8.5	7.2
63 (SOAEL)	2.2	2.4	2.2	1.9

8.6.163 The areas of the 57 dB daytime 2025 and 2031 contours for the DC Scenario are below the contour area limit of 9.1 km^2 and are forecast to reduce by 2031 compared to 2025. This shows the proposals are consistent with the APF[12] policy of “sharing the benefits” of the quieter new generation aircraft and that the overall noise under the DC Scenario is less than that permitted under the CADP1 permission.

8.6.164 Table 8-59 shows that the forecast noise contours for the 2025 DC Scenario are smaller than those forecast in the With Development Scenario in the 2015 UES and similar in area to the Without Development Scenario. The 2031 DC contours are smaller than both the With and Without Development contours in the 2015

UES. This suggests that in 2025 summer daytime noise will be less overall than forecast for 2025 With Development in the 2015 UES and similar to that forecast without development. By 2031 with the proposed development the daytime noise will be less than assessed without development in the 2015 UES. This suggests the summer daytime air noise effects of the proposed development are less than those assessed in the 2015 UES.

8.6.165 Table 8-60 and Table 8-61 show the number of people excluding and including permitted developments respectively within the 2025 noise contours in the 2015 UES and the 2025 DC and 2031 DC contours in this assessment.

Table 8-60: Air Noise Population Counts, $L_{Aeq,16h}$ Average Mode Summer Day

Noise Contour, dB $L_{Aeq,16h}$	Population excluding Permitted Developments			
	CADP1 2025 Without Dev.	CADP1 2025 With Dev.	2025 DC	2031 DC
57	35,600	39,600	49,050	37,550
63 (SOAEL)	2,600	2,900	2,550	2,550

Table 8-61: Air Noise Population Counts, $L_{Aeq,16h}$ Average Mode Summer Day

Noise Contour, dB $L_{Aeq,16h}$	Population including Permitted Developments[36]			
	CADP1 2025 Without Dev.	CADP1 2025 With Dev.	2025 DC	2031 DC
57	70,900	76,800	106,550	81,050
63 (SOAEL)	11,500	12,050	12,650	8,600

8.6.166 The number of people living near the airport has increased since the time of the 2015 UES. This means in some cases there are more people within the noise contours, even where the noise contours are smaller than those forecast in 2015 UES. It was expected that population around the airport would increase, which is why the 2015 UES assessed the number of people including and excluding permitted developments at the time. In the time since the 2015 UES many of these permitted developments have been built, and further developments proposed.

8.6.167 The number of people forecast to be within 2025 DC noise contours based on the latest population data is between that forecast based on 2015 data in the 2015 UES and that based on 2015 data including the 2015 permitted developments. This shows that the summer daytime air noise effects of the proposed development are within the range assessed in the 2015 UES. The number of people within the 2031 DC noise contours is similar to that for the 2025 noise contours excluding permitted developments in the 2015 UES, despite the increase in the population around the airport.

8.6.168 Given the 2031 DC summer daytime air noise contours are smaller than those assessed in the 2015 UES and the number of people within those contours excluding permitted developments is within the range presented in the 2015 UES, the effects of the proposed development are not considered likely to result in materially different long term daytime air noise effects.

8.6.169 It is not possible to compare the predicted night-time and weekend effects of the proposed development with those of the approved CADP1 scheme as no changes were proposed to the night-time or weekend periods as part of the original CADP1 application and accordingly no detailed assessment was undertaken in 2015 UES. The effects of the proposed development in 2031 are therefore new effects in addition to those previously identified, however they in 2031 have been assessed as negligible for the weekend

[36] For the CADP1 results the permitted developments relate to the permitted development assessment carried out in 2014 for the UES. For the DC Scenario results the permitted development relates to the latest assessment carried out in 2022 for this ES.

and negligible to minor adverse for the night-time and not significant. No new significant effects have been identified.

Ground Noise

8.6.170 Appendix 8.4 provides the further details of the ground noise assessment. This section summarises the ground noise effects arising from the proposed development.

8.6.171 This section commences by presenting, for a set of representative locations, an account of how noise levels will change under each scenario during the daytime, night-time and weekend. These locations are not assessed as specific receptors, but rather used to illustrate the general noise trends for different areas around the airport. They are the same representative locations assessed in the 2015 UES.

8.6.172 This section then goes on to compare and discuss specific pairs of scenarios (e.g. 2031 DM vs 2031 DC) separately in terms of the ground noise effects on the modelled receptors around the airport. Details of these receptors are given in Section 8.3 and are discussed further in Appendix 8.4.

8.6.173 The assessments have all been carried out on the basis of external noise levels, as this is what the main criteria relate to. Therefore, mitigation in the form of improved sound insulation is not accounted for. This will reduce the internal noise levels for dwellings where works have been carried out, and therefore the absolute effects will be lower than assessed for those properties.

Daytime

8.6.174 To explore by how much noise exposure levels in the daytime are expected to change between different scenarios, noise predictions have been undertaken comparing the various scenarios and the change expected at a series of representative locations around the airport. The locations assessed are shown in Figure 8.4.1 in Appendix 8.4.

8.6.175 Table 8-62 shows the daytime ground noise exposure levels for 2019 and the DM Scenario (in brackets) and the relative change in noise level for the DC Scenario compared to the DM Scenario for each of the three assessment years. Daytime ground noise contours are shown in Figures 8.4.2 to 8.4.8 in Appendix 8.4.

Table 8-62: Ground Noise Exposure Levels And Relative Change, $L_{Aeq,16h}$ Average Mode Summer Day

Locations	Absolute level ($L_{Aeq,16h}$) dB or change DC-DM						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
(A) Drew Road	(49)	(49)	0	(49)	-1.1	(48)	+0.2
(B) North Side of Royal Albert Docks	(59)	(58)	0	(59)	-1	(58)	+0.6
(C) Camel Road Flats	(51)	(52)	-0.1	(52)	-1.7	(51)	-0.1
(D) Parker Street	(49)	(48)	+0.1	(49)	-0.2	(48)	-0.2
(E) Newland Street	(49)	(49)	+0.6	(49)	-3.8	(50)	-5.1
(F) Storey Road School	(48)	(47)	+0.4	(47)	+1.6	(49)	+0.8
(G) Norton Pharmaceuticals	(43)	(42)	+0.3	(42)	+1.4	(43)	+0.8
(H) University of East London	(57)	(55)	+0.3	(55)	+1.3	(56)	+0.9
(I) Royal Docks Business	(57)	(55)	+0.4	(56)	+2	(57)	+1.2
(J) Brixham Street	(48)	(48)	+0.4	(49)	+1.8	(50)	+1.3

8.6.176 At all locations the noise levels forecast for the DM Scenario are similar to those that occurred in 2019. Absolute levels of ground noise are generally low, being below the LOAEL at 6 locations and with no locations exposed to noise levels above the SOAEL in 2019. This is forecast to remain broadly similar in the future for both the DM and DC Scenarios.

8.6.177 In 2025 for the DC Scenario noise levels at all locations are forecast to be similar to those for the DM Scenario, with negligible increases of less than 1 dB at some locations and no change or a decrease at the others.

8.6.178 In 2027 for the DC Scenario noise levels at locations (A) to (E) are forecast to reduce compared to the DM Scenario. This is partly due to the construction of some of the remaining CADP1 infrastructure, which will provide additional screening. For instance, for (E) Newland Street there is a reduction in noise of 3.8 dB (medium magnitude of change) due to the construction of part of the eastern pier extension, which is taller than the existing temporary noise barrier and thus provides more screening from the noise of aircraft on the eastern stands. In addition, the DC Scenario has more movements by new generation aircraft, these aircraft have not been assumed to provide a ground noise benefit, however they need to use the larger Code-C stands, which are primarily on the eastern apron. This means that as the fleet transitions to the new generation aircraft there will generally be more ground noise to the east of the airport and less ground noise to the west and south west of the airport.

8.6.179 For locations to the north and east, such as (F) to (J), which largely do not benefit from the additional screening, the DC Scenario is forecast to result in negligible increases in noise of less than 2 dB. This increase in noise at these locations is partly due to the additional movements forecast for the DC Scenario, and partly due to the additional use of the eastern stands due to the greater use of the new generation aircraft in the DC Scenario.

8.6.180 In 2031 for the DC Scenario noise levels at locations (C) to (E) are forecast to reduce compared to the DM Scenario. This is partly due to the construction of the remaining CADP1 infrastructure, which will provide additional screening, particularly at (E) Newland street, where there is a reduction in noise of 5.1 dB (medium magnitude of change) due to the construction of the remainder of the eastern pier extension and the permanent noise barrier. Locations (C) and (D) benefit from the reduced use of the western apron due to the greater use of new generation aircraft in the DC Scenario, resulting in a negligible reduction in noise at these locations.

8.6.181 For locations (A), (B) and (F) to (J) the DC Scenario is forecast to result in negligible increases in noise of less than 2 dB at all locations with most locations increasing by less than 1 dB. The increase in noise at these locations is largely due to the additional movements forecast for the DC Scenario. There is also slightly greater use of the eastern apron stands in the DC Scenario due to a slightly higher proportion of new generation aircraft in the DC forecast, however by 2031 the DM Scenario is also forecast to have a high proportion of these aircraft.

Night-Time

8.6.182 The night-time noise assessment is based on the aircraft movements between 06:30 and 06:59. The airport is closed for the remainder of the night-time period (23:00-06:29). Table 8-63 shows the night-time ground noise exposure levels for 2019 and the DM Scenario (in brackets) and the relative change in noise level for the DC Scenario compared to the DM Scenario for each of the three assessment years. Night-time ground noise contours are shown in Figures 8.4.9 to 8.4.15 in Appendix 8.4.

Table 8-63: Ground Noise Exposure Levels And Relative Change, $L_{Aeq,8h}$ Average Mode Summer Night

Locations	Absolute level ($L_{Aeq,8h}$) dB or change DC-DM						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
(A) Drew Road	(34)	(35)	+1.5	(35)	-0.2	(34)	+1.8
(B) North Side of Royal Albert Docks	(43)	(44)	+1.5	(44)	+0.1	(43)	+2.7
(C) Camel Road Flats	(35)	(38)	+1.5	(38)	-0.5	(37)	+1.6
(D) Parker Street	(34)	(35)	+1.7	(35)	+1.5	(35)	+1.2
(E) Newland Street	(33)	(35)	+2.4	(35)	-2.4	(37)	-3.7
(F) Storey Road School	(31)	(33)	+2.2	(33)	+4	(35)	+3
(G) Norton Pharmaceuticals	(26)	(28)	+2.1	(28)	+3.6	(30)	+3
(H) University of East London	(40)	(41)	+2	(41)	+3.5	(43)	+3.1
(I) Royal Docks Business	(42)	(41)	+2.1	(41)	+4.2	(44)	+3.2
(J) Brixham Street	(32)	(35)	+2.2	(35)	+4.3	(37)	+3.5

8.6.183 At some locations the noise levels forecast for the DM Scenario are similar to those that occurred in 2019. For locations D-H and J there are some changes of more than 3 dB by 2031. This is primarily due to the forecast greater use of the eastern apron stands due to the transition to new generation aircraft. There is also forecast to be a small increase in night-time movements over time for the DM Scenario.

8.6.184 Absolute levels of ground noise at night are generally low, being below the LOAEL at all locations in 2019. This is forecast to remain the same for the 2031 DM Scenario. In 2031 for the DC Scenario 7 of the locations are forecast to remain below the LOAEL, with 3 locations forecast to be slightly above the LOAEL, but well below the SOAEL.

8.6.185 In 2025 for the DC Scenario there are forecast to be increases in noise levels at all locations of less than 3 dB (low magnitude of change), with 5 locations forecast to increase by less than 2 dB (negligible magnitude change). These increases in noise are primarily due to the greater number of night-time movements forecast for the DC Scenario.

8.6.186 In 2027 for the DC Scenario noise levels at locations (A) to (D) are forecast to experience a negligible change of less than 2 dB. Night-time noise at location (E) Newland Street is forecast to reduce by 2.4 dB (low magnitude of change) due to the construction of part of the eastern pier extension, which provides additional screening at this location, this offsets the increase in movements for the DC Scenario.

8.6.187 For locations to the north and east, such as (F) to (J), which largely do not benefit from the additional screening, the DC Scenario is forecast to result in increases in noise of between 3 dB and 5 dB (medium magnitude of change). This increase in noise at these locations is partly due to the additional movements forecast for the DC Scenario, and partly due to the additional use of the eastern stands due to the greater use of the new generation aircraft in the DC Scenario. It is important to recognise that absolute levels at these locations are forecast to remain low, with 4 of the 5 locations below the LOAEL and location (I) only just above the LOAEL. Airborne aircraft noise at these locations, assessed in the air noise section, will also generally be higher than the ground noise levels and many of these areas, including location (I), would be eligible for the airport's air noise sound insulation scheme.

8.6.188 In 2031 for the DC Scenario noise levels are forecast to increase at all locations, except for location (E) Newland Street, where there is a forecast reduction in noise of 3.7 dB (medium magnitude of change) due to the construction of the remainder of the eastern pier extension and the permanent noise barrier. Three locations are forecast to experience an increase of 2 dB or less (negligible magnitude of change). Three locations are forecast to experience an increase of between 2 and 3 dB (low magnitude of change). The

remaining 3 locations are forecast to experience an increase of between 3 and 4 dB (medium magnitude of change). These increases are primarily due to the greater number of night-time movements forecast for the DC Scenario. It is important to recognise that absolute levels at these locations are forecast to remain low, with 1 of these locations below the LOAEL and the other 2 locations only just above the LOAEL. Airborne aircraft noise at these locations, assessed in the air noise section, will also generally be higher than the ground noise levels, and many of these areas would be eligible for the airport's air noise SIS.

Weekend

8.6.189 Table 8-64 shows the weekend ground noise exposure levels for 2019 and the DM Scenario (in brackets) and the relative change in noise level for the DC Scenario compared to the DM Scenario for each of the three assessment years. Weekend ground noise contours are shown in Figures 8.4.16 to 8.4.22 in Appendix 4.

Table 8-64: Ground Noise Exposure Levels And Relative Change, $L_{Aeq,16h}$ Average Mode Summer Weekend Day

Locations	Absolute level ($L_{Aeq,16h}$) dB or change DC-DM						
	2019	2025 DM	2025 DC	2027 DM	2027 DC	2031 DM	2031 DC
(A) Drew Road	(46)	(46)	+0.3	(46)	-0.2	(45)	+1.3
(B) North Side of Royal Albert Docks	(56)	(55)	+0.3	(56)	-0.1	(55)	+1.7
(C) Camel Road Flats	(47)	(49)	+0.2	(49)	-0.8	(48)	+1
(D) Parker Street	(46)	(45)	+0.4	(46)	+0.8	(45)	+0.9
(E) Newland Street	(46)	(46)	+0.9	(46)	-2.9	(47)	-4.1
(F) Storey Road School	(45)	(44)	+0.6	(44)	+2.6	(46)	+2
(G) Norton Pharmaceuticals	(40)	(39)	+0.6	(39)	+2.4	(40)	+2
(H) University of East London	(54)	(52)	+0.6	(52)	+2.3	(53)	+2.1
(I) Royal Docks Business	(54)	(52)	+0.8	(52)	+3	(54)	+2.3
(J) Brixham Street	(45)	(45)	+0.7	(46)	+2.9	(47)	+2.5

8.6.190 At all locations the noise levels forecast for the DM Scenario are similar to those that occurred in 2019. Absolute levels of ground noise are generally low, being below the LOAEL at 7 locations and no locations are exposed to noise levels above the SOAEL in 2019. This is forecast to remain broadly similar in the future for both the DM and DC Scenarios. Weekend ground noise levels in 2019 were lower than the daytime noise levels over the whole week, and this is forecast to remain the same for both the DM and DC Scenarios.

8.6.191 In 2025 for the DC Scenario noise levels at all locations are forecast to be similar to those for the DM Scenario, with negligible increases of less than 1 dB at all locations.

8.6.192 In 2027 for the DC Scenario noise levels at locations (A) to (C) and (E) are forecast to reduce compared to the DM Scenario. This is partly due to the construction of some of the remaining CADP1 infrastructure, which will provide additional screening. For instance at (E) Newland Street there is a reduction in noise of 2.9 dB (low magnitude of change) due to the construction of part of the eastern pier extension, which is taller than the existing temporary noise barrier and this provides more screening from the noise from aircraft on the eastern stands. In addition, the DC Scenario has more movements by new generation aircraft, these aircraft have not been assumed to provide a ground noise benefit, however they need to use the larger code-c stands, which are primarily on the eastern apron. This means that as the fleet transitions to the new generation aircraft there will generally be more ground noise to the east of the airport and less ground noise to the west and south west of the airport.

8.6.193 For locations to the north and east, such as (F) to (J), which largely do not benefit from the additional screening, the DC Scenario is forecast to result in increases in noise of between 2 and 3 dB (low magnitude of change). This increase in noise at these locations is partly due to the additional movements forecast for the DC Scenario, and partly due to the additional use of the eastern stands due to the greater use of the new generation aircraft in the DC Scenario.

8.6.194 In 2031 for the DC Scenario, noise levels are forecast to increase at all locations, except for location (E) Newland Street, where there is a forecast reduction in noise of 4.1 dB (medium magnitude of change) due to the construction of the remainder of the eastern pier extension and the permanent noise barrier. Six locations are forecast to experience an increase of 2 dB or less (negligible magnitude of change). The other 3 locations are forecast to experience an increase of between 2 and 3 dB (low magnitude of change). These increases are primarily due to the greater number of weekend movements forecast for the DC Scenario.

Predicted Ground Noise Effects and Their Significance

8.6.195 This section sets out the ground noise effects arising from the proposed development by comparing the results of the DM Scenario to those of the DC Scenario. A subjective account of how noise conditions will change between 2019 (the baseline year) and the 2031 DM and DC Scenarios has also been included to provide context. To summarise, the assessment of effects is based on a comparison of the following key scenarios:

- 2019 vs 2031 DM and 2031 DC;
- 2025 DM vs 2025 DC;
- 2027 DM vs 2027 DC; and
- 2031 DM vs 2031 DC.

2019 (Baseline Year) vs 2031 DM and DC Scenarios

8.6.196 The airport is forecast to grow to its current passenger limit of 6.5 mppa by 2031 under the DM Scenario. Annual aircraft movements are forecast to increase from 83,963 in 2019 to 94,000 in 2031. The airport is forecast to grow to its proposed passenger limit of 9 mppa by 2031 under the DC Scenario. Annual aircraft movements are forecast to increase from 83,963 in 2019 to 111,000 in 2031.

8.6.197 The increase in both scenarios will be accompanied by the replacement of many of the most common aircraft at the airport with new generation equivalents. These new generation aircraft will need to use the larger code-c stands due to their greater wingspan. Most of these stands are on the eastern apron. This will mean greater use of these stands as the fleet transition progresses and correspondingly less usage of the main and west apron stands.

8.6.198 The forecast increase in movements and greater use of the eastern stands will result in overall increases in daytime, night-time and weekend noise levels for areas to the east of the airport under the DM Scenario. For areas to the west of the airport noise levels are expected to remain similar or in some cases reduce slightly, due to the reduction in use of the main and west apron stands.

8.6.199 By 2031 under the DC Scenario construction of the remaining elements of CADP1 is expected to have been completed. These will provide additional screening for many residents to the south of the airport, for instance locations to the south of the new eastern apron will benefit from the construction of the eastern pier extension and the permanent noise barrier, both of which are taller than the temporary noise barrier currently in place. This additional height will result in reductions in noise for most residents in these areas.

8.6.200 For areas to the north and east of the airport, which largely do not benefit from the additional screening, there are forecast to be increases in daytime ground noise, this is partly due to the increases in aircraft movements and partly due to the greater use of the eastern stands due to the transition to new generation aircraft. Airborne aircraft noise, assessed in the air noise section, will also be higher than the ground noise levels in many areas. Those above the LOAEL will generally already have been offered treatment by the

airport's air noise SIS or the CSIS or have been required to be built with a high level of sound insulation by planning condition.

8.6.201 The proposed increase in the cap on flights in the 06.30-07.00 period is forecast to result in increases in night-time ground noise in most areas. Absolute levels of night-noise are forecast to remain low, with over 90% of receptors forecast to remain below the LOAEL and no receptors forecast to experience night-time ground noise above the SOAEL. Airborne aircraft noise, assessed in the air noise section, will also be higher than the ground noise levels in many areas. Consequently those above the LOAEL for ground noise will generally already have been offered treatment by the airport's air noise SIS or the CSIS or have been required to be built with a high level of sound insulation by planning condition.

8.6.202 The proposed extension of operational hours on Saturdays into the early evening and an increase in the weekend and Saturday movement limits is forecast to result in increases in weekend ground noise in most areas. Absolute levels of weekend noise are forecast to remain low, with over 80% of receptors forecast to remain below the LOAEL and only 6 receptors forecast to experience weekend ground noise above the SOAEL. Those above the LOAEL will also generally already have been offered treatment by the airport's air noise SIS or the CSIS or have been required to be built with a high level of sound insulation by planning condition. Weekend ground noise levels are forecast to remain well below typical daytime ground noise levels over the whole week.

2025 DM vs 2025 DC

8.6.203 This section summarises the noise effects forecast for 2025. Annual aircraft movements are forecast to be 78,500 in the 2025 DM Scenario compared to 83,000 in the 2025 DC Scenario. The fleet mix for the two scenarios are broadly similar, but there are forecast to be a slightly greater proportion of movements by the quieter new generation aircraft in the DC Scenario, resulting in a slightly greater use of the eastern apron stands.

8.6.204 The absolute and relative impact ratings in the tables below and the resulting scale of effects are based on the criteria set out in Section 8.3.

8.6.205 The following Tables summarise how the proposed development will affect average summer daytime, night-time and weekend noise levels based on the absolute levels arising under the 2025 DC Scenario and the change in noise level compared to the 2025 DM Scenario that is experienced:

- Table 8-65, Table 8-66 and Table 8-67 – Daytime Noise (dB $L_{Aeq,16h}$)
- Table 8-68, Table 8-69 and Table 8-70 – Night-time Noise (dB $L_{Aeq,8h}$)
- Table 8-71, Table 8-72 and Table 8-73 – Weekend Noise (dB $L_{Aeq,16h}$)

Table 8-65: Ground Noise Receptor Counts, $L_{Aeq,16h}$ Average Mode Summer Day

Receptor	Number of Receptors	
	2025 DM	2025 DC
Receptors < 50 dB $L_{Aeq,16h}$	3,036	2,982
Receptors ≥ 50 dB $L_{Aeq,16h}$ (LOAEL)	633	686
Receptors ≥ 60 dB $L_{Aeq,16h}$ (SOAEL)	4	5
Receptors ≥ 70 dB $L_{Aeq,16h}$ (UAEL)	0	0

Table 8-66: Receptors Exposed to Absolute and Relative Ground Noise Impacts, 2025 DC Vs 2025 DM, Daytime

2025 DC Noise Level, dB $L_{Aeq,16h}$	Absolute Impact	Receptors								
		Change in Noise Level DC vs DM, dB $L_{Aeq,16h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible		Low	Medium	High	
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
< 50 dB	Negligible	0	0	0	123	153	2,706	0	0	0
50 (LOAEL) to 59.9	Low	0	0	0	75	8	603	0	0	0
60 (SOAEL) to 69.9	Medium	0	0	0	3	1	1	0	0	0
≥ 70 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

Table 8-67: Potential Significant Rating for Ground Noise Effects, 2025 DC, Daytime

Potential Significance Rating	Number of Receptors		
	Beneficial	No Change	Adverse
Negligible	201	162	3,310
Minor	0	-	0
Significant - Moderate	0	-	0
Significant - Major	0	-	0

8.6.206 Overall, it can be seen that between the DM and DC Scenario, there is no material change in the number of those people adversely affected by daytime ground noise. The number of receptors exposed to daytime noise levels at or above the LOAEL (low absolute impact) increases slightly from 633 under the DM Scenario to 686 under the DC Scenario. The number of receptors exposed to daytime noise levels at or above the SOAEL (medium absolute impact) remains similar, specifically there are 4 for the DM Scenario and 5 for the DC Scenario. No receptors are exposed to noise levels with an absolute impact rated as high (above the UAEL).

8.6.207 Based on the absolute levels for the DC Scenario and the changes in noise comparing the DC and DM Scenarios, the daytime noise effects are rated as potentially negligible adverse for 3,310 receptors, with no change for 162 receptors and potentially negligible beneficial for 201 receptors. Overall, this is rated as a **Negligible** effect.

Table 8-68: Ground Noise Receptor Counts, $L_{Aeq,8h}$ Average Mode Summer Night-time

Receptor	Number of Receptors	
	2025 DM	2025 DC
Receptors < 45 dB $L_{Aeq,8h}$	3,661	3,573
Receptors ≥ 45 dB $L_{Aeq,8h}$ (LOAEL)	12	100
Receptors ≥ 55 dB $L_{Aeq,8h}$ (SOAEL)	0	0
Receptors ≥ 65 dB $L_{Aeq,8h}$ (UAEL)	0	0

Table 8-69: Receptors Exposed to Absolute and Relative Ground Noise Impacts, 2025 DC Vs 2025 DM, Night-time

2025 DC Noise Level, dB $L_{Aeq,8h}$	Absolute Impact	Receptors								
		Change in Noise Level DC vs DM, dB $L_{Aeq,8h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible		Low	Medium	High	
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
< 45 dB	Negligible	0	0	0	0	0	695	2,877	1	0
45 (LOAEL) to 54.9	Low	0	0	0	0	0	19	81	0	0
55 (SOAEL) to 64.9	Medium	0	0	0	0	0	0	0	0	0
≥ 65 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

Table 8-70: Potential Significant Rating for Ground Noise Effects, 2025 DC, Night-time

Potential Significance Rating	Number of Receptors		
	Beneficial	No Change	Adverse
Negligible	0	0	3,592
Minor	0	-	81
Significant - Moderate	0	-	0
Significant - Major	0	-	0

8.6.208 Overall, it can be seen that between the DM and DC Scenario, there is no material change in the number of those people adversely affected by night-time ground noise. While the number of receptors exposed to night-time noise levels at or above the LOAEL (low absolute impact) increases from 12 under the DM Scenario to 100 under the DC Scenario the large majority remain below the LOAEL. No receptors are exposed to noise levels at or above the SOAEL (medium absolute impact) or at or above the UAEL (high absolute impact).

8.6.209 Based on the absolute levels for the DC Scenario and the changes in noise comparing the DC and DM Scenarios, the night-time noise effects are rated as potentially negligible adverse for 3,592 receptors, and potentially minor adverse for 81 receptors. Overall, this is rated as a **Negligible** effect.

Table 8-71: Ground Noise Receptor Counts, $L_{Aeq,16h}$ Average Mode Summer Weekend

Receptor	Number of Receptors	
	2025 DM	2025 DC
Receptors < 50 dB $L_{Aeq,16h}$	3,371	3,313
Receptors ≥ 50 dB $L_{Aeq,16h}$ (LOAEL)	301	359
Receptors ≥ 60 dB $L_{Aeq,16h}$ (SOAEL)	1	1
Receptors ≥ 70 dB $L_{Aeq,16h}$ (UAEL)	0	0

Table 8-72: Population Exposed to Absolute and Relative Ground Noise Impacts, 2025 DC Vs 2025 DM, Weekend

2025 DC Noise Level, dB $L_{Aeq,16h}$	Absolute Impact	Receptors								
		Change in Noise Level DC vs DM, dB $L_{Aeq,16h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible		Low	Medium	High	
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
< 50 dB	Negligible	0	0	0	0	5	3,308	0	0	0
50 (LOAEL) to 59.9	Low	0	0	0	0	3	356	0	0	0
60 (SOAEL) to 69.9	Medium	0	0	0	0	0	1	0	0	0
≥ 70 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

Table 8-73: Potential Significant Rating for Ground Noise Effects, 2025 DC, Weekend

Potential Significance Rating	Number of Receptors		
	Beneficial	No Change	Adverse
Negligible	0	8	3,665
Minor	0	-	0
Significant - Moderate	0	-	0
Significant - Major	0	-	0

8.6.210 Overall, it can be seen that between the DM and DC Scenario, there is no material change in the number of those people adversely affected by weekend ground noise. The number of receptors exposed to weekend noise levels at or above the LOAEL (low absolute impact) increases slightly from 301 under the DM Scenario to 359 under the DC Scenario. The number of receptors exposed to weekend noise levels at or above the SOAEL (medium absolute impact) remains the same at 1 for both the DM and DC Scenarios. No receptors are exposed to noise levels at or above the UAEL (high absolute impact).

8.6.211 Based on the absolute levels for the DC Scenario and the changes in noise comparing the DC and DM Scenarios, the weekend noise effects are rated as potentially negligible adverse for 3,665 receptors, with no change for 8 receptors. Overall, this is rated as a **Negligible** effect.

2027 DM vs 2027 DC

8.6.212 This section summarises the noise effects forecast for 2027. Annual aircraft movements are forecast to be 84,500 in the 2027 DM Scenario compared to 97,000 in the 2027 DC Scenario. There are forecast to be a much greater proportion of movements by the quieter new generation aircraft in the DC Scenario, resulting in an increase in the use of the eastern apron stands and corresponding decreases in the use of the main and western apron stands. By 2027 under the DC Scenario some elements of the remaining CADP1 infrastructure are expected to have been built, such as the first stage of the new east pier. These additional buildings result in extra screening for some areas to the south of the airport, leading to reductions in noise for residents in these areas.

8.6.213 The following tables summarise how the proposed development will affect average summer daytime, night-time and weekend noise levels based on the absolute levels arising under the 2027 DC Scenario and the change in noise level compared to the 2027 DM Scenario that is experienced:

- Table 8-74, Table 8-75 and Table 8-76 – Daytime Noise (dB $L_{Aeq,16h}$);
- Table 8-77, Table 8-78 and Table 8-79 – Night-time Noise (dB $L_{Aeq,8h}$); and

- Table 8-80, Table 8-81 and Table 8-82 – Weekend Daytime Noise (dB $L_{Aeq,16h}$).

Table 8-74: Ground Noise Receptor Counts, $L_{Aeq,16h}$ Average Mode Summer Day

Receptor	Number of Receptors	
	2027 DM	2027 DC
Receptors < 50 dB $L_{Aeq,16h}$	3,006	2,851
Receptors ≥ 50 dB $L_{Aeq,16h}$ (LOAEL)	662	798
Receptors ≥ 60 dB $L_{Aeq,16h}$ (SOAEL)	5	24
Receptors ≥ 70 dB $L_{Aeq,16h}$ (UAEL)	0	0

Table 8-75: Receptors Exposed to Absolute and Relative Ground Noise Impacts, 2027 DC Vs 2027 DM, Daytime

2027 DC Noise Level, dB $L_{Aeq,16h}$	Absolute Impact	Receptors								
		Change in Noise Level DC vs DM, dB $L_{Aeq,16h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible			Low	Medium	High
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
< 50 dB	Negligible	2	29	108	517	26	1,687	434	48	0
50 (LOAEL) to 59.9	Low	0	0	24	65	0	501	174	34	0
60 (SOAEL) to 69.9	Medium	0	0	0	1	0	22	1	0	0
≥ 70 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

Table 8-76: Potential Significant Rating for Ground Noise Effects, 2027 DC, Daytime

Potential Significance Rating	Number of Receptors		
	Beneficial	No Change	Adverse
Negligible	720	26	2,692
Minor	26	-	174
Significant - Moderate	0	-	35
Significant - Major	0	-	0

8.6.214 Overall, it can be seen that daytime noise exposure levels are predicted to increase slightly between the DM and DC Scenario. The number of receptors exposed to daytime noise levels at or above the LOAEL (low absolute impact) increases from 662 under the DM Scenario to 798 under the DC Scenario. The number of receptors exposed to daytime noise levels at or above the SOAEL (medium absolute impact) increases from 5 under the DM to 24 under the DC Scenario. No receptors are exposed to noise levels with an absolute impact rated as high (above the UAEL).

8.6.215 Based on the absolute levels for the DC Scenario and the changes in noise comparing the DC and DM Scenarios, the daytime noise effects are rated as negligible for over 90% of receptors. There are 26 receptors forecast to experience a potential minor beneficial effect and 174 receptors forecast to experience a potential minor adverse effect. 35 receptors are forecast to experience a potentially significant moderate adverse effect. 16 of these are student dorms in the UEL accommodation buildings. The buildings were specifically designed to have a very good level of sound insulation due to their proximity to the airport. The other 19 receptors are within

the airport's air noise sound insulation contours and therefore have already been treated or offered treatment by the air noise SIS or have been treated under the CSIS.

8.6.216 As over 90% of the receptors are forecast to experience a negligible effect and the few receptors forecast to experience a potentially significant effect have already been offered treatment by the airport's sound insulation schemes or were built with a good standard of sound insulation, the daytime ground noise effects in 2027 are rated as a **Negligible** effect overall.

Table 8-77: Ground Noise Receptor Counts, $L_{Aeq,8h}$ Average Mode Summer Night-time

Receptor	Number of Receptors	
	2027 DM	2027 DC
Receptors < 45 dB $L_{Aeq,8h}$	3,660	3,506
Receptors ≥ 45 dB $L_{Aeq,8h}$ (LOAEL)	13	167
Receptors ≥ 55 dB $L_{Aeq,8h}$ (SOAEL)	0	0
Receptors ≥ 65 dB $L_{Aeq,8h}$ (UAEL)	0	0

Table 8-78: Receptors Exposed to Absolute and Relative Ground Noise Impacts, 2027 DC Vs 2027 DM, Night-time

2027 DC Noise Level, dB $L_{Aeq,8h}$	Absolute Impact	Receptors								
		Change in Noise Level DC vs DM, dB $L_{Aeq,8h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible		Low	Medium	High	
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
< 45 dB	Negligible	1	5	11	325	46	376	181	2,493	68
45 (LOAEL) to 54.9	Low	0	0	0	5	0	0	0	162	0
55 (SOAEL) to 64.9	Medium	0	0	0	0	0	0	0	0	0
≥ 65 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

Table 8-79: Potential Significant Rating for Ground Noise Effects, 2027 DC, Night-time

Potential Significance Rating	Number of Receptors		
	Beneficial	No Change	Adverse
Negligible	346	46	3,050
Minor	1	-	68
Significant - Moderate	0	-	162
Significant - Major	0	-	0

8.6.217 Overall, it can be seen that between the DM and DC Scenario, there is slight increase in the number of those people adversely affected by night-time ground noise although the majority remain below the LOAEL. The number of receptors exposed to night-time noise levels at or above the LOAEL (low absolute impact) increases from 13 under the DM Scenario to 167 under the DC Scenario. No receptors are exposed to noise levels at or above the SOAEL (medium absolute impact) or at or above the UAEL (high absolute impact).

8.6.218 Based on the absolute levels for the DC Scenario and the changes in noise comparing the DC and DM Scenarios, the night-time noise effects are rated as negligible for over 90% of receptors. There is 1 receptor forecast to experience a potential minor beneficial effect and 68 receptors forecast to experience a potential minor adverse effect. 162 receptors are forecast to experience a potentially significant moderate adverse effect. 157 of these are student dorms in the UEL accommodation buildings. These buildings were specifically designed to have a very good level of sound insulation due to their proximity to the airport. The other 5 receptors have been treated under the CSIS.

8.6.219 As over 90% of the receptors are forecast to experience a negligible effect and the receptors forecast to experience a potentially significant effect have already been offered treatment by the airport's sound insulation schemes or were built with a good standard of sound insulation, the night-time ground noise effects in 2027 are rated as a **Negligible to Minor Adverse** effect overall.

Table 8-80: Ground Noise Receptor Counts, $L_{Aeq,16h}$ Average Mode Summer Weekend

Receptor	Number of Receptors	
	2027 DM	2027 DC
Receptors < 50 dB $L_{Aeq,16h}$	3,356	3,167
Receptors ≥ 50 dB $L_{Aeq,16h}$ (LOAEL)	316	505
Receptors ≥ 60 dB $L_{Aeq,16h}$ (SOAEL)	1	1
Receptors ≥ 70 dB $L_{Aeq,16h}$ (UAEL)	0	0

Table 8-81: Receptors Exposed to Absolute and Relative Ground Noise Impacts, 2027 DC Vs 2027 DM, Weekend

2027 DC Noise Level, dB $L_{Aeq,16h}$	Absolute Impact	Receptors								
		Change in Noise Level DC vs DM, dB $L_{Aeq,16h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible			Low	Medium	High
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
< 50 dB	Negligible	2	4	28	380	51	500	1,553	646	3
50 (LOAEL) to 59.9	Low	0	0	0	43	1	7	330	124	0
60 (SOAEL) to 69.9	Medium	0	0	0	1	0	0	0	0	0
≥ 70 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

Table 8-82: Potential Significant Rating for Ground Noise Effects, 2027 DC, Weekend

Potential Significance Rating	Number of Receptors		
	Beneficial	No Change	Adverse
Negligible	456	52	2,706
Minor	2	-	333
Significant - Moderate	0	-	124
Significant - Major	0	-	0

8.6.220 Overall, it can be seen that between the DM and DC Scenario, there is a slight increase in number of those people adversely affected by weekend ground noise. The number of receptors exposed to weekend

noise levels at or above the LOAEL (low absolute impact) increases from 316 under the DM Scenario to 505 under the DC Scenario. The number of receptors exposed to weekend noise levels at or above the SOAEL (medium absolute impact) remains the same at 1 for both the DM and DC Scenarios. No receptors are exposed to noise levels at or above the UAEL (high absolute impact).

8.6.221 Based on the absolute levels for the DC Scenario and the changes in noise comparing the DC and DM Scenarios, the weekend noise effects are rated as negligible for over 80% of receptors. There are 2 receptors forecast to experience a potential minor beneficial effect and 333 receptors forecast to experience a potential minor adverse effect. 124 receptors are forecast to experience a potentially significant moderate adverse effect. 52 of these are student dorms in the UEL accommodation buildings. These buildings were specifically designed to have a very good level of sound insulation due to their proximity to the airport. The other 72 receptors are within the airport's air noise sound insulation contours and therefore have already been treated or offered treatment under the air noise SIS or have been treated under the CSIS.

8.6.222 As over 80% of the receptors are forecast to experience a negligible effect and the receptors forecast to experience a potentially significant effect have already been offered treatment by the airport's sound insulation schemes or were built with a good standard of sound insulation, the weekend ground noise effects in 2027 are rated as a **Negligible to Minor Adverse** effect overall.

2031 DM vs 2031 DC

8.6.223 This section summarises the noise effects forecast for 2031. Annual aircraft movements are forecast to be 94,000 in the 2031 DM Scenario compared to 111,000 in the 2031 DC Scenario. There are forecast to be a slightly greater proportion of movements by the quieter new generation aircraft in the DC Scenario, resulting in an increase in the use of the eastern apron stands and corresponding decreases in the use of the main and western apron stands.

8.6.224 By 2031 under the DC Scenario, all remaining elements of the CADP1 infrastructure are expected to have been built. These additional buildings result in extra screening for some areas to the south of the airport, leading to reductions in noise for residents in these areas.

8.6.225 In 2031 the jet centre is forecast to no longer be in use under the DC Scenario or may only have a small number of movements. When not in use for jet centre aircraft, the jet centre apron may instead be used as a stand for commercial aircraft. This has been allowed for in the modelling of the DC Scenario.

8.6.226 The following Tables summarise how the proposed development will affect average summer daytime, night-time and weekend noise levels based on the absolute levels arising under the 2031 DC Scenario and the change in noise level compared to the 2031 DM Scenario that is experienced:

Table 8-83, Table 8 84 and Table 8-85 – Daytime Noise (dB $L_{Aeq,16h}$);

- Table 8-84Table 8-86, Table 8-87 and Table 8-88 – Night-time Noise (dB $L_{Aeq,8h}$); and
- Table 8-89, Table 8-90 and Table 8-91 – Weekend Daytime Noise (dB $L_{Aeq,16h}$).

Table 8-83: Ground Noise Receptor Counts, $L_{Aeq,16h}$ Average Mode Summer Day

Receptor	Number of Receptors	
	2031 DM	2031 DC
Receptors < 50 dB $L_{Aeq,16h}$	2,815	2,816
Receptors ≥ 50 dB $L_{Aeq,16h}$ (LOAEL)	840	809
Receptors ≥ 60 dB $L_{Aeq,16h}$ (SOAEL)	18	48
Receptors ≥ 70 dB $L_{Aeq,16h}$ (UAEL)	0	0

Table 8-84: Receptors Exposed to Absolute and Relative Ground Noise Impacts, 2031 DC Vs 2031 DM, Daytime

2031 DC Noise Level, dB $L_{Aeq,16h}$	Absolute Impact	Receptors								
		Change in Noise Level DC vs DM, dB $L_{Aeq,16h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible			Low	Medium	High
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
< 50 dB	Negligible	133	221	101	345	66	1,913	27	10	0
50 (LOAEL) to 59.9	Low	0	2	9	60	25	695	7	11	0
60 (SOAEL) to 69.9	Medium	0	0	0	0	0	48	0	0	0
≥ 70 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

Table 8-85: Potential Significant Rating for Ground Noise Effects, 2031 DC, Daytime

Potential Significance Rating	Number of Receptors		
	Beneficial	No Change	Adverse
Negligible	727	91	2,693
Minor	142	-	7
Significant - Moderate	2	-	11
Significant - Major	0	-	0

8.6.227 Overall, it can be seen that daytime noise exposure levels are predicted to remain similar between the DM and DC Scenario. The number of receptors exposed to daytime noise levels at or above the LOAEL (low absolute impact) reduces slightly from 840 under the DM Scenario to 809 under the DC Scenario. The number of receptors exposed to daytime noise levels at or above the SOAEL (medium absolute impact) increases slightly from 18 under the DM to 48 under the DC Scenario. No receptors are exposed to noise levels with an absolute impact rated as high (above the UAEL).

8.6.228 Based on the absolute levels for the DC Scenario and the changes in noise comparing the DC and DM Scenarios, the daytime noise effects are rated as negligible for over 90% of receptors. There are 142 receptors forecast to experience a potential minor beneficial effect and 7 receptors forecast to experience a potential minor adverse effect. 2 receptors are forecast to experience a potentially significant moderate beneficial effect. 11 receptors are forecast to experience a potentially significant moderate adverse effect. All of these buildings are within the airport's air noise sound insulation contours and therefore have already been treated or offered treatment under the air noise SIS or have been treated under the CSIS.

8.6.229 As over 90% of the receptors are forecast to experience a negligible effect and the few receptors forecast to experience a potentially significant effect have already been offered sound insulation or were built with a good standard of sound insulation, the daytime ground noise effects in 2031 are rated as a **Negligible** effect overall.

Table 8-86: Ground Noise Receptor Counts, $L_{Aeq,8h}$ Average Mode Summer Night-time

Receptor	Number of Receptors	
	2031 DM	2031 DC
Receptors < 45 dB $L_{Aeq,8h}$	3,597	3,446
Receptors ≥ 45 dB $L_{Aeq,8h}$ (LOAEL)	76	227
Receptors ≥ 55 dB $L_{Aeq,8h}$ (SOAEL)	0	0
Receptors ≥ 65 dB $L_{Aeq,8h}$ (UAEL)	0	0

Table 8-87: Receptors Exposed to Absolute and Relative Ground Noise Impacts, 2031 DC Vs 2031 DM, Night-time

2031 DC Noise Level, dB $L_{Aeq,8h}$	Absolute Impact	Receptors								
		Change in Noise Level DC vs DM, dB $L_{Aeq,8h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible		Low	Medium	High	
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
< 45 dB	Negligible	63	182	88	198	8	424	931	1,543	9
45 (LOAEL) to 54.9	Low	0	0	0	0	0	1	9	217	0
55 (SOAEL) to 64.9	Medium	0	0	0	0	0	0	0	0	0
≥ 65 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

Table 8-88: Potential Significant Rating for Ground Noise Effects, 2031 DC, Night-time

Potential Significance Rating	Number of Receptors		
	Beneficial	No Change	Adverse
Negligible	468	8	2,899
Minor	63	-	18
Significant - Moderate	0	-	217
Significant - Major	0	-	0

8.6.230 Overall, it can be seen that between the DM and DC Scenario, there is slight increase in the number of those people adversely affected by night-time ground noise. The number of receptors exposed to night-time noise levels at or above the LOAEL (low absolute impact) increases from 76 under the DM Scenario to 227 under the DC Scenario. No receptors are exposed to noise levels at or above the SOAEL (medium absolute impact) or at or above the UAEL (high absolute impact).

8.6.231 Based on the absolute levels for the DC Scenario and the changes in noise comparing the DC and DM Scenarios, the night-time noise effects are rated as negligible for over 90% of receptors. There are 63 receptors forecast to experience a potential minor beneficial effect and 18 receptors forecast to experience a potential minor adverse effect. 217 receptors are forecast to experience a potentially significant moderate adverse effect. 215 of these are student dorms in the UEL accommodation buildings. These buildings were specifically designed to have a very good level of sound insulation due to their proximity to the airport. The other 2 receptors are within the airport's air noise sound insulation contours and therefore have already been treated or offered treatment by the air noise SIS.

8.6.232 As over 90% of the receptors are forecast to experience a negligible effect and the receptors forecast to experience a potentially significant effect have already been offered sound insulation or were built with a good standard of sound insulation, the night-time ground noise effects in 2031 are rated as a **Negligible to Minor Adverse** effect overall.

Table 8-89: Ground Noise Receptor Counts, $L_{Aeq,16h}$ Average Mode Summer Weekend

Receptor	Number of Receptors	
	2031 DM	2031 DC
Receptors < 50 dB $L_{Aeq,16h}$	3,246	3,091
Receptors ≥ 50 dB $L_{Aeq,16h}$ (LOAEL)	426	576
Receptors ≥ 60 dB $L_{Aeq,16h}$ (SOAEL)	1	6
Receptors ≥ 70 dB $L_{Aeq,16h}$ (UAEL)	0	0

Table 8-90: Receptors Exposed to Absolute and Relative Ground Noise Impacts, 2031 DC Vs 2031 DM, Weekend

2031 DC Noise Level, dB $L_{Aeq,16h}$	Absolute Impact	Receptors								
		Change in Noise Level DC vs DM, dB $L_{Aeq,16h}$								
		Beneficial					Adverse			
		High	Medium	Low	Negligible		Low	Medium	High	
		≥6	3 to 5.9	2 to 2.9	0.1 to 1.9	0	0.1 to 1.9	2 to 2.9	3 to 5.9	≥6
< 50 dB	Negligible	64	189	85	212	19	978	1,488	54	2
50 (LOAEL) to 59.9	Low	0	0	1	15	1	110	432	17	0
60 (SOAEL) to 69.9	Medium	0	0	0	0	0	1	5	0	0
≥ 70 dB (UAEL)	High	0	0	0	0	0	0	0	0	0

Table 8-91: Potential Significant Rating for Ground Noise Effects, 2031 DC, Weekend

Potential Significance Rating	Number of Receptors		
	Beneficial	No Change	Adverse
Negligible	501	20	2,631
Minor	65	-	434
Significant - Moderate	0	-	22
Significant - Major	0	-	0

8.6.233 Overall, it can be seen that between the DM and DC Scenario, there is a slight increase in number of those people adversely affected by weekend ground noise. The number of receptors exposed to weekend noise levels at or above the LOAEL (low absolute impact) increases from 426 under the DM Scenario to 576 under the DC Scenario. The number of receptors exposed to weekend noise levels at or above the SOAEL (medium absolute impact) increases slightly from 1 under the DM to 6 under the DC Scenario. No receptors are exposed to noise levels with an absolute impact rated as high (above the UAEL).

8.6.234 Based on the absolute levels for the DC Scenario and the changes in noise comparing the DC and DM Scenarios, the weekend noise effects are rated as negligible for over 80% of receptors. There are 65 receptors forecast to experience a potential minor beneficial effect and 434 receptors forecast to experience a potential

minor adverse effect. 22 receptors are forecast to experience a potentially significant moderate adverse effect. 12 of these are student dorms in the UEL accommodation buildings. These buildings were specifically designed to have a very good level of sound insulation due to their proximity to the airport. The other 10 receptors are within the airport's air noise sound insulation contours and therefore have already been treated or offered treatment by the air noise SIS or have been treated under the CSIS.

8.6.235 As over 80% of the receptors are forecast to experience a negligible effect and the few receptors forecast to experience a potentially significant effect have already been offered sound insulation or were built with a good standard of sound insulation, the weekend ground noise effects in 2031 are rated as a **Negligible to Minor Adverse** effect overall.

Summary

8.6.236 In summary, the ground noise effects under the DC Scenario are generally greater than under the DM Scenario. The number of receptors adversely affected by daytime, night-time and weekend noise is higher under the DC Scenario. However, most receptors are exposed to daytime, night-time and weekend ground noise below the LOAEL. Very few receptors are exposed to daytime or weekend ground noise levels above the SOAEL and no receptors in the night-time.

8.6.237 A small proportion of receptors are forecast to experience potentially significant moderate increases in daytime, night-time and weekend ground noise. Most of these are student rooms in the UEL accommodation blocks. These blocks have a very good standard of sound insulation and were specifically designed to deal with noise from the airport. All of the receptors exposed to potentially significant moderate increases in ground noise are within the airport's air noise sound insulation contours and are therefore eligible for or already treated by the air noise SIS or the CSIS or were already designed with a good standard of sound insulation. These effects are therefore rated as not significant.

8.6.238 For the reasons outlined above, overall the daytime ground noise effects are rated as **Negligible** and the night-time and weekend ground noise effects are rated as **Negligible to Minor Adverse.**

8.6.239 Proposed major developments around the airport will not significantly change the cumulative level of ground noise at the receptors. The development of land to the North of Albert Dock has the potential to result in reductions in aircraft ground noise for the residential properties in Beckton. The buildings on this development will act as local noise barriers. Any reductions will however be limited due to the distance of these buildings from the airport.

Comparison with Findings of the 2015 UES

8.6.240 The above assessment considers the effects of the proposed development. This section discusses whether the effects are in line with those predicted in the 2015 UES.

8.6.241 The CadnaA noise model used to predict the ground noise levels has been updated since the 2015 UES. There are a greater number of receptors in the latest model, primarily due to newly built developments since the time of the 2015 UES and also partly due to an expansion of the study area considered. Due to the greater number of receptors in the model, the absolute number of receptors exposed to a particular predicted effect cannot be directly compared with the numbers in the 2015 UES.

8.6.242 The 2015 UES predicted that 1.9% of receptors were exposed to daytime ground noise levels above the SOAEL and that this would increase by a further 1.8% with the CADP1 development of receptors to a total of 3.7%. This assessment predicts that in the daytime and the weekend less than 1% of receptors will be exposed to noise levels above the SOAEL in 2031 for the DC Scenario. In the night-time no receptors are forecast to be exposed to noise levels above the SOAEL.

8.6.243 Overall, this suggests that noise effects of the proposed development are similar to or slightly less than the effects predicted for CADP1 in the 2015 UES. All of the small number of receptors predicted to experience a potentially significant moderate increase in ground noise in the daytime, night-time or weekend are either

already treated by or eligible for treatment by the airport's air noise SIS or the CSIS or were required to be built with a very good standard of sound insulation by planning condition due to their proximity to the airport.

Road Traffic Noise

8.6.244 Appendix 8.5 provides further details of the road traffic noise assessment and includes a figure showing the assessment locations. The results are presented in this section. The road traffic flows that underpin this assessment include the predicted construction traffic flows in each assessment year.

8.6.245 This assessment focusses on seven key local roads and considers the noise effects on the worst affected property or properties on each of those roads. These seven roads are the same as those assessed in the 2015 UES. The assessment considers daytime and weekend road traffic noise levels. The 18 hour (06:00-24:00) traffic flows this assessment is based on cover the airport's entire operational period (06:30-22:30), therefore a separate assessment of night-time noise is not considered necessary.

8.6.246 This section sets out the road traffic noise effects arising from the proposed development by comparing the results of the DM Scenario to those of the DC Scenario. A subjective account of how noise conditions will change between 2019 (the baseline year) and the 2031 DM and DC Scenarios has also been included to provide context.

2019 (Baseline Year) vs 2031 DM and DC Scenarios

Daytime

8.6.247 More of the receptors are forecast to be exposed to noise levels above the SOAEL (medium absolute impact) in 2031 than in 2019. This is expected to occur for both the DM and DC Scenarios and is due to a forecast increase in vehicle movements on the local road network, most of which is unrelated to the airport.

8.6.248 The changes in road traffic noise at these receptors compared to 2019 are negligible in most cases. The exceptions are the 2 receptors on Woolwich Manor Way, which are forecast to experience an increase of less than 5 dB (low relative impact) and the receptor on Woodman St, which is forecast to experience an increase of less than 10 dB (medium relative impact). The increases at these three locations are due to the opening up of the eastern end of the airport access road and the associated increase in road traffic in this area. This is expected to occur for both the DM and DC Scenarios. Properties in this area are eligible for the airport's air noise SIS and therefore will have (or have been offered) insulation or will have been required to be built with sufficient noise insulation by planning condition.

Weekend

8.6.249 More of the receptors are forecast to be exposed to weekend noise levels above the SOAEL (medium absolute impact) in 2031 than in 2019. This is expected to occur for both the DM and DC Scenarios and is due to a forecast increase in vehicle movements on the local road network, most of which is unrelated to the airport.

8.6.250 The changes in weekend road traffic noise at these receptors are negligible in most cases. The exceptions are the 2 receptors on Woolwich Manor Way, which are forecast to experience an increase of less than 5 dB (low relative impact) and the receptor on Woodman St, which is forecast to experience an increase of less than 10 dB (medium relative impact). The increases at these three locations are due to the opening up of the eastern end of the airport access road and the associated increase in road traffic in this area. This is expected to occur for both the DM and DC Scenarios. Properties in this area are eligible for the airport's air noise sound insulation schemes and therefore will have (or have been offered) insulation or will have been required to be built with sufficient noise insulation by planning condition.

2025 DM vs 2025 DC

Daytime

8.6.251 Table 8-92 presents the weekend daytime road traffic noise levels for the 2025 DM and 2025 DC Scenarios at the nine assessment locations.

Table 8-92: Daytime Road Traffic Noise Levels 2025 DM vs 2025 DC, $L_{A10,18h}$ Facade

Receptor	Road	Distance to Nearside Kerb, m	Noise Level, dB $L_{A10,18h}$		
			2025 DM	2025 DC	Change in Noise Level DC-DM
(A) Fox Connaught	Connaught Bridge	34	70	70	+0.1
(B) 2 Camel Road	Hartman Road	14	69	70	+0.2
(C) Marriott Hotel	Connaught Road	4	71	72	+0.1
(D1) Yeoman Court	Royal Albert Way East	28	69	69	0.0
(D2) 38 Strait Road	Royal Albert Way East	33	69	69	0.0
(E) Compressor House	Royal Albert Way West	40	69	69	0.0
(F1) Bascule Bridge	Woolwich Manor Way	11	71	71	+0.1
(F2) 7 Fish Guard Way	Woolwich Manor Way	15	69	69	+0.1
(G) 29 Woodman St	Woodman St	26	61	62	+0.3

8.6.252 In 2025 for the DM Scenario there are forecast to be 8 of the receptors exposed to noise levels above the SOAEL (medium absolute impact). The other receptor is forecast to be exposed to noise levels above the LOAEL (low absolute impact). In the 2025 DC Scenario the same 8 receptors are forecast to be exposed to noise levels above the SOAEL (medium absolute impact), with the remaining receptor forecast to be exposed to noise levels above the LOAEL (low absolute impact).

8.6.253 Comparing the DM and DC Scenarios 3 of the receptors are forecast to experience no change in noise. The other 6 receptors are forecast to experience a negligible increase in noise of less than 3 dB under the DC Scenario. This constitutes a **Negligible** effect.

Weekend

8.6.254 Table 8-93 presents the weekend daytime road traffic noise levels for the 2025 DM and 2025 DC Scenarios at the nine assessment locations.

Table 8-93: Weekend Daytime Road Traffic Noise Levels 2025 DM vs 2025 DC, $L_{A10,18h}$ Facade

Receptor	Road	Distance to Nearside Kerb, m	Noise Level, dB $L_{A10,18h}$		
			2025 DM	2025 DC	Change in Noise Level DC-DM
(A) Fox Connaught	Connaught Bridge	34	69	69	+0.1
(B) 2 Camel Road	Hartman Road	14	66	66	+0.2
(C) Marriott Hotel	Connaught Road	4	70	70	+0.1
(D1) Yeoman Court	Royal Albert Way East	28	68	68	+0.1
(D2) 38 Strait Road	Royal Albert Way East	33	68	68	+0.1
(E) Compressor House	Royal Albert Way West	40	68	68	0.0
(F1) Bascule Bridge	Woolwich Manor Way	11	70	70	+0.1
(F2) 7 Fish Guard Way	Woolwich Manor Way	15	68	68	0.0
(G) 29 Woodman St	Woodman St	26	60	60	+0.2

8.6.255 In 2025 for the DM Scenario there are forecast to be 7 of the receptors exposed to noise levels above the SOAEL (medium absolute impact). The other 2 receptors are forecast to be exposed to noise levels above the LOAEL (low absolute impact). In the 2025 DC Scenario the same 7 receptors are forecast to be exposed to noise levels above the SOAEL (medium absolute impact), with the remaining 2 receptors forecast to be exposed to noise levels above the LOAEL (low absolute impact).

8.6.256 Comparing the DM and DC Scenarios 2 of the receptors are forecast to experience no change in noise. The other 7 receptors are forecast to experience a negligible increase in noise of less than 3 dB under the DC Scenario. This constitutes a **Negligible** effect.

2027 DM vs 2027 DC

Daytime

8.6.257 Table 8-94 presents the weekend daytime road traffic noise levels for the 2027 DM and 2027 DC Scenarios at the nine assessment locations.

Table 8-94: Daytime Road Traffic Noise Levels 2027 DM vs 2027 DC, $L_{A10,18h}$ Facade

Receptor	Road	Distance to Nearside Kerb, m	Noise Level, dB $L_{A10,18h}$		
			2027 DM	2027 DC	Change in Noise Level DC-DM
(A) Fox Connaught	Connaught Bridge	34	70	70	0.0
(B) 2 Camel Road	Hartman Road	14	69	70	+0.7
(C) Marriott Hotel	Connaught Road	4	71	72	+0.1
(D1) Yeoman Court	Royal Albert Way East	28	69	69	0.0
(D2) 38 Strait Road	Royal Albert Way East	33	69	69	0.0
(E) Compressor House	Royal Albert Way West	40	69	69	0.0
(F1) Bascule Bridge	Woolwich Manor Way	11	71	71	+0.1
(F2) 7 Fish Guard Way	Woolwich Manor Way	15	69	69	0.0
(G) 29 Woodman St	Woodman St	26	61	62	+0.5

8.6.258 In 2027 for the DM Scenario there are forecast to be 8 of the receptors exposed to noise levels above the SOAEL (medium absolute impact). The other receptor is forecast to be exposed to noise levels above the LOAEL (low absolute impact). In the 2027 DC Scenario the same 8 receptors are forecast to be exposed to noise levels above the SOAEL (medium absolute impact), with the remaining receptor forecast to be exposed to noise levels above the LOAEL (low absolute impact).

8.6.259 Comparing the DM and DC Scenarios 5 of the receptors are forecast to experience no change in noise. The other 4 receptors are forecast to experience a negligible increase in noise of less than 3 dB under the DC Scenario. This constitutes a **Negligible** effect.

Weekend

8.6.260 Table 8-95 presents the weekend daytime road traffic noise levels for the 2027 DM and 2027 DC Scenarios at the nine assessment locations.

Table 8-95: Weekend Daytime Road Traffic Noise Levels 2027 DM vs 2027 DC, $L_{A10,18h}$ Facade

Receptor	Road	Distance to Nearside Kerb, m	Noise Level, dB $L_{A10,18h}$		
			2027 DM	2027 DC	Change in Noise Level DC-DM
(A) Fox Connaught	Connaught Bridge	34	69	69	+0.1
(B) 2 Camel Road	Hartman Road	14	67	67	+0.7
(C) Marriott Hotel	Connaught Road	4	70	70	+0.1
(D1) Yeoman Court	Royal Albert Way East	28	68	68	0.0
(D2) 38 Strait Road	Royal Albert Way East	33	68	68	0.0
(E) Compressor House	Royal Albert Way West	40	68	68	+0.1
(F1) Bascule Bridge	Woolwich Manor Way	11	70	70	+0.1
(F2) 7 Fish Guard Way	Woolwich Manor Way	15	68	68	+0.1
(G) 29 Woodman St	Woodman St	26	60	61	+0.4

8.6.261 In 2027 for the DM Scenario there are forecast to be 7 of the receptors exposed to noise levels above the SOAEL (medium absolute impact). The other 2 receptors are forecast to be exposed to noise levels above the LOAEL (low absolute impact). In the 2027 DC Scenario the same 7 receptors are forecast to be exposed to noise levels above the SOAEL (medium absolute impact), with the remaining 2 receptors forecast to be exposed to noise levels above the LOAEL (low absolute impact).

8.6.262 Comparing the DM and DC Scenarios 2 of the receptors are forecast to experience no change in noise. The other 7 receptors are forecast to experience a negligible increase in noise of less than 3 dB under the DC Scenario. This constitutes a **Negligible** effect.

2031 DM vs 2031 DC

Daytime

8.6.263 Table 8-96 presents the weekend daytime road traffic noise levels for the 2031 DM and 2031 DC Scenarios at the nine assessment locations.

Table 8-96: Daytime Road Traffic Noise Levels 2031 DM vs 2031 DC, $L_{A10,18h}$ Facade

Receptor	Road	Distance to Nearside Kerb, m	Noise Level, dB $L_{A10,18h}$		
			2031 DM	2031 DC	Change in Noise Level DC-DM
(A) Fox Connaught	Connaught Bridge	34	70	70	0.0
(B) 2 Camel Road	Hartman Road	14	67	68	+0.6
(C) Marriott Hotel	Connaught Road	4	71	71	0.0
(D1) Yeoman Court	Royal Albert Way East	28	69	69	0.0
(D2) 38 Strait Road	Royal Albert Way East	33	69	69	0.0
(E) Compressor House	Royal Albert Way West	40	69	69	0.0
(F1) Bascule Bridge	Woolwich Manor Way	11	71	71	+0.2
(F2) 7 Fish Guard Way	Woolwich Manor Way	15	69	70	+0.2
(G) 29 Woodman St	Woodman St	26	65	65	+0.4

8.6.264 In 2031 for the DM Scenario there are forecast to be 7 of the receptors exposed to noise levels above the SOAEL (medium absolute impact). The other receptor is forecast to be exposed to noise levels above the LOAEL (low absolute impact). In the 2031 DC Scenario 8 receptors are forecast to be exposed to noise levels above the SOAEL (medium absolute impact), with the remaining receptor forecast to be exposed to noise levels above the LOAEL (low absolute impact).

8.6.265 Comparing the DM and DC Scenarios 5 of the receptors are forecast to experience no change in noise. The other 4 receptors are forecast to experience a negligible increase in noise of less than 3 dB under the DC Scenario. This constitutes a **Negligible** effect.

Weekend

8.6.266 Table 8-97 presents the weekend daytime road traffic noise levels for the 2031 DM and 2031 DC Scenarios at the nine assessment locations.

Table 8-97: Weekend Daytime Road Traffic Noise Levels 2031 DM vs 2031 DC, $L_{A10,18h}$ Facade

Receptor	Road	Distance to Nearside Kerb, m	Noise Level, dB $L_{A10,18h}$		
			2031 DM	2031 DC	Change in Noise Level DC-DM
(A) Fox Connaught	Connaught Bridge	34	69	69	0.0
(B) 2 Camel Road	Hartman Road	14	65	65	+0.6
(C) Marriott Hotel	Connaught Road	4	70	70	0.0
(D1) Yeoman Court	Royal Albert Way East	28	68	68	0.0
(D2) 38 Strait Road	Royal Albert Way East	33	68	68	0.0
(E) Compressor House	Royal Albert Way West	40	68	68	+0.1
(F1) Bascule Bridge	Woolwich Manor Way	11	70	70	+0.1
(F2) 7 Fish Guard Way	Woolwich Manor Way	15	68	68	+0.2
(G) 29 Woodman St	Woodman St	26	62	62	+0.5

8.6.267 In 2031 for the DM Scenario there are forecast to be 7 of the receptors exposed to noise levels above the SOAEL (medium absolute impact). The other 2 receptors are forecast to be exposed to noise levels above the LOAEL (low absolute impact). In the 2031 DC Scenario the same 7 receptors are forecast to be exposed to noise levels above the SOAEL (medium absolute impact), with the remaining 2 receptors forecast to be exposed to noise levels above the LOAEL (low absolute impact).

8.6.268 Comparing the DM and DC Scenarios 4 of the receptors are forecast to experience no change in noise. The other 5 receptors are forecast to experience a negligible increase in noise of less than 3 dB under the DC Scenario. This constitutes a **Negligible** effect.

8.6.269 Overall comparing the DC and DM Scenarios finds that all of the road traffic noise effects are negligible for the daytime and the weekend. Weekend noise levels were lower than the overall daytime noise levels in 2019 and this is forecast to remain the case in the future for both the DC and DM Scenarios. The above assessment focusses on the worst affected properties from these roads, most properties are positioned further from these roads and therefore will be exposed to lower absolute levels of noise. The overall road traffic noise effects are rated as **Negligible.**

Comparison with Findings of the 2015 UES

8.6.270 The above assessment considers the effects of the proposed development. This section discusses whether the effects are in line with those predicted in the 2015 UES.

8.6.271 The assessment of road traffic noise in the 2015 UES focussed on free-field noise levels and considered only the noise from the nearest road to each receptor. The above assessment is based on façade noise levels predicted using the CadnaA noise model. The predicted noise levels therefore include contributions from all modelled roads, not just the closest one. The absolute levels of noise predicted in the 2015 UES are therefore not directly comparable with those presented above.

8.6.272 The changes in noise forecast in this assessment in 2031 are very small. For the daytime 5 of the receptors are forecast to experience no change in noise with the other 4 forecast to experience changes in noise of less than 1 dB. For the weekend 4 of the receptors are forecast to experience no change in noise with the other 5 forecast to experience a change of less than 1 dB.

8.6.273 The 2015 UES identified all but one receptor as experiencing significant absolute levels of noise, with the exception of Woodman St. This is the same as that forecast for the 2031 DC Scenario. The 2015 UES identified no significant changes in noise, with the exception of Woodman St. This is in line with the changes predicted comparing 2019 with the 2031 DC Scenario.

8.6.274 Overall, the 2015 UES concluded that CADP1 would result in a residual negligible road traffic noise impact. The proposed development would not materially alter this conclusion.

Assessment of Effects: Sensitivity Tests

Faster and Slower Growth Scenarios

Air Noise

8.6.275 The Faster Growth and Slower Growth sensitivity tests (discussed in further detail in Chapter 3 of the ES) have been quantitatively assessed for air noise. These scenarios assess the point at which 9mppa is reached, Faster Growth in 2029 and Slower Growth in 2033. This affects the level of modernisation of the forecast movements.

8.6.276 The sections below compare the air noise effects of the faster and Slower Growth Scenarios with the 2031 core DC Scenario for daytime, night-time, and weekend noise. Consideration is first given to the change in noise levels at 12 key receptor locations. The number of people forecast to experience noise above the LOAEL and SOAEL levels is then presented.

Daytime

8.6.277 Table 8-98 shows the daytime air noise exposure levels for the DC Scenario (in brackets) and the relative change in noise level for the 2029 Faster Growth and 2033 Slower Growth Scenarios.

Table 8-98: Air Noise Exposure Levels And Relative Change, $L_{Aeq,16h}$ Average Mode Summer Day

Locations	Absolute level ($L_{Aeq,16h}$) dB or change Sensitivity-DC		
	2031 DC	2029 Faster	2033 Slower
(1) Blackwall / A1261	(57)	0	-0.1
(2) Britannia Village	(63)	0	-0.1
(3) Silvertown / A1020	(60)	0	-0.1
(4) Custom House	(59)	0	-0.1
(5) Camel Road	(65)	0	-0.1
(6) Royal Albert Dock (north)	(63)	0	-0.1
(7) North Woolwich (north)	(59)	0	-0.1
(8) Thamesmead	(59)	0	-0.1
(9) Eastern Quay Apts, Britannia Village	(64)	0	-0.1
(10) Coral Apts, Western Gateway	(61)	0	-0.1
(11) Silvertown Quays	(66)	0	-0.1
(12) Ramada Hotel	(64)	0	-0.1

8.6.278 The 2029 Faster Growth Scenario is forecast to result in the same noise levels as the core DC Scenario at all locations. The 2033 Slower Growth Scenario is forecast to result in a negligible reduction in noise of 0.1 dB compared to the DC Scenario at all locations.

8.6.279 The population counts within key daytime air noise contours for the 2031 DC, 2029 Faster Growth and 2033 Slower Growth Scenarios are presented in Table 8-99. The daytime contours for the 2029 Faster Growth and 2033 Slower Growth Scenarios are shown in Figures 8.3.102 and 8.3.103 respectively.

Table 8-99: Air Noise Population Counts, $L_{Aeq,16h}$ Average Mode Summer Day

Contour, dB $L_{Aeq,16h}$	Number of People including Permitted Developments		
	2031 DC	2029 Faster	2033 Slower
51 (LOAEL)	302,250	302,400	298,250
63 (SOAEL)	8,600	8,600	8,600

8.6.280 The number of people forecast to be exposed to noise levels above the LOAEL are similar between the three scenarios. There are 302,250 people under the 2031 DC Scenario, 302,400 people under the 2029 Faster Growth Scenario and 298,250 people under the 2033 Slower Growth Scenario. There are 8,600 people forecast to be exposed to noise levels above the SOAEL for all three scenarios.

8.6.281 The predicted daytime noise levels at the key receptors under the 2029 Faster Growth and 2033 Slower Growth Scenarios are very similar to and in many cases the same as those forecast for the 2031 DC Scenario. The number of people forecast to be exposed to daytime noise levels above the LOAEL and above the SOAEL are also very similar and in some cases the same for all three scenarios. Therefore, in the event that growth in passengers at the airport is slightly faster or slower than the core DC Scenario suggests, no material change is expected in the daytime noise effects.

Night-Time

8.6.282 The forecasts for the 2029 Faster Growth and 2033 Slower Growth Scenarios are identical to the 2031 DC Scenario. Therefore, the associated noise assessment would give the same findings.

Weekend

8.6.283 Table 8-100 shows the weekend daytime air noise exposure levels for the DC Scenario (in brackets) and the relative change in noise level for the 2029 Faster Growth and 2033 Slower Growth Scenarios.

Table 8-100: Air Noise Exposure Levels And Relative Change, $L_{Aeq,16h}$ Average Mode Summer Weekend Day

Locations	Absolute level ($L_{Aeq,16h}$) dB or change Sensitivity-DC		
	2031 DC	2029 Faster	2033 Slower
(1) Blackwall / A1261	(55)	0	-0.1
(2) Britannia Village	(60)	0	-0.1
(3) Silvertown / A1020	(58)	0	-0.1
(4) Custom House	(57)	0	-0.1
(5) Camel Road	(63)	0	-0.1
(6) Royal Albert Dock (north)	(61)	0	0
(7) North Woolwich (north)	(57)	0	0
(8) Thamesmead	(57)	0	-0.1
(9) Eastern Quay Apts, Britannia Village	(61)	0	-0.1
(10) Coral Apts, Western Gateway	(59)	0	-0.1
(11) Silvertown Quays	(64)	0	-0.1
(12) Ramada Hotel	(62)	0	-0.1

8.6.284 The 2029 Faster Growth Scenario is forecast to result in the same noise levels as the DC Scenario at all locations. The 2033 Slower Growth Scenario is forecast to result in a negligible reduction in noise of 0.1 dB compared to the DC Scenario at 10 of the locations and no change at the remaining 2 locations.

8.6.285 The population counts within key weekend daytime air noise contours for the 2031 DC, 2029 Faster Growth and 2033 Slower Growth Scenarios are presented in Table 8-101. The weekend contours for the 2029 Faster Growth and 2033 Slower Growth Scenarios are shown in Figures 8.3.104 and 8.3.105 respectively.

Table 8-101: Air Noise Population Counts, $L_{Aeq,16h}$ Average Mode Summer Weekend Day

Contour, dB $L_{Aeq,16h}$	Number of People including Permitted Developments		
	2031 DC	2029 Faster	2033 Slower
51 (LOAEL)	199,950	200,250	196,950
63 (SOAEL)	3,400	3,400	3,100

8.6.286 The number of people forecast to be exposed to noise levels above the LOAEL are similar between the three scenarios. There are 199,950people under the 2031 DC Scenario, 200,250 people under the 2029 Faster Growth Scenario and 196,950 people under the 2033 Slower Growth Scenario. The number of people forecast to be exposed to noise levels above the SOAEL are similar between the three scenarios. There are 3,400 people under the 2031 DC and 2029 Faster Growth Scenarios and 3,100 people under the 2033 Slower Growth Scenario.

8.6.287 The predicted weekend noise levels at the key receptors under the 2029 Faster Growth and 2033 Slower Growth Scenarios are very similar to and in many cases the same as those forecast for the 2031 DC Scenario. The number of people forecast to be exposed to weekend noise levels above the LOAEL and above the SOAEL under the 2029 Faster Growth and 2033 Slower Growth Scenarios are also very similar to and in some cases the same as those under the 2031 DC Scenario. Therefore, in the event that growth in passengers at the airport is slightly faster or slower than the core DC Scenario suggests, no material change is expected in the weekend noise effects.

Ground Noise

8.6.288 Ground noise is primarily affected by the number of aircraft movements, no benefit has been assumed from the new generation aircraft therefore the fleet mix has only a limited influence on the amount of noise. The 2029 Faster Growth and 2033 Slower Growth sensitivity forecasts have very similar numbers of movements to the 2031 core DC forecast.

8.6.289 For the Slower Growth Scenario the construction programme is expected to progress in line with growth in passengers and aircraft movements, and the built infrastructure of the airport including buildings and barriers and other noise screening is expected to occur in line with this growth, as set out in Chapter 6 of the ES.

8.6.290 For the Faster Growth Scenario the built infrastructure will progress in line with the DC Scenario. The primary ground noise benefits of the new infrastructure are the additional screening they provide to residents to the south of the eastern apron. Noise barriers are required by planning condition to be in place before any of the new stands on this apron can be used. These noise barriers will provide protection for residents in the local area.

8.6.291 The Faster Growth and Slower Growth sensitivities would therefore be expected to change the years in which particular ground noise effects might occur, but not materially change the overall magnitude of those effects.

Road Traffic Noise

8.6.292 Road traffic noise is primarily affected by the number of passengers. The 2029 Faster Growth and 2033 Slower Growth sensitivity forecasts ultimately have the same number of passengers as the 2031 core DC forecast. Therefore, as with ground noise, the Faster Growth and Slower Growth sensitivities would be expected to change the years in which particular road traffic noise effects might occur but would not materially change the overall magnitude of those effects.

Construction Noise

8.6.293 For the Slower Growth Scenario, the construction programme is expected to be delayed by two years. This will change the years in which elements are constructed but is not expected to change the overall order or pacing of the programme. Therefore, the Slower Growth Scenario is not expected to materially alter the construction noise effects associated with the core DC assessment.

8.6.294 The construction programme for the Faster Growth Scenario would be the same as that for the core DC Scenario. Therefore, the construction noise effects of the Faster Growth Scenario would be the same as those for the DC Scenario.

Proposed Early Morning Limit

8.6.295 This sensitivity assesses the noise effects in the event that the airport was to operate the maximum of 9 movements every early morning throughout the 92-day summer period (excluding Sundays).

8.6.296 The Proposed Early Morning Limit Scenario has been quantitatively assessed for air noise and ground noise. This sensitivity scenario would not materially affect daytime or weekend air noise; therefore this sensitivity assessment focusses on night-time noise.

Air Noise

8.6.297 The core DC Scenario is based on the expected number of early morning movements across the 92-day summer period. This includes 9 movements being operated on some days, however not every day, with an average of around 8.9 per day (excluding Sunday).

8.6.298 The sections below compare the night-time air noise effects of the Proposed Early Morning Limit Scenario with the 2031 core DC Scenario. Consideration is first given to the change in noise levels at 12 key receptor locations. The number of people forecast to experience noise above the LOAEL and SOAEL levels is then presented.

8.6.299 Table 8-102 shows the night-time air noise exposure levels for the 2031 DC Scenario (in brackets) and the relative change in noise level for the Proposed Early Morning Limit Scenario.

Table 8-102: Air Noise Exposure Levels And Relative Change, $L_{Aeq,8h}$ Average Mode Summer Night-time

Locations	Absolute level ($L_{Aeq,8h}$) dB or change Sensitivity-DC	
	2031 DC	2031 Proposed Early Morning Limit
(1) Blackwall / A1261	(44)	0
(2) Britannia Village	(49)	0
(3) Silvertown / A1020	(48)	0
(4) Custom House	(46)	0
(5) Camel Road	(53)	0
(6) Royal Albert Dock (north)	(50)	0
(7) North Woolwich (north)	(46)	+0.1
(8) Thamesmead	(45)	0
(9) Eastern Quay Apts, Britannia Village	(50)	0
(10) Coral Apts, Western Gateway	(48)	0
(11) Silvertown Quays	(53)	0
(12) Ramada Hotel	(52)	0

8.6.300 The Proposed Early Morning Limit Scenario is forecast to result in no change at most locations with a negligible increase of 0.1 dB compared to the DC Scenario at Location 7.

8.6.301 The population counts within the key night-time air noise contours for the 2031 DC and 2031 Proposed Early Morning Limit Scenarios are presented in Table 8-103. The night-time contours for the 2031 Proposed Early Morning Limit Scenario are shown in Figure 8.3.106.

Table 8-103: Air Noise Population Counts, $L_{Aeq,8h}$ Average Mode Summer Night-time

Contour, dB $L_{Aeq,16h}$	Number of People including Permitted Developments	
	2031 DC	2031 Proposed Early Morning Limit
45 (LOAEL)	55,200	55,500
55 (SOAEL)	70	70
63 (UAEL)	0	0

8.6.302 The Proposed Early Morning Limit Scenario is forecast to result in very slightly more people exposed to noise levels above the LOAEL. The number of people forecast to be exposed to noise levels above the SOAEL are the same for both scenarios.

8.6.303 The predicted night-time noise levels at the key receptors under the Proposed Early Morning Limit Scenario are very similar to and in most cases the same as those forecast for the 2031 DC Scenario. The number of people forecast to be exposed to night-time noise levels above the LOAEL for the Proposed Early Morning Limit Scenario are also similar. The number of people forecast to be exposed to night-time noise levels above the SOAEL is the same for both scenarios. Therefore, in the event that the number of early morning flights over the summer period were greater than expected, no material change is expected in the night-time air noise effects.

Ground Noise

8.6.304 The ground noise assessment is based on scheduled stand time, whereas air noise is based on runway time, as most ground noise occurs on and around the stand. The 2031 DC core case includes an average of 10.5 scheduled early morning movements per day (excluding Sunday). The 2031 Proposed Early Morning Limit sensitivity is based on 11 scheduled early morning movements per day (excluding Sunday). These 11 scheduled stand movements are expected to result in 9 actual runway movements in the early morning period, as has been assessed for air noise, due to the time taken for departures to reach the runway.

8.6.305 The sections below compare the night-time ground noise effects of the Proposed Early Morning Limit Scenario with the 2031 DC Scenario. Consideration is first given to the change in noise levels at 10 representative locations. The number of people forecast to experience noise above the LOAEL and SOAEL levels is then presented.

Table 8-104: Ground Noise Exposure Levels And Relative Change, $L_{Aeq,8h}$ Average Mode Summer Night

Locations	Absolute level ($L_{Aeq,8h}$) dB or change Sensitivity-DC	
	2031 DC	2031 Proposed Early Morning Limit
(A) Drew Road	(36)	+0.2
(B) North Side of Royal Albert Docks	(46)	+0.2
(C) Camel Road Flats	(38)	+0.2
(D) Parker Street	(36)	+0.2
(E) Newland Street	(33)	+0.2
(F) Storey Road School	(38)	+0.2
(G) Norton Pharmaceuticals	(33)	+0.2
(H) University of East London	(46)	+0.2
(I) Royal Docks Business	(47)	+0.2
(J) Brixham Street	(41)	+0.2

8.6.306 The Proposed Early Morning Limit Scenario is forecast to result in negligible increases of up to 0.2 dB compared to the DC Scenario at all locations. Noise levels at all locations are forecast to remain relatively low, with seven of the locations exposed to night-time noise levels below the LOAEL and the remaining three locations forecast to be exposed to night-time noise levels just over the LOAEL for both scenarios.

8.6.307 The receptor counts within key night-time ground noise contours for the 2031 DC and 2031 Proposed Early Morning Limit Scenarios are presented in Table 8-105. The night-time ground noise contours for the 2031 Proposed Early Morning Limit Scenario are shown in Figure 8.4.23 in Appendix 8.4.

Table 8-105: Ground Noise Receptor Counts, $L_{Aeq,8h}$ Average Mode Summer Night-time

Receptor	Number of Receptors	
	2031 DC	2031 Proposed Early Morning Limit
Receptors < 45 dB $L_{Aeq,8h}$	3,446	3,436
Receptors ≥ 45 dB $L_{Aeq,8h}$ (LOAEL)	227	237
Receptors ≥ 55 dB $L_{Aeq,8h}$ (SOAEL)	0	0
Receptors ≥ 65 dB $L_{Aeq,8h}$ (UAEL)	0	0

8.6.308 The Proposed Early Morning Limit Scenario is forecast to result in slightly more receptors exposed to noise levels above the LOAEL. There are no receptors forecast to be exposed to night-time noise levels above the SOAEL or the UAEL for either scenario.

8.6.309 The predicted night-time noise levels at the representative locations under the Proposed Early Morning Limit Scenario are very similar to those forecast for the 2031 DC Scenario. The number of receptors forecast to be exposed to night-time noise levels above the LOAEL for the Proposed Early Morning Limit Scenario are also similar. There are no receptors forecast to be exposed to night-time noise levels above the SOAEL or the UAEL for either scenario. Therefore, in the event that the average number of early morning flights over the summer period were greater than expected, no material change is expected in the night-time noise effects.

Road Traffic Noise

8.6.310 A slight change in the number of early morning flights, but with no overall change in the number of passengers over the day is not expected to have a material effect on the 18 hour road traffic flows the road traffic noise assessment is based on. Therefore, the Proposed Early Morning Limit Scenario is not expected to materially alter the road traffic noise effects associated with the core assessment.

Construction Noise

8.6.311 A change in the number of early morning flights, but with no overall change in the number of passengers or flights over the year, is not expected to have any effect on the construction programme. Therefore, the Proposed Early Morning Limit Scenario is not expected to materially alter the construction noise effects associated with the core assessment.

Alterative Fleet Mix

Air Noise

8.6.312 The sections below compare the weekend air noise effects of the 2031 Alternative Fleet Mix Scenario with the 2031 core DC Scenario. Consideration is first given to the change in noise levels at 12 key receptor locations. The number of people forecast to experience noise above the LOAEL and SOAEL levels is then presented.

8.6.313 Table 8-106 shows the weekend daytime air noise exposure levels for the DC Scenario (in brackets) and the relative change in noise level for the 2031 Alternative Fleet Mix Scenario.

Table 8-106: Air Noise Exposure Levels And Relative Change, $L_{Aeq,16h}$ Average Mode Summer Weekend Day

Locations	Absolute level ($L_{Aeq,16h}$) dB or change Sensitivity-DC	
	2031 DC	2031 Alternative Fleet Mix
(1) Blackwall / A1261	(55)	+0.2
(2) Britannia Village	(60)	+0.1
(3) Silvertown / A1020	(58)	0
(4) Custom House	(57)	-0.1
(5) Camel Road	(63)	-0.1
(6) Royal Albert Dock (north)	(61)	0
(7) North Woolwich (north)	(57)	0
(8) Thamesmead	(57)	+0.2
(9) Eastern Quay Apts, Britannia Village	(61)	+0.1
(10) Coral Apts, Western Gateway	(59)	+0.2
(11) Silvertown Quays	(64)	+0.2
(12) Ramada Hotel	(62)	+0.1

8.6.314 The 2031 Alternative Fleet Mix Scenario is forecast to result in negligible changes in noise of up to 0.2 dB compared to the DC Scenario, with negligible increases at some locations and negligible decreases at other locations.

8.6.315 The population counts within key weekend daytime air noise contours for the 2031 DC, 2029 Faster Growth and 2033 Slower Growth Scenarios are presented in Table 8-107. The weekend contours for the 2031 Alternative Fleet Mix Scenario are shown in Figure 8.3.107 in Appendix 8.3.

Table 8-107: Air Noise Population Counts, $L_{Aeq,16h}$ Average Mode Summer Weekend Day

Contour, dB $L_{Aeq,16h}$	Number of People including Permitted Developments	
	2031 DC	2031 Alternative Fleet Mix
51 (LOAEL)	199,950	205,100
63 (SOAEL)	3,400	3,300

8.6.316 The number of people forecast to be exposed to noise levels above the LOAEL is slightly higher for the Alternative Fleet Mix Scenario compared the DC Scenario. The number of people forecast to be exposed to noise levels above the SOAEL is slightly lower for the Alternative Fleet Mix Scenario compared to the DC Scenario. Overall, the number of people forecast to be exposed to weekend noise levels above the LOAEL and above the SOAEL are broadly similar for the two scenarios.

8.6.317 The predicted weekend noise levels at the key receptors under the 2031 Alternative Fleet Mix Scenario are very similar to and in some cases the same as those forecast for the 2031 DC Scenario. The number of people forecast to be exposed to weekend noise levels above the LOAEL and above the SOAEL are broadly similar for the two scenarios, with slightly more people exposed to noise levels above the LOAEL for the Alternative Fleet Mix Scenario, but slightly fewer people exposed to noise levels above the SAOEL. Therefore, in the event that the A220-300 or other new generation aircraft with a similar noise performance that are not in the core DC forecast were to operate at the airport, no material change is expected in the weekend noise effects.

Ground Noise

8.6.318 Ground noise is primarily affected by the number of aircraft movements, no benefit has been assumed from the new generation aircraft, therefore the fleet mix has only a limited influence on the amount of noise. Therefore, the Alternative Fleet Mix Scenario is not expected to materially alter the ground noise effects associated with the core assessment.

Road Traffic Noise

8.6.319 A change in the specific aircraft types used, but with no overall change in the number of passengers at the weekend is not expected to have any effect on the 18 hour road traffic flows the road traffic noise assessment is based on. Therefore, the Alternative Fleet Mix Scenario is not expected to materially alter the road traffic noise effects associated with the core assessment.

Construction Noise

8.6.320 The A220-300 uses the same stands as the other new generation aircraft. Use of this aircraft type is therefore not expected to have any effect on the construction programme. Therefore, the Alternative Fleet Mix Scenario is not expected to materially alter the construction noise effects associated with the core assessment.

'No Build' Sensitivity Test

8.6.321 It is considered unlikely, but it is possible that the remaining elements of CADP1 would not be built out for the foreseeable future for the DM Scenario. If this were the case, there would inherently be no construction noise effects associated with the DM Scenario. As no meaningful construction activity is expected to occur prior to 2031 for the DM Scenario, whether or not CADP1 is eventually built will not affect the other noise assessment topics, namely air noise, ground noise and road traffic noise, which have been assessed in 2025, 2027 and 2031.

8.7 Further Mitigation and Monitoring

8.7.1 This assessment has shown that there are no new or materially different significant operational noise effects due to the proposed development, from those identified previously in the 2015 UES. Therefore, no further mitigation is required to reduce the noise beyond that introduced as part of the CADP1 permission and outlined in Section 8.5 above. Nevertheless, LCY are proposing to enhance the SIS as part of the proposed development. after reviewing the SIS schemes to ensure that they offer appropriate compensation to those potentially affected (as required by the Aviation Policy Framework).

Improved Noise Insultation Scheme

8.7.2 The current scheme and proposed scheme are summarised in Table 8-108, along with estimates of the cost of the proposed scheme per dwelling based on the airport's experience of properties treated to date. This is subject to the eligibility criteria which apply under the scheme. Further details are given below.

Table 8-108: Current and Proposed Air Noise SIS

Tier (Previous Name)	Current SIS	Proposed SIS	Budgeted Cost per Property of Proposed SIS
Low (Tier 1)	Dwellings within the 57 dB $L_{Aeq,16h}$ daytime contour Full cost of mechanical vents for all dwellings and full cost of secondary or standard double glazing where only single glazing is fitted.	Dwellings within the 57 dB $L_{Aeq,16h}$ daytime contour Full cost of mechanical vents for all dwellings and full cost of secondary or standard double glazing where only single glazing is fitted.	£5,000
Middle (Intermediate Tier)	Dwellings within the 63 dB $L_{Aeq,16h}$ daytime contour Full cost of secondary glazing and mechanical vents or a grant or £3,400 towards high acoustic performance double glazing.	Dwellings within the 63 dB $L_{Aeq,16h}$ daytime or 60 dB $L_{Aeq,16h}$ weekend contours. Daytime threshold to reduce to 60 dB $L_{Aeq,16h}$ by 2031. Full cost of secondary glazing and mechanical vents or a contribution towards high acoustic performance double glazing based on the cost of fitting secondary glazing to the specific property.	£8,000
High (Tier 2)	Dwellings within the 66 dB $L_{Aeq,16h}$ daytime contour Full cost of high acoustic performance double glazing and mechanical vents.	Dwellings within the 66 dB $L_{Aeq,16h}$ daytime or 55 dB $L_{Aeq,8h}$ night-time contours Full cost of high acoustic performance double glazing and mechanical vents.	£10,000

Low Tier

8.7.3 The Low Tier was previously called Tier 1. No changes are proposed to the eligibility or works offered under the Low Tier of the sound insulation scheme. It will continue to offer the full cost of mechanical vents to all dwellings within the 57 dB $L_{Aeq,16h}$ summer daytime noise contour and provide secondary or standard double glazing where only single glazing is currently fitted, with installation managed by the airport and carried out by its contractors. Based on properties treated to date the airport have budgeted for a cost of £5,000 per property. However, if the costs for a property are higher, the airport will pay the extra so there will be no cost to residents.

Middle Tier

8.7.4 The Middle Tier was previously called the Intermediate Tier. The Middle Tier currently offers a £3,400[37] grant towards high acoustic performance double glazing and mechanical vents, with residents required to manage the works and appoint a contractor themselves. Alternatively, the airport will manage and install secondary glazing and mechanical vents.

8.7.5 The airport proposes to continue to offer the full cost of secondary glazing and mechanical vents, with installation managed by the airport and carried out by its contractors. Based on properties treated to date the airport have budgeted for a cost of £8,000 per property. However, if the costs for a property are higher, the airport will pay the extra so there is no cost to residents.

8.7.6 It is acknowledged that although the sound reduction of secondary glazing is generally at least as good as high acoustic performance double glazing, secondary glazing can be unpopular with residents due to aesthetics. Therefore, as an alternative the airport will offer a contribution equal to the cost of installing secondary glazing and mechanical vents at their property, with residents paying the difference between the cost of secondary glazing and high performance double glazing. The airport would manage and install the high acoustic performance double glazing and mechanical vents, as they do for the existing high tier. This replaces the existing fixed cash grant.

8.7.7 This is expected to help increase take-up of the scheme, particularly in properties where the cost of access is high, as the cost of scaffolding can use much of the existing cash grant. The proposed scheme would

[37] Inflation linked, originally the grant was £3,000, currently around £3,400.

generally cover the costs of access, as the contribution is linked to the costs specific to each property. In addition, the airport have sought to make it easier for residents to access the scheme by managing and installing the works themselves, rather than requiring the residents to source and appoint their own contractor.

8.7.8 In addition to the enhancement of the works offered as part of the Middle Tier, the airport are also proposing to extend the eligibility for the scheme. The existing scheme offers works to dwellings within the 63 dB $L_{Aeq,16h}$ summer daytime noise contour. From commencement the airport proposes to expand the eligibility threshold for the Middle Tier works to any dwellings within the 60 dB $L_{Aeq,16h}$ summer weekend daytime contour. In addition, the airport proposes to phase in an extension of the summer daytime threshold down to 60 dB $L_{Aeq,16h}$. The eligibility threshold would be set at 62 dB $L_{Aeq,16h}$ from 2027[38], 61 dB $L_{Aeq,16h}$ from 2029[39] and 60 dB $L_{Aeq,16h}$ from 2031[40].

High Tier

8.7.9 The High Tier was previously called Tier 2. No changes are proposed to the works offered under the High Tier of the sound insulation scheme. It will continue to offer the full cost of high acoustic performance double glazing and mechanical vents to all dwellings within the 66 dB $L_{Aeq,16h}$ summer daytime noise contour, with installation managed by the airport and carried out by its contractors. Based on properties treated to date the airport have budgeted for a cost of £10,000 per property. However, if the costs for a property are higher, the airport will pay the extra so there will be no cost to residents.

8.7.10 The airport is proposing to create an additional eligibility criterion for the High Tier based on the 55 dB $L_{Aeq,8h}$ summer night-time contour. This would apply from the implementation of the proposed amendments.

8.7.11 This will ensure that everyone exposed to air noise above the SOAEL in the daytime, night-time or weekend is eligible for sound insulation works from commencement.

Construction Sound Insulation Scheme

8.7.12 The airport operated a CSIS in accordance with Condition 89 of the existing CADP1 permission. This provided the same works as are provided under the High Tier of the air noise scheme to any dwelling exposed to construction noise from the airport in excess of 55 dB $L_{Aeq,15m}$ at night.

8.7.13 The small number of dwellings forecast to experience a construction noise level of this magnitude due to the construction of the remaining elements of CADP1 have all already been treated or offered treatment by CSIS. In the event of any other dwellings being forecast to experience this level of noise in the future, they would be eligible for the same sound insulation treatment as that offered by the CSIS.

Contour Area Limit

8.7.14 The airport has a limit on the area of its 57 dB $L_{Aeq,16h}$ summer daytime contour of 9.1 km^2. All of the forecast contours comply with this limit. The airport is also required to submit a Contour Reduction Strategy showing the methods they will use to reduce the area of the noise contour by 2030 and every 5 years after that. No change to these arrangements are proposed.

QC Limit

8.7.15 The ANCS QC system has an annual limit of 22,000 per calendar year. The actual QC is based on the noise certificates of the individual operating aircraft and as such cannot be precisely calculated for a forecast. However, estimates have been made based on the aircraft types in the forecasts. All of the estimated QC

[38] Three years from commencement

[39] Five years from commencement

[40] Seven years from commencement

forecasts are within the existing limit of 22,000. The QC limit is reviewed regularly with LBN and can be adjusted as necessary. No change to these arrangements are proposed.

8.8 Residual Effects and Conclusions

8.8.1 Table 8-109 summarises the overall residual noise effects arising from the proposed development for each of the four sources of noise assessed for the principal assessment year of 2031. The effects from each of these noise sources is then discussed in more detail below.

Table 8-109: Summary of Residual Environmental Effects

Noise Source	Period	Overall Effect Rating	Significant/Not Significant
Air Noise	Daytime	Negligible	Not Significant
	Night-time	Negligible to Minor Adverse	Not Significant
	Weekend	Negligible	Not Significant
Ground Noise	Daytime	Negligible	Not Significant
	Night-time	Negligible to Minor Adverse	Not Significant
	Weekend	Negligible to Minor Adverse	Not Significant
Road Traffic Noise	Daytime[41]	Negligible	Not Significant
	Weekend	Negligible	Not Significant
Construction Noise	Daytime	Negligible	Not Significant
	Night-time	Negligible to Minor Adverse	Not Significant

Air Noise

8.8.2 The proposed amendments will allow a greater number of passengers at London City Airport compared to the Do Minimum scenario (approximately 2.5 mppa). The Development Case scenario will also result in more movements compared to the Do Minimum scenario, although still within the airport's existing cap of 111,000 per year. The proposed amendments also include an increase in the number of permitted flights in the early morning period (06:30-06:59). The proposed amendments include an extension of the airport's operating hours on Saturday and increases in the number of permitted movements at the weekend.

8.8.3 The area of the 57 dB contour is forecast to reduce compared to 2019 and be around 20% less than the current contour area limit by 2031 under the DC Scenario. The number of people exposed to significant levels of aircraft air noise during the daytime period will generally reduce by 2031 compared to 2019. This is primarily due to the change in aircraft utilising the airport, with more of the cleaner, quieter, new generation aircraft introduced over time. Overall, the number of people forecast to be exposed to daytime air noise is in line with that predicted in the CADP1 2015 UES.

8.8.4 Due to the incentives of longer overall operating hours and greater flexibility, the airlines are forecast to re-fleet sooner in the Development Case scenario, resulting in daytime air noise being less in 2027 than for the Do Minimum scenario. By 2031 the airlines are expected to have also commenced re-fleeting in the Do Minimum scenario, therefore daytime air noise is greater for the Development Case scenario, as there are more movements in this scenario. Comparing the Development Case and Do Minimum scenarios all changes in daytime air noise are forecast be **Negligible** (less than 2 dB).

[41] The daytime road traffic noise assessment covers the airport's entire operational period as so includes night-time noise associated with the airport.

8.8.5 The number of people exposed to air noise during the night (06:30-06:59) will increase compared to now and will be slightly more for the Development Case scenario compared to the Do Minimum scenario. This is due to the proposed increase in the cap on aircraft movements in this period.

8.8.6 Nobody is forecast to experience a significant increase in night-time air noise levels between the Do Minimum scenario and the Development Case scenario, with the vast majority of people forecast to experience a negligible increase of less than 2 dB. Night-time noise levels are forecast to remain low, with just 70 people forecast to be exposed to a significant night-time noise level. A new night-time eligibility criterion for the sound insulation scheme will ensure that everyone exposed to significant levels of night-time noise will have or be offered the highest level of noise insulation. No changes are proposed to the daily 8 hour night-time respite period (22:30-06:30), with no flights allowed in this period.

8.8.7 The number of people exposed to air noise during the weekend in 2031 will remain similar to 2019, as the greater use of quieter new generation aircraft by 2031 will offset the increase in weekend movements. The number of people exposed to air noise during the weekend will be more for the Development Case scenario compared to the Do Minimum scenario. This is due to the proposed extension to the airport's operating hours on Saturdays into the early evening and the resulting increase in weekend movements. Comparing the Development Case and Do Minimum scenarios all changes in weekend air noise are forecast be **Negligible** (less than 2 dB).

8.8.8 A new weekend eligibility criterion for the sound insulation scheme will ensure that everyone exposed to significant levels of weekend noise will have or be offered a high level of noise insulation. The existing Middle Tier of the sound insulation scheme will also be enhanced in terms of what is offered, with everyone offered the full cost of secondary glazing and mechanical vents or an equivalent contribution towards high acoustic performance double glazing.

8.8.9 Overall, the proposed amendments are not forecast to result in significant adverse effects for any of the residents around the airport. The proposed amendments are expected to result in a faster transition to quieter, new generation aircraft. This will result in earlier reductions in daytime aircraft noise for local residents than would occur without the proposed amendments. The existing comprehensive sound insulation scheme will be further enhanced, with new eligibility criteria and an improved offer for those eligible for the middle tier of the scheme.

Ground Noise

8.8.10 Compared to 2019 there is forecast to be a change in the distribution of ground noise around the area and therefore the change in the population that will be exposed to ground noise, resulting in increased ground noise levels for some and decreases for others. This is partly due to the greater use of new generation aircraft in the future. These aircraft will use the eastern apron stands more and the main and western apron stands less, leading to a shift in noise to the east. For the Development Case scenario, the remaining elements of CADP1 will have been built, which includes additional buildings. These buildings will result in reductions in ground noise for some residents to the south of the airport due to the additional screening they will provide.

8.8.11 The ground noise effects for the Development Case scenario are generally greater than for the Do Minimum scenario. The number of dwellings adversely affected by daytime, night-time and weekend noise is higher for the Development Case scenario. However, most local dwellings are exposed to daytime, night-time and weekend ground noise below the LOAEL. Very few receptors are exposed to daytime or weekend ground noise levels above the SOAEL and no receptors in the night-time (06:30-06:59).

8.8.12 A small proportion of dwellings are forecast to experience potentially significant moderate increases in daytime, night-time and weekend ground noise. Most of these are student rooms in the UEL accommodation blocks. These blocks have a very good standard of sound insulation and were specifically designed to deal with noise from the airport. All of the dwellings exposed to potentially significant moderate increases in ground noise are within the airport's air noise sound insulation schemes or the construction sound insulation scheme and are

therefore eligible for or already treated by these schemes or were already designed with a good standard of sound insulation. These increase in ground noise are therefore not forecast to result in significant effects.

8.8.13 Overall, based on the proportion of dwellings forecast to be exposed to ground noise levels above the SOAEL, the noise effects of CADP1 with the proposed amendments are similar to or slightly less than the effects predicted for CADP1 in the 2015 UES.

Road traffic Noise

8.8.14 The proposed amendments are not forecast to result in any significant changes in road traffic noise levels around the airport. Comparing the Development Case and Do Minimum scenarios finds that all of the road traffic noise effects are negligible for the daytime and the weekend. Weekend noise levels were lower than the overall daytime noise levels in 2019 and this is forecast to remain the case in the future for both scenarios.

8.8.15 The area around Woodman Street is forecast to experience a significant increase in noise compared to 2019 due to the opening up of the eastern end of the airport access road. This would occur with or without the proposed amendments and the effects are in line with those presented in the CADP1 UES. Properties in this area are eligible for the airport's air noise sound insulation schemes and therefore will have (or have been offered) insulation or will have been required to be built with enhanced noise insulation by planning condition.

Construction Noise

8.8.16 The construction noise daytime assessment has been carried out using predictions at a number of key locations. The construction of the remaining elements of CADP1 are not predicted to give rise to significant levels of daytime noise at any receptor. Overall, the daytime noise effects are rated as negligible. The daytime noise effects are the same as those forecast for the later years of CADP1 in the 2015 UES.

8.8.17 A detailed assessment of Out of Operation Hours construction noise has been undertaken considering dwellings around the airport. This assessment was carried out on a worst case basis, assuming all OOOH works would take place at night. A small number of dwellings are forecast to experience significant levels of night-time noise however these have all already been treated or offered treatment by the airport's construction sound insulation scheme. Overall, the construction of the remaining elements of CADP1 are predicted to result in a negligible to minor adverse effect Out of Operational Hours.

8.8.18 Overall, the number of dwellings forecast to be exposed to significant levels of construction noise Out of Operational Hours is lower than that predicted in the 2015 UES. The OOOH effects of the construction of the remaining elements of CADP1 are therefore less than those forecast in the 2015 UES.

8.9 Assessment of Cumulative Effects

8.9.1 The assessment of the effects of noise considers each type of source in isolation, such as aircraft air and ground noise, road traffic and construction noise, rather than in combination. The reason for this is that the primary research undertaken into community response and noise considers each noise source separately, not in combination. A summary of the results of the assessment of noise from various sources is provided in Section 8.8.

Heathrow Airport

8.9.2 Some of the areas overflown by flights from LCY are also overflown by some Heathrow Airport flights. These are mainly arriving aircraft which come into the area before turning west to land on one of Heathrow's runways. Due to the variation in the directions these aircraft approach from, and the different points where they complete their turn to the west, these aircraft are spread over a wide area. They are also at greater heights than LCY flights. Consequently, the noise from Heathrow Airport, while covering a wide area is not very concentrated.

8.9.3 The focus of the noise assessment is to determine if there will be significant effects from proposed amendments. It is therefore concentrated on the area which is exposed to the highest noise levels from LCY. For air noise this has been defined as the area above the LOAEL. In this area, and even more so in the area above the SOAEL, the overall air noise is dominated by the activity from LCY and allowing for Heathrow Airport flights would not affect the assessment.

8.9.4 For areas further from LCY, while the additional noise from Heathrow Airport may increase the overall level of noise, it will if anything reduce any change in the noise due to the proposed amendments, as the amendments will have no effect on the noise from Heathrow Airport. The noise from Heathrow Airport would therefore not lead to any findings of greater effects.

In-Combination Climate Change Impacts

8.9.5 This section provides an assessment of potential changes to the findings of the noise assessment, taking into account the predicted future conditions as a result of climate change, known as In combination Climate Change Impacts (ICCI). In combination and cumulative effects are reported in Chapter 14 Cumulative Effects.

8.9.6 This assessment has been undertaken using the methodology and climate change predictions described in Chapter 11:Climate Change. In doing so it is noted that the predicted future conditions as a results of climate change are the same for both the DM and DC Scenarios. The results are provided in Table 8-110.

Table 8-110: Noise In-Combination Climate Change Impacts

Climate Hazard	Likely ICCI	Consequence of ICCIs Considering Embedded Environmental Measures/Good Practice	Significance of ICCI Effects
Increase occurrence of heatwaves	Potential to exacerbate noise effects on communities in terms of individual dwellings and on a wider community, due to windows being open more often due to an increase in high temperatures.	The noise assessment criteria do not rely on a specific assumption on how often windows are open. The airport's sound insulation schemes offer treatment to everyone exposed to significant levels of noise. All the schemes include the full cost of fitting mechanical ventilators. These allow residents to achieve ventilation while keeping their windows closed. Consequently, no further impact on noise effects arising from the ICCI is expected.	Negligible Not significant
Increase in mean temperature and humidity	Increases in temperature and humidity of the air altering the atmospheric attenuation of noise.	Over distances of a few hundred metres, atmospheric effects can be ignored for sound with low frequency prominence, such as aircraft noise. Consequently, increases in temperature and humidity is unlikely to affect ground-based noise sources such as ground noise, construction noise and surface access noise. Due to the longer distances that aircraft noise travels, the effect of increases in temperature and humidity can affect aircraft noise levels. However, the change in atmospheric absorption will only have a significant effect on high frequencies. Given the prominence of low frequencies in aircraft noise, it would take a substantial change in climate to result in a perceptible change in air noise. Consequently, it is expected that any changes in noise will not result in additional impacts.	Negligible Not significant