Statutory Consultation 2022

# Preliminary Environmental Information Report

Volume 3: Appendix 16.2

**Draft Operational Noise Management Plan**

# Contents



## Tables



## Insets

# 1 INTRODUCTION

## 1.1 Background

1.1.1 Luton Rising (a trading name for London Luton Airport Limited (the Applicant)) is proposing to expand London Luton Airport (the airport) by submitting an application for a Development Consent Order (DCO) for works that will allow the airport to grow to accommodate 32 million passengers per annum (mppa). A current planning permission for works at the airport, called Project Curium (LBC ref: 12/01400/FUL), limits passenger throughput to 18 mppa.

1.1.2 London Luton Airport Operations Ltd (LLAOL) have direct control over the operation of the airport under a concession agreement with the Applicant. This agreement is currently in place until 2031. Therefore, the management of noise associated with operating the airport is under the direct control of LLAOL.

1.1.3 This document is the Draft Operational Noise Management Plan (ONMP) that the airport operator would implement following consent of the DCO. The draft plan supplements the Preliminary Environmental Information Report (PEIR) for consultation. It sets out the long-term goals for noise management during the lifespan of the Proposed Development.

# 2 LUTON AIRPORT NOISE ACTION PLAN

2.1.1 LLAOL provide a Noise Action Plan (NAP), which is updated every five years in line with requirements set out in the Environmental Noise (England) Regulations 2006 (Ref. 1). The NAP responds to paragraph 2.69 of the Consultation Response on UK Airspace Policy, which states an objective is to:

*"…limit and, where possible, reduce the number of people in the UK significantly affected by the adverse impacts from aircraft noise".*

2.1.2 The current NAP applies to the period from 2019 to 2023 (Ref. 2) and sets out five main work areas to manage aircraft noise associated with the airport, as reproduced in **Table 2.1**.

Table 2.1: NAP Main Work Areas

| Approach | Description |
|---|---|
| Operational Procedures | We will constantly review our operating procedures to ensure the most environmentally friendly procedures are in place, as part of this we will challenge best practice to provide continuous improvement. If more fundamental changes to airspace are required, we will proactively engage with stakeholders, in line with CAP 1616, to effectively manage aircraft noise impacts. |
| Quieter Aircraft | Modern aircraft of today are less noisy than previous generations, however as traffic continues to grow where demand for air travel increases, this reduction can often be counteracted by the number of aircraft overflying an area. At the airport we are encouraging operators to use the quietest |

| | |
|---|---|
| | aircraft practicable to the Luton operation, particularly during early morning and night time periods. |
| Land-use Planning and Mitigation | Through communication with local planning authorities we will continue to discourage developments near the airport which would give rise to the number of people significantly affected by noise. Furthermore, we will proactively review the Noise Insulation Scheme to ensure that it remains an effective means of noise mitigation. |
| Operational Restrictions | Restrictions should not be the first option when it comes to noise management however, we have a range of operating restrictions including movement limits and noise quota limits. Where restrictions are in place, we are focused on ensuring that they are adhered to fully. |
| Working with the local community and industry partners | In order to reduce the impact of noise we recognise the importance of working with our communities and industry partners to understand any concerns and take action where possible, keeping communities up to date. |

# 3 NOISE MANAGEMENT MEASURES

## 3.1 ICAO Balanced Approach

3.1.1 Aircraft noise management is subject to the concept of a 'Balanced Approach' (ICAO Resolution A33/7 (Ref. 3). This is given legal effect in the UK through Regulation (EU) 598/2014 (Ref. 4). The Balanced Approach explores various measures to control noise at airports through consideration of four principal elements:

a. reduction of noise at source;
b. land use planning and noise management;
c. noise abatement and operational procedures; and
d. operating restrictions.

3.1.2 Although there is no hierarchy of measures to the Balanced Approach, the Airports (Noise-related Operating Restrictions) (England and Wales) Regulations 2018 (Ref 5) seeks to ensure that 'noise related operating restrictions' are only imposed:

a. when other measures within the Balanced Approach have first been considered; and
b. where those other measures are not in themselves sufficient to attain the specific noise abatement objectives for the airport.

3.1.3 If a noise based operating restriction is considered necessary, it can only be imposed after the cost effectiveness of the restriction has been considered and if the measures together are *no more than is necessary* to achieve the environmental noise abatement objectives set for the airport.

3.1.4 Regulation 598 reflects the fundamental requirement of the ICAO Balanced Approach is that, when determining the most appropriate combination of noise mitigation measures for a given airport, operating restrictions should only be introduced after consideration of the other three elements of the Balanced Approach.

3.1.5 The mitigation measures set up in this ONMP have been defined with reference to the ICAO Balanced Approach. Additionally, noise control measures that will be defined in the Noise Envelope are set out in this document.

## 3.2 Reduction of Noise at Source

3.2.1 Reduction of aircraft noise at source relates to improvements in aircraft technology to reduce aircraft noise. Noise emissions from aircraft have been controlled since the 1970s through aircraft noise limits out in Annex 16 of the Convention on International Civil Aviation. The first noise certification standard was set out in Chapter 2 of Annex 16, Volume 1 and was introduced in 1972. Noise limits were defined as a direct function of Maximum Take-off Mass in order to recognise that heavier aeroplanes produce more noise than lighter aeroplane types.

3.2.2 Following the introduction of Chapter 2, higher bypass ratio jet engines were introduced into service that resulted in reductions in aircraft noise. Consequently, the Chapter 2 aircraft standard was added to through the introduction of Chapter 3 in 1978, which reduced noise certification limits set out in Chapter 2.

3.2.3 In 2006, the ICAO Chapter 4 noise certification standards were introduced, which ensured that the latest available technology is incorporated into new aircraft designs. The Chapter 4 standard has since been superseded by the new Chapter 14 noise standard for jet and propeller-driven aeroplanes. It is applicable to new aeroplane types submitted for certification on or after 31 December 2017, and on or after 31 December 2020 for aircraft less than 55 tonnes in mass.

3.2.4 In 2002, Chapter 2 aircraft were outlawed from the EU, so only Chapter 3, Chapter 4 and Chapter 14 aircraft are currently operational.

3.2.5 Introducing new aircraft types into service is a cyclical process that can be fraught with delays, as has been seen recently with the introduction of both Airbus and Boeing's new models. A standard fleet life lasts between 10 and 25 years, with low-cost airlines operating at the airport typically replacing their aircraft after approximately 14 to 15 years. Consequently, the switch from older types to the latest aircraft can be expected throughout the lifespan of the Proposed Development.

3.2.6 The objectives for fleet modernisation at the airport are as follows:

a. 100% of aircraft will be Chapter 4 or equivalent by 2022; and
b. At least 95% aircraft will be Chapter 14 or equivalent by 2035.

## 3.3 Land use Planning and Noise Management

### Noise Metrics

3.3.1 The $L_{Aeq,16h}$ noise metric was adopted by the UK Government in 1990 and is used in the UK to describe the average daytime noise levels of aircraft. The metric was adopted as the UK Aircraft Noise Index Study (Ref. 6) found it correlated well with community annoyance.

3.3.2 The assessment criteria for aviation noise was expanded on during the appraisal for increasing UK airport capacity in the Appraisal Framework Consultation (Ref. 7) document. The document recommends the use of both the $L_{Aeq,16h}$ and $L_{night}$ for assessing aircraft noise impacts. In the Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace (October 2017) (Ref. 8), the $L_{night}$ is recommended to be written as $L_{Aeq,8h}$ so it is consistent with the daytime noise metric.

3.3.3 In 2002 the European Commission published Directive 2002/49/EC, which established the $L_{den}$ as a common environmental noise indicator for the European Union. The $L_{den}$ is the logarithmic average of the day, evening and night sound levels, weighted for the sensitivity of the different time periods.

3.3.4 The $L_{Aeq,16h}$, $L_{Aeq,8h}$ (both for summer average movements) and $L_{den}$ (for annual average movements) noise metrics are used to illustrate aircraft noise at the airport in LLAOL's Annual Monitoring Reports. As these noise metrics represent the average continuous noise level over defined periods, they are not consistent with people's perception of aircraft noise as a number of discrete, noticeable events.

3.3.5 Air Navigation Guidance (Ref. 9) identifies the Number Above noise metric to provide greater context to air noise contours through providing information on the number of events exceeding a defined noise level. The N65 (for daytime) and the N60 (for night-time) describe the number of aircraft generating noise above 65 dB $L_{ASmax}$ and 60 dB $L_{ASmax}$.

3.3.6 The N65 and N60 metrics will be presented in the Environmental Statement and considered for inclusion in future operational reporting.

3.3.7 The Future Airspace Strategy and Sustainable Aviation have sponsored the Civil Aviation Authority (CAA) who will be supported by the National Air Traffic Services (NATS) to develop a new Low Noise Arrival Metric. LLAOL will monitor any published results and explore the possibility of adopting the Low Noise Arrival Metric to better define aircraft arrival noise.

### Land Use Planning

3.3.8 The relationship between land use around an airport and airport noise is a significant factor in the development of land around an airport. Development of residential housing and community facilities such as schools, hospitals and places of worship should only be undertaken with due consideration of the potential for aircraft noise impacts.

3.3.9 The objective of compatible land-use planning is to ensure that noise sensitive developments mentioned above are located away from the airport and to encourage non-noise sensitive development (such as industrial and commercial use) to locate around the airport. PPGN makes reference to Professional Practice Guidance: Planning and Noise (ProPG) (Ref. 10), which provides planning guidance for the consideration of new residential development that will be exposed predominantly to airborne noise from transport sources. Additionally, ProPG provides guidance for land use planning for residential developments around airports.

3.3.10 Guidance on defining land use planning zones is contained in ICAO Doc 9184 (Ref. 11). The manual provides guidance on the use of various tools for the minimisation, control or prevention of the impact of aircraft noise in the vicinity of airports and describes the practices adopted for land-use planning and management. The document recommends that a minimum of two zones, presented in **Table 3.1**, are established for the purpose of land-use planning with regard to aircraft noise in the vicinity of the airport. Outside the noise zones, restrictions to development are not generally required.

Table 3.1: Land Use Planning Zones

| Zone | Noise exposure level | Restrictions |
|---|---|---|
| A | High | Noise sensitive land uses should be restricted, and most developments are not permitted |
| B | Moderate | There may be some need to restrict land uses and developments |

3.3.11 The Applicant will enter discussion with relevant Local Authorities to explore the possibility of introducing land use planning zones into their Local Plans by 2025. Land use planning zones would be updated annually by LLAOL to aid Local Authorities in restricting new noise sensitive development in areas of High and Moderate noise exposure.

## Noise Related Landing Charges

3.3.12 LLAOL currently operate landing fees for aircraft. The charges per tonne, based on the authorised maximum take-off weight (MTOW) for Chapter 3 aircraft and above are:

a. Base Charge £150.58 per landing plus £2.24 per tonne.
b. Minimum £340.98 per landing.

3.3.13 Aircraft below Chapter 3 are subject to a 200% surcharge.

3.3.14 Aircraft operating at night (23:00 and 06:59 Local Time) are charged per landing or departure based on aircraft MTOW as follows:

a. Base £121.14 per movement plus £2.24 per tonne for each landing or take-off.
b. Minimum £311.54 per movement.

3.3.15 Landing charges are reviewed annually to encourage the use of quieter aircraft.

## Noise Fining System

3.3.16 Noise-related fines are put into the Community Trust Fund, which provides grants to community groups and charities in Bedfordshire, Hertfordshire and Buckinghamshire.

### *Noise Violation Limits*

3.3.17 A system of fines is in place to penalise aircraft operators that do not adhere to noise abatement procedures and/or noise limits set by the airport operator. Noise levels of departing aircraft are monitored at 6.5km from start-of-roll point, which is the departure noise certification location defined by the ICAO, at three permanent noise monitoring locations covering easterly and westerly departures. Any aircraft departure exceeding the noise violation limits (NVL) at these monitors will be charged based on the charges set out in **Table 3.2**.

Table 3.2: Noise Limit Violation Fines

| Excess over Noise | Frequency | Fine per Event |
|---|---|---|
| For day flights the NVL will be set at 80 dB $L_{ASmax}$ 07:00 – 22:59 local time | | |
| Any event | | £1,000 |
| For night flights the NVL will be set at 79 dB $L_{ASmax}$ 23:00 – 06:59 local time | | |
| Any event | | £2,000 |

3.3.18 Noise violation limits and fines will be reviewed biennially.

### *Noise Preferential Routes*

3.3.19 Aircraft taking off normally generate more noise than landing, as such aircraft are required to follow specific paths called Noise Preferential Routes (NPRs) (see Section 3.4 for more details) unless otherwise directed by air traffic control. Aircraft flying outside the NPR below the release altitude may be subject to a penalty. Penalties for track violations are presented in **Table 3.3**. NPR violation penalties will be reviewed biennially.

Table 3.3: Track Violation Fines

| Occurrence Rate | Daytime 07:00 to 22:59 | Night-time 23:00 to 06:59 |
|---|---|---|
| Any event | £1,000 | £2,000 |

## Noise Complaint System

3.3.20 LLAOL investigates, logs and responds to all concerns relating to aircraft activity. General information is available on the London Luton Airport website and complaints can be submitted by telephone, email, or through the online Flight Tracking system (TraVis).

3.3.21 Details of the complaints response procedure are set out in LLAOL's Aircraft Noise Enquiries and Complaints Procedure (available on the London Luton Airport website). The noise complaints handling system is kept under continual review to ensure the local community receives timely feedback in relation to concerns raised.

## Noise Monitoring Plan

3.3.22 LLAOL has a noise monitoring scheme currently in place which is covered by three permanent noise monitors and seven temporary noise monitors that are moved around periodically according to a yearly schedule. The results of temporary noise monitoring are presented as community reports and the results from permanent noise monitoring stations are presented in the Annual Noise Monitoring Report, the most recent of which is for 2020 (available on the London Luton Airport website).

3.3.23 Data collected from noise monitoring stations allows:

a. identification of noise infringements and to subsequently impose penalties where relevant;
b. monitoring of track-keeping and work with operators to improve performance;
c. monitoring of noise in all local communities; and
d. investigation of complaints of disturbance and enquiries.

3.3.24 The CAA document CAP 1691 (Ref. 12) recommends that additional permanent noise monitors on departure routes located beyond 6.5 km from start-of-roll could be adopted. These monitors would help to provide a clearer picture of aircraft departure noise levels and could help to further incentivise airline performance, improve transparency and enhance community engagement. Additionally, the Noise Envelope Design Group (NEDG) (see **section 4**) has suggested that a monitor at 2.5 km from start-of-roll may be helpful to understand aircraft noise performance close to the airport.

3.3.25 LLAOL will explore the possibility of providing additional permanent noise monitoring stations along departure routes. LLAOL will decide whether the monitors should be subject to supplementary NVLs, advisory noise levels or whether monitors will be for informative purposes only.

3.3.26 The **Draft Green Controlled Growth** (GCG) document contains how monitoring will be undertaken to ensure compliance with the cap on the size of noise contours proposed in the Noise Envelope (see **section 4**). On commencement of GCG at the point where passenger throughput increases above the 18 mppa baseline, a Monitoring Plan would be produced by the airport operator detailing when, where, and how noise monitoring and reporting will take place.

## Compensation Scheme

3.3.27 The current noise insulation scheme offered by the airport covers properties within the 63 dB $L_{Aeq,16h}$ and 55 dB $L_{Aeq,8}$h noise contours. Consequently, all

properties identified as experiencing a likely significant noise effect due to the Proposed Development will be eligible for noise insulation and provision of noise insulation can help avoid significant effects. This demonstrates compliance with Paragraph 5.68 of the Airport National Policy Statement (ANPS) (Ref. 13) to avoid significant impacts on health and quality of life.

3.3.28 As part of the Proposed Development, the noise insulation scheme has been updated. The updated noise insulation scheme improves on the current scheme by adopting government proposals set out in Aviation 2050 that the noise insulation policy threshold extends from the 63 dB $L_{Aeq,16h}$ contour.

3.3.29 The proposed compensation scheme sets a four-tiered scheme starting at 54 dB $L_{Aeq,16h}$ as follows:

a. Scheme 1 – properties within the 63 dB $L_{Aeq,16h}$ contour will be offered a full package of sound insulation to habitable rooms;
b. Scheme 2 – properties within the 60 dB $L_{Aeq,16h}$ contour will be offered a contribution of up to £8,000 for agreed noise insulation works to be undertaken;
c. Scheme 3 – properties within the 57 dB $L_{Aeq,16h}$ contour will be offered a contribution of up to £5,000 for agreed noise insulation works to be undertaken; and
d. Scheme 4 – properties within the 54 dB $L_{Aeq,16h}$ contour will be offered a contribution of up to £3,500 for agreed noise insulation works to be undertaken.

3.3.30 Additional details on the proposed noise insulation scheme and a new discretionary property compensation scheme are presented in the **Draft Compensation Policies and Measures** document provided as part of statutory consultation.

## 3.4 Noise Abatement and Operational Procedures

3.4.1 The airport operates in either an easterly or westerly direction depending on the wind direction, as aircraft are required to take off and land into the wind for safety reasons. During westerly operations, aircraft will depart towards the west, most of the time Luton's wind comes from the west so this happens, on average, for 70% of the time. Easterly operations, when aircraft depart to the east, occur on average for 30% of the time.

3.4.2 The Flight Operations Committee (FLOPC) is made up of airline operators at the airport and discusses noise infringements, track keeping statistics, data from any ongoing trials and continuous descent approach compliance. The committee is focussed on improving operations at the airport, whilst ensuring this minimises noise at local communities.

## Departure Procedures

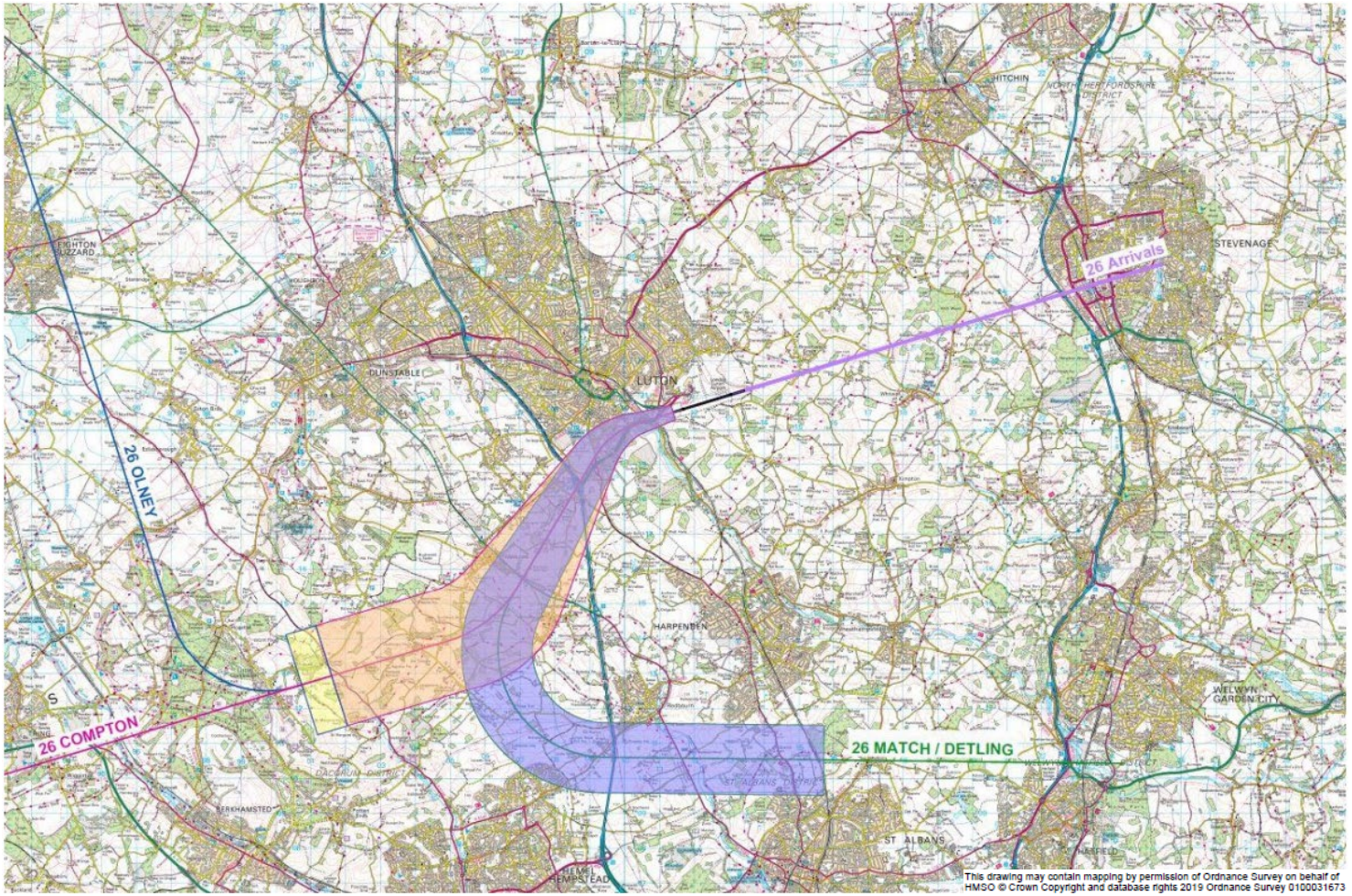
### *Noise Preferential Routes*

3.4.3 Aircraft taking off are required to follow NPRs, unless directed otherwise by air traffic control. The NPRs are the routes that departing aircraft are required to follow to join with the main UK airspace. Aircraft flying inside these corridors are considered to be flying on-track. The NPRs at Luton are designed to avoid the overflight of built-up areas where practicable. NPRs are presented in **Inset 1** for westerly departures and **Inset 2** for easterly departures.

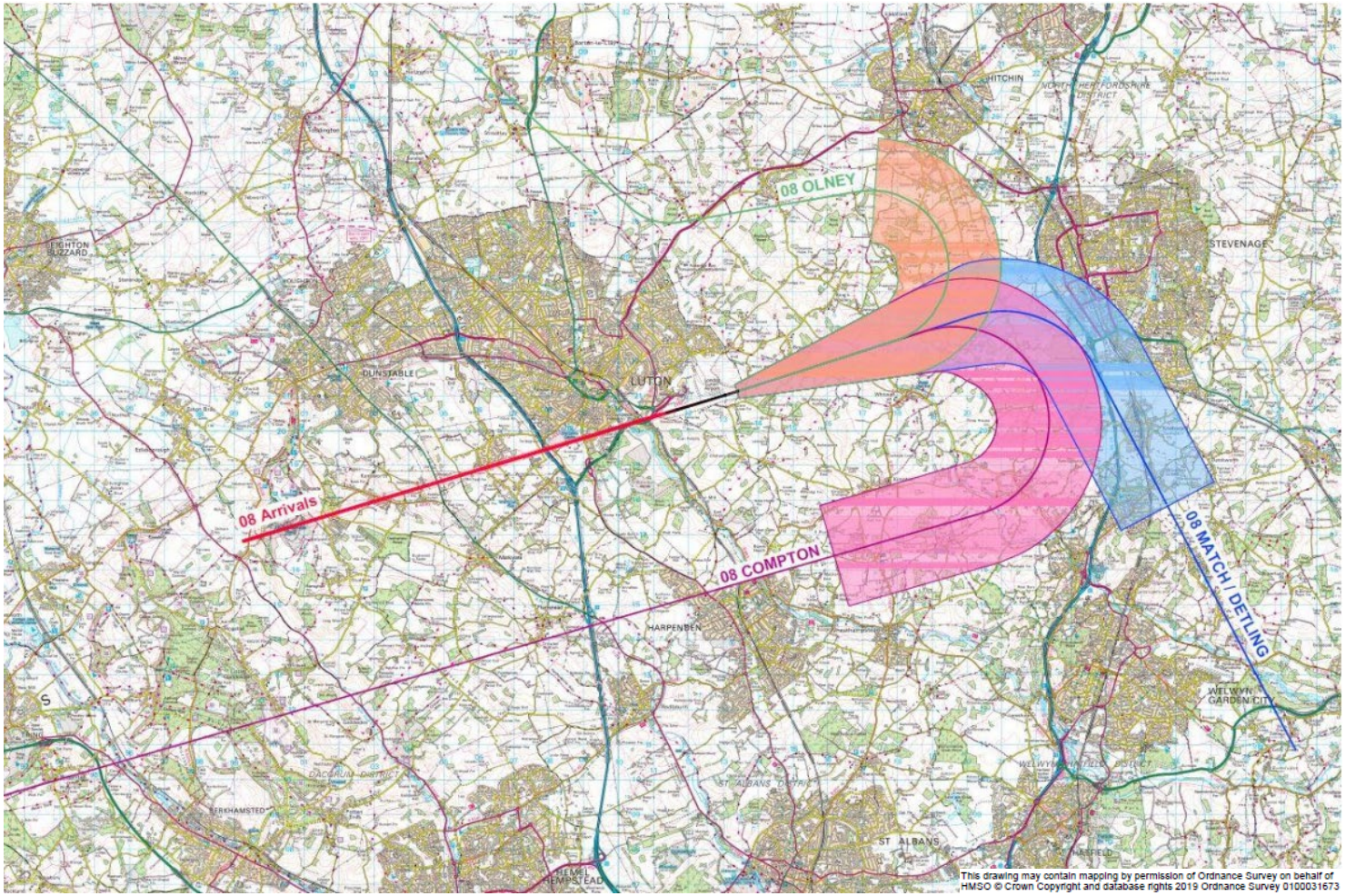
3.4.4 Each NPR is contained in a corridor extending 1.5 km either side of the NPR centre line. Departing aircraft must remain within the NPR until reaching a release altitude of 3,000 ft during the day or 4,000 ft at night. The exception to this is on the Area Navigation (RNAV) departure route (25 Match/Detling) where the corridor extends 1 km either side of the centreline and the release altitude is 4,000 ft for both day and night.

3.4.5 Once an aircraft reaches the NPR release altitude, a controller can vector it onto a more direct heading to its destination, which may take the aircraft outside the NPR corridor. There may be occasions where it is necessary for safety reasons (e.g. to avoid severe weather conditions) to vector aircraft off NPRs below the release altitude. This is standard air traffic management procedure followed by all airports in this country and other member states of ICAO.

# Inset 1: Westerly (25) Noise Preferential Routes



# Inset 2: Easterly (07) Noise Preferential Routes



### *Noise Abatement Departure Procedures*

3.4.6 Noise Abatement Departure Procedures (NADP) defined in PANS-OPS, Volume 1 (Ref. 14) covers two NADPs (NADP1 and NADP2) to mitigate noise. NADPs cover the area where an aircraft increases altitude from 800 ft to 3,000 ft. NADP1 is designed to mitigate noise close to the airport whereas NADP2 is designed to mitigate noise further from the airport.

3.4.7 For NADP1, the aim is to get aircraft as high as possible as quickly as possible so aircraft will climb at a steep departure angle between 800 and 3,000 ft. Whilst increasing take-off power increases the amount of noise being emitted by the engines, communities will benefit from aircraft getting as high as possible as quickly as possible.

3.4.8 For NADP2, the aim is to operate the aircraft as quietly as possible through operating at reduced thrust and climb rate. This procedure aims to be quieter overall over a longer distance. This procedure also has the benefit of being more fuel efficient.

3.4.9 There are no clear benefits from adopting either NADP1 or NADP2 as each procedure redistributes noise from one location to another. Consequently, the potential noise benefit on departure routes due to adoption of either/ or NADP1 or NADP2 will be explored by LLAOL and recommendations will be implemented by 2025.

### *Continuous Climb Operations*

3.4.10 A continuous climb to cruise altitude has always been the default practice for airlines and air traffic for aircraft departures. However, there are occasion when stepped climbs i.e. climbs with periods of level flight, are required to maintain safe separation between aircraft where there are crossing flows of air traffic. Continuous climb operations will be used whenever practicable to minimise thrust-generated noise from aircraft departures.

## Approach Procedures

### *Approach Routes*

3.4.11 While there are defined flight paths for departing aircraft, there are none for arriving until aircraft are established on the final approach. This is because there is less operational flexibility in landing a plane than there is in taking off as aircraft are required to line up with the runway from several miles away in order to carry out a stable approach on a predefined glide slope. This procedure ensures that aircraft safety is not jeopardised.

### *Deployment of Landing Gear*

3.4.12 Deployment of the landing gear significantly increases aircraft drag and airframe noise. Additionally, besides aerodynamic noise, the extra drag must be compensated by increasing the engine thrust so there is a corresponding increase in engine noise.

3.4.13 Deployment of landing gear will normally be initiated at around 2,000 ft above ground level (agl); however, it is possible to delay this procedure until around 1,500 ft agl or (approximately 5 nautical miles from the runway threshold) to ensure aircraft are fully stabilised by 1,000 ft agl in preparation for landing. Deployment is affected by weather conditions with high wind conditions requiring an earlier landing gear deployment to provide more time for aircraft to safely stabilise prior to 1,000 ft agl.

3.4.14 Implementation of optimal landing gear deployment has demonstrated noise benefits of between 2.7 dB and 3.4 dB for Stevenage, Dagnall and Whipsnade. LLAOL encourage airline operators to delay deployment of the landing gear if safety requirements allow to minimise noise generated on aircraft approaches.

3.4.15 As it is not possible for airports to monitor when aircraft deploy their landing gear, this measure cannot be enforced through implementation of a fining system. However, optimal deployment of landing gear does not just benefit reduced noise levels, but there are benefits to the airline operator through reduced levels of fuel burn due to additional thrust requirements when the landing gear is deployed.

3.4.16 Airplane operators are encouraged to delay landing gear deployment as much as safety restrictions permit. LLAOL will annually provide airline operators with information detailing the benefits of optimal deployment of landing gear.

### *Continuous Descent Approaches*

3.4.17 Conventional stepped aircraft approaches are typically adopted at airports with aircraft descending for periods before levelling off and waiting for permission from air traffic control to begin descending again. Application of increased engine thrust is required to level out the aircraft during descent. This use of increased levels of thrust while descending results in increase engine noise.

3.4.18 The optimum approach altitude profile takes the form of a continuously descending path, with level flight segments kept to a minimum and only used when it is strictly necessary. The continuous descent allows engine thrust levels to be kept at a low level with the benefit of reduced levels of engine noise and reduced fuel burn. To ensure that aircraft approach noise affecting receptors is minimised, continuous descent approaches will be used where practicable to minimise thrust-generated noise.

3.4.19 LLAOL encourage all operators to use a continuous descent approach and currently have a target of 95% compliance.

### *Steeper Approach Angle*

3.4.20 The international standard altitude approach profile has aircraft descending on a 3° glide slope. Major international airports such as Frankfurt and Heathrow Airports have successfully trialled a 3.2° glide slope. An increased glide slope reduces aircraft noise at the ground in two ways:

a. the height of aircraft over the ground is increased meaning noise has further to travel and is reduced at the ground; and

b. the aircrafts rate of descent is increased, which reduces the engine power required.

3.4.21 An increased glide slope may not be practicable at the airport due to the comparatively short runway length. Aircraft speed is likely to require increased flap setting to control the aircraft speed on approach thus, increasing aerodynamic noise. Additionally, the increased aircraft speed on approach would likely require increased levels of reverse thrust to safely stop aircraft. Consequently, an increased glide slope may not be possible to implement due to safety concerns and there may be no net noise benefit to increased flap settings and use of reverse thrust.

3.4.22 An alternative concept that would allow an increased approach glide slope is the two-segment approach. This approach incorporates an intermediate approach phase flown at a steeper angle, before transitioning to the standard glide slope on final approach. Adoption of segmented approach could potentially provide noise benefits further out during the approach phase, without affecting the final approach phase.

3.4.23 Although the runway length at the airport may prohibit the safe implementation of steeper approach slopes, an assessment has been undertaken on measures to increase the glide slope of approaching aircraft that can be adopted. The findings of this assessment will be reported by LLAOL in 2022.

### *Displaced Thresholds*

3.4.24 Aircraft noise can be mitigated through displacement of airport runway thresholds to a location further down the runway. Displaced runway thresholds have most commonly been employed to increase the clearance between approaching aircraft and obstacles but can be applied to reduce aircraft noise at the ground. Displacing runway thresholds allow aircraft to fly at higher altitudes as they pass over communities located near the airport. The benefit of this is the distance between aircraft and ground is increased thus lowering aircraft noise at sensitive receptors.

3.4.25 A displaced threshold will provide noise benefits to sensitive receptors affected by aircraft noise; however, there may be potential impacts on capacity and operational resilience. Consequently, use of displaced thresholds is likely to be most effective at night when there is less demand for runway use.

3.4.26 Due to the length of the runway, displaced thresholds are only likely to be practicable for small aircraft. Consequently, the possibility of adopting displaced thresholds for executive jet arrivals at night will be explored within the safety constraints of the runway length. Any recommendations will be implemented by 2025.

## 3.5 Operating Restrictions

### Night-time Operating Restrictions

3.5.1 A limit on aircraft movements during the night quota period from 23:30 to 06:00 is operated at the airport. The total number of permitted aircraft movements

during the night quota period over a continuous rolling 12-month period is 9,650. This limit will be continued in future to control aircraft noise at night.

# 4 NOISE ENVELOPE

4.1.1 Having regard to the ANPS, the Applicant is putting forward Noise Envelope proposals as part of the application for development consent. Consequently, the NEDG has been established to assist the Applicant in meeting the requirements set out in paragraph 5.60 of the ANPS, which are:

a. An envelope should be tailored to local priorities and include clear noise performance targets.

b. The design of the envelope should be defined in consultation with local communities and relevant stakeholders.

c. The benefits of future technological improvements should be shared between the applicant and its local communities, hence helping to achieve a balance between growth and noise reduction.

d. Suitable review periods should be set in consultation with the parties mentioned above to ensure the noise envelope's framework remains relevant.

4.1.2 The Noise Envelope will be secured as part of the DCO application through Green Controlled Growth (see the Draft Green Controlled Growth Proposals document) so will be a legally binding framework of limits and controls to manage aircraft noise. The **Draft Green Controlled Growth** document includes details on how the Noise Envelope will be enforced.

4.1.3 The Noise Envelope is being designed to protect communities whilst enabling the airport to operate efficiently and allow it to grow in accordance with the limits defined by the Noise Envelope. The Noise Envelope will provide certainty to the industry and communities about how noise will be managed to comply with government policy to contribute to improvements to health and quality of life.

4.1.4 The NEDG will have joint responsibility with the Applicant for ensuring that the Noise Envelope proposals submitted as part of the application for development consent:

a. include the principles and priorities on which the Noise Envelope is based;

b. include the enforceable limits or performance targets;

c. have a method for evaluating noise control measures;

d. have a mechanism for sharing the benefits of technological improvements between the community and the Applicant; and

e. have a review mechanism.

4.1.5 Membership of the NEDG includes the following:

a. Luton Rising DCO Programme Representative;

b. Luton Rising Noise Consultant;

c. Luton Rising Aviation Adviser;

d. A NATS representative;

e. An Independent Commission of Civil Aviation Noise (ICCAN) representative (now disbanded, the CAA will take on some ICCAN duties in April 2022 and will be invited to any future meetings);

f. A single representative (officer not elected member) from each of the four host authorities and Bedfordshire Borough Council, Hertfordshire and Buckinghamshire County Councils;

g. An easyJet representative to represent the commercial airline sector;

h. Single representation of the cargo operations;

i. Single representation of the fixed base operations;

j. A representative from the Chamber of Commerce to represent the commercial interests in the area local to the airport; and

k. Two representatives to represent the local interest groups (such as Luton and District Association for the Control of Aircraft Noise (LADACAN)).

4.1.6 The NEDG has met and discussed approaches to various forms of control to be included in their recommendations for a noise envelope. A summary of the noise control measures under consideration by the NEDG are presented in **Table 4.1**.

4.1.7 The noise control measures in **Table 4.1** are presented in the form of limit values which are not to be exceeded. Threshold values have been defined below each limit; if these values are exceeded, the airport operator would be required to put forward proposals as to how future growth and operations would be managed to avoid the limit values being exceeded. As separate of targets were also identified by the NEDG which were considered as appropriate management tools which the airport operator should use to manage operations and achieve compliance with thresholds and limits.

4.1.8 Review periods will be defined to ensure that the Noise Envelope remains relevant so any improvements in aircraft technology can be shared between local communities and the Applicant.

Table 4.1: Proposed Noise Envelope Management Framework

| Control Measure and Time Period | Limit | Threshold | Target (for management) |
|---|---|---|---|
| Night-time Quota Period – Movement Cap | 9,650 movements over 12-month rolling average | 90% of limit | - |
| Night-time Quota Period – QC Cap | 12-month rolling average. Value to be determined | 90% of limit | - |
| Annual Movement Cap | 12-month rolling average. Value to be determined | 90% of limit | - |
| Average Summer Day – Daytime | Area enclosed by 54 dB $L_{Aeq,16hr}$ | 85% of limit | Quota based target to be derived to be equivalent |

| | | | |
|---|---|---|---|
| | contour. Numerical value to be determined | | to threshold value but provide forward looking control that must be monitored through forecasting and scheduling |
| Average Summer Day – Night-time | Area enclosed by 48 dB $L_{Aeq,8hr}$ contour. Numerical value to be determined | 85% of limit | Quota based target to be derived to be equivalent to threshold value but provide forward looking control that must be monitored through forecasting and scheduling |
| Noise Violation Limits | Noise violation limits to be applied at current locations. Limit values to be graded based on departure QC of aircraft. | | |

4.1.9 The 'size' of the noise contours in **Table 4.1** will be determined based on the Environmental Statement that accompanies the DCO application. These limits will be set such that the benefits in aircraft technology from new generation and next generation aircraft will be shared between the airport operator and the local communities. The sharing of benefits of new aircraft technology can be demonstrated through a reduction in noise contour areas compared to the 2019 baseline.

4.1.10 Our expectation is that changes in contour area resulting from any airspace change proposals will be accommodated within the DCO Noise Envelope (unless approved as a change to the DCO).

4.1.11 Accommodating airspace change in the Noise Envelope provides another range of noise mitigation measures that can be called upon to achieve growth alongside reduced noise impact in the event that either A321neo noise performance does not improve, or next generation aircraft are either no quieter or perhaps noisier than the new aircraft coming into the fleet now.

4.1.12 The NEDG will continue to meet throughout the development of the application to agree recommendations for the values of such limits and controls to manage aircraft noise that will be submitted as part of the application for development consent. The measures set out for the management and enforcement of GCG will form the mechanism for ensuring compliance with the limits set out within the Noise Envelope.

# 5 AIRSPACE MODERNISATION

5.1.1 This section covers potential noise improvements that may occur due to the redesign of UK airspace, which is taking place in parallel with the application for development consent.

5.1.2 Airspace redesign for the airport is part of a much larger process involving modernisation of airspace across the whole of the South East of England, which requires substantial coordination across all airports and with National Air Traffic

Services (NATS). As is the case for other airport expansion proposals, the process of securing consent for development and for airspace change is subject to two separate processes and timescales.

5.1.3 Much of the UK's airspace structure was designed in the 1950s and 1960s. It was designed around ground-based navigation systems and does not currently make best use of modern technologies. The airspace over the south east of England has the highest volume of traffic across the country and some adaption of the historic airspace has been necessary to accommodate the growth to date.

5.1.4 The current inefficient airspace can lead to delays to passengers and constrains the number of flights that can safely be handled over the south east of England. With demand for air travel expected to continue to grow, it is recognised by the UK Government, in its recent consultation on the future of UK Aviation: Aviation 2050, that changes to the airspace are now necessary to prevent increases in passenger disruption, economic costs and environmental impacts.

5.1.5 NATS states that the airport may be a significant beneficiary of airspace redesign through the suggestion that the 55 dB noise contour (unspecified noise metric) may reduce by 28% as a potential outcome of airspace redesign base on one optimised scenario (Ref. 15). Whilst this is only an indicative figure pending finalisation of the new airspace design, it does suggest that it is likely there will be noise benefits in the areas around the airport from the modernisation of airspace.

5.1.6 Changes are being made to arrival routes to the airport, through an airspace change known as AD6, which will be implemented from 24th February 2022. However, the changes in approaches are only expected to affect communities at distance from the airport with results showing that there is a marginal change in properties exposed to air noise levels exceeding the LOAEL (Ref. 16). Consequently, airspace redesign has not been considered further in this PEIR.

5.1.7 The airport has initiated its airspace change proposal as part of Future Airspace Strategy Implementation South. This proposal has reached the Option Development stage but cannot progress to the next stage until the next iteration of the overall airspace Masterplan is approved. Hence, the timescale for any specific changes that would be made to departure routes from the airport is not yet clear.

5.1.8 A key technology that will replace the current ground-based navigation system in the modernising airspace will be satellite-based Performance Based Navigation (PBN). This technology has the ability to allow clearly defined approach and departure routes to be defined and will accurately provide pilots and air traffic controllers with a predicted trajectory that identifies the point at which an aircraft will arrive in certain airspace.

5.1.9 More accurate information from the PBN system is expected to allow historical airspace protocols, such as 'stacking', to be abandoned in favour of more direct routings on arrival to airports. The reduction in aircraft holding stacks will allow the use of more continuous climbs and descents. the airport is particularly constrained by the Bovingdon stack so the most immediate benefit from

airspace redesign is likely to occur due to the lifting of altitude constraints imposed by the Bovingdon stack.

5.1.10 PBN will enable aircraft to follow a more precise route so aircraft routes may become narrower and more concentrated than today. This means that while the overall area subject to noise may reduce, noise may become more concentrated for some. However, due to the more precise routing of aircraft, more routes can be established within the same amount of airspace. These additional routes can introduce the potential to provide noise respite as there may be opportunity to vary the routes flown. Consideration of avoiding populated areas and 'quiet areas' (to be defined through the airspace design process) will be undertaken during the redesign of the airport's airspace.

5.1.11 Any proposed designs will look to meet the design principles selected by stakeholders in Stage 1 of the CAP 1616 process, which includes exploring route designs that provide respite. Whether modernised airspace leads to one concentrated route or utilises multiple routes to provide respite; airspace redesign will be subject to consultation with local communities prior to a final design in 2024.

5.1.12 A summary of the key measures to be explored in the redesign of the airspace that may be implemented to reduce noise include:

a. use a single route to minimise the number of people overflown;
b. provision of multiple routes to allow noise predictable periods of respite for affected local communities;
c. departing aircraft following an efficient continuous climb route to reach 7,000ft; and
d. arriving aircraft using an efficient continuous descent to the runway.

5.1.13 Our expectation is that changes in contour area resulting from any airspace change proposals will be accommodated within the DCO Noise Envelope (unless approved as a change to the DCO).

# 6 GROUND NOISE

6.1.1 For safety reasons, aircraft must undergo regular maintenance checks. Following any engine changes a series of engine ground runs will be carried out. Engine ground running activities are restricted to the purpose-built noise attenuated engine run-up bay (ERUB).

6.1.2 The ERUB would be moved in the Proposed Development towards the east end of the runway shown as Work No. 2g in **Figure 4.3** provided in Volume 4 of the PEIR. The existing area screens receptors through use of a bund, which is estimated from ground height data to be approximately 5m in height. The new ERUB will be an enclosure with an open side facing roughly south and will be 12m in height and provide enhanced levels of screening of engine testing activities over the current arrangement.

6.1.3 Noise generated by ground operations can be further minimised through the following measures:

a. Aircraft taxiing management measures will be adopted to ensure efficient operations on the ground to minimise taxi times and time spent idling by an aircraft waiting to depart or at an occupied gate will be minimised.
b. Auxiliary Power Units (APU) are used on aircraft as a power source while the main engines are turned off. The use of APUs is restricted and aircraft are encouraged to used quieter Ground Power Units as an alternative.
c. Use of APUs at gates will be minimised through provision of fixed electrical ground power units at the new terminal.
d. Aircraft will be encouraged to taxi from the landing runway to the gate with one engine switched off where practicable.

# 7 SUMMARY OF NOISE MANAGEMENT MEASURES

| Action | Performance Indicator | Target |
|---|---|---|
| **Reduction of Noise at Source** | | |
| To phase out noisier aircraft and encourage the use of quieter aircraft | % Chapter 4 aircraft | 100% aircraft to be Chapter 4 or equivalent by 2022 |
| | % Chapter 14 aircraft | At least 95% aircraft to be Chapter 14 or equivalent by 2035 |
| **Land Use Planning and Noise Management** | | |
| Review publications on the Low Noise Arrival Metric and explore the possibility of adopting | Evidence of work | To assess the Low Noise Arrival metric and whether it can be implemented |
| Introduce reduced landing charges to incentivise operators to adopt new quieter aircraft technology and review biennially | Publication of landing charges | Introduce new landing charges in 2022 |
| Reduce the Maximum Noise Violation Limits (NVL) for departing aircraft and biennially review the penalties to ensure it remains effective in seeking to reduce departure noise. | Reduction of NVL's. | Reduced NVL's to 80dB during the day time and 79dB in January 2020 |
| Enforce NPR track violation fining system and review biennially | % aircraft on the approved Noise Preferential Route | All aircraft to keep to the approved Noise Preferential Routes for departures, unless safety or weather avoidance reasons apply. Investigate each violation, monitor, and identify measures to reduce further. |
| To listen to stakeholders and help to reduce the number of noise related complaints | Response times for noise related complaints | Respond to noise related complaints within 8-days |
| | Number of noise related complaints and complainants | Monitor and report on the number of noise related complaints each year |
| To monitor noise effectively and report results | Publication of noise monitoring results | Report on targets quarterly |

| Action | Performance Indicator | Target |
|---|---|---|
| Explore the possibility of increasing permanent noise monitoring stations on departure routes to monitor noise at further distances than 6.5 km | Evidence of works | Assess the benefit of additional permanent noise monitors |
| Provide an updated noise compensation scheme to that improves on the current scheme | Number of properties provided with full insulation package | Provide a noise insulation package for habitable rooms of properties within the 60 dB $L_{Aeq,16h}$ noise contour in accordance with Aviation 2050 |
| **Noise Abatement and Operational Procedures** | | |
| Undertake a review of Noise Abatement Departure Procedures used at the airport to evaluate their effectiveness and work with airline partners to identify and implement improvements. | Evidence of the review. | To assess the effectiveness and establish targets for noise reduction. |
| Work with Air Traffic Control, airlines and local communities' stakeholders to explore opportunities to facilitate more continuous climb operations (CCO). | Evidence of work. | Explore opportunities and make appropriate changes to facilitate more CCO's |
| Work with airline partners to promote and encourage the adoption of low power, low drag procedures such as delayed landing gear deployment in order reduce noise from arriving aircraft. | % of aircraft using low power, low drag procedures. | Increase the number of operators using low power, low drag procedures. |
| Work with our airline partners to improve performance relating to Continuous Descent Approach (CDA) with the aim of reducing the noise impact to the communities below. | % aircraft using a Continuous Descent Approach | 95% aircraft to adopt a Continuous Descent Approach, where practicable, by 2022 |
| Explore the possibility of introducing steeper approaches | % of operations on Slightly Steeper Approach | Assess if Slightly Steeper Approaches can be adopted |

| Action | Performance Indicator | Target |
|---|---|---|
| | | and implement recommendations by 2025 |
| Explore the possibility of adopting displaced thresholds for executive jets at night | Evidence of work | Assess the noise benefit and safety constraints of operating displaced thresholds |
| To keep up-to-date with the latest research on the impact of noise and noise interventions | Amount of money spent on research. | Monitor the amount of funding provided for research into the impact of noise and noise interventions<br>Issue annual reports on the latest research findings |
| **Operating Restrictions** | | |
| Operate within the night quota period movement limit | Aircraft movements in the night quota period published annually | A maximum of 9,650 aircraft movements over a rolling 12-month period during the night quota period |
| Produce a Noise Envelope containing enforceable limits or thresholds | Production of a Noise Envelope | Noise Envelope to be developed and submitted as part of the DCO application |
| **Airspace Modernisation** | | |
| Work with community stakeholders to develop a plan to protect quiet areas as defined by UK government policy. | Identification of quiet areas | Develop a plan and ensure this is protecting quiet areas. |
| Use the airspace modernisation process to explore options to reduce the noise impact at communities affected by aircraft noise through measures such as efficient continuous climbs and descents, and provision of respite through multiple routes | Evidence of works | Submit airspace designs to CAA within designated time periods. |
| **Ground Noise** | | |
| Continue to promote and encourage the use of single engine taxi procedures at the airport. | Minutes of FLOPC meetings. | Increase the number of aircraft using single engine taxi procedures, as recorded by airlines. |

| Action | Performance Indicator | Target |
|---|---|---|
| The use of Aircraft Auxiliary Power Units will be monitored and restrictions on their use enforced. | Minutes of FLOPC meetings. | Ensure operators are aware of the APU procedures at Flight Operations Committee meetings. |
| Engine testing will only take place in the purpose-built ERUB. | Minutes of FLOPC meetings. | Restrict engine testing to the designated engine testing area |
| Engine testing will be restricted to daytime periods only. | Minutes of FLOPC meetings. | Restrict engine testing for aircraft in the daytime period only. |
| To supply aircraft ground power requirements through fixed electrical ground power. | % of aircraft using Fixed Electric Ground Power on new stands | To have Fixed Electric Ground Power and target a zero use of Auxiliary Power Unit and Ground Power Unit in Terminal 2 stands, unless in emergencies or the event of FEGP failure. |
| Taxiing of aircraft will be managed so the time spent idling by an aircraft waiting to depart or at an occupied gate will be minimised. | Minutes of FLOPC meetings. | Reduce aircraft idle time at stands and runways. |
| Aircraft taxiing will be regulated to prevent aircraft operating with excessive engine use. | Minutes of FLOPC meetings. | Reduce unnecessary engine use during taxiing, as recorded by airlines. |

# GLOSSARY AND ABBREVIATIONS

| Term | Definition |
|---|---|
| APU | Auxiliary Power Unit |
| CAA | Civil Aviation Authority |
| FLOPC | Flight Operations Committee |
| ICAO | International Civil Aviation Organization |
| the Applicant | London Luton Airport Limited |
| the airport | London Luton Airport |
| NADP | Noise Abatement Departure Procedures |
| NAP | Noise Action Plan |
| NATS | National Air Traffic Services |
| NPR | Noise Preferential Route |
| NVL | Noise Violation Limits |
| MTOW | Maximum Take-off Weight |
| ONMP | Operational Noise Management Plan |
| PBN | Performance Based Navigation |
| PEIR | Preliminary Environmental Information Report |

# REFERENCES

Ref 1 Statutory Instruments 2006 No 2238, The Environmental Noise (England) Regulations 2006.
Ref 2 London Luton Airport (2014), *Noise Action Plan 2019-2023*.
Ref 3 International Civil Aviation Organization (2001), *Assembly Resolutions in Force*.
Ref 4 European Parliament and Council of the European Union (2014), Regulation (EU) No 598/2014.
Ref 5 Statutory Instruments 2018 No 785, The Airports (Noise-related Operating Restrictions) (England and Wales) Regulations 2018
Ref 6 Civil Aviation authority. DR Report 8402: United Kingdom Aircraft Noise Study: Main Report.
Ref 7 Airports Commission (2014); Appraisal Framework
Ref 8 Department for Transport (2017), *Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace*.
Ref 9 Department for Transport (2017), *Air Navigation Guidance*.
Ref 10 Association of Noise Consultants/ Institute of Acoustic/ Chartered Institute of Environmental Health (2017); Professional Practice Guidance: Planning and Noise.
Ref 11 International Civil Aviation Organisation (2002); Airport Planning Manual, Part 2 — Land Use and Environmental Control.
Ref 12 Civil Aviation Authority (2018), CAP 1691 Departure Noise Mitigation: Main Report.
Ref 13 Department for Transport (2018) Airports National Policy Statement: new runway capacity and infrastructure at airports in the South East of England, ISBN 978-1-5286-0441-3, CCS0518695116 06/18
Ref 14 International Civil Aviation Organization (2006), Procedures for Air Navigation Services Volume 1: Flight Procedures
Ref 15 Department for Transport (2018), Airspace Modernisation Supporting Document, Q4 of Appendix A.
Ref 16 NATS/ London Luton Airport (2020), *Proposed Changes to London Luton Airport Arrivals Airport Consultation Document*.