

# LONDON CITY AIRPORT

## NOISE CONTOUR STRATEGY 2022

Report to

London City Airport  
Hartmann Road  
London  
E16 2PX

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20 October 2022

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## 1.0 INTRODUCTION

The City Airport Development Programme (CADP1) planning application (13/01228/FUL) was granted planning permission by the Secretaries of State for Communities and Local Government and Transport in July 2016 following an appeal and public inquiry which was held in March/April 2016.

Condition 33 of the CADP1 permission is as follows:

*The area enclosed by the 57dB LAeq 16hr Contour shall not exceed 9.1 km<sup>2</sup> when calculated by the Federal Aviation Authority Integrated Noise Model Version 7 or later version.*

*Within five years of the Commencement of Development a Noise Contour strategy shall be submitted to the local planning authority for approval in writing which defines the methods to be used by the Airport operator to reduce the area of the Noise Contour by 2030.*

*Thereafter the Airport shall be operated in accordance with the approved Noise Contour strategy. The approved Noise Contour strategy shall be reviewed not later than the 5th year after approval and every 5th year thereafter in order to seek further reductions in the size of the Noise Contour by 2030 and beyond. The reviews shall be submitted to the local planning authority for approval in writing within 3 months of such review dates and implemented as approved.*

This report responds to above by detailing a Noise Contour Strategy (NCS). It also details the existing noise management measures at the airport and how these fit into the proposed NCS, including a discussion of the key factors that control the area of a noise contour. The report concludes with the expected outcome of the strategy.

For clarity, this strategy is based on the existing consents for the airport.

A glossary of acoustic terminology is included in Appendix 1.

## **2.0 EXISTING NOISE MANAGEMENT**

The current noise management at LCA is summarised in Appendix 2 which reproduces Section 6 from the airport's current (2018-2023) Noise Action Plan<sup>1</sup> (NAP).

Those elements that specifically relate to the Noise Contour are given below.

- 6.1 Aircraft Movement Limits
- 6.4 Departure and Arrival Procedures
- 6.5 Noise Management and Mitigation Scheme (NOMMS)
  - 6.5.1 Combined Noise and Track Monitoring System
  - 6.5.2 Quiet Operating Procedures
  - 6.5.3 Incentives and Penalties Scheme
  - 6.5.6 Annual Noise Contours
  - 6.5.7 Reverse Thrust
- 6.7 Aircraft Noise Categorisation Scheme (ANCS)

Two of these, the NOMMS and ANCS, are regularly reviewed with LBN.

The UK Aeronautical Information Package (AIP) for LCA outlines the restrictions on aircraft operators and on aircraft movements to aid in controlling noise emissions. These procedures have been in place for a number of years. The current restrictions are reproduced in Appendix 2.

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<sup>1</sup> [https://assets.ctfassets.net/ggj4kbqgcch2/5OvmkWej5kwQopprH5T90P/995d6f59b252e1df2c92318e656c69bf/LCY\\_Noise\\_Action\\_Plan\\_2018-2023.pdf](https://assets.ctfassets.net/ggj4kbqgcch2/5OvmkWej5kwQopprH5T90P/995d6f59b252e1df2c92318e656c69bf/LCY_Noise_Action_Plan_2018-2023.pdf)

### **3.0 NOISE CONTOUR REDUCTION METHODS**

The purpose of the Noise Contour Strategy (NCS) is to define the methods to be used by the airport operator to reduce the area of the Noise Contour<sup>2</sup> by 2030. The key factors that control the area of a noise contour are discussed below.

#### **3.1 Amount of Activity**

The number of aircraft movements affects the size of noise contours. The current aircraft movement numbers are already controlled by planning conditions. Compliance with these conditions is continually monitored by LCA with quarterly and annual reports provided to LBN.

#### **3.2 Aircraft Types**

Which aircraft types undertake the movements also has an effect on the size of noise contours. These are already limited by both physical restrictions, such as relatively short runway and the required steep approach, and Condition 18 which has resulted in an Aircraft Noise Categorisation Scheme (ANCS). This is applied by LCA with regular reports provided to LBN.

In addition, one of the purposes of the CADP1 application was to enable a new generation of quieter aircraft to use the airport. These quieter new generation aircraft have been in operation at LCA since 2017 and the airport is working with its airlines to encourage increased use of these quieter aircraft types. Increasing the use of these aircraft types will contribute to future reductions in the area of the Noise Contour.

One method of incentivising airlines to use quieter aircraft types is via landing fees. These are subject to commercial negotiations and are therefore confidential and bespoke to each airline, however LCA's desire to incentivise the use of next generation aircraft is a significant factor when agreeing these charges.

#### **3.3 Operation Procedures**

How the aircraft are operated also effects the size of noise contours. The existing planning conditions require the operation of a Noise Management and Mitigation Strategy (NOMMS). This shall include quiet operating procedures. LCA developed a NOMMS which was submitted to the local planning authority and formal approval received. The airport has subsequently applied the strategy and will apply any revised NOMMS agreed with LBN.

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<sup>2</sup> The 57 dB  $L_{Aeq\ 16hr}$  Contour for the summer period.

The airport also operates an incentives and penalties scheme. This scheme monitors noise levels from individual departing aircraft. The scheme encourages airlines to operate aircraft more quietly, rewarding those airlines with credits towards co-partnering LCA delivering a Community Projects Fund each year. Under the penalties part of the scheme a fixed penalty for exceeding upper noise limits is charged. The credit award thresholds and upper noise limits are regularly reviewed to ensure they remain at appropriate levels.

For some airports the details of the local airspace influence the operational procedures such that they affect the size of their noise contours. However, the extent of the 57 dB  $L_{Aeq,16h}$  contour for LCA is relatively limited, so any airspace changes are not expected to significantly affect the area of the contour.

### **3.4 Noise Contours**

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 for the upcoming year. The noise contours are regularly validated using results from the Noise and Flight Track Monitoring System (NFTMS). These noise contours are reported to LBN and are used to check compliance with the Condition 33 contour area limit. The contours can also be used to check progress towards expected future reductions in the area of the Noise Contour.

#### **4.0 NOISE CONTOUR STRATEGY**

The Noise Contour Strategy (NCS) includes several of the noise management measures that are in place at the airport. The airport is also working with the airlines to encourage the modernising of their fleets, and has facilitated the change through the provision of the airside elements of the CADP1 permission. This provides the required stands for them to operation from. Between them the NCS measures:

- control the number of aircraft operating at the airport
- control the aircraft types that can operate at the airport
- facilitate and encourage the use of quieter new generation aircraft
- require the use of quiet operating procedures
- monitor the noise from individual movements, both in the air and on the ground
- offer incentives and penalties to the airlines based on the noise of their flights
- monitor the development of the annual contours



## **5.0 EXPECTED OUTCOME**

The Noise Contour Strategy (NCS) is to define the methods to be used by the airport operator to reduce the area of the Noise Contour by 2030. To assess the expected outcome of the NCS, noise contours have been computed for various years based on forecasts of the anticipated activity taking into account the measures outlined above.

The noise contours have been produced using the methodology within the approved Air Noise Contour Validation 2022 Assessment<sup>3</sup>. This uses the Aviation Environmental Design Tool (AEDT) software developed by the US Federal Aviation Administration (FAA) which replaced their Integrated Noise Model Version 7. The AEDT software has been used to produce the contours for LCA since 2019.

The resulting forecast area of the 57 dB  $L_{Aeq,16h}$  Noise Contour is less than 9.1 km<sup>2</sup> for all of the assessed scenarios, and therefore no further measures are expected to be required. The progression of the noise contour area will be monitored until the next review of the strategy, due in 2027.

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**David Charles**  
Partner

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<sup>3</sup> Report reference: A11327\_10\_RP030\_2.0 dated 21 April 2022.  
LBN approval reference 22/02356/S106 dated 19 October 2022.

## APPENDIX 1

### GLOSSARY OF ACOUSTIC TERMINOLOGY

## **Sound**

This is a physical vibration in the air, propagating away from a source, whether heard or not.

### **The Decibel, dB**

The unit used to describe the magnitude of sound is the decibel (dB) and the quantity measured is the sound pressure level. The decibel scale is logarithmic and it ascribes equal values to proportional changes in sound pressure, which is a characteristic of the ear. Use of a logarithmic scale has the added advantage that it compresses the very wide range of sound pressures to which the ear may typically be exposed to a more manageable range of numbers. The threshold of hearing occurs at approximately 0 dB (which corresponds to a reference sound pressure of  $2 \times 10^{-5}$  Pascals) and the threshold of pain is around 120 dB.

The sound energy radiated by a source can also be expressed in decibels. The sound power is a measure of the total sound energy radiated by a source per second, in watts. The sound power level,  $L_w$  is expressed in decibels, referenced to  $10^{-12}$  watts.

### **Frequency, Hz**

Frequency is analogous to musical pitch. It depends upon the rate of vibration of the air molecules that transmit the sound and is measure as the number of cycles per second or Hertz (Hz). The human ear is sensitive to sound in the range 20 Hz to 20,000 Hz (20 kHz). For acoustic engineering purposes, the frequency range is normally divided up into discrete bands. The most commonly used bands are octave bands, in which the upper limiting frequency for any band is twice the lower limiting frequency, and one-third octave bands, in which each octave band is divided into three. The bands are described by their centre frequency value and the ranges which are typically used for building acoustics purposes are 63 Hz to 4 kHz (octave bands) and 100 Hz to 3150 Hz (one-third octave bands).

### **A-weighting**

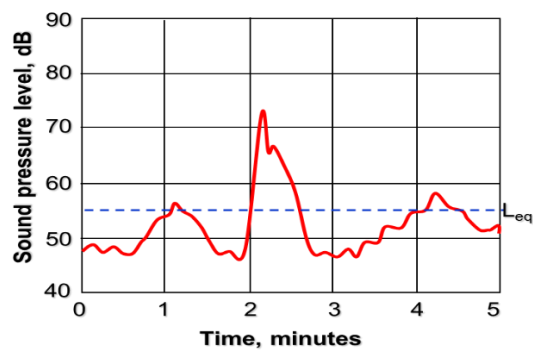
The sensitivity of the ear is frequency dependent. Sound level meters are fitted with a weighting network which approximates to this response and allows sound levels to be expressed as an overall single figure value, in dB(A).

## Environmental Noise Descriptors

Where noise levels vary with time, it is necessary to express the results of a measurement over a period of time in statistical terms. Commonly used descriptors are the  $L_{Aeq,T}$  family, where for the daytime period the value of T is 16 hours.

Statistical Term	Description
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$L_{Aeq,T}$	<p>The most widely applicable unit is the equivalent continuous A-weighted sound pressure level (<math>L_{Aeq,T}</math>). It is an energy average and is defined as the level of a notional sound which (over a defined period of time, T) would deliver the same A-weighted sound energy as the actual fluctuating sound. This is shown in the graph below:</p>
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## APPENDIX 2

### SUMMARY OF NOISE MANAGEMENT

- LCA Noise Action Plan (2018-2023) Section 6 Noise Management (Pages 13-23)
- LCA UK AIP Section 2.21 Noise Abatement Procedures



## Section 6 - Noise Management

As noted in Section 4, LCY has a number of existing noise mitigation measures already in place. As part of the CADP permission many new schemes designed to mitigate the noise impact of aircraft operations have been introduced or are being introduced, these are a requirement of the CADP planning permission. These, together with the short runway length and steep approach angle, limit the types of aircraft which can use the airport.

LCY is committed to minimising, where possible, the noise impact of its operations on the local area.

### 6.1 Aircraft Movement Limits

As part of the planning permission granted by LBN in July 2009 LBN introduced strict limits to the number of daily aircraft movements, these have been retained within the CADP permission. These include:

- 100 per day on Saturdays, 200 per day on Sundays, but no more than 280 on any consecutive Saturday and Sunday;
- 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.

Also retained in the CADP permission are the previous limits for aircraft movements which occur during specific operational periods:

- 400 aircraft movements per calendar year or 150 in any consecutive 3 months between 22.00 and 22.30 hours, or 12.30 and 13.00 hours on a Saturday;
- 6 aircraft movements between 06.30 and 06.59 hours on Mondays to Saturdays with no more than 2 in the first fifteen minutes.

In addition as part of the CADP permission a new limit of 45 scheduled movements per hour has been introduced and the annual movement limit of 120,000 movements per year has reduced to 111,000 per year.

### 6.2 Airport Operating Hours

The airport's approved operating hours are unchanged under CADP. The airport is permitted to operate flights between the following hours:

- 06.30 and 22.30 on weekdays;
- 06.30 and 13.00 on Saturdays;
- 12.30 and 22.30 on Sundays;
- 09.00 and 22.30 on Public or Bank Holidays;
- Full closure on 25th December.

There is a 24 hour period of closure from Saturday lunchtime to Sunday lunchtime. The final 30 minutes of operation on every day of the week is solely for flights scheduled earlier which have been unavoidably delayed.

## London City Airport Noise Action Plan 2018–2023

### 6.3 Management of Environmental Complaints

LCY has an environmental Complaint Management System by which anyone can contact LCY to register a complaint or request information about airport operations. Communication can be either by telephone, post, email or via the LCY website.

Each complaint or enquiry is registered by the airport, investigated, responded to and resolved where practical. All environmental complaints and enquiries are reported to LBN within 15 days, a summary of these are provided quarterly to the London City Airport Consultative Committee (LCACC) and they are reported annually in the APR.

Figures 1 and 2 present the number of environmental complaints received by LCY since 2013 in absolute terms and per 1,000 aircraft movements respectively. These are categorised as following:

- Aircraft noise – including all airborne aviation issues such as traffic frequency, flight paths, aborted approaches etc.;
- Ground noise – including aircraft and non-aircraft sources of noise such as engine runs, plant, generators, construction, road noise, maintenance and bird-scaring activities;
- Air quality – such as odours, although there were no complaints related to air quality between 2013 and 2017;
- Other – non-aviation related complaints such as alleged TV signal interference;
- Non-LCY – complaints regarding air traffic not associated with this airport.

As displayed in Figures 1 and 2 the number of noise complaints remained broadly constant until 2016. The increase in 2016 has been attributed to the introduction of RNAV departure routes, which concentrate flights along the existing flight paths, thereby reducing the total area overflown, but also leading to an increased number of overflights for those directly below the flight paths.

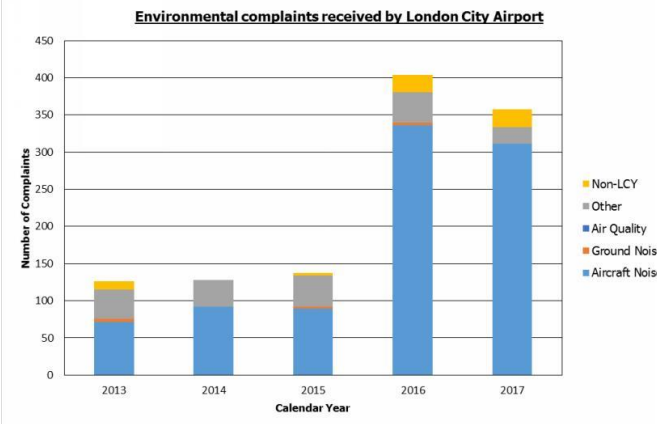


Figure 1 Total Environment complaints received by London City Airport (2013–2017)

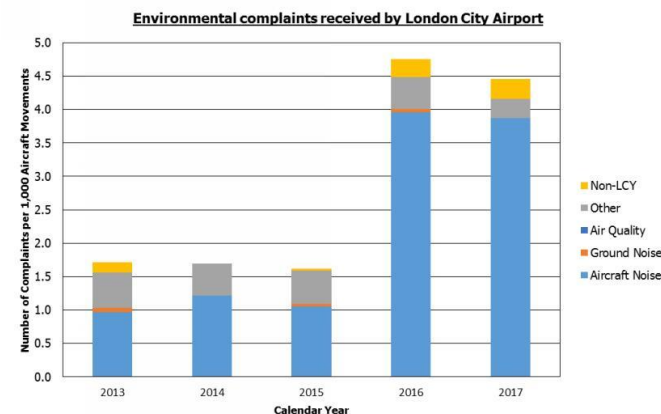


Figure 2 Environmental Complaints received by London City Airport (2013–2017) per 1,000 Aircraft Movements



#### 6.4 Departure and Arrival Procedures

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 Civil Aviation Authority. The UK Aeronautical Information Publication (AIP) for LCY outlines the restrictions on aircraft operators and aircraft movements to control noise<sup>6</sup>. These include:

- Standard noise abatement procedures for aircraft departing the airport following the Standard Instrument Departure (SID) instructions;
- Minimum requirements for aircraft departing LCY 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 LCY 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);
- Instructions for following holding patterns over the airfield.

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

<sup>6</sup> [http://www.nats-uk.ead-it.com/public/index.php%3Foption=com\\_content&task=blogcategory&id=92&Itemid=141.html](http://www.nats-uk.ead-it.com/public/index.php%3Foption=com_content&task=blogcategory&id=92&Itemid=141.html)

#### 6.5 Noise Management and Mitigation Scheme (NOMMS) (approved May 2017)

As required by planning condition LCY have produced NOMMS which is a framework to provide a robust system of noise monitoring and mitigation including the measurement and monitoring of a range of different sources of noise generated from airport operations, including air noise from aircraft arriving and departing and noise related to aircraft on the ground. NOMMS has been expanded under CADP to cover 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;
- Sound Insulation Scheme.

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

Once approved by LBN in May 2017 NOMMS replaced the previous Noise Management Scheme and Temporary Noise Monitoring Strategy.



##### 6.5.1 Combined Noise and Track Monitoring System

For many years the airport has operated a system of four noise monitors (NMTs 1-4) which are positioned close to the airport and primarily measure sideline noise as part of the Noise and Flight Track Monitoring System (NFTMS). The NFTMS has been enhanced with the addition of two further noise monitors (NMTs 5&6) which are located under the arrival and departure paths from each runway end (for a map indicating the locations of these monitors see Appendix E).

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 CADP permission. It is also used for determining credit awards and penalties as part of the Incentives and Penalties Scheme and for categorisation purposes following the introduction of the Aircraft Noise Categorisation Scheme.

A seventh mobile noise monitor (NMT7) has been added to the scheme, which is used to monitor aircraft related ground noise and also reverse thrust usage. It has been initially located close to the LBN offices in Building 1000 adjacent to the runway, but will be relocated as required.

The flight track monitoring component of the system is permanently linked to the airport's radar feed, which is provided by the local 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.

The Annual Performance Report (APR) presents results from the NFTMS including:

- Average departure and arrival noise levels by aircraft type and airline (including sideline, flyover and approach noise levels.);
- Data on reverse thrust by aircraft type and airline;
- Data on flight track keeping performance by aircraft type and airline relative to corridors associated with departure standard instrument departure routes.

##### 6.5.2 Quiet Operating Procedures

LCY 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 LCY, subject to the safe operation of aircraft.

Quiet operating procedures at LCY also include the following:

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



### 6.5.3 Incentives and Penalties Scheme

A scheme of incentives and penalties based on departure noise levels as measured by the NFTMS has been introduced following approval by LBN in May 2017. The penalty limits are the most stringent of any UK airport for daytime operations.

LCY are setting up and funding an annual Community Projects Fund which will be used to deliver specific project(s) in the local community. It is subject to an annual minimum of £75,000. Community projects and charities from the Local Area<sup>7</sup> can apply for funding for a specific project.

The scheme encourages airlines to operate aircraft more quietly, rewarding those airlines with credits towards co-partnering LCY delivering a Community Projects Fund each year.

<sup>7</sup>The "Local Area" Boroughs includes the 11 East London Boroughs of Newham, Tower Hamlets, Greenwich, Bexley, Lewisham, Southwark, Barking & Dagenham, Havering, Redbridge, Waltham Forest and Hackney, as well as Epping Forest District Council.



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.

### 6.5.4 Control of Ground Noise

Aircraft maintenance and repair work and ground running of aeroplane engines is restricted to certain hours set out below except in exceptional circumstances.

- 06.30 and 22.00 on weekdays;
- 06.30 and 12.30 on Saturdays;
- 12.30 and 22.00 on Sundays;
- 09.00 and 22.00 on Public or Bank Holidays.

The time of any engine ground running on the apron for maintenance is monitored. There is a ground running noise limit of 60 dB L<sub>Aeq,12h</sub> 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, LCY will take action as necessary to ensure the limit is not exceeded. Any excessive or unnecessary operation of aircraft engines is investigated by the airport.

An Electronic Flight Progress Strips (EFPS) system has been installed at LCY which provides the ability to monitor the time that aircraft operate engines on the ground, from engine start-up until the time of departure 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 will be investigated by the airport and measures will be identified to reduce the engine running time as far as possible.

The use of Fixed Electrical Ground Power (FEGP) on stands at LCY reduces the impact of noise with the reduction of the use of mobile Ground Power Units (GPUs) which run on diesel. The use of mobile GPUs will be banned from the end of 2020, until then their use is restricted to the airport's operational hours and 30 minutes before and after. FEGP is already installed at Stands 1-10 and 15 and as part of the CADP permission is required to be installed on any new or altered stands prior to their use and on Stands 12-14 within one year of delivering any new or altered stands.

At LCY the use of auxiliary power units is limited to a maximum of 10 minutes before departure from the stand and 10 minutes after arrival except under exceptional circumstances.

### 6.5.5 Ground Noise Studies

LCY are required to conduct a Ground Noise Study every three years. Three such studies have been undertaken to date in 2010, 2013 and 2016.

The 2010 Ground Noise Study was reviewed by LBN with no additional noise mitigation measures required. Noise measurements made in 2013 and 2016 were not significantly different to those measured in 2010.

### 6.5.6 Annual Noise Contours

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.

The CADP planning permission has introduced a limit on the area of the 57 dB L<sub>Aeq,16h</sub> contour of 9.1 km<sup>2</sup> and LCY are required to produce a Noise Contour Strategy that seeks to reduce the area of the noise contours by 2030 and beyond. The noise contours are also used for determining eligibility under the Sound Insulation Scheme.

### 6.5.7 Reverse Thrust

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.

### 6.5.8 Sound Insulation Scheme

#### Residential

As part of the CADP permission, the Airport has upgraded its two tier scheme to an improved three tier scheme, offering sound insulation treatment to eligible residential properties within the 57 dB  $L_{Aeq,16h}$  (Tier1) and 66 dB  $L_{Aeq,16h}$  (Tier 2) and adding a third tier for properties within the 63 dB  $L_{Aeq,16h}$  (Tier 3) noise contour. 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 scheme 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.

Properties within the 57 dB  $L_{Aeq,16h}$  contour (Tier 1) are eligible for works to achieve an average sound reduction of not less than 25 dB. Properties with double glazed windows will already meet this acoustic standard. Properties with single glazing are offered 100% of the costs of secondary glazing or 100% of the costs of thermal double glazing.

The eligibility daytime noise contour level of 57 dB  $L_{Aeq,16h}$  is more stringent than that used at other UK airports. Some local homes are not eligible for Tier 1 works as they were built inside the airport's noise contours after particular dates when the growth of the airport and its noise impact would have been known by developers. Partly as a result of a higher standard of glazing required under Building Regulations and partly as a result of planning conditions attached to the relevant planning permissions, those developers were required to install adequate sound insulation during construction of the property.

Eligible properties within the 66 dB  $L_{Aeq,16h}$  noise contour (Tier 2) are offered a higher standard of noise reduction and, following CADP, the scheme has now been enhanced to provide 100% of the cost of high performance double glazing.

As part of the CADP permission, an additional intermediate tier (Tier 3) has been introduced for properties within the 63 dB  $L_{Aeq,16h}$  noise contour. This provides acoustic vents and either secondary glazing or a grant of £3,000 towards high performance double glazing.

A detailed list of the latest residential properties eligible for works under the scheme can be found on the LCY Consultative Committee website:

<http://lcacc.org/meeting-papers-key-documents/airport-annual-performance-report/>

#### Purchase Offer

Any eligible property within the 69 dB  $L_{Aeq,16h}$  contour will receive an offer from the airport to purchase the property at the open market value within 6 months of the owner/occupier making an application for the airport to do so. To date no eligible properties have been identified as being within the 69 dB contour.

#### Construction Noise Sound Insulation Scheme

As part of the CADP permission, as well as an enhanced sound insulation scheme to mitigate aircraft noise, LCY are also providing advanced sound insulation for properties close to the airport to mitigate the noise impacts from construction activities. Nearly 600 properties have been offered treatment under this scheme, providing high performance double glazing and acoustic ventilation.

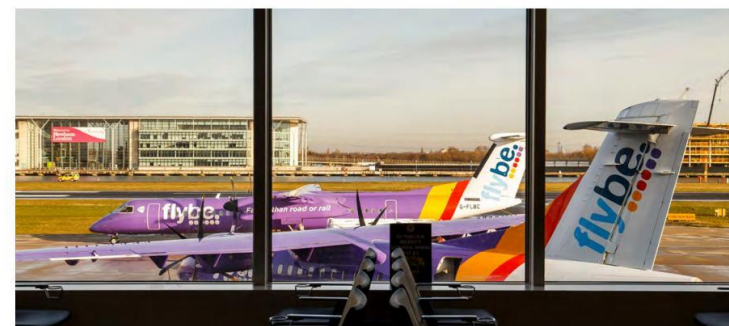
### Noise Insulation Payment Scheme (NIPS)

The airport is committed to a scheme where any new residential developments within the 57 dB or 66 dB  $L_{Aeq,16h}$  noise contours which received planning permission but had not been built as of 9th July 2009 will benefit from a noise insulation payment scheme that funds during construction any additional works anticipated as a result of the airport's 2009 planning approval, over and above any pre-agreed planning conditions (or Building Regulations standards) with regard to external sound insulation.

As part of the CADP permission the NIPS has now been extended to developments within the 57 dB, 63 dB or 66 dB  $L_{Aeq,16h}$  CADP contours, but outside the corresponding 2009 planning contours, if the development was granted planning permission prior to the CADP planning permission in July 2016.

#### Public Buildings

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



### 6.6 Noise Factored Movements (NFM)

All aircraft operating at LCY are required to demonstrate their ability to operate within one of five departure Noise Categories, as shown in Table 1.

The Noise Reference Level is the departure noise level as measured at NMTs 1-4. It is expressed in PNdB and calculated using an established procedure described in the CADP permission.

Category of Aircraft	Noise Reference Level	Noise Factor
A	91.6–94.5	1.26
B	88.6–91.5	0.63
C	85.6–88.5	0.31
D	82.6–85.5	0.16
E	Less than 82.6	0.08

Table 1: Aircraft Noise Categories

As this table demonstrates, LCY has an upper noise limit of 94.5 PNdB based on an annual average of departure noise levels for a given aircraft type and therefore only those aircraft categorised as Category A or less are permitted to operate at LCY.



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Each category is also assigned a noise factor as shown in Table 1 above and there is currently a limit of 120,000 noise factored movements per year. In addition noise factored movements are restricted to 125% of the weekly movements limit.

### 6.7 Aircraft Noise Categorisation Scheme (ANCS)

A new Aircraft Noise Categorisation Scheme (ANCS) has been introduced at the airport based on a noise quota count (QC) system. The scheme has been running alongside the existing noise factored system since January 2018. After one year of operating simultaneously the NFM system is due to be replaced by the ANCS. Under the ANCS each aircraft type will be assigned a separate quota count (QC) for arrivals and for departures, based on their certification noise levels and categorised into 1 dB bands, rather than the 3 dB bands used in the existing NFM system. The noise level bands that correspond to each QC score are shown in Table 2. The quota count system is similar to that operated at many UK airports at night.



Noise Level Band, EPNdB	QC Score
94 - 94.9	2
93 - 93.9	1.6
92 - 92.9	1.25
91 - 91.9	1
90 - 90.9	0.8
89 - 89.9	0.63
88 - 88.9	0.5
87 - 87.9	0.4
86 - 86.9	0.315
85 - 85.9	0.25
84 - 84.9	0.2
83 - 83.9	0.16
82 - 82.9	0.125
81 - 81.9	0.1
80 - 80.9	0.08
79 - 79.9	0.063
78 - 78.9	0.05
77 - 77.9	0.04
76 - 76.9	0.0315
75 - 75.9	0.025
74 - 74.9	0.02
73 - 73.9	0.016
72 - 72.9	0.0125
71 - 71.9	0.01
70 - 70.9	0.008
69 - 69.9	0.0063
68 - 68.9	0.005

Table 2: QC Scores

Certification noise levels are measured in EPNdB and are assessed according to a standardised procedure set out by the International Civil Aviation Organisation (ICAO). The certification noise levels are measured at three points known as approach, sideline and flyover as shown in figure 3. As the certification noise levels are assessed with an approach angle of 3°, an adjustment is made to the arrival certification noise levels to allow for the 5.5° approach used at LCY.

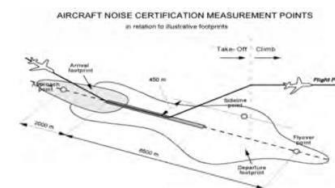


Figure 3 Certification Measurement Points<sup>8</sup>

By allowing for arrival and flyover noise the ANCS takes into account communities to the east and west of the airport, in addition to those to the north and south who were already taken into account under the NFM system.

The ANCS QC system has an annual limit designed to be equivalent to the NFM limit of 120,000 noise factored movements. The annual QC limit has initially been set at 22,000 per calendar year, with a maximum of 742.5 in any single week. These limits will be reviewed after the first year of operation and periodically after that.

Under the ANCS all aircraft that operate at LCY must comply with the noise requirements of ICAO Chapter 4<sup>9</sup>. In addition no aircraft louder than those permitted to operate at LCY under the NFM system will be allowed to operate under the ANCS.

The following noise level limits will be applied:

- Flyover: 88.0 EPNdB;
- Sideline: 93.5 EPNdB;
- Approach 98.0 EPNdB.<sup>10</sup>

The sum of the certification noise levels at each of the three positions must also be less than 271 EPNdB.

### 6.8 Permanent Eastern Apron Extension Noise Barrier

As part of the CADP permission a new noise barrier is being installed prior to the use of the new aircraft stands on the eastern apron.

### 6.9 Mitigation measures and residual Noise Impact Assessment

It is important to recognise that the NAP's primary purpose is to determine if the various mitigation techniques employed by the airport are protecting the local community by mitigating resulting noise impacts from the airport operation. This is assessed in Appendix A and indeed forms part of the overall conclusion of the performance of the NAP in Section 7.

<sup>9</sup> Chapter 4 of Annex 16 to the Convention on International Civil Aviation, Environmental Protection, Volume 1, Aircraft Noise

<sup>10</sup> This relates to the specific noise certification level on approach given in the aircraft's noise certificate (which relates to an approach at 3 degrees) rather than the Arrival Level used for determining QC scores as described above (which relates to an approach at 5.5 degrees.)

<sup>8</sup> Reproduced from ERCD Report 0205 Quota Count Validation Study: Noise Measurements and Analysis, Civil

## 5 HELICOPTER OPERATIONS

- a) Use of the airport by helicopters is not permitted without prior authorisation from the Airport Authority.
- b) See EGLL AD 2.22 and chart AD 2-EGLL-3-2 for details of helicopter procedures within the London CTR and London City CTR.

## 6 USE OF RUNWAYS

- a) Minimum Runway Occupancy Time - Departing Aircraft.
  - i. The crew of departing aircraft must inform ATC if they are not ready for departure when instructed by ATC to line-up.
  - ii. Whenever possible, cockpit checks should be completed prior to line-up and any checks requiring completion when lined-up on the runway should be kept to the minimum required.
  - iii. Pilots not able to comply with these requirements should notify City Tower as soon as possible.
- b) Minimum Runway Occupancy Time - Arriving Aircraft.
  - i. Pilots are reminded that prompt exit from the runway enables ATC to apply minimum spacing on final approach that will achieve maximum runway utilisation and will minimise the occurrence of 'go-arounds'.
  - ii. When landing Runway 09, TWY Foxtrot is not to be used as a RET. Any aircraft that continues landing roll beyond TWY Kilo may infringe the ILS critical area.
  - iii. When landing on Runway 27, A318, BCS1 and E290 pilots should plan to exit at Hold Delta (after a back-track if required). A318, BCS1 and E290 aircraft are not permitted to exit via Holds Charlie, Bravo, or Alpha. All other aircraft types may use any exit to vacate the runway except Hold Echo which shall only be used when specifically instructed by ATC. Pilots should be aware that use of Hold Alpha will increase Runway Occupancy Time.
  - iv. Pilots expecting to use the full runway length to stop (e.g. due aircraft weight/meteorological conditions) are requested to inform Thames Radar on first contact.
- c) The end of the 336 M TDZ is marked with two pairs of white inset high intensity lights. This visual reference may be lost prior to landing depending on point of touchdown and attitude of the aircraft. If during final approach it is anticipated that the touchdown point will be outside this area, a missed approach procedure should be initiated.

## 7 TRAINING

- a) Only training necessary for the operation of aircraft at the aerodrome will be permitted. All training is subject to the approval of the Airport Director.

### EGLC AD 2.21 NOISE ABATEMENT PROCEDURES

- a) Noise abatement procedures for aircraft departing London City and joining Controlled Airspace are included in the appropriate Standard Instrument Departure (SID) instructions.
- b) Aircraft departing London City CTR/CTA into the FIR or departing on training flights within the London City CTR/CTA are to climb straight ahead to a minimum of 1000 ft aal before turning on track unless otherwise instructed by ATC.
- c) Aircraft making approaches to London City without assistance from the ILS shall follow a descent path which will not result in its being at any time lower than the approach path that would be followed by an aircraft using the ILS glide path.
- d) Pilots of aircraft carrying out visual approaches to Runway 09 and Runway 27 shall not fly below altitude 1600 ft and 1500 ft respectively until established on the final approach.

### EGLC AD 2.22 FLIGHT PROCEDURES

## 1 PROCEDURES FOR INBOUND AIRCRAFT

### a) Standard Arrival Routes - London City

The standard routes for inbound aircraft are detailed in the Standard Arrival Routes (STAR) shown at AD 2-EGLC-7-STAR Charts.

### b) RNAV 1 IFR Arrivals from the ATS En-Route Structure via JACKO or GODLU

Aircraft and crews equipped and approved for RNAV 1 operations can expect to be cleared to fly an RNAV1 Transition as detailed in AD 2-EGLC-7-RNAV 1 Charts.

### c) Non-RNAV1 IFR Arrivals from the ATS En-Route Structure via JACKO or GODLU

After passing JACKO or GODLU, non-RNAV1 arrivals will be vectored by ATC for arrival at London City for the appropriate approach procedure.

**Note:** In the event of RCF the procedures detailed in EGLC AD 2.22 paragraph 3 are to be followed.

### d) Inbound Speed Control